



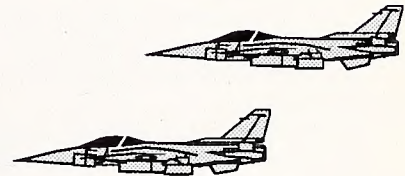
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# FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE COLORADO AIRSPACE INITIATIVE

VOLUME II – Appendices



August 1997

## ABBREVIATIONS AND ACRONYMS LIST

ACBT	Air combat training	KIAS	knots indicated airspeed
ACC	Air Combat Command	LANTIRN	Low-Altitude Navigation Targeting Infrared for Night
AFB	Air Force Base	lbs	pounds
AFI	Air Force Instruction	L <sub>dn</sub>	Day-Night Average Sound Level (A-weighted)
AFR	Air Force Regulation	L <sub>dnmr</sub>	Onset Rate-Adjusted Monthly Day-Night Average Sound Level (A-weighted)
AGL	Above ground level	LOWAT	Low-Altitude Air-to-Air Training
AMRAAM	Advanced Medium Range Air-to-Air Missile	MAILS	Multiple Aircraft Instantaneous Line Source
ANG	Air National Guard	MAP	municipal airport
ANGB	Air National Guard Base	MEA	minimum en route altitude
ANGRC	Air National Guard Readiness Center	MOA	Military Operations Area
AQCR	Air Quality Control Region	MOU	Memorandum of Understanding
ATC	Air Traffic Control	mph	miles per hour
BAM	Bird Avoidance Model	MSA	Metropolitan Statistical Area
BASH	bird-aircraft strike hazard	MSL	mean sea level
BDU	Bomb Dummy Unit	MTR	Military Training Route
BLM	Bureau of Land Management	NAAQS	National Ambient Air Quality Standards
CAI	Colorado Airspace Initiative	NEPA	National Environmental Policy Act
CDOW	Colorado Division of Wildlife	NGB	National Guard Bureau
CEQ	Council on Environmental Quality	NHPA	National Historic Preservation Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	NM	nautical mile (approximately 1.15 statute mile)
CFR	U.S. Code of Federal Regulations	NO <sub>2</sub>	nitrogen dioxide
CIG	Citizen Information Group	NOA	Notice of Availability
CO	carbon monoxide	NOAA	National Oceanic and Atmospheric Administration
COANG	Colorado Air National Guard	NOI	Notice of Intent
dB	decibel	NOTAM	Notice to Airmen
DEIS	Draft Environmental Impact Statement	NO <sub>x</sub>	nitrogen oxides
DIA	Denver International Airport	NPDES	National Pollutant Discharge Elimination System
DOD	Department of Defense	NPS	National Park Service
DOPAA	Description of the Proposed Action and Alternatives	NRHP	National Register of Historic Places
DOT	U.S. Department of Transportation	NWR	National Wildlife Refuge
EA	Environmental Assessment	O <sub>3</sub>	Ozone
EIAP	Environmental Impact Analysis Process	OSHA	Occupational Safety and Health Administration
EIS	Environmental Impact Statement	Pb	Lead
EPA	Environmental Protection Agency	PM <sub>10</sub>	particulate matter with aerodynamic diameter less than 10 microns
ESA	Endangered Species Act	ppm	parts per million
FAA	Federal Aviation Administration	PSD	Prevention of Significant Deterioration
FAR	Federal Aviation Regulations	RCRA	Resource Conservation and Recovery Act
FEIS	Final Environmental Impact Statement	ROD	Record of Decision
FEMA	Federal Emergency Management Agency	ROI	region of influence
FG	Fighter Group	SARA	Superfund Amendments and Reauthorization Act
FICON	Federal Interagency Committee on Noise	SAT	Surface Attack Tactics
FICUN	Federal Interagency Committee on Urban Noise	SEL	Sound Exposure Level
FL	Flight Level	SHPO	State Historic Preservation Office
FLIP	Flight Information Publication	SIP	State Implementation Plan
FONSI	Finding of No Significant Impact	SO <sub>2</sub>	sulfur dioxide
FSS	Flight Service Stations	SOP	Special Operating Procedures
FW	Fighter Wing	SO <sub>x</sub>	sulfur oxides
FWS	Fish and Wildlife Service	SR	State Route
FY	Fiscal Year	STR	Strategic Training Range
HAP	high accident potential	THC	total hydrocarbons
HMTA	Hazardous Materials Transportation Act	TIG	Technical Information Group
HUD	Department of Housing and Urban Development	USAF	United States Air Force
Hz	Hertz	USFWS	U.S. Fish and Wildlife Service
I	Interstate	USGS	U.S. Geological Survey
IFR	Instrument flight rules	VFR	visual flight rules
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning	VR	Visual Route
IR	Instrument route	WG	Wing
ISCST	Industrial Sources Complex Short-Term	µg/m <sup>3</sup>	micrograms per cubic meter

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# FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE COLORADO AIRSPACE INITIATIVE

VOLUME II – Appendices

Air National Guard  
National Guard Bureau  
Andrews Air Force Base, Maryland

August 1997



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July 6, 1977

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**APPENDIX A**

**FEDERAL REGISTER NOTICES**





Friday  
July 9, 1993

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**DEPARTMENT OF DEFENSE****Department of the Air Force**

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**Notice of Intent to Prepare  
Environmental Impact Statement for  
the Modification of Military Special Use  
Airspace To Support the 140th Fighter  
Wing, Colorado Air National Guard,  
Buckley Air National Guard Base, CO**

The United States Air Force and the Air National Guard are announcing their intent to prepare an Environmental Impact Statement (EIS) to analyze proposed modifications known as the Colorado Airspace Initiative (CAI).

The proposed action under consideration would modify the existing military airspace structure in order to facilitate operations into and out of the new Denver International Airport and meet the training requirements of the 140th Fighter Wing, Buckley Air National Guard Base, Colorado.

The Air Force and Air National Guard are planning to conduct a series of Scoping meetings on the following dates and times at the indicated locations:

- August 2, 1993—7 p.m.  
Penrose School, Penrose, CO
- August 3, 1993—7 p.m.  
Custer County School, Westcliffe, CO
- August 4, 1993—7 p.m.  
Moffat School District, Moffat, CO
- August 5, 1993—7 p.m.  
Rye High School, Rye, CO
- August 9, 1993—7 p.m.  
Fowler High School, Los Animas, CO
- August 10, 1993—7 p.m.  
Los Animas High School, Los Animas, CO
- August 11, 1993—7 p.m.  
Greeley County High School, Tribune, KS
- August 12, 1993—7 p.m.  
Kit Carson Town Hall, Kit Carson, CO
- August 17, 1993—7 p.m.  
Prairie School, New Raymer, CO

The purposes of these meetings are to present information concerning the proposed actions and alternatives under consideration and to solicit public input with respect to issues to be addressed, effort to be expended and alternatives that should be addressed in the EIS. Questions or clarifications concerning the proposal or any other information presented will be answered as they relate to the scope of the effort anticipated.

The Scoping meeting will include opportunities for clarification of the proposal and statements from representatives of government agencies and the public. To insure the maximum opportunity for public participation, initial presentations and questions by individuals will be limited to a maximum of five minutes until all those desiring an opportunity to speak have been accommodated. Additional presentations and questions will be accepted at the end of the meeting. Submission of written comments and questions will be accepted. Submission of written comments is encouraged but is not required. Written comments and questions of any length submitted at the meeting or during the scoping period will be considered in their entirety.

To ensure the Air Force and the Air National Guard have sufficient time to consider public input on issues and alternatives in the preparation of the Draft EIS, comments should be submitted to the address below by September 3, 1993. The Air Force and the Air National Guard will accept comments at the address below at any time during the environmental impact analysis process.

For further information concerning the preparation of the EIS for the CAI, or to provide written comment, contact: Environmental Support, Air National Guard Readiness Center, ANGR/CEVS, Attention: MSgt Katherine Jones, 3500 Fetchet Avenue, Mail Stop 18, Andrews Air Force Base, MD 20331-5157, Telephone: (301) 981-8143.

**Patsy J. Conner,**

*Air Force Federal Register Liaison Officer.*

[FR Doc. 93-16061 Filed 7-8-93; 8:45 am]

BILLING CODE 3010-01-M

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Friday  
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Dated: January 3, 1994.

**L.M. Bynum,**

*OSD Federal Register Liaison Officer,  
Department of Defense.*

[FR Doc. 94-371 Filed 1-6-94; 8:45 am]

BILLING CODE 5000-04-M

## Department of the Air Force

### Addendum to the Environmental Impact Statement for the Modification of Military Special Use Airspace To Support the 140th Fighter Wing, Colorado Air National Guard Buckley Air National Guard Base, Aurora, Colorado; Notice of Intent

The United States Air Force and the Air National Guard are announcing an addendum to the Colorado Airspace Initiative Environmental Impact Statement (EIS).

The addendum modifies proposed actions and alternatives to the Colorado Airspace Initiative Environmental Impact Statement as a result of the recently enacted Colorado Wilderness Act of 1993 and the Air National Guard's policy regarding aircraft overflight of Wilderness and Wild & Scenic River Areas.

The Air Force and Air National Guard are planning to conduct a Scoping meeting at the Blanca/Fort Garland Community Center, Fort Garland, Colorado, February 1, 1994, 5 p.m. ending at approximately 10 p.m. Additional nights will be scheduled depending upon attendance and will be announced at the meeting.

The purpose of this meeting is to present information concerning the addendum and to solicit public input with respect to issues to be addressed, effort to be expended, and alternatives that should be addressed in the EIS. Questions or clarifications concerning the proposal or any other information presented will be answered as they relate to the scope of the effort anticipated.

The Scoping meeting will include opportunities for clarification of the addendum and statements from representatives of government agencies and the public. To ensure the maximum opportunity for public participation, initial presentations and questions by individuals will be limited to a maximum of five minutes until all those desiring an opportunity to speak have been accommodated. Additional presentations and questions will be accepted at the end of the meeting. Submission of written comments and questions will be accepted. Submission of written comments is encouraged but is not required. Written comments and

questions of any length submitted at the meeting or during the public comment period will be considered in their entirety.

To ensure the Air Force and the Air National Guard have sufficient time to consider public input on issues and alternatives in the preparation of the Draft EIS, comments should be submitted to the address below by February 28, 1994. The Air Force and Air National Guard will accept comments at the address below at any time during the environmental impact analysis process.

For further information concerning the addendum, preparation of the EIS for the Colorado Airspace Initiative, or to provide written comment, contact:

Environmental Support, Air National Guard Readiness Center, ANGR/CEVS, Attention: Mr. Harry A. Knudsen, Jr., 3500 Fetchet Avenue, Mail Stop 18, Andrews Air Force Base, MD 20331-5157, Telephone: (301) 981-8143.

#### List of Subjects

Environmental Protection,  
Environmental Impact Statement, US Air Force-Air National Guard, Buckley ANGB, Colorado, Notice of Intent Addendum to the Environmental Impact Statement for the Modifications of Military Special Use Airspace to Support the 140th Fighter Wing, Colorado Air National Guard Buckley Air National Guard Base, Aurora, Colorado.

**Patsy J. Conner,**

*Air Force Federal Register Liaison Officer.*

[FR Doc. 94-302 Filed 1-6-94; 8:45 am]

BILLING CODE 3910-01-W

Friday  
March 29, 1996

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matter finds that a grant of the certificate is required by the public convenience and necessity. If a motion for leave to intervene is timely filed, or if the Commission on its own motion believes that a formal hearing is required, further notice of such hearing will be duly given.

Under the procedure herein provided for, unless otherwise advised, it will be unnecessary for the applicant to appear or be represented at the hearing.

G. Any person or the Commission's staff may, within 45 days after the issuance of the instant notice by the Commission, file pursuant to Rule 214 of the Commission's Procedural Rules (18 CFR 385.214) a motion to intervene or notice of intervention and pursuant to Section 157.205 of the Regulations under the Natural Gas Act (18 CFR 157.205) a protest to the request. If no protest is filed within the time allowed therefore, the proposed activity shall be deemed to be authorized effective the day after the time allowed for filing a protest. If a protest is filed and not withdrawn within 30 days after the time allowed for filing a protest, the instant request shall be treated as an application for authorization pursuant to Section 7 of the Natural Gas Act.

Lois D. Cashell,

Secretary.

[FR Doc. 96-7672 Filed 3-28-96; 8:45 am]

BILLING CODE 6717-01-P

## ENVIRONMENTAL PROTECTION AGENCY

[ER-FRL-5414-8]

### Environmental Impact Statements; Notice of Availability

Responsible Agency: Office of Federal Activities, General Information (202) 564-7167 OR (202) 564-7153.

Weekly receipt of Environmental Impact Statements Filed March 18, 1996 Through March 22, 1996 Pursuant to 40 CFR 1506.9.

*EIS No. 960130*, FINAL EIS, SFW, TX, Balcones Canyonlands Conservation Plan, Issuance of a Permit to Allow Incidental Take of Golden-cheeked Warbler, Black-capped Vireo and Six Karst Invertebrates, Travis County, TX, Due: April 29, 1996, Contact: Joseph E. Johnston (512) 490-0063.

*EIS No. 960131*, FINAL EIS, BLM, OR, Lake Abert Area Designation as an Area of Critical Environmental Concerns (ACEC), High Desert Management Framework Amendment Plan, Right-of-Way Grant and Drilling Permit, Valley Falls, Lake County, OR,

Due: April 29, 1996, Contact: Paul Whitman (503) 947-6110.

*EIS No. 960132*, FINAL EIS, FHW, NC, Winston-Salem Northern Beltway (Western Section), Construction, from US 158 Northward to US 52, Funding and COE Section 404 Permit, Forsyth County, NC, Due: April 29, 1996, Contact: Nicholas L. Graf (919) 856-4346.

*EIS No. 960133*, FINAL EIS, IBR, MT, Tongue River Basin Project, Implementation, Tongue River Dam and Reservoir, COE Section 404 Permit, Bighorn County, MT, Due: April 29, 1996, Contact: John Boehmke (406) 247-7715.

*EIS No. 960134*, DRAFT EIS, UAF, CO, NM, KS, NB, WY, Colorado Airspace Initiative, Modifications to the National Airspace System, such as the F-16 Aircraft and Aircrews of the 140th Wing of the Colorado Air National Guard, Also modifying existing Military Operations Areas (MOAs) and Military Training Routes (MTRs), CO, NM, KS, NB and WY, Due: June 05, 1996, Contact: Harry A. Knudsen (301) 836-8143.

*EIS No. 960135*, DRAFT EIS, APH, Programmatic EIS—Veterinary Services (VS) Programs, Implementation, to Detect, Prevent, Control, and Eradicate Domestic and Foreign Animal Diseases and Pests, All 50 States and the United States Territories, Due: May 28, 1996, Contact: Dr. William E. Ketter (301) 734-8565.

*EIS No. 960136*, REVISED DRAFT EIS, NPS, AK, Denali (South Slope) National Park and Preserve Development Concept Plan, Implementation, Additional Information, Mantanuska-Susitna Borough, AK, Due: May 13, 1996, Contact: Nancy Swanton (907) 257-2651.

Dated: March 26, 1996.

William D. Dickerson,

Director, NEPA Compliance Division, Office of Federal Activities.

[FR Doc. 96-7753 Filed 3-28-96; 8:45 am]

BILLING CODE 6560-50-U

[ER-FRL-5414-9]

### Environmental Impact Statements and Regulations; Availability of EPA Comments

Availability of EPA comments prepared March 11, 1996 Through March 15, 1996 pursuant to the Environmental Review Process (ERP), under Section 309 of the Clean Air Act and Section 102(2)(c) of the National Environmental Policy Act as amended.

Requests for copies of EPA comments can be directed to the Office of Federal Activities at (202) 564-7167.

An explanation of the ratings assigned to draft environmental impact statements (EISs) was published in the Federal Register dated April 14, 1996 (60 FR 19047).

#### Draft EIS's

ERP No. D-AFS-J02033-UT Rating LO, Dixie National Forest Oil and Gas Leasing on Federal Lands, Implementation, Garfield, Kane, Iron, Washington, Piute and Wayne Counties, UT.

*Summary:* EPA provided no formal written comments. EPA has no objection to the preferred alternative as described in the EIS.

ERP No. D-AFS-L65254-AK Rating LO, 1995 Mendenhall Glacier Recreation Area Management Plan, Implementation, Tongass National Forest, Juneau Ranger District, Chatham Area, AK.

*Summary:* EPA expressed a lack of objections for the proposed action.

ERP No. D-BLM-G65064-TX Rating LO, Texas Land and Resource Management Plan (RMP), Implementation, Split Estates Federal Mineral Ownership (FMO), Several Counties, TX.

*Summary:* EPA had no objection to the selection of the preferred alternative described in the draft EIS.

ERP No. D-FHW-E40763-NC Rating EC2, Winston-Salem Northern Beltway, (Eastern Section) from US 52 North of Winston-Salem to US 421/I-40 Business east of Winston-Salem, Construction, Funding and COE Section 404 Permit, Forsyth County, NC.

*Summary:* EPA had environmental concerns that the 12 mile long Bypass evaluated in the draft EIS is only one of two segments of a planned Northern Bypass. The NEPA review should have been comprehensive. EPA is also concerned about secondary impacts to a water supply.

ERP No. D-FHW-E40765-FL Rating EC2, East-West Multimodal Corridor Transportation Improvements, Beginning at the Tamiami Campus of Florida International University (FIU) extending the length of FL 836, Port of Miami, Dade County, FL.

*Summary:* EPA's review found that all of the proposed alternatives will have relatively minor impact to the natural environment, but did express concerns for impacts to the urban human environment in the form of noise and relocations.

ERP No. D-FHW-K40215-CA Rating EC2, East Sonora Bypass/CA-108 Construction, CA-108 from Post Mile







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Rocky Mountain Region  
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Denver, CO 80225

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National Park Service  
P.O. Box 25287  
Denver, CO 80225

Mr. Ron Cattany  
Deputy Director  
Department of Natural Resources  
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Mr. Austin Condon  
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and Pawnee National Grassland  
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Rocky Mountain Region  
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Lakewood, CO 80225

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Mr. Robert Jacobsen  
Regional Director  
U.S. Fish and Wildlife Service  
Mail Stop 60120  
P.O. Box 25486  
Denver Federal Center  
Denver, CO 80225

Mr. Dan Jiron  
U.S. Department of Agriculture  
Pike & Isabel National Forests  
Comanche & Cimmaron National Grasslands  
1920 Valley Drive  
Pueblo, CO 81008

Mr. Jack W. McGraw  
Regional Director  
U.S. Environmental Protection Agency  
Region 8  
999 18th Street, Suite 500  
Denver, CO 80202-2405

Mr. Ted Mellan  
FAA Northwest Mountain Region  
1601 Lind Avenue SW  
Renton, WA 98055

Mr. Bob Moore  
Colorado State Director  
Bureau of Land Management  
2850 Youngfield Street  
Lakewood, CO 80215-7076

Mr. Ralph Morgenweck  
Regional Director  
U.S. Fish and Wildlife Service  
Mail Stop 60120  
P.O. Box 25486  
Denver Federal Center  
Denver, CO 80225

Mr. Richard Prang  
Manager, System Management Branch  
FAA Northwest Mountain Region  
1601 Lind Ave. S.W.  
Renton, WA 98055-4506

Mr. Dennis Roberts  
Director, Division of Aeronautics  
Department of Transportation  
6848 S. Revere Parkway, Suite 101  
Englewood, CO 80112-6703

Ms. Paulette Russel  
Regional Director  
U.S. Fish and Wildlife Service  
P.O. Box 25486  
Denver Federal Center  
Denver, CO 80225

Mr. Wayne A. Smith  
Air Traffic Manager  
Denver ARTCC  
2211 17th Avenue  
Longmont, CO 80501

Mr. Ken Smith  
U.S. Department of the Interior  
Canon City District Office/BLM  
3170 East Main Street  
Box 2200  
Canon City, CO 81212

### State Agency Representative

Colorado Department of Health  
Air Quality Control Commission  
APCD-ADM-B1  
4300 Cherry Creek Drive  
Denver, CO 80222

## ICEP/DOPAA Distribution List (continued)

Office of the Attorney General  
Colorado Department of Law  
1525 Sherman, 5th Floor  
Denver, CO 80203

Colorado Department of Natural Resources  
Division of Parks and Outdoor Recreation  
1313 Sherman, Room 618  
Denver, CO 80203

Colorado Department of Natural Resources  
Division of Parks and Outdoor Recreation, South  
Region  
2126 North Weber  
Colorado, CO 80908

Colorado Department of Natural Resources  
Division of Wildlife - Southeast Region  
2126 North Weber  
Colorado, CO 80907

Colorado Department of Natural Resources  
Sate Board of Land Commissioners  
1313 Sherman, Room 620  
Denver, CO 80203

Colorado Historical Society  
1300 Broadway  
State Historic Preservation  
Denver, CO 80203

Colorado Office of Business Development  
1625 Broadway, Suite 1710  
Denver, CO 80202

Director  
Colorado Tourism Board  
1625 Broadway, Suite 1700  
Denver, CO 80202

Commissioner's Office  
Department of Agriculture  
Animal Industry Division  
700 Kipling Street  
Suite 4000  
Lakewood, CO 80215

Department of Health  
Air Pollution Control Division  
2450 West 2nd Avenue  
Denver, CO 80223

Department of Housing and Urban Affairs  
Public Affairs  
1405 Curtis Street  
Executive Tower N  
Denver, CO 80202

Director  
Department of Natural Resources  
Division of Wildlife  
6060 Broadway  
Denver, CO 80216

Director  
State Forest Service  
203 Forestry Building  
Colorado State University  
Fort Collins, CO 80523

Mr. Steve Adams  
Wildlife and Parks Department  
502 Landon State Office Building  
900 S.W. Jackson Street  
Topeka, KS 66612-1593

Mr. Len Attebery  
South Central Tourism Office  
2299 County Road 347  
Westcliffe, CO 81252

Mr. Larry Knoche  
Director, Bureau of Environmental Remediation  
Kansas Dept. of Health & the Environment  
Forbes Field  
Building 740  
Topeka, KS 66620

### Local Agency Representative

Chairman of the Board  
Board of Commissioners  
Crowley County  
6th and Maine  
Ordway, CO 81063

Chairman of the Board  
Board of Commissioners  
Hamilton County  
P.O. Box 4  
Syracuse, KS 67878

Chairman of the Board  
Board of Commissioners  
Huerfano County  
401 Main Street  
Walsenburg, CO 81089

Chairman of the Board  
Board of Commissioners  
Pueblo County  
215 West 10th Street  
Pueblo, CO 81003

Chairman of the Board  
Board of Commissioners  
Saguache County  
P.O. Box 176  
Saguache, CO 81149

Chairman of the Board  
Board of Commissioners  
Sherman County  
813 Broadway, Room 102  
Goodland, KS 67735

Chairman of the Board  
Board of Commissioners  
Wallace County  
P.O. Box 277  
Tribune, KS 67879

Deputy Director  
Department of Local Affairs  
1313 Sherman Street, Room 518  
Denver, CO 80203

District Environmental Coordinator  
3170 East Main Street  
Box 311  
Canon City, CO 81212

East Central Council of Local Governments  
District 5  
535 Main Street, Room 22  
Box 28  
Stratton, CO 80836

Huerfano/Las Animas Area Council of  
Governments  
District 14  
Room 201, Courthouse Building  
Trinidad, CO 81082

Pueblo Area Council of Governments  
District 7  
1 City Hall Place  
Box 1427  
Pueblo, CO 81002

San Luis Resource Area  
3170 East Main Street  
Box 311  
Canon City, CO 81212

Southeast Colorado Enterprise Development,  
Inc.  
District 6  
103 A. East Elm  
Box 1600  
Lamar, CO 81052

Upper Arkansas Area Council of Governments  
District 13  
Box 510  
Canon City, CO 81212

Ms. Patricia Barela-Rivera  
Deputy Director  
Department of Local Affairs  
1313 Sherman Street, Room 518  
Denver, CO 80203

Mr. Robert Bauserman  
Board of Commissioners  
Otero County  
P.O. Box 511  
La Junta, CO 81050

Mr. Cardon Berry  
Board of Commissioners  
Kiowa County  
P.O. Box 591  
Eads, CO 81035

Commissioner Stanley Bider  
Board of Commissioners  
Las Animas County  
Courthouse, Room 207  
Trinidad, CO 81082

Commissioner Ken Clark  
Board of Commissioners  
Las Animas County  
Courthouse, Room 207  
Trinidad, CO 81082

Mr. John Coleman  
Board of Commissioners  
Custer County  
1277 Road 118  
Westcliffe, CO 81252

Chairman Charles R. Covington  
Chairman of the Board  
Board of Commissioners  
Lincoln County  
P.O. Box 67  
Hugo, CO 80821

Ms. Debra Downs  
Field Manager, South Central Region  
Colorado Department of Local Affairs  
P.O. Box 300  
Alamosa, CO 81101

## IICEP/DOPAA Distribution List (continued)

Chairman Tom Doyle  
Chairman of the Board  
Board of Commissioners  
Fremont County  
615 Macon Avenue, Room 102  
Canyon Coty, CO 81212

Mr. R. Dykstra  
Board of Commissioners  
Kit Carson County  
P.O. Box 249  
Burlington, CO 80807

Mr. Dutch Eikenberg  
Board of Commissioners  
Prowers County  
Box 1046  
Lamar, CO 81052

Mr. Tim Gallagher  
Alamosa County Commissioners  
P.O. Box 178  
Alamosa, CO 81101

Mr. L. Herndon  
Board of Commissioners  
Kit Carson County  
P.O. Box 249  
Burlington, CO 80807

Sheriff Fred Jobe  
Custer County Sheriff's Department  
205 South 6th Street  
Box 92  
Westcliffe, CO 81252

Mr. Mark Lowrey  
Field Manager, Southeastern Region  
Colorado Department of Local Affairs  
2200 Bonforte Blvd., LW317  
Pueblo, CO 81001

Commissioner Eugene Lujan  
Board of Commissioners  
Las Animas County  
Courthouse, Room 207  
Trinidad, CO 81082

Mr. Paul McConnellogue  
Air Traffic Manager  
Denver ARTCC  
2211 17th Avenue  
Longmont, CO 80501

Mr. Floyd McEwen  
Board of Commissioners  
Cheyenne County  
P.O. Box 67  
Cheyenne Wells, CO 80810

Commissioner Ray Miller  
Board of Commissioners  
Baca County  
P.O. Box 116  
Springfield, CO 81073

Mr. Robert Philleo  
County Commissioner/OSA  
P.O. Box 10  
Crestone, CO 81131

Mr. William Reiners  
Huerfano County Commissioners  
401 Main Street  
Walsenburg, CO 81089

Mr. John Roesch  
Board of Commissioners  
Bent County  
P.O. Box 350  
Las Animas, CO 81054

Chairman Don Sels  
Chairman of the Board  
Board of Commissioners  
Prowers County  
Box 1046  
Lamar, CO 80152

Commissioner Cherry Seymour  
Board of Commissioners  
Lincoln County  
P.O. Box 67  
Hugo, CO 80821

Mr. R. B. Smith  
Chairman of the Board  
Board of Commissioners  
Kit Carson County  
P.O. Box 249  
Burlington, CO 80807

Commissioner John Stulp  
Board of Commissioners  
Prowers County  
Box 1046  
Lamar, CO 80152

Mr. Robert Temple  
Board of Commissioners  
Prowers County  
Box 1046  
Lamar, CO 81052

Commissioner Charles Wait  
Board of Commissioners  
Baca County  
P.O. Box 116  
Springfield, CO 81073

Commissioner Harvey Wann  
Board of Commissioners  
Lincoln County  
P.O. Box 67  
Hugo, CO 80821

Commissioner Clede Widner  
Board of Commissioners  
Prowers County  
Box 1046  
Lamar, CO 80152

Mr. J.D. Wilson  
Board of Commissioners  
Kiowa County  
P.O. Box 591  
Eads, CO 81035

Mr. Robert Zimmerman  
Board of Commissioners  
Alamosa County  
P.O. Box 178  
Alamosa, CO 81101

### Library

Aguilar Public Library  
146 West Maine Street  
P.O. Box 586  
Aguilar, CO 81020-0586

Albany County Public Library  
310 S. 8th Street  
Laramie, WY 82070

American Legion Auxiliary Library  
P.O. Box 11  
Cheyenne Wells, CO 80810

Ault Public Library  
105 West Ault Street  
Ault, CO 80610-0147

Baca County Library  
733 Main Street  
Springfield, CO 81073-1542

Baca County Library  
Two Buttes Branch  
P.O. Box 13  
Two Buttes, CO 81084-0031

Baca County Library  
Walsh Branch  
P.O. Box 201  
Walsh, CO 81090-0201

Barkman Branch  
Pueblo Library District  
1300 Jerry Murphy Blvd.  
Pueblo, CO 81001-1862

Briggsdale Community Library  
210 Main Street  
Briggsdale, CO 80611-0028

Burlington Public Library  
321 14th Street  
Burlington, CO 80807-1607

Canon City Public Library  
516 Macon Avenue  
Canon City, CO 81212

Carbon Valley Ranch Library  
4th and Maple  
P.O. Box 118  
Frederick, CO 80530

Carnegie Public Library  
202 North Animas  
Trinidad, CO 81082

Colorado Department of Local Affairs  
State Planning Library  
1313 Sherman, Room 521  
Denver, CO 80203

Colorado Division of State  
Archives and Public Records  
1313 Sherman Street  
Denver, CO 80203

Colorado Division of Wildlife Library  
6060 Broadway Library  
Denver, CO 80216-1000

## ICEP/DOPAA Distribution List (continued)

Colorado Division of Wildlife  
Research Center Library  
317 West Prospect  
Fort Collins, CO 80526-2097

Colorado Historical Society  
Stephen H. Hart Library  
1300 Broadway  
Denver, CO 80203-2137

Costilla County Public Library  
402 Church Place  
San Luis, CO 81152

Cotapaxi School Community Library  
P.O. Box 785  
Cotapaxi, CO 81223-0385

Custer County Public Library  
109 Main Street  
P.O. Box 71  
Westcliffe, CO 81251-9138

Dacono Public Library  
P.O. Box 186  
Dacono, CO 80514

Denver Wildlife Research Center Library  
USDA/APHIS/S&T  
P.O. Box 25266  
Building 16, Federal Center  
Denver, CO 80225-0266

East Morgan County Library District  
500 Clayton Street  
Brush, CO 80723

Flagler Community Library  
P.O. Box 367  
Flagler, CO 80815-0367

Florence Public Library  
2nd and Pikes Peak  
Florence, CO 81226

Fort Lupton Public and School Library  
425 South Denver Avenue  
Fort Lupton, CO 80621

Fort Morgan Public Library  
414 Main Street  
Fort Morgan, CO 80701

Fowler Public Library  
114 East Cranston Avenue  
Fowler, CO 81039-1198

Frank I. Lamb Branch  
Pueblo Library District  
2525 South Pueblo Blvd.  
Pueblo, CO 81005

Garcia Public Library  
General Delivery  
Garcia, CO 81134

Gardner Library  
Highway 69  
Gardner, CO 81040

Great Sand Dunes National Monument Library  
11999 Highway 150  
Mosca, CO 81146

Holly Public Library  
119 East Cheyenne  
P.O. Box 706  
Holly, CO 81047

Hudson Public Library  
555 Main Street  
P.O. Box 188  
Hudson, CO 80642

Huerfano Public Library  
323 Main Street  
Walsenburg, CO 81089-1842

Kiowa County Public Library  
1305 Goff Street  
P.O. Box 757  
Eads, CO 81036-0757

La Veta Public Library  
310 Main Street  
P.O. Box 28  
La Veta, CO 81055

Lamar Public Library  
104 East Parmenter  
Lamar, CO 81052-3239

Laramie County Public Library  
2800 Central Avenue  
Cheyenne, WY 82001

Las Animas Bent County  
Lower Arkansas Valley Regional Library  
415 Bent Avenue  
Las Animas, CO 81054

Manzanola Public School Library  
301 South Catalpa Street  
P.O. Box 148  
Manzanola, CO 81058-0148

McClelland Library  
Pueblo Library District  
100 East Abriendo Avenue  
Pueblo, CO 81001-1997

National Park Service Library  
P.O. Box 25787  
Denver, CO 80225-2845

Penrose Community Library  
P.O. Box 181  
Penrose, CO 81240-0318

Pine Bluff Public Library  
2800 Central Avenue  
Cheyenne, WY 82001

Platte County Public Library  
904 9th Street  
Wheatland, WY 82201

Platteville Public Library  
502 Marion Avenue  
P.O. Box 567  
Platteville, CO 80651

Pritchett Public Library  
P.O. Box 12  
Pritchett, CO 81064

Public Library  
208 S. Walnut Street  
Kimball, NE 69145

Public Library  
1112 12th Avenue  
Sidney, NE 69162

Rocky Ford Public Library  
10th and Maple Streets  
Rocky Ford, CO 81067

Saguache County Public Library  
8th and Pitkin  
P.O. Box 448  
Saguache, CO 81149-0448

Saguache County Public Library  
Center Branch  
400 South Worth  
P.O. Box 306  
Center, CO 81125-0306

Southeastern Colorado Area  
Health Education Center  
1225 North Grand, Suite 103  
Pueblo, CO 81003-2845

Southern Peaks Public Library  
423 Fourth Street  
Alamosa, CO 81101-2601

State Library  
State Capitol, 3rd Floor  
Topeka, KS 66612-1593

Stratton Public Library  
331 New York Avenue  
P.O. Box 267  
Stratton, CO 80836-0267

Swink Public Library  
321 Columbia Avenue  
P.O. Box 267  
Swink, CO 81077-0267

U.S. Bureau of Land Management Library  
Building 50  
Denver Federal Center  
Denver, CO 80225

U.S. Department of Interior  
OSM-WSC Library  
1020 15th Street, Brooks Tower  
Denver, CO 80202-2359

U.S. E.P.A.  
National Enforcement Investigation Center  
Denver Federal Center  
Building 53  
Denver, CO 80225

U.S. E.P.A. Region VIII Library  
999 18th Street, Suite 500  
Denver, CO 80202-2405

U.S. Fish & Wildlife Service  
National Ecology Research Center Library  
4512 McMurry Avenue  
Fort Collins, CO 80525-3400

Weld County Library District  
Centennial Park Branch  
2227 23rd Avenue  
Greeley, CO 80631

Weld County Library District  
Lincoln Park Branch  
919 7th Street  
Greeley, CO 80631

## IICEP/DOPAA Distribution List (continued)

Windsor-Severance Library District  
214 5th Street  
Windsor, CO 80550

Woodruff Memorial Library  
522 Colorado Avenue  
P.O. Box 479  
La Junta, CO 81050-0479

Wyoming Department of Administration &  
Information  
Library Division  
2031 Capitol Avenue  
Cheyenne, WY 82002

Dr. Glenn A. Jones  
Memorial Library  
Idaho and Jay Street  
P.O. Box 457  
Johnstown, CO 80534-0457

Mr. Pincheon  
Moffat School Public Library  
P.O. Box 428  
Moffat, CO 81143

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### Media

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Ms. Genevieve Anton  
Gazette Telegraph  
P.O. Box 1779  
Colorado, CO 80901

Ms. Constance Baucum  
Wet Mountain Tribune  
P.O. Box 300  
Westcliffe, CO 81252

Mr. Pat Driscoll  
Denver Post  
1560 Broadway  
Denver, CO 80202

Mr. Sam Ebersol  
KTSC-TV  
2200 Bonforte Blvd.  
Pueblo, CO 81001

Mr. Dick Foster  
Rocky Mountain News  
7 East Bijou, Suite 204  
Colorado, CO 80903

Ms. Tracy Harmon  
Pueblo Chieftan  
P.O. Box 801  
Canon City, CO 81212

Mr. Ray James  
M.E. Alamosa News  
410 San Juan Avenue  
Alamosa, CO 81101

Mr. Paul Larmer  
High Country News  
P.O. Box 1090  
Poynia, CO 81428

Ms. Linda Pacheco  
KSLV-Radio  
P.O. Box 631  
109 Adams  
Monte Vista, CO 81144

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### Public Interest Group

---

American Sheep Industry  
6911 S. Yosemite  
Englewood, CO 80112

Colorado Environmental Coalition  
777 Grant Street, #606  
Denver, CO 80203

Colorado Parks and Recreation Assn.  
P.O. Box 1037  
Wheat Ridge, CO 80034

Colorado Waterfowl Association  
Road 52  
Kiowa, CO 80013

Colorado Wildlife Federation  
7475 Dakin, #137  
Denver, CO 80221

Coloradoans for Clean Air  
1985 Grape  
Denver, CO 80220

Mr. Darrell Arnold  
La Veta Alliance  
P.O. Box 126  
La Veta, CO 81055

Mr. Jeff Briggs  
Gardner Community Corporation  
P.O. Box 143  
Gardner, CO 81040

Mr. Reeves Brown  
Colorado Cattlemen's Association  
8833 Ralson Road  
Arvada, CO 80002

Ms. Pam George  
Zapata Homeowners Association  
P.O. Box 83  
Mosca, CO 81146

Mr. Bill Hix  
Huerfano Basin Livestock Association  
722 Penn Avenue  
Walsenburg, CO 81089

Mr. David Johnson  
Sierra Club  
Sangre de Cristo Group  
1920 Greenwood  
Pueblo, CO 81003

Mr. Freeman Laster  
San Luis Valley Cattlemen's Association  
23234 W. Highway 160  
Del Norte, CO 81132

Mr. Gary Martin  
Fremont Cattlemen's Association  
P.O. Box 1342  
Canon City, CO 81212

Ms. Eleanor C. Mueller  
Open Space Alliance  
P.O. Box 93  
Crestone, CO 81131

Ms. Susan Nequette  
Custer County Action Assn.  
P.O. Box 186  
Westcliffe, CO 81252

Mr. & Mrs. Charles Proctor  
Custer County Action Association  
81 Road 191  
Westcliffe, CO 81252

Mr. Harold R. Reinhart  
Moffat-Hooper-Mosca Service League  
138 Skyview, Box 96  
Crestone, CO 81131

Ms. Pat Richmond  
SLV Information & Education Center  
P.O. Box 144  
Crestone, CO 81131

Mr. David M. Rumph  
Custer County Action Association  
P.O. Box 150  
Westcliffe, CO 81252

Mr. Robert Senderhauf  
Custer County Action Association  
902 Main Street  
Westcliffe, CO 81252

Mr. Mark Spink  
Custer County Action Association  
18 Blackberry Court  
Box 728  
Westcliffe, CO 81252

Ms. Kate Steichen  
Open Space Alliance  
P.O. Box 303  
Crestone, CO 81131

Mr. Roger Stuber  
Colorado Cattlemen's Association  
5420 South Quebec Street  
P.O. Box 3469  
Englewood, CO 80155

Mr. Curt Wilson  
Custer County Stockgrowers Association  
2037 County Road 115  
Westcliffe, CO 81252

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### Business

---

Polytrade International  
640 South Sunset Avenue, Suite 203  
West Covina, CA 91790

Mr. Charles M. Archer  
Valley Rural Electric Corp., Inc.  
3625 West U.S. Hwy. 160  
Monte Vista, CO 81144

Mr. Thomas Cruther  
Spiritual Life Institute  
Nada Hermitage  
P.O. Box 219  
Crestone, CO 81131

Mr. & Mrs. Wayne & Ann Ewing  
West Central Community Health Center, Inc.  
P.O. Box 185  
Westcliffe, CO 81252

## IICEP/DOPAA Distribution List (continued)

Dean Fleming  
Libre Incorporated  
1271 County Road 626  
Gardner, CO 81040

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### *Private Individual*

---

Mr. & Mrs. Earl & Joyce Adair  
411 Larkspur Lane  
Westcliffe, CO 81252

Mr. & Mrs. Gary C. Adams  
1423 Country Road 192  
Westcliffe, CO 81252

Mr. & Mrs. Fred & Patricia Amin  
9349 Manzanita Drive  
Alta Loma, CA 91701

Mr. & Mrs. Victor Aragon  
Route 1, P.O. Box 73  
Fowler, CO 81039

Mr. Roger Bach  
10966 Wicks Street  
Sun Valley, CA 91352

Mr. James E. Bales  
18924 Highway 202  
Rocky Ford, CO 81606

Mr. William F. Befus  
1161 South Raleigh Street  
Denver, CO 80219

Mr. & Mrs. Stan Bergsma  
251 West 22nd  
Holland, MI 49423

Mr. & Mrs. Stanley Bond  
2061 Forest Street  
Denver, CO 80207

Mr. & Mrs. Chris Bordelon  
Route 2, P.O. Box 281  
Cottonport, LA 71327

Mr. Ilse Boudreau  
2 Boulder Drive  
Wolcott, CT 06716

Mr. & Mrs. Charles Boule  
212 Matterhorn Circle So.  
Westcliffe, CO 81252

Mr. & Mrs. Lawrence & Boyd  
P.O. Box 113  
Eads, CO 81036

Ms. Billie Bramhall  
423 Shore Wood  
Duncanville, TX 75116

Mr. Kurtis B. Bray  
P.O. Box 3140  
Omaha, NE 68103-0140

Ms. Cheryl Breese  
P.O. Box 336  
Westcliffe, CO 81252

Mr. & Mrs. Thomas Brown  
P.O. Box 463  
South Sutton, NH 03273

Ms. Patricia Brown  
1446 Lizzie #A  
San Luis Obispo, CA 93401

Mrs. Beulah M. Brunell  
485 Sundown Lane  
Denver, CO 80221

Mr. & Mrs. Wayne Bryan  
450 Buffalo Avenue  
Egg Harbor, NJ 08215

Ms. Charlotte Buck  
1325-A Bear Mountain Drive  
Boulder, CO 80303

Mr. Don W. Buelow  
7402 Pembroke Court  
Castle Rock, CO 80104

Mr. Allen Butler  
P.O. Box 146  
Silver Cliff, CO 81249

Ms. Barbara A. Campbell  
P.O. Box 521  
Eureka, MS 39025

Ms. Alexand B. Campbell  
669 Deerhaven  
Westcliffe, CO 81252

Ms. Judy M. Cannon  
1918 Lost Creek Drive  
Arlington, TX 76006

Mr. & Mrs. Tony Cantu  
7542 South Quay Court  
Littleton, CO 80123-5449

Mr. & Mrs. Bert Chapman  
7542 South Saulsbury Ct.  
Littleton, CO 80123

Ms. Barbara Chappell  
144 South Lawn Avenue  
Bluffton, OH 45817

Mr. & Mrs. Cliver  
P.O. Box 176  
Sundance, WY 82729-0176

Mr. Kevin Corbely  
10700 E. Dartmouth Ave.  
Apt. CC 203  
Aurora, CO 80014

Mr. & Mrs. L.J. Covington  
2039 Elmira Street  
Aurora, CO 80010

Mr. W.J. Craig  
1601 College Street  
Cleveland, MS 38732

Ms. Catherine M. Cramer  
792 Ponderosa Road  
La Veta, CO 81055

Mr. & Mrs. Louis Curran  
675 Ardath Lane  
Pueblo, CO 81005

Mr. & Mrs. John Czarapata  
12250 North Avenue, #108A  
Wauwatosa, WI 53226

Mr. Shawn Dame  
11 Ridge Road  
Hopewell, NJ 08525

Mr. B.A. de la Houssaye  
1046 Harrison  
Denver, CO 80206

Mr. Jack L. Dickerson  
P.O. Box 216  
Silver Cliff, CO 81252

Mr. & Mrs. Ken Diley  
P.O. Box 83  
Hillside, CO 81232

Mr. & Mrs. James DiSimoni  
1110 Rhonda Lee  
Cooperas Cove, TX 76552

Mr. & Mrs. Don Edwards  
5810 W. 38th Avenue, #28  
Sunset Ridge, CO 80212

Mr. & Mrs. Ray Elder  
116 Sunnyside Lane  
Florence, CO 81226

Mr. James A. Elliot  
6242 West Lakeside Court  
Littleton, CO 80125

Mr. V. Ellis  
P.O. Box 13  
Wetmore, CO 81253

Mr. & Mrs. Robert Farris  
4865 Dutch Ridge Road  
Beaver, PA 15009

Mr. Larry O. Fenstermaker  
6080 Tichy Blvd.  
Commerce City, CO 80022

Mr. & Mrs. Don Fick  
1500 2600 Road  
Cedar Ridge, CO 81413

Ms. Marilyn Fisher  
P.O. Box 384  
Conway Springs, KS 67031

Mr. & Mrs. Carol & W.L. Fuller  
5733 Ammons Street  
Fort Worth, TX 76117

Mr. & Mrs. William & Gaines  
P.O. Box 803  
Westcliffe, CO 81252-0186

William R. & Garner  
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## APPENDIX C

# GENERAL COORDINATION LIST



# General Coordination List

---

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---

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The Honorable Tom Holgerson  
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The Honorable Roger G. Jensen  
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REGULATORY REQUIREMENTS

1.1 REGULATORY REQUIREMENTS

The regulatory requirements are summarized in the following table:

- 1.1.1 The regulatory requirements are summarized in the following table:
- 1.1.2 The regulatory requirements are summarized in the following table:
- 1.1.3 The regulatory requirements are summarized in the following table:
- 1.1.4 The regulatory requirements are summarized in the following table:
- 1.1.5 The regulatory requirements are summarized in the following table:
- 1.1.6 The regulatory requirements are summarized in the following table:
- 1.1.7 The regulatory requirements are summarized in the following table:
- 1.1.8 The regulatory requirements are summarized in the following table:
- 1.1.9 The regulatory requirements are summarized in the following table:
- 1.1.10 The regulatory requirements are summarized in the following table:

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**APPENDIX D**

**REGULATORY REQUIREMENTS**



## APPENDIX D

### REGULATORY REQUIREMENTS

#### D.1 AIRSPACE MANAGEMENT

The applicable regulations regarding airspace include:

- *Air Force Instruction (AFI) 11-206* prescribes general flight rules which govern the operation of aircraft flown by the U.S. Air Force (USAF), to include the Air National Guard (ANG).
- *AFI 13-201* defines types and uses of military training airspace and other USAF airspace management techniques.
- *AFI 11-F16* defines flying training requirements for F-16 pilots.
- *FAA Handbook 7110.65* prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services in the United States.
- *FAA Handbook 7610.4* specifies procedures for air traffic control planning, coordination, and services during defense activities and special military operations conducted in airspace controlled by or under the jurisdiction of the FAA.
- *FAA Handbook 7400.2C* prescribes policy, criteria, and procedures applicable rulemaking and nonrulemaking actions associated with airspace allocation and utilization, obstruction evaluation and marking, airport airspace analyses, and the establishment of air navigation aids.
- *FAA Handbook 7400.6* provides a compilation of regulations containing current airspace designations and pending amendments to those designations that are issued by the FAA. This order is published annually for the benefit of the public, since airspace designations are not carried in the Code of Federal Regulations or the Federal Aviation Regulations.
- *Federal Aviation Act of 1958* created the Federal Aviation Administration (FAA) and charged the FAA Administrator with ensuring the safety of aircraft and the efficient use of the National Airspace System within the jurisdiction of the United States.
- *Federal Aviation Regulation Part 71* delineates the designation of Federal airways, area low routes, controlled airspace, and navigational reporting points.
- *Federal Aviation Regulation Part 73* defines special use airspace and prescribes the requirements of the use of that airspace.
- *Federal Aviation Regulation Part 91* describes the rules governing the operation of aircraft within the United States.

#### D.2 SAFETY

The Air National Guard operates under an extensive set of regulations and procedures aimed at ensuring the safety of the public as well as Air National Guard

personnel, facilities, and equipment. The regulations, procedures, plans, and agreements most pertinent to the proposed action include:

- *140th FW Bird-Aircraft Strike Hazard (BASH) Plan* establishes measures to identify, avoid and prevent bird-aircraft strikes.
- *AFI 13-212, Vols 1 and 2*, establishes procedures for the planning, construction, design, operation, and maintenance of weapons ranges. It defines criteria for target placement, weapons safety footprints, and buffer zones as well as safety procedures involving aircraft or ordnance malfunctions.
- *AFI 91-301* contains Air Force occupational safety, fire prevention, and health regulations governing a wide range of activities and procedures associated with safety in the workplace.
- *Department of Defense Flight Information Publication (FLIP)* indicates locations of potential hazards (e.g., bird aggregations, obstructions) and noise sensitive locations under military airspace and defines horizontal and/or vertical avoidance measures. The FLIP is updated monthly to present current conditions.

### **D.3 NOISE**

The applicable regulations and procedures regarding noise include:

- *Federal Interagency Committee Guidelines for Considering Noise in Land Use Planning and Control of 1980* reflects the concurrence on the use of the  $L_{dn}$  metric by all Federal agencies.
- *Federal Interagency Committee Review of Selected Noise Analysis Issues of 1992* reflects a reaffirmation on the use of the  $L_{dn}$  metric by all Federal agencies.
- *Air Force Manual 19-10* describes tools to aid in the development of acceptable noise environments.
- *Executive Order 12088* requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution, including noise pollution, with respect to Federal facilities and activities under the control of the agency.

### **D.4 LAND USE**

National and state resource management plans, local plans and zoning regulations, and other policies that pertain to land use, provide a guideline for development in these areas. Other pertinent Federal laws include:

- *National Wild and Scenic Rivers Act of 1968* defines wild, scenic, and recreational rivers, designates a river classification, and establishes limits to development on shoreland areas.
- *Wilderness Act of 1964* requires a wilderness review of roadless areas to determine suitability for designation by Congress as a Wilderness Area.



- *Department of Transportation Act of 1966* prohibits the Secretary of Transportation from approving a project which requires the use or "taking" of any publicly owned land from a public park unless there is no feasible alternative to the use of the land and plans to minimize harm to the park are considered.
- *Colorado Wilderness Act of 1993* designates certain lands within Colorado as components of the National Wilderness Preservation System.

## **D.5 VISUAL RESOURCES/AESTHETICS**

Regulations, plans, and policies affecting aesthetics include Federal statutes, regulations and procedures that apply to public lands and federally protected areas, state and local scenic highway designations, and local plans and policies that regulate aesthetics. These include:

- *Forest Management Act* provides direction to the US Forest Service to develop a visual management system to inventory and evaluate scenic resources, and to establish visual quality objectives.
- *Forest Service Visual Management System* requires that development on Forest Service lands be done in conformity with applicable forest land-management plans which describe visual quality objectives for areas under consideration.
- *National Wild and Scenic Rivers Act of 1968* designates wild, scenic, and recreational rivers and establishes limits to management activities. Regulated corridors average 1/4 miles on each side of the river.
- *Wilderness Act of 1964* requires a wilderness review of roadless areas to determine suitability for designation by Congress as Wilderness Area.

These regulations and guidelines provide a basis for evaluating the compatibility of components or structures in an area. However, no such regulatory foundation exists for evaluating visual impacts from overflights. The FAA has not established specific regulations with respect to overflights of environmentally sensitive areas. An interagency cooperation agreement between the National Park Service, Fish and Wildlife Service, Bureau of Land Management, and FAA suggests that aircraft remain above 2,000 feet AGL when overflying wilderness areas.

## **D.6 BIOLOGICAL RESOURCES**

The applicable laws and regulations regarding biological resources include:

- *The Clean Water Act* requires a NPDES permit for all discharges to reduce pollution that could affect any form of life. Section 404 of this act regulates development in streams and wetlands and requires a permit from the U.S. Army Corps of Engineers.
- *Endangered Species Act of 1973* as amended, protects proposed and listed threatened or endangered species. Formal consultation with the US Fish and Wildlife Service is required under Section 7 of the act for Federal projects and all other projects and all other projects that require Federal permits where such actions could directly or indirectly affect any proposed or listed species.

- *Executive Order 12088* requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to Federal facilities and activities under the control of the agency.
- *Migratory Bird Treaty Act of 1972* protects migratory waterfowl and all seabirds by limiting the transportation, importation, killing, or possession of those birds.

## **D.7 CULTURAL RESOURCES**

Numerous Federal laws and regulations require Federal agencies such as the Air National Guard to consider the effects of a proposed action on cultural resources. These laws and regulations stipulate a process of compliance, define the responsibilities of the agency proposing the action, and prescribe the relationship among other involved agencies such as state historical commissions. The most pertinent laws and regulations concerning the protection and treatment of cultural resources include:

- *National Historic Preservation Act of 1966* provides a broad base for the implementation of preservation goals by establishing the National Register of Historic Places (National Register) and the Advisory Council on Historic Preservation (Advisory Council). Section 106 of this act requires that Federal agencies take into account the effect of an action or undertaking on cultural resources included in or eligible for inclusion in the National Register.
- *36 CFR 60* defines a set of criteria for evaluating the significance of resources and their eligibility to the National Register.
- *36 CFR 800* establishes an explicit set of procedures for Federal agencies to meet their obligations under the National Historic Preservation Act and Executive Order 11593. The regulations operationalize the requirements of the Section 106 process, establishing procedures for determining the eligibility of a resource and for defining possible adverse effects.
- *American Indian Religious Freedom Act* states that it is the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise traditional religions. These rights include, but are not limited to, access to traditional sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.
- *Archaeological Resources Protection Act of 1979* ensures the protection of archaeological resources on Federal lands. This act defines civil and criminal penalties for illegally obtaining or affecting archaeological resources on Federal or Native American lands.
- *Executive Order 11593* directs all Federal land-holding agencies to identify cultural resources, nominate qualifying resources to the National Register, and agencies to avoid damaging resources that might be eligible for the National Register.

## **D.8 AIR RESOURCES**

The applicable laws and regulations regarding air resources include:

- *The Clean Air Act* states that a national goal is to prevent any further impairment of visibility within federally mandated Class I areas such as National Parks and Wilderness Areas from manmade sources of air pollution. Visibility impairment is defined as (1) a reduction in regional visual range or (2) atmospheric discoloration or plume blight from exhaust effluents. Criteria to determine significant impacts on visibility within Class I areas exist for stationary emission sources, but do not pertain to mobile sources since they are generally exempt from permit review by regulatory agencies.
- Title 40 of the Code of Federal Regulations (CFR) parts 50 and 51, reflecting the Clean Air Act Amendments of 1977 and 1990, dictates that the NAAQS must be maintained nationwide. State and local agencies are delegated authority to enforce the NAAQS and to establish air quality standards and regulations of their own. The adopted state standards and regulations must be at least as restrictive as the Federal requirements.

## **D.9 SOCIOECONOMICS**

NEPA requires the consideration of socioeconomic factors to the extent that they affect "the quality of the human environment." The concept of impacts to the human environment is addressed in 40 CFR 1508.14, and recognized by the Air Force in AFI 32-7061.

## **D.10 WATER RESOURCES**

Statutes, regulations, and executive orders enacted to protect water resources form the basis for policy guidelines and management practices relating to water resources. They include:

- *The Clean Water Act* requires any point source that discharges waste into waters of the United States to obtain a National Pollution Discharge Elimination System (NPDES) permit. Section 404 of this act regulates development in streams and wetlands and requires a permit from the U.S. Army Corps of Engineers prior to such activities.
- *Executive Order 12088* requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to Federal facilities and activities under the control of the agency.
- *Safe Drinking Water Act* requires the Environmental Protection Agency (EPA) to establish a program which provides for the safety of the nation's drinking water.
- *National Wild and Scenic Rivers Act of 1968* protects natural resources designated as wild and scenic river systems.

## **D.11 HAZARDOUS MATERIALS**

Federal and state laws, policies, and regulations apply to activities involving hazardous materials. This regulatory framework provides the guidelines and management

practices to minimize adverse impacts resulting from hazardous materials utilization. They include:

- *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, and the Superfund Amendments and Reauthorization Act (SARA) of 1986* provide liability and compensation for cleanup and emergency response from hazardous substances released and discharged into the environment and the clean up of hazardous disposal sites.
- *Hazardous Materials Transportation Act (HMTA) of 1975* establishes criteria for shippers and carriers that manage hazardous materials and includes training and qualifications of persons handling hazardous materials.
- *Resource Conservation and Recovery Act (RCRA) of 1976* regulates storage, transportation treatment, and disposal of hazardous waste that could adversely affect the environment.
- *Solid Waste Disposal Act (SWDA) and Amendments of 1980* amends RCRA with additional regulation of energy and materials conservation and the establishment of a National Advisory Council.

#### **D.12 ENVIRONMENTAL EQUITY**

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs Federal agencies to address and consider the impacts on environmental and human health conditions in minority and low income communities from Federal actions. The general purposes of this Executive Order are:

- To focus the attention of Federal agencies on human health and environmental conditions in minority communities and low-income communities with the goal of achieving environmental justice
- To foster non-discrimination in Federal programs that substantially affect human health of the environment
- To give minority communities and low-income communities greater opportunities for public participation in, and access to public information on, matters relating to human health and the environment.

APPENDIX E

AS A RESULT OF THE SCOPING PROCESS AND

ISSUES IDENTIFIED, THE NATIONAL GUARD BUREAU

HAS IDENTIFIED A PREFERRED ALTERNATIVE. THE

PREFERRED ALTERNATIVE IS AN EVOLUTION OF THE

ORIGINAL PROPOSED ROUTE IDENTIFIED AS

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**APPENDIX E**

**DETAILS ON INDIVIDUAL AIRSPACE COMPONENTS**

**AS A RESULT OF THE SCOPING PROCESS AND ISSUES IDENTIFIED, THE NATIONAL GUARD BUREAU HAS IDENTIFIED A PREFERRED ALTERNATIVE. THE PREFERRED ALTERNATIVE IS AN EVOLUTION OF THE ORIGINAL PROPOSED ACTION, NOW IDENTIFIED AS THE ORIGINAL PROPOSAL.**

**For the Original Proposal, see page E-1 to E-17.**

**For the Preferred Alternative, see page E-18 to E-28.**

**For existing airspaces (the No-Action Alternative), see page E-29 to E-33.**

## APPENDIX E

### DETAILS ON INDIVIDUAL AIRSPACE COMPONENTS

This appendix provides specific information describing the configuration of the proposed airspace components and the anticipated utilization for each airspace associated with the alternatives addressed for the Colorado Airspace Initiative.

Table E-1 provides an overview of sorties associated with the alternatives addressed in this Environmental Impact Statement. In the individual subsections that follow in this appendix, utilization within individual airspace components is presented in a series of tables showing specific details on those sorties. Please note that whenever tables refer to "other" aircraft, this includes C-130, A-10, F-15, B-1, and other DOD aircraft.

**An aircraft typically uses several MOAs and/or MTRs on a single training flight. For example, a single aircraft may fly a single training flight through IR-415, IR-409, the Airburst MOA, and the Airburst Range at Fort Carson. This one sortie would be counted in each of the sortie totals for each of these airspace components. Therefore, the totals shown in Table E-1 for each airspace component cannot be simply added together to produce a total sorties count for any of the overall alternatives, as this would over-count the sortie totals.**

**Table E-1. Summary of the Sorties for All Identified Aircraft Associated with the Alternatives**

AIRSPACE	NUMBER OF SORTIES <sup>1</sup>		
	NO-ACTION (EXISTING/BASELINE)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
<i>Cheyenne MOA (Kit Carson)</i>	1,324	2,019	1,804
<i>Pinon Canyon MOA</i>	41	44	62
<i>La Veta Low MOA</i> <i>La Veta High MOA</i>	445 695	1,100	320 634
<i>Airburst MOA (Fremont)</i>	2,536	2,531	2,461
<i>Two Buttes Low MOA</i> <i>Two Buttes High MOA</i>	0 0	418 661	475 854
<i>IR-409 (whole route)</i> <i>IR-409 Segments F to I</i>	176 1,641	114 1,062	53 845
<i>VR-413</i>	100	254	176
<i>VR-412</i>	10	0	0
<i>IR-414</i>	16	32	62
<i>XIR-424</i>	0	266	211
<i>IR-415</i>	40	92	88
<i>IR-416</i>	30	46	62
<i>XIR-426</i>	0	46	62
<i>XVR-1427 (whole route)</i> <i>XVR-1427 Segments F to I</i>	0 0	346 250	343 185

Note:

- Types of aircraft flown include fighter aircraft such as F-16, F-14, F-15, and F-18, bomber aircraft such as B-1 and B-52, and airlift aircraft such as C-130 and KC-135, and other like aircraft.

## E.1 THE ORIGINAL PROPOSAL

The following subsections present and describe airspace associated with the Original Proposal Alternative.

### E.1.1 Original Proposal—Modification of Kit Carson MOA (Rename as Cheyenne MOA)

#### E.1.1.1 Airspace Description

The Cheyenne High/Low MOA would have many of the same boundaries as Kit Carson B MOA (see Figure 2-1). It would be centered approximately 120 NM southeast of Buckley ANGB. This proposal would delete Kit Carson A and B MOAs and establish Cheyenne High and Low MOAs. Cheyenne High MOA would have the same eastern and most of the same northern and southern boundaries as Kit Carson B MOA. The western boundary would be shortened approximately 10 NM with a short north-south segment then continue southeast to connect with the southern border. Cheyenne High would extend vertically from 9,000 feet MSL up to, but not including, 18,000 feet MSL. Cheyenne Low MOA would have the same northern, western, and southern borders as Cheyenne High. The eastern border would coincide with the Kit Carson A MOA eastern border (i.e., approximately 7 NM west of the Cheyenne High eastern border). Cheyenne Low would extend vertically from 300 feet AGL up to, but not including, 9,000 feet MSL. The Cheyenne MOA would be 68 NM long at the furthest point and 30 NM wide.

The Cheyenne MOA would be used primarily for LOWAT, ACBT and Intercept training. Typically, not more than four aircraft would operate in Cheyenne MOA simultaneously. Occasionally, as many as eight aircraft would operate in the Cheyenne MOA simultaneously. An eight-aircraft scenario would consist of four non-140th Wing (WG) aircraft along with four 140 WG F-16 aircraft to conduct ACBT or LOWAT. All missions would be flown at subsonic airspeeds between 250 to 550 KIAS (285 to 625 MPH).

The area would be used predominantly between the hours of sunrise to sunset. The 140 WG estimates that not more than five percent (5%) of the total flights in Cheyenne MOA would be flown between sunset and 10:00 PM. The 140 WG would not schedule flight operations between 10:00 PM and 7:00 AM.

Geographic coordinates of the Cheyenne High MOA would be as follows:

Beginning at	38°53.5'N 103°00.0'W
to	38°45.0'N 103°00.0'W
to	38°28.0'N 102°22.0'W
to	38°52.0'N 101°28.5'W
to	39°16.0'N 101°45.0'W
to	point of beginning.

Geographic coordinates of the Cheyenne Low MOA would be as follows:

Beginning at	38°53.5'N 103°00.0'W
to	38°45.0'N 103°00.0'W
to	38°28.0'N 102°22.0'W
to	38°49.0'N 101°36.5'W
to	39°14.0'N 101°51.0'W
to	point of beginning.



**E.1.1.2 Airspace Utilization**

This five-sided MOA would be 68 NM long and 30 NM wide at its furthest point, and it would be centered approximately 120 NM southeast of Buckley ANGB. Tables E-2 and E-3 display the proposed annual sortie utilization and profiles, respectively, to be flown in Cheyenne MOA.

**Table E-2. Current and Original Proposal Annual Sortie Utilization in Cheyenne MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT <sup>1</sup> )	SORTIES/YEAR (ORIGINAL PROPOSAL)
140 WG	F-16C/D	1,109	1,654
150 FG	F-16C/D	0	72
27 FW	F-16	0	58
ADVERSARY	F-14/F-15/F-18	65	75
MULTIPLE	OTHER	150	160
TOTALS		1,324	2,019

Note: 1. Current use information reflects Kit Carson MOA utilization

**Table E-3. Original Proposal Sortie Profiles in Cheyenne MOA**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
F-16C/D	500' AGL - 1,500' AGL	8
	1,500' AGL - 3,000' AGL	6
	3,000' AGL - 5,000' AGL	10
	5,000' AGL - ABOVE	23
ADVERSARY AND OTHER	5,000' AGL - ABOVE	35

**E.1.2 Original Proposal—Pinon Canyon MOA Modification**

**E.1.2.1 Airspace Description**

This proposal would move the eastern boundary of Pinon Canyon MOA approximately 1 NM to obtain adequate clearance from a north-south airway (V-169). This action is a result of an FAA review of the aeronautical feasibility of the proposed Two Buttes MOA. This is an administrative action and not a 140 WG operational requirement. This action will be executed regardless of any other action(s) of the Colorado Airspace Initiative. Geographic coordinates of the revised Pinon Canyon MOA (see Figure 2-3) would be as follows:

Beginning at 37°38.4'N 104°11.2'W  
to 37°01.3'N 104°07.7'W  
to 37°16.5'N 103°42.5'W  
to 37°27.3'N 103°31.0'W  
to 37°52.9'N 103°21.2'W  
to 37°45.4'N 103°53.5'W

to 37°41.7'N 104°02.5'W  
to point of beginning.

**E.1.2.2 Airspace Utilization**

The FAA will move the eastern border of the Pinon Canyon MOA approximately 1 NM to obtain adequate clearance from a north-south airway (V-169) regardless of any other proposed action in the Colorado Airspace Initiative. Tables E-4 and E-5 display the proposed sortie utilization and profiles, respectively, to be flown annually in Pinon Canyon MOA.

**Table E-4. Current and Original Proposal Annual Sortie Utilization in Pinon Canyon MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (ORIGINAL PROPOSAL)
140 WG	F-16	41	40
MULTIPLE	OTHER	0	4
TOTALS		41	44

**Table E-5. Original Proposal Annual Sortie Profiles in Pinon Canyon MOA**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
F-16C/D	500' AGL - 1,500' AGL	5
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	25
	5,000' AGL - Above	2
OTHER	500' AGL - 1,500' AGL	5
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	25
	5,000' AGL - Above	2

**E.1.3 Original Proposal—La Veta MOA Modification**

**E.1.3.1 Airspace Description**

This proposal would move the western boundary of the present La Veta High MOA east approximately 5 NM and delete the La Veta Low designation (see Figure 2-4). It would also revise the altitude limits of the MOA to 300 feet AGL up to, but not including, 18,000 feet MSL. An ATCAA would be associated with the La Veta MOA with the same horizontal boundaries and would extend vertically from FL 180 to FL 290.

The Greenhorn Mountain Wilderness and the Sangre de Cristo Wilderness underlie portions of the airspace associated with the modified La Veta MOA. Each Federal wilderness area would be avoided in accordance with the ANG wilderness overflight policy presented in Appendix L.

The La Veta MOA would be used primarily for LOWAT and ACBT. Typically, not more than four aircraft would operate in the La Veta MOA simultaneously. Occasionally, as many as eight aircraft would operate in the La Veta MOA simultaneously. An eight-aircraft scenario would consist of four non-140 WG aircraft along with four 140 WG F-16 aircraft to conduct ACBT or LOWAT. All missions would be flown at subsonic airspeeds between 250 to 550 KIAS (285 to 625 MPH). The area would be used predominantly between the hours of sunrise to sunset. The 140 WG would not schedule flight operations to be in the MOA between 10:00 PM and 7:00 AM. Geographic coordinates of the modified La Veta MOA would be as follows:

Beginning at 38°15.5'N 104°55.0'W  
 to 38°17.0'N 105°19.0'W  
 to 37°57.0'N 105°19.0'W  
 to 37°50.0'N 105°30.0'W  
 to 37°36.0'N 105°30.0'W  
 to 37°36.0'N 105°05.0'W  
 to 37°40.5'N 104°45.0'W  
 to 37°55.0'N 104°38.0'W  
 to 38°04.0'N 104°49.0'W  
 to point of beginning.

**E.1.3.2 Airspace Utilization**

This proposal would reduce the size of the La Veta MOA by moving a portion of the western border. Tables E-6 and E-7 display the proposed sortie utilization and profiles to be flown annually in La Veta MOA, respectively.

**Table E-6. Current and Original Proposal Annual Sortie Utilization in La Veta MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (ORIGINAL PROPOSAL)
140 WG	F-16	999	874
150 FG	F-16	65	72
27 FW	F-16	0	58
ADVERSARY	F-14/F-15/F-18	84	96
TOTALS		1,148	1,100

**Table E-7. Original Proposal Sortie Profiles in La Veta MOA**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
F-16C/D	500' AGL - 1,500' AGL	5
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	6
	5,000' AGL - ABOVE	9
ADVERSARY	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	5
	5,000' AGL - ABOVE	15

**E.1.4 Original Proposal—Modification of Fremont MOA (Rename as Airburst MOA)**

**E.1.4.1 Airspace Description**

The Airburst MOA would be used primarily for tactical re-entries and conventional weapon delivery profiles on the Airburst Range (R-2601). It would be activated when R-2601 is activated and would be sectioned into A, B, and C areas (see Figure 2-5). Airburst A would extend vertically from 1,500 feet AGL to, but not including, 18,000 feet MSL. Airburst B would extend vertically from 300 feet AGL to, but not including, 18,000 feet MSL. Airburst C would extend vertically from 300 feet AGL to 8,500 feet MSL.

Normally, not more than four aircraft would be in Airburst MOA simultaneously. Typical profiles would be four F-16 aircraft assigned to the 140 WG making multiple entries to the range from a point approximately 20 NM from a target on the Airburst Range. Aircraft would typically fly between 300 feet AGL and 8,500 feet MSL at speeds up to 540 KIAS (615 MPH). The area would be used predominantly between the hours of sunrise to sunset. The 140 WG would not schedule flight operations to be in the MOA between 10:00 PM and 7:00 AM. The geographic coordinates of Airburst A, B, and C MOAs would be as follows:

**Airburst A -**

Beginning at 38°40.0'N 104°53.0'W  
to 38°37.5'N 104°53.0'W  
then southwest along Colorado Highway 115  
to 38°29.6'N 104°57.5'W  
to 38°26.2'N 104°57.5'W  
to 38°26.2'N 105°00.5'W  
to 38°24.5'N 105°01.0'W  
to 38°25.5'N 105°17.0'W  
to 38°42.0'N 105°08.0'W  
to point of beginning excluding a 3 NM radius  
of Fremont County Airport  
(38°25.5'N 105°06.3'W).

**Airburst B -**

Beginning at 38°26.2'N 105°00.5'W  
to 38°26.1'N 104°49.0'W  
to 38°25.6'N 104°49.0'W  
to 38°23.7'N 104°50.0'W  
to 38°24.5'N 105°01.0'W  
to point of beginning.

**Airburst C -**

Beginning at 38°24.5'N 105°01.0'W  
to 38°23.7'N 104°50.0'W  
to 38°13.3'N 104°53.8'W  
to 38°15.5'N 104°55.0'W  
to 38°16.2'N 105°04.6'W  
to point of beginning.

**E.1.4.2 Airspace Utilization**

Tables E-8 and E-9 display the proposed sortie utilization and profiles to be flown annually in the Airburst MOA.

**Table E-8. Original Proposal Annual Sortie Utilization in Airburst MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT <sup>1</sup> )	SORTIES/YEAR (ORIGINAL PROPOSAL)
140 WG	F-16C/D	1,732	1,396
150 FG	F-16C/D	498	577
27 FW	F-16	306	458
MULTIPLE	OTHER	0	100
TOTALS		2,536	2,531

NOTE: 1. Current use information reflects Fremont MOA and IR-409 utilization

**Table E-9. Original Proposal Sortie Profiles in Airburst MOA**

AIRSPACE	AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
Airburst A MOA	F-16C/D	1,500' AGL - 3,000' AGL	3
		3,000' AGL - 5,000' AGL	1
		5,000' AGL - ABOVE	4
	OTHER	1,500' AGL - 3,000' AGL	3
		3,000' AGL - 5,000' AGL	1
		5,000' AGL - ABOVE	4
Airburst B MOA	F-16C/D	500' - 1,500' AGL	1
		1,500' AGL - 3,000' AGL	1
		3,000' AGL - 5,000' AGL	1
		5,000' AGL - ABOVE	1
	OTHER	500' AGL - 1,500' AGL	1
		1,500' AGL - 3,000' AGL	1
Airburst C MOA	F-16C/D	3,000' AGL - 5,000' AGL	1
		5,000' AGL - ABOVE	1
	OTHER	500' AGL - 1,500' AGL	2
		1,500' AGL - 3,000' AGL	2

**E.1.5 Original Proposal—Two Buttes MOA Establishment**

**E.1.5.1 Airspace Description**

This proposal would establish a new MOA immediately east of and adjoining Pinon Canyon MOA (centered approximately 140 NM southeast of Buckley ANGB). This proposal would necessitate a slight adjustment to shorten the eastern border of the Pinon Canyon MOA due to FAA requirements (see Figure 2-6). This MOA would be used for low, medium, and high altitude air-to-air training and AMRAAM. It would be stratified into a low and high MOA, each with the same lateral boundaries. Two Buttes Low would extend vertically from 300 feet AGL up to, but not including, 10,000 feet MSL (this approximates 5,000 feet AGL). Two Buttes High would extend vertically from

10,000 feet MSL up to, but not including, 18,000 feet MSL. Two Buttes Low would be used approximately one weekend per month.

Typically, not more than four aircraft would be in Two Buttes MOA simultaneously. Occasionally, as many as eight aircraft would operate in the Two Buttes MOA simultaneously. An eight-aircraft scenario would consist of four non-140 WG aircraft along with four 140 WG F-16 aircraft. All missions would be flown at subsonic airspeeds between 250 to 550 KIAS (285 to 625 MPH). The area would be used predominantly between the hours of sunrise to sunset. The 140 WG would not schedule flight operations to be in the MOA between 10:00 PM and 7:00 AM. Geographic coordinates of the Two Buttes MOA would be as follows:

Beginning at 37°52.9'N 103°21.2'W  
to 37°59.0'N 103°00.0'W  
to 37°51.0'N 102°28.1'W  
to 37°41.6'N 102°18.7'W  
to 37°19.6'N 103°17.5'W  
to 37°27.3'N 103°31.1'W  
to point of beginning.

#### **E.1.5.2 Airspace Utilization**

#### **Two Buttes High MOA**

This MOA would be east of and adjoining Pinon Canyon MOA. It would be a six-sided, irregularly shaped area 60 NM long and 30 NM wide at its furthest points, and centered approximately 140 NM southeast of Buckley ANGB. Tables E-10 and E-11 display the proposed annual sortie utilization and profiles, respectively, to be flown in Two Buttes High MOA.

**Table E-10. Original Proposal Annual Sortie Utilization in Two Buttes High MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR
140 WG	F-16C/D	345
ADVERSARY	F-14/F-15/F-18	296
MULTIPLE	OTHER	20
TOTALS		661

**Table E-11. Original Proposal Sortie Profiles in Two Buttes High MOA**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
ALL	10,000' MSL- ABOVE	20

#### **Two Buttes Low MOA**

This MOA would have the same lateral dimensions as Two Buttes High. Tables E-12 and E-13 display the proposed sortie utilization and profiles to be flown annually in Two Buttes Low MOA, respectively.

**Table E-12. Original Proposal Annual Sortie Utilization in Two Buttes Low MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR
140 WG	F-16C/D	216
150 FG	F-16C/D	72
27 FW	F-16	58
ADVERSARY	F-14/F-15/F-18	72
TOTALS		418

**Table E-13. Original Proposal Annual Sortie Profiles in Two Buttes Low MOA**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
F-16C/D	500' AGL - 1,500' AGL	6
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	5
ADVERSARY AND OTHER	500' AGL - 1,500' AGL	0
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	5

**E.1.6 Original Proposal—IR-409 Modification**

**E.1.6.1 Airspace Description**

This route (see Figure 2-7) is used for visual navigation training that supports LOWAT and air-to-surface training. The 140 WG would not schedule flight operations on the route between 10:00 PM to 7:00 AM. Table E-14 describes the proposed route.

**Table E-14. Original Proposal IR-409 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
10,000 feet MSL or as assigned	A	38°11.8'N 102°41.2'W (no change)	
10,000 feet MSL or as assigned	B	37°59.0'N 102°38.0'W (no change)	A to B 3 Left/3 Right
100 feet AGL to 7,700 feet MSL	C	37°43.5'N 102°37.0'W (no change)	B to C 3 Left/3 Right
100 feet AGL to 7,700 feet MSL	D	37°10.0'N 103°08.0'W (no change)	C to D 8 Left/8 Right
100 feet AGL to 7,000 feet MSL	E	36°58.0'N 103°16.0'W (no change)	D to E 8 Left/8 Right
100 feet AGL to 8,000 feet MSL	F	37°36.0'N 104°03.0'W (no change)	E to F 8 Left/8 Right
100 feet AGL to 8,000 feet MSL	G	37°45.0'N 104°43.0'W	F to G 8 Left/8 Right
100 feet AGL to 8,000 feet MSL	H	37°47.0'N 104°54.0'W	G to H 5 Left/8 Right
100 feet AGL to 14,500 feet MSL	I	38°15.6'N 104°57.8'W	H to I 15 Left/2.5 Right

### E.1.6.2 Airspace Utilization

This MTR begins approximately 130 NM southeast of Buckley ANGB and terminates in Airburst MOA. It would be used primarily for visual navigation that supports air-to-surface training. Tables E-15 and E-16 display the proposed annual sortie utilization and profiles, respectively.

**Table E-15. Current and Original Proposal Annual Sortie Utilization on IR-409**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (ORIGINAL PROPOSAL)
140 WG	F-16	866	14
150 FG	F-16	469	548
27 FW	F-16	306	400
MULTIPLE	OTHER	0	100
TOTALS		1,641	1,062

**Table E-16. Original Proposal Sortie Profiles on IR-409**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 28 minutes.

### E.1.7 Original Proposal—VR-413 Modification

#### E.1.7.1 Airspace Description

This route (see Figure 2-8) would be used for visual navigation and LOWAT. The area proposed for the modified VR-413 is depicted in Figure 2-1. This proposal would relocate Point E approximately 14 nautical miles south-southeast of its current location and reduce the route width to 4 NM left and 5 NM right of centerline between Point D and Point E and to 2.5 NM left and right of centerline between Point E and Point F. Points G and H would be relocated to conform with the proposed IR-409 modification. In addition, the maximum altitude between points B and H would increase to 2,000 AGL to comply with the ANG's wilderness overflight policy. The proposal would modify the route beginning at Point F to coincide with IR-409 through La Veta MOA. The 140 WG would not schedule flight operations on the route between 10:00 PM to 7:00 AM. Table E-17 describes the proposed routing.

#### E.1.7.2 Airspace Utilization

This route would be used for visual navigation and LOWAT. Tables E-18 and E-19 display the proposed annual sortie utilization and profiles, respectively, to be flown on VR-413.



**Table E-17. Original Proposal VR-413 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)	
12,000 feet MSL	A	39°07.0'N 104°55.0'W (no change)		
300 feet AGL to 3,000 feet AGL	B	38°54.0'N 105°28.0'W (no change)	A to B	5 Left/5 Right
300 feet AGL to 3,000 feet AGL	C	38°29.0'N 105°52.0'W (no change)	B to C	5 Left/5 Right
300 feet AGL to 3,000 feet AGL	D	38°18.0'N 106°02.0'W (no change)	C to D	5 Left/5 Right
300 feet AGL to 3,000 feet AGL	E	37°29.3'N 105°35.8'W	D to E	4 Left/5 Right
300 feet AGL to 3,000 feet AGL	F	37°36.0'N 105°12.0'W (no change)	E to F	2.5 Left/2.5 Right
100 feet AGL to 8,000 feet MSL	G	37°47.0'N 104°54.0'W	F to G	5 Left/5 Right
100 feet AGL to 14,500 feet MSL	H	38°15.6'N 104°57.8'W	G to H	15 Left/2.5 Right

**Table E-18. Current and Original Proposal Annual Sortie Utilization on VR-413**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (ORIGINAL PROPOSAL)
140 WG	F-16C/D	100	254

**Table E-19. Original Proposal Sortie Profiles on VR-413**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	300' AGL - 3,000' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 22 minutes.

**E.1.8 Original Proposal—VR-412 Deletion**

This route would be deleted.

**E.1.9 Original Proposal—IR-414 Modification**

**E.1.9.1 Airspace Description**

This proposal would modify IR-414 by deleting the maneuver area designation along the route. The lateral dimensions of this route would remain as currently charted. The minimum altitude would be raised from surface to 300 feet AGL.

**E.1.9.2 Airspace Utilization**

This MTR begins approximately 70 NM southeast and terminates approximately 144 NM southeast of Buckley ANGB. It would be used primarily for

visual navigation training and LOWAT. Tables E-20 and E-21 display the proposed annual sortie utilization and sortie profiles, respectively.

**Table E-20. Current and Original Proposal Annual Sortie Utilization on IR-414**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (ORIGINAL PROPOSAL)
140 WG	F-16C/D	16	28
MULTIPLE	OTHER	0	4
TOTALS		16	32

**Table E-21. Original Proposal Sortie Profiles on IR-414**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 13 minutes.

**E.1.10 Original Proposal—XIR-424 Establishment**

**E.1.10.1 Airspace Description**

This proposed route (see Figure 2-11) would follow the reverse of IR-414 then continue to Airburst C MOA, following the IR-409 ground track as described in Table E-22. This route would be used primarily for visual navigation and LOWAT to support air-to-surface training. The 140 WG would not schedule flight operations on the route between 10:00 PM to 7:00 AM.

**Table E-22. Original Proposal XIR-424 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)	
11,000 feet MSL or as assigned	A	39°05.0'N 101°45.0'W		
300 feet AGL to 8,000 feet MSL	B	38°48.0'N 102°36.0'W	A to B	18 Left/10 Right
300 feet AGL to 8,000 feet MSL	C	38°42.0'N 102°51.0'W	B to C	3 Left/3 Right
300 feet AGL to 8,000 feet MSL	D	38°16.0'N 103°45.0'W	C to D	3 Left/3 Right
300 feet AGL to 7,500 feet MSL	E	37°56.0'N 104°37.0'W	D to E	3 Left/3 Right
100 feet AGL to 8,000 feet MSL	F	37°47.0'N 104°54.0'W	E to F	5 Left/5 Right
100 feet AGL to 14,500 feet MSL	G	38°15.6'N 104°57.8'W	F to G	15 Left/2.5 Right

**E.1.10.2 Airspace Utilization**

This MTR would follow the reverse of IR-414 then continue into Airburst MOA and would be used primarily for visual navigation and LOWAT to support air-to-surface training. Tables E-23 and E-24 display the proposed annual sortie utilization and profiles, respectively.

**Table E-23. Original Proposal Annual Sortie Utilization on XIR-424**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR
140 WG	F-16C/D	266

**Table E-24. Original Proposal Sortie Profiles on XIR-424**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 24 minutes.

**E.1.11 Original Proposal—IR-415 Modification**

**E.1.11.1 Airspace Description**

This route (see Figure 2-12) would be used for visual navigation and LOWAT. The 140 WG would not schedule flight operations on the route between 10:00 PM to 7:00 AM. Table E-25 describes the proposed route.

**Table E-25. Original Proposal IR-415 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)	
7,000 feet MSL	A	39°36.5'N 104°11.0'W (no change)		
300 feet AGL to 7,000 feet MSL	B	39°34.0'N 103°13.0'W (no change)	A to B	3 Left/3 Right
300 feet AGL to 7,000 feet MSL	C	38°55.0'N 103°17.0'W (no change)	B to C	3 Left/3 Right
10,000 feet MSL (alt. exit point)	C <sub>1</sub>	38°50.0'N 103°29.3'W	C to C <sub>1</sub>	3 Left/3 Right
300 feet AGL to 6,000 feet MSL	D	38°16.0'N 103°45.0'W (no change)	C to D	3 Left/3 Right
300 feet AGL to 6,500 feet MSL	E	37°56.0'N 104°37.0'W (no change)	D to E	3 Left/3 Right
300 feet AGL to 8,000 feet MSL	F	37°47.0'N 104°54.0'W	E to F	5 Left/5 Right
300 feet AGL to 14,500 feet MSL	G	38°15.6'N 104°57.8'W	F to G	15 Left/2.5 Right

### E.1.11.2 Airspace Utilization

This MTR begins approximately 20 NM east-southeast of Buckley ANGB and terminates in Airburst MOA. Tables E-26 and E-27 display the proposed annual sortie utilization and sortie profiles, respectively.

**Table E-26. Current and Original Proposal Annual Sortie Utilization on IR-415**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (ORIGINAL PROPOSAL)
140 WG	F-16C/D	40	84
MULTIPLE	OTHER	0	8
TOTALS		40	92

**Table E-27. Original Proposal Sortie Profiles on IR-415**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 26 minutes.

### E.1.12 Original Proposal—IR-416 Modification

#### E.1.12.1 Airspace Description

This proposed route would follow the existing IR-416 and terminate at point G. This proposal would eliminate the southern portion of the route--points H to L (see Figure 2-13). This route would be used for visual navigation training to support LOWAT operations in the Cougar MOA. The 140 WG would not schedule flight operations on the route between 10:00 PM to 7:00 AM. Table E-28 describes the proposed route.

**Table E-28. Original Proposal IR-416 Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
11,000 feet MSL or as assigned	A	40°47.0'N 105°20.0'W (no change)	
300 feet AGL to 11,000 feet MSL	B	41°14.0'N 106°08.0'W (no change)	A to B 5 Left/5 Right
300 feet AGL to 12,000 feet MSL	C	41°36.0'N 106°12.0'W (no change)	B to C 5 Left/5 Right
300 feet AGL to 9,000 feet MSL	D	41°39.5'N 106°00.0'W (no change)	C to D 5 Left/5 Right
300 feet AGL to 9,000 feet MSL	E	42°00.0'N 105°03.0'W (no change)	D to E 5 Left/5 Right
300 feet AGL to 7,500 feet MSL	F	41°44.0'N 104°03.0'W (no change)	E to F 5 Left/5 Right
300 feet AGL to 7,300 feet MSL	G	40°58.0'N 103°56.0'W (no change)	F to G 5 Left/5 Right

**E.1.12.2 Airspace Utilization**

This MTR begins approximately 85 NM northwest of Buckley ANGB and would terminate in the Cougar MOA. Tables E-29 and E-30 display the proposed annual sortie utilization and sortie profiles, respectively.

**Table E-29. Current and Original Proposal Annual Sortie Utilization on IR-416**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (ORIGINAL PROPOSAL)
140 WG	F-16	30	42
MULTIPLE	OTHER	0	4
TOTALS		30	46

**Table E-30. Original Proposal Sortie Profiles on IR-416**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 24 minutes.

**E.1.13 Original Proposal—XIR-426 Establishment**

**E.1.13.1 Airspace Description**

This route (see Figure 2-14) would follow the reverse of IR-416 beginning at point L and proceed north to terminate at point G. The start point of the new route (point A) would be IR-416 point L. The route would end at point F (IR-416 point G). This route would be used primarily for visual navigation and LOWAT in conjunction with Cougar MOA to support air-to-surface training. The 140 WG would not schedule flight operations on the route between 10:00 PM to 7:00 AM. Table E-31 describes the proposed route.

**Table E-31. Original Proposal XIR-426 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
10,000 feet MSL or as assigned	A	39°26.0'N 103°37.0'W	
300 feet AGL to 10,000 feet MSL	B	39°49.0'N 103°33.0'W	A to B 3 Left/3 Right
300 feet AGL to 7,000 feet MSL	C	40°00.0'N 103°26.0'W	B to C 3 Left/3 Right
300 feet AGL to 7,000 feet MSL	D	40°24.0'N 103°29.0'W	C to D 3 Left/3 Right
300 feet AGL to 10,000 feet MSL	E	40°27.0'N 103°41.0'W	D to E 3 Left/3 Right
300 feet AGL to 7,300 feet MSL	F	40°58.0'N 103°56.0'W	E to F 5 Left/5 Right

### E.1.13.2 Airspace Utilization

This route would follow the reverse of the currently charted IR-416 beginning at point L and proceed north to terminate at Point G. The start point (point A) of the new route would be IR-416 point L. Tables E-32 and E-33 display the proposed annual sortie utilization and profiles, respectively, to be flown on XIR-426.

**Table E-32. Original Proposal Sortie Utilization on XIR-426**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR
140 WG	F-16	42
MULTIPLE	OTHER	4
TOTALS		46

**Table E-33. Original Proposal Sortie Profiles on XIR-426**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 10 minutes.

### E.1.14 Original Proposal—XVR-1427 Establishment

#### E.1.14.1 Airspace Description

This proposal would establish a visual route (see Figure 2-15) that would begin approximately 7 NM south of the northern border of Cheyenne MOA. The route would proceed south to approximately 20 NM south of Cheyenne MOA, then proceed west through the new Two Buttes Low and Pinon Canyon MOAs to IR-409 point F. From point F, the route would follow the revised IR-409 routing through the La Veta MOA. IR-409 route and altitude restrictions would apply beginning at point G proceeding through the La Veta MOA. The Greenhorn Mountain Wilderness underlies a portion of the airspace associated with the proposed route. This Federal wilderness area would be avoided by lateral means. Table E-34 describes the proposed route.

**Table E-34. Original Proposal XVR-1427 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
1,500 feet AGL or as assigned	A	39°00.0'N 102°00.0'W	
300 feet AGL to 1,500 feet AGL	B	38°43.0'N 101°51.0'W	A to B 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	C	38°01.0'N 102°00.0'W	B to C 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	D	37°51.0'N 102°29.0'W	C to D 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	E	37°36.0'N 103°31.0'W	D to E 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	F	37°36.0'N 104°03.0'W	E to F 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	G	37°45.0'N 104°43.0'W	F to G 8 Left/8 Right
300 feet AGL to 1,500 feet AGL	H	37°47.0'N 104°54.0'W	G to H 5 Left/8 Right
300 feet AGL to 1,500 feet AGL	I	38°15.6'N 104°57.8'W	H to I 15 Left/2.5 Right

**E.1.14.2 Airspace Utilization**

This proposal would establish a new MTR that would begin approximately 130 NM southeast of Buckley ANGB and terminate at Airburst C MOA. The route would be used primarily for visual navigation to support air-to-surface training. Tables E-35 and E-36 display the proposed annual sortie utilization and profiles, respectively, to be flown on XVR-1427.

**Table E-35. Original Proposal Annual Sortie Utilization on XVR-1427**

UNIT	AIRCRAFT	SORTIES/YEAR
140 WG	F-16	216
150 FG	F-16	72
27 FW	F-16	58
TOTALS		346

**Table E-36. Original Proposal Sortie Profiles on XVR-1427**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 27 minutes.

**E.2 PREFERRED ALTERNATIVE**

The following subsections present and describe the airspace associated with the Preferred Alternative.

**E.2.1 Preferred Alternative—Modification of Kit Carson MOA (Rename as Cheyenne MOA)**

The airspace configuration of Cheyenne MOA under the Preferred Alternative would be the same as that described for the Original Proposal Alternative. Tables E-37 and E-38 show the proposed annual sortie utilization and profiles, respectively, to be flown in Cheyenne MOA under the Preferred Alternative.

**Table E-37. Current and Preferred Alternative Annual Utilization in Cheyenne MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	1,109	1,498
150 FG	F-16	0	72
ADVERSARY	F-14/F-15/F-18	65	70
MULTIPLE	Other	150	164
TOTALS		1,324	1,804

**Table E-38. Sortie Profiles in Cheyenne MOA Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
F-16C/D	500' AGL - 1,500' AGL	8
	1,500' AGL - 3,000' AGL	6
	3,000' AGL - 5,000' AGL	10
	5,000' AGL - ABOVE	23
ADVERSARY AND OTHER	5,000' AGL - ABOVE	35

**E.2.2 Preferred Alternative—Pinon Canyon MOA Modification**

The airspace configuration of Pinon Canyon MOA under the Preferred Alternative would be the same as that described for the Original Proposal Alternative. Tables E-39 and E-40 show the proposed annual sortie utilization and profiles, respectively, to be flown in Pinon Canyon under the Preferred Alternative.

**Table E-39. Current and Preferred Alternative Annual Utilization in Pinon Canyon MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	41	56
MULTIPLE	Other	0	6
TOTALS		41	62



**Table E-40. Annual Sortie Profiles in Pinon Canyon MOA Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
F-16C/D	500' AGL - 1,500' AGL	5
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	25
	5,000' AGL - Above	2
OTHER	500' AGL - 1,500' AGL	5
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	25
	5,000' AGL - Above	2

**E.2.3 Preferred Alternative—La Veta MOA Modification**

The airspace configuration of La Veta MOA under the Preferred Alternative would remain unchanged and would be the same as that described for the No-Action Alternative. Tables E-41 and E-42 show the proposed sortie utilization and profiles for La Veta MOA, respectively.

**Table E-41. Current and Preferred Alternative Annual Sortie Utilization in La Veta MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	999	824
150 FG	F-16	65	72
ADVERSARY	F-14/F-15/F-18	84	58
TOTALS		1,148	954

**Table E-42. Sortie Profiles in La Veta MOA Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
F-16C/D	500' AGL - 1,500' AGL	5
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	6
	5,000' AGL - ABOVE	9
ADVERSARY AND OTHER	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	5
	5,000' AGL - ABOVE	15

**E.2.4 Preferred Alternative—Modification of Fremont MOA (Rename as Airburst MOA)**

Configuration of Airburst MOA under the Preferred Alternative would be the same as the Original Proposal Alternative except that the southern border of Airburst A would move north to exclude the area over Canon City and Penrose. The coordinates of the Airburst A MOA would then be as follows:

Airburst A -  
 Beginning at 38°40.0'N 104°53.0'W  
 to 38°37.5'N 104°53.0'W  
 then southwest along Colorado Highway 115  
 to 38°29.6'N 104°57.5'W  
 to 38°26.2'N 104°57.5'W  
 to 38°26.2'N 105°00.5'W  
 to 38°29.0'N 105°06.0'W  
 to 38°29.0'N 105°15.5'W  
 to 38°42.0'N 105°08.0'W  
 to point of beginning.

Airburst B and Airburst C MOA would have the same lateral dimensions as described for the Original Proposal Alternative; however, the bottom altitude would be raised to 500 feet AGL.

Tables E-43 and E-44 show the proposed annual sortie utilization and profiles, respectively, to be flown in Airburst MOA under the Preferred Alternative.

**Table E-43. Current and Preferred Alternative Annual Utilization in Airburst MOA**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT) <sup>1</sup>	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	1,732	1,588
150 FG	F-16	498	577
27 FW	F-16	306	72
MULTIPLE	Other	0	224
<b>TOTALS</b>		<b>2,536</b>	<b>2,461</b>

Note: 1. Current use information reflects Fremont MOA and IR-409 utilization.

**Table E-44. Sortie Profiles in Airburst MOA Under the Preferred Alternative**

AIRSPACE	AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
Airburst A MOA	F-16C/D	1,500' AGL - 3,000' AGL	3
		3,000' AGL - 5,000' AGL	1
		5,000' AGL - ABOVE	4
	OTHER	1,500' AGL - 3,000' AGL	3
3,000' AGL - 5,000' AGL		1	
5,000' AGL - ABOVE		4	
Airburst B MOA	F-16C/D	500' - 1,500' AGL	1
		1,500' AGL - 3,000' AGL	1
		3,000' AGL - 5,000' AGL	1
		5,000' AGL - ABOVE	1
	OTHER	500' AGL - 1,500' AGL	1
		1,500' AGL - 3,000' AGL	1
Airburst C MOA	F-16C/D	500' AGL - 1,500' AGL	2
		1,500' AGL - 3,000' AGL	2
	OTHER	500' AGL - 1,500' AGL	3
		1,500' AGL - 3,000' AGL	3

**E.2.5 Preferred Alternative—Two Buttes High and Low MOA Establishment**

The airspace configuration of Two Buttes High and Low MOA under the Preferred Alternative would be the same as that described for the Original Proposal Alternative. Tables E-45 and E-47 show the proposed annual sortie utilization to be flown in Two Buttes High and Low MOA, respectively. Tables E-46 and E-48 show the proposed sortie profiles for Two Buttes High and Low MOA, respectively.

**Table E-45. Annual Utilization in Two Buttes High MOA Under the Preferred Alternative**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	492
150 FG	F-16	24
ADVERSARY	F-14/F-15/F-18	260
MULTIPLE	Other	78
TOTALS		854

**Table E-46. Sortie Profiles in Two Buttes High MOA Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
ALL	10,000' MSL- ABOVE	20

**Table E-47. Annual Utilization in Two Buttes Low MOA Under the Preferred Alternative**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	240
150 FG	F-16	72
ADVERSARY	F-14/F-15/F-18	120
MULTIPLE	Other	43
TOTALS		475

**Table E-48. Annual Sortie Profiles in Two Buttes Low MOA Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	APPROX TIME (MIN/SORTIE)
F-16C/D	500' AGL - 1,500' AGL	6
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	5
ADVERSARY AND OTHER	500' AGL - 1,500' AGL	0
	1,500' AGL - 3,000' AGL	5
	3,000' AGL - 5,000' AGL	5

**E.2.6 Preferred Alternative—IR-409 Modification**

Under the Preferred Alternative, IR-409 would continue to use the existing route dimensions and altitude of the No-Action Alternative. However, the bottom altitude of IR-409 would be raised from the surface to 300 feet AGL from Point C to Point G (near Cedarwood) and from the surface to 500 feet AGL from Point G to the Airburst Range (Point I). Table E-49 describes the proposed route. Tables E-50 and E-51 show the proposed annual sortie utilization and profiles, respectively, to be flown in IR-409 under the Preferred Alternative.

**Table E-49. IR-409 Route Description Under the Preferred Alternative**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
10,000 feet MSL or as assigned	A	38°11.8'N 102°41.2'W	
10,000 feet MSL or as assigned	B	37°59.0'N 102°38.0'W	A to B 3 Left/3 Right
300 feet AGL to 7,700 feet MSL	C	37°43.5'N 102°37.0'W	B to C 3 Left/3 Right
300 feet AGL to 7,700 feet MSL	D	37°10.0'N 103°08.0'W	C to D 8 Left/8 Right
300 feet AGL to 7,000 feet MSL	E	36°58.0'N 103°16.0'W	D to E 8 Left/8 Right
300 feet AGL to 8,000 feet MSL	F	37°36.0'N 104°03.0'W	E to F 7 Left/15 Right
300 feet AGL to 8,000 feet MSL	G	37°56.0'N 104°37.0'W	F to G 7 Left/7 Right
500 feet AGL to 8,000 feet MSL	H	38°12.0'N 104°59.0'W	G to H 3 Left/3 Right
500 feet AGL to 8,500 feet MSL	I	38°26.0'N 104°53.0'W	H to I 5.5 Left/3.5 Right

**Table E-50. Current and Preferred Alternative Annual Utilization in IR-409**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	866	286
150 FG	F-16	469	457
27 FW	F-16	306	72
MULTIPLE	Other	0	83
TOTALS		1,641	898

**Table E-51. Sortie Profiles on IR-409 Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 28 minutes.

**E.2.7 Preferred Alternative—VR-413 Modification**

The route for VR-413 under the Preferred Alternative would relocate Point E approximately 14 NM south-southeast of its current location. The proposed route would rejoin the existing route alignment at Point F and continue on to Point H at Cedarwood. From Cedarwood, the route would adopt the route structure of IR-409 and continue on to the Airburst Range (Point J). The route would be reduced in width to 3 NM right and left of the centerline for its entire length, except for the last leg through Airburst MOA where it adopts the widths of IR-409. The bottom elevation would be raised from the surface to 500 feet AGL for the entire route. Table E-52 describes the proposed route.

**Table E-52. VR-413 Description Under the Preferred Alternative**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
12,000 feet MSL	A	39°07.0'N 104°55.0'W (no change)	
500 feet AGL to 3,000 feet AGL	B	38°54.0'N 105°28.0'W (no change)	A to B 3 Left/3 Right
500 feet AGL to 3,000 feet AGL	C	38°29.0'N 105°52.0'W (no change)	B to C 3 Left/3 Right
500 feet AGL to 3,000 feet AGL	D	38°18.0'N 106°02.0'W (no change)	C to D 3 Left/3 Right
500 feet AGL to 3,000 feet AGL	E	37°29.3'N 105°35.8'W	D to E 3 Left/3 Right
500 feet AGL to 3,000 feet AGL	F	37°36.0'N 105°12.0'W (no change)	E to F 3 Left/3 Right
500 feet AGL to 3,000 feet AGL	G	37°44.0'N 104°57.0'W	F to G 3 Left/3 Right
500 feet AGL to 3,000 feet AGL	H	37°56.0'N 104°37.0'W	G to H 3 Left/3 Right
500 feet AGL to 3,000 feet AGL	I	38°12.0'N 104°59.0'W	H to I 3 Left/3 Right
500 feet AGL to 3,000 feet AGL	J	38°26.0'N 104°53.0'W	I to J 5.5 Left/3.5 Right

The bottom altitude of the MTR would be raised to 500 feet AGL for the entire route. In addition, as with the Original Proposal, the maximum altitude between points B and H would increase to 3,000 feet AGL in order to avoid the Sangre de Cristo and Greenhorn Mountain Wilderness Areas. Tables E-53 and E-54 show the proposed annual sortie utilization and profiles, respectively, to be flown in VR-413 under the Preferred Alternative.

**Table E-53. Current and Preferred Alternative Annual Sortie Utilization on VR-413**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16C/D	100	176

**Table E-54. Sortie Profiles on VR-413 Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 22 minutes.

**E.2.8 Preferred Alternative—VR-412 Deletion**

The airspace configuration and utilization under the Preferred Alternative would be the same as those described for the Original Proposal Alternative.

**E.2.9 Preferred Alternative—IR-414 Modification**

The airspace configuration of IR-414 under the Preferred Alternative would be the same as that described for the Original Proposal Alternative. Tables E-55 and E-56 show the proposed annual sortie utilization and profiles, respectively, to be flown in IR-414 under the Preferred Alternative.

**Table E-55. Current and Preferred Alternative Annual Utilization in IR-414**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	16	56
MULTIPLE	Other	0	6
TOTALS		16	62

**Table E-56. Sortie Profiles on IR-414 Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 13 minutes.

**E.2.10 Preferred Alternative--XIR-424 Establishment**

Routing for XIR-424 under the Preferred Alternative would be the same as the Original Proposal Alternative except that XIR-424 would join existing IR-409 at Cedarwood and adopt its route widths from that point. The bottom altitude of XIR-424 would be raised to 500 feet AGL from Cedarwood (Point E) to the Airburst Range (Point G). Table E-57 describes the proposed route. Tables E-58 and E-59 show the proposed annual sortie utilization and profiles, respectively, to be flown on XIR-424 under the Preferred Alternative.

**Table E-57. XIR-424 Route Description Under the Preferred Alternative**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)	
11,000 feet MSL or as assigned	A	39°05.0'N 101°45.0'W		
300 feet AGL to 8,000 feet MSL	B	38°48.0'N 102°36.0'W	A to B	18 Left/10 Right
300 feet AGL to 8,000 feet MSL	C	38°42.0'N 102°51.0'W	B to C	3 Left/3 Right
300 feet AGL to 8,000 feet MSL	D	38°16.0'N 103°45.0'W	C to D	3 Left/3 Right
300 feet AGL to 8,000 feet MSL	E	37°56.0'N 104°37.0'W	D to E	3 Left/3 Right
500 feet AGL to 8,000 feet MSL	F	38°12.0'N 104°59.0'W	E to F	3 Left/3 Right
500 feet AGL to 8,500 feet MSL	G	38°26.0'N 104°53.0'W	F to G	5.5 Left/3.5 Right

**Table E-58. Preferred Alternative Annual Sortie Utilization on XIR-424**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	192
MULTIPLE	OTHER	19
TOTALS		211

**Table E-59. Sortie Profiles on XIR-424 Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 24 minutes.

### E.2.11 Preferred Alternative—IR-415 Modification

Under the Preferred Alternative, existing IR-415 would join existing IR-409 at Cedarwood (Point E), conform to the route widths and altitudes of IR-409, and continue to the Airburst Range (Point G). The bottom altitude of the MTR would be raised to 500 feet AGL from Cedarwood to the Airburst Range. Table E-60 describes the proposed route. Tables E-61 and E-62 show the proposed annual sortie utilization and profiles, respectively, to be flown on IR-415 under the Preferred Alternative.

**Table E-60. IR-415 Route Description Under the Preferred Alternative**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)	
300 feet AGL to 7,000 feet MSL	A	39°36.5'N 104°11.0'W		
300 feet AGL to 7,000 feet MSL	B	39°34.0'N 103°13.0'W	A to B	3 Left/3 Right
300 feet AGL to 7,000 feet MSL	C	38°55.0'N 103°17.0'W	B to C	3 Left/3 Right
300 feet AGL to 6,000 feet MSL	D	38°16.0'N 103°45.0'W	C1 to D	3 Left/3 Right
300 feet AGL to 6,500 feet MSL	E	37°56.0'N 104°37.0'W	D to E	3 Left/3 Right
500 feet AGL to 8,000 feet MSL	F	38°12.0'N 104°59.0'W	E to F	3 Left/3 Right
500 feet AGL to 8,500 feet MSL	G	38°26.0'N 104°53.0'W	F to G	5.5 Left/3.5 Right

**Table E-61. Current and Preferred Alternative Annual Utilization in IR-415**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	40	80
MULTIPLE	Other	0	8
TOTALS		40	88

**Table E-62. Sortie Profiles on IR-415 Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 26 minutes.

### E.2.12 Preferred Alternative—IR-416 Modification

The airspace configuration of IR-416 under the Preferred Alternative would be the same as that described for the Original Proposal Alternative. Tables E-63 and E-64 display the proposed annual sortie utilization and sortie profiles, respectively.



**Table E-63. Current and Preferred Alternative Annual Sortie Utilization on IR-416**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR (CURRENT)	SORTIES/YEAR (PREFERRED ALTERNATIVE)
140 WG	F-16	30	56
MULTIPLE	OTHER	0	6
TOTALS		30	62

**Table E-64. Sortie Profiles on IR-416 Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 24 minutes.

**E.2.13 Preferred Alternative—XIR-426 Establishment**

The configuration of XIR-426 under the Preferred Alternative would be the same as that described for the Original Proposal Alternative. Tables E-65 and E-66 display the proposed annual sortie utilization and profiles, respectively, to be flown on XIR-426.

**Table E-65. Sortie Utilization on XIR-426 Under the Preferred Alternative**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR
140 WG	F-16	56
MULTIPLE	OTHER	6
TOTALS		62

**Table E-66. Sortie Profiles on XIR-426 Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 10 minutes.

**E.2.14 Preferred Alternative—XVR-1427 Establishment**

The configuration of XVR-1427 under the Preferred Alternative is the same as the Original Proposal Alternative except that the route would join existing IR-409 at Cedarwood and conform to the existing IR-409 route widths. The bottom altitude of XVR-1427 would be raised to 500 feet AGL from Cedarwood (Point G) to the Airburst Range (Point I). Table E-67 describes the proposed route. Tables E-68 and E-69 show the proposed annual sortie utilization and profiles, respectively, to be flown on XVR-1427 under the Preferred Alternative.

**Table E-67. XVR-1427 Route Description Under the Preferred Alternative**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
1,500 feet AGL or as assigned	A	39°00.0'N 102°00.0'W	
300 feet AGL to 1,500 feet AGL	B	38°43.0'N 101°51.0'W	A to B 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	C	38°01.0'N 102°00.0'W	B to C 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	D	37°51.0'N 102°29.0'W	C to D 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	E	37°36.0'N 103°31.0'W	D to E 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	F	37°36.0'N 104°03.0'W	E to F 5 Left/5 Right
300 feet AGL to 1,500 feet AGL	G	37°56.0'N 104°37.0'W	F to G 7 Left/7 Right
500 feet AGL to 1,500 feet AGL	H	38°12.0'N 104°59.0'W	G to H 3 Left/3 Right
500 feet AGL to 1,500 feet AGL	I	38°26.0'N 104°53.0'W	H to I 5.5 Left/3.5 Right

**Table E-68. Sortie Utilization on XVR-1427 Under the Preferred Alternative**

UNIT	AIRCRAFT TYPE	SORTIES/YEAR
140 WG	F-16	360
150 FG	F-16	120
MULTIPLE	OTHER	48
TOTALS		528

**Table E-69. Sortie Profiles on XVR-1427 Under the Preferred Alternative**

AIRCRAFT TYPE	ALTITUDE BAND	SPEED (KNOTS)	POWER (%)
F-16C/D	500' AGL - 1,500' AGL	480	88

Note: An aircraft traveling at 480 KIAS would traverse the route in approximately 27 minutes.

### **E.3 NO-ACTION ALTERNATIVE (EXISTING AIRSPACE)**

#### **E.3.1 No-Action Alternative—Kit Carson A/B MOA**

This MOA is centered approximately 110 NM southeast of Buckley ANGB. The lateral boundaries of Kit Carson B MOA encompass Kit Carson A MOA. Kit Carson B MOA is approximately 30 NM wide and 70 NM long and extends vertically from 9,000 feet MSL up to, but not including, 18,000 feet MSL. Kit Carson A MOA is approximately 25 NM wide and 45 NM long and extends vertically from 100 feet AGL up to, but not including, 9,000 feet MSL. Denver ARTCC notified the 140 WG that Kit Carson MOA would have to be modified, or perhaps deleted, to provide mandatory clearance from commercial aircraft on standard arrival and departure routes at the new Denver International Airport.

Geographic coordinates of the Kit Carson A/B MOAs are as follows:

##### Kit Carson A MOA

Beginning at 38°57.0'N 102°41.0'W  
to 39°14.3'N 101°51.2'W  
to 38°48.6'N 101°36.3'W  
to 38°31.0'N 102°27.0'W  
to point of beginning.

##### Kit Carson B MOA

Beginning at 38°47.0'N 103°22.0'W  
to 39°16.0'N 101°45.5'W  
to 38°52.0'N 101°28.5'W  
to 38°19.5'N 102°41.0'W  
to point of beginning.

#### **E.3.2 No-Action Alternative—Pinon Canyon MOA**

This MOA is centered approximately 140 NM south-southeast of Buckley ANGB. The MOA is approximately 35 NM in length and width. Ft. Carson schedules this MOA, which extends vertically from 100 feet AGL up to, but not including, 10,000 feet MSL.

Geographic coordinates of the Pinon Canyon MOA are as follows:

Beginning at 37°38.4'N 104°11.2'W  
to 37°01.8'N 104°07.7'W  
to 37°16.5'N 103°42.5'W  
to 37°27.3'N 103°31.0'W  
to 37°30.2'N 103°28.0'W  
to 37°35.5'N 103°31.5'W  
to 37°40.0'N 103°31.5'W  
to 37°53.5'N 103°29.3'W  
to 37°45.4'N 103°53.5'W  
to 37°41.7'N 104°02.5'W  
to point of beginning.

### **E.3.3 No-Action Alternative—La Veta High/Low MOA**

This MOA is centered approximately 100 NM south-southwest of Buckley ANGB. The MOA is approximately 40 NM wide and long at its extremes. La Veta Low MOA extends vertically from 1,500 feet AGL up to and including 13,000 feet MSL. La Veta High MOA extends vertically from 13,000 feet MSL up to, but not including, 18,000 feet MSL.

Geographic coordinates of the La Veta High MOA are as follows:

Beginning at	38°15.5'N 104°55.0'W
to	38°17.0'N 105°19.0'W
to	37°50.0'N 105°30.0'W
to	37°36.0'N 105°30.0'W
to	37°36.0'N 105°05.0'W
to	37°40.5'N 104°45.0'W
to	37°55.0'N 104°38.0'W
to	38°04.0'N 104°49.0'W
to	point of beginning.

Geographic coordinates of the La Veta Low MOA are as follows:

Beginning at	38°15.5'N 104°55.0'W
to	38°04.0'N 104°49.0'W
to	38°00.9'N 104°45.2'W
to	37°55.0'N 105°00.0'W
to	38°16.3'N 105°07.9'W
to	point of beginning

### **E.3.4 No-Action Alternative—Fremont MOA**

This MOA is centered approximately 70 NM south of Buckley ANGB. The MOA is approximately 12 NM wide and 12 NM long. It extends vertically from 1,500 feet AGL up to, but not including, 18,000 feet MSL. The area is used to support operations on the Airburst Gunnery Range.

Geographic coordinates of Fremont MOA are as follows:

Beginning at	38°40.0'N 104°53.0'W
to	38°37.5'N 104°53.0'W
thence	southwest along Colorado Highway 115
to	38°29.6'N 104°57.5'W
to	38°26.1'N 104°57.5'W
to	38°26.2'N 104°53.0'W
to	38°24.0'N 104°53.0'W
to	38°25.5'N 105°17.0'W
to	38°42.0'N 105°08.0'W
to	point of beginning excluding a 3 NM radius of Fremont County Airport (38°25.8'N 105°06.5'W)

**E.3.5 No-Action Alternative—IR-409**

This route is used for visual navigation training that supports air-to-surface training. Table E-70 describes the route.

**Table E-70. Existing IR-409 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
10,000 feet MSL or as assigned	A	38°11.8'N 102°41.2'W	
10,000 feet MSL or as assigned	B	37°59.0'N 102°38.0'W	A to B 3 Left/3 Right
Surface to 7,700 feet MSL	C	37°43.5'N 102°37.0'W	B to C 3 Left/3 Right
Surface to 7,700 feet MSL	D	37°10.0'N 103°08.0'W	C to D 8 Left/8 Right
Surface to 7,000 feet MSL	E	36°58.0'N 103°16.0'W	D to E 8 Left/8 Right
Surface to 8,000 feet MSL	F	37°36.0'N 104°03.0'W	E to F 7 Left/15 Right
Surface to 8,000 feet MSL	G	37°56.0'N 104°37.0'W	F to G 7 Left/7 Right
Surface to 8,000 feet MSL	H	38°12.0'N 104°59.0'W	G to H 3 Left/3 Right
Surface to 8,500 feet MSL	I	38°26.0'N 104°53.0'W	H to I 5.5 Left/3.5 Right

**E.3.6 No-Action Alternative—VR-413**

This route is used for visual navigation training to support operations into Airburst Range. Table E-71 describes the route.

**E-71. Existing VR-413 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
12,000 feet MSL	A	39°07.0'N 104°55.0'W	
Surface to 12,800 feet MSL	B	38°54.0'N 105°28.0'W	A to B 5 Left/5 Right
Surface to 13,300 feet MSL	C	38°29.0'N 105°52.0'W	B to C 5 Left/5 Right
Surface to 13,300 feet MSL	D	38°18.0'N 106°02.0'W	C to D 5 Left/5 Right
Surface to 15,000 feet MSL	E	37°41.0'N 105°42.0'W	D to E 11 Left/6 Right
Surface to 14,000 feet MSL	F	37°36.0'N 105°12.0'W	E to F 3 Left/3 Right
Surface to 13,000 feet MSL	G	37°44.0'N 104°57.0'W	F to G 5 Left/5 Right
Surface to 8,000 feet MSL	H	37°56.0'N 104°37.0'W	G to H 5 Left/5 Right

**E.3.7 No-Action Alternative—VR-412**

This route is used for visual navigation training. Table E-72 describes the route.

**Table E-72. Existing VR-412 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
12,000 feet MSL	A	39°07.0'N 104°55.0'W	
Surface to 12,800 feet MSL	B	38°54.0'N 105°28.0'W	A to B 5 Left/5 Right
Surface to 13,300 feet MSL	C	38°29.0'N 105°52.0'W	B to C 5 Left/5 Right
Surface to 15,300 feet MSL	D	37°56.0'N 105°27.0'W	C to D 5 Left/5 Right
Surface to 15,000 feet MSL	E	37°31.0'N 105°13.0'W	D to E 5 Left/5 Right
Surface to 13,000 feet MSL	F	37°36.0'N 105°12.0'W	E to F 5 Left/5 Right
Surface to 13,000 feet MSL	G	37°44.0'N 104°57.0'W	F to G 5 Left/5 Right
Surface to 8,000 feet MSL	H	37°56.0'N 104°37.0'W	G to H 5 Left/5 Right
Surface to 6,500 feet MSL	I	38°16.0'N 103°45.0'W	H to I 3 Left/3 Right
Surface to 6,000 feet MSL	J	38°55.0'N 103°17.0'W	I to J 3 Left/3 Right
Surface to 7,700 feet MSL	K	39°16.0'N 102°51.0'W	J to K 3 Left/3 Right
Surface to 10,000 feet MSL	L	39°22.0'N 102°21.0'W	K to L 5.5 Left/5.5 Right

**E.3.8 No-Action Alternative—IR-414**

This route is used for visual navigation training that supports air-to-surface training. Table E-73 describes the route.

**Table E-73. Existing IR-414 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
8,000 feet MSL or as assigned	A	38°16.0'N 103°45.0'W	
Surface to 8,000 feet MSL	B	38°48.0'N 102°36.0'W	A to B 3 Left/3 Right
Surface to 11,000 feet MSL	C	39°05.0'N 101°45.0'W	B to C 10 Left/18 Right

**E.3.9 No-Action Alternative—IR-415**

This route is used for visual navigation training that supports air-to-surface training. Table E-74 describes the route.

**Table E-74. Existing IR-415 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
7,000 feet MSL	A	39°36.5'N 104°11.0'W	
Surface to 7,000 feet MSL	B	39°34.0'N 103°13.0'W	A to B 3 Left/3 Right
Surface to 7,000 feet MSL	C	38°55.0'N 103°17.0'W	B to C 3 Left/3 Right
10,000 MSL (at exit point)	C <sub>1</sub>	38°50.0'N 103°29.3'W	C to C <sub>1</sub> 3 Left/3 Right
Surface to 6,000 feet MSL	D	38°16.0'N 103°45.0'W	C <sub>1</sub> to D 3 Left/3 Right
Surface to 6,500 feet MSL	E	37°56.0'N 104°37.0'W	D to E 3 Left/3 Right

**E.3.10 No-Action Alternative—IR-416**

This route is used for visual navigation training to support operations in the New Raymer MOA. Table E-75 describes the route.

**Table E-75. Existing IR-416 Route Description**

ALTITUDE DATA	POINT	LATITUDE/LONGITUDE	ROUTE WIDTH (NM) (LEFT/RIGHT OF CENTERLINE)
11,000 feet MSL or as assigned	A	40°47.0'N 105°20.0'W	
Surface to 11,000 feet MSL	B	41°14.0'N 106°08.0'W	A to B 5 Left/5 Right
Surface to 12,000 feet MSL	C	41°36.0'N 106°12.0'W	B to C 5 Left/5 Right
Surface to 9,000 feet MSL	D	41°39.5'N 106°00.0'W	C to D 5 Left/5 Right
Surface to 9,000 feet MSL	E	42°00.0'N 105°03.0'W	D to E 5 Left/5 Right
Surface to 7,500 feet MSL	F	41°44.0'N 104°03.0'W	E to F 5 Left/5 Right
Surface to 7,300 feet MSL	G	40°58.0'N 103°56.0'W	F to G 5 Left/5 Right
Surface to 10,000 feet MSL	H	40°27.0'N 103°41.0'W	G to H 12 Left/9 Right
Surface to 7,000 feet MSL	I	40°24.0'N 103°29.0'W	H to I 3 Left/3 Right
Surface to 7,000 feet MSL	J	40°00.0'N 103°26.0'W	I to J 3 Left/3 Right
Surface to 10,000 feet MSL	K	39°49.0'N 103°33.0'W	J to K 3 Left/3 Right
10,000 feet MSL	L	39°26.0'N 103°37.0'W	K to L 3 Left/3 Right

APPENDIX F

COLORADO AIRSPACE INITIATIVE WORKING  
GROUP MEETING MINUTES AND WORKING  
GROUP AND GOVERNOR ROMER INPUTS INTO  
DEVELOPMENT OF PREFERRED ALTERNATIVE





THE COLORADO AIRSPACE INITIATIVE WORKING GROUP HAS IDENTIFIED A PREFERRED ALTERNATIVE. THE ORIGINAL PROPOSED ACTION, NOW IDENTIFIED AS THE ORIGINAL PROPOSAL, WAS A RESULT OF THE SCOPING PROCESS AND ISSUES IDENTIFIED BY THE NATIONAL GUARD BUREAU.

THE NATIONAL GUARD BUREAU HAS IDENTIFIED A PREFERRED ALTERNATIVE. THE ORIGINAL PROPOSED ACTION, NOW IDENTIFIED AS THE ORIGINAL PROPOSAL, WAS A RESULT OF THE SCOPING PROCESS AND ISSUES IDENTIFIED BY THE NATIONAL GUARD BUREAU.

THE ORIGINAL PROPOSED ACTION, NOW IDENTIFIED AS THE ORIGINAL PROPOSAL, WAS A RESULT OF THE SCOPING PROCESS AND ISSUES IDENTIFIED BY THE NATIONAL GUARD BUREAU. THE NATIONAL GUARD BUREAU HAS IDENTIFIED A PREFERRED ALTERNATIVE. THE ORIGINAL PROPOSED ACTION, NOW IDENTIFIED AS THE ORIGINAL PROPOSAL, WAS A RESULT OF THE SCOPING PROCESS AND ISSUES IDENTIFIED BY THE NATIONAL GUARD BUREAU.

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## APPENDIX F

# COLORADO AIRSPACE INITIATIVE WORKING GROUP MEETING MINUTES AND WORKING GROUP AND GOVERNOR ROMER INPUTS INTO DEVELOPMENT OF PREFERRED ALTERNATIVE

**AS A RESULT OF THE SCOPING PROCESS AND ISSUES IDENTIFIED, THE NATIONAL GUARD BUREAU HAS IDENTIFIED A PREFERRED ALTERNATIVE. THE PREFERRED ALTERNATIVE IS AN EVOLUTION OF THE ORIGINAL PROPOSED ACTION, NOW IDENTIFIED AS THE ORIGINAL PROPOSAL.**

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APPENDIX F

DEVELOPMENT OF PREFERRED ALTERNATIVE  
GROUP AND GOVERNOR FORMER INPUTS INTO  
GROUP MEETING MINUTES AND WORKING  
COLORADO AIRSPACE INITIATIVE WORKING

**APPENDIX F--COLORADO AIRSPACE INITIATIVE WORKING GROUP MEETING  
MINUTES AND WORKING GROUP AND GOVERNOR ROMER INPUTS INTO  
DEVELOPMENT OF PREFERRED ALTERNATIVE**

**F.1 INTRODUCTION AND BACKGROUND**

The CAI Working Group was formed as an ad hoc committee in January 1994. The Working Group was established to provide a forum for ANGRC, the 140 WG, several Federal and State of Colorado agencies, Congressional office and Governor's office representatives, and public groups to discuss the Colorado Airspace Initiative (CAI) draft Environmental Impact Statement (EIS).

The Working Group evolved from an ANGRC public participation initiative that began with the commencement of the CAI EIS in July 1993. In order to facilitate understanding of the CAI and the EIS process, ANGRC desired to have on-going dialogue with Federal, State, and local agencies and concerned citizens. This desire led to the establishment of a Technical Information Group (TIG) and a Citizen Information Group (CIG). The State of Colorado Governor's Office was instrumental in identifying individuals to serve as members of the groups. ANGRC envisioned the groups as a means to facilitate EIS data collection, analysis, and the reporting of results.

The TIG and CIG first met on July 11 and 12, 1993 in Pueblo, CO. Notes from meetings attended by ANGRC and 140 WG staff are included in the following four sections (F.2, F.3, F.4, and F.5) at the request of the TIG and SIG. These meetings were timed to coincide with the *Federal Register* publication of the Notice of Intent (NOI) to prepare the CAI EIS. The focus of these meetings was a discussion of the CAI Description of Proposed Action and Alternatives (DOPAA). The next meetings of the groups were held on January 10 and 11, 1994. These meetings were also held in Pueblo, CO, and were scheduled to coincide with the *Federal Register* notice that one additional scoping meeting and two additional information meetings would be held. The focus of these meetings was to discuss an addendum to the July 1993 DOPAA.

In these latter TIG and CIG meetings, members and observers indicated a desire for the groups to meet together so that technical information and citizen perspectives could be shared in a common forum. Out of this desire, the Working Group was established by elected officials in January 1994 as an additional public input forum. The State of Colorado Governor's office and two Congressional offices were instrumental in identifying individuals to serve as Working Group members and act as facilitators. In serving as facilitators, these representatives assisted the Working Group in identifying key issues and concerns regarding the CAI and in developing a modified version of the Proposed Action, which is now known as the Preferred Alternative. In addition, representatives of the ANGRC and 140 WG attended the Working Group meetings as resource advisors, when invited. In this role, the resource advisors were able to answer technical questions and provide relevant information regarding the CAI and National Environmental Policy Act.

The Working Group first met on February 2, 1994. On March 7 and 8, 1994 the Working Group met again in Pueblo, CO. At their invitation, ANGRC and 140 WG staff were present. ANGRC and 140 WG staff were also invited and were present at Working Group meetings on April 14, 1994, May 5, 1994, and May 25, 1994. The Group also met several times in sessions where ANGRC and 140 WG staff were not invited. Notes from meetings attended by ANGRC and 140 WG staff are included in the following five sections (F.6, F.7, F.8, F.9, and F.10) at the request of the Working Group.

In its May 25, 1994 meeting, the Working Group documented recommendations for changes to the CAI Proposed Action. These recommendations are

included in Section F.11. After the meeting, the Working Group adjourned until a later date.

The Working Group recommendations were reviewed by the Governor's office, ANGRC, and the 140 WG in light of the criteria included in Section 1.3.3. Section F.12 is the Governor's recommendations. These recommendations were used in formulating the Preferred Alternative.

## **F.2 MEETING NOTES FROM THE CITIZEN INFORMATION GROUP (CIG) MEETING ON JULY 12, 1993**

The meeting began at 7:20 pm. A total of 30 persons were in attendance.

Mr. Ron Watson of the Air National Guard Readiness Center (ANGRC) opened the meeting with a welcome and a statement of purpose. He expressed his desire to receive information for the CAI Environmental Impact Statement (EIS) "that the public of Colorado wants" included. He discussed the location and timing of future meetings, indicating his willingness to adjust meeting places and times. He asked Mr. Jim Peck, with the Office of the Governor, to coordinate the location of the next meeting to meet the needs of the participants. Mr. Watson reminded the group that the next meeting was planned to coincide with publication of the draft EIS (DEIS), and that a total of four meetings were envisioned.

He also explained the relationship of this Citizen Information Group meeting to the planned EIS scoping meetings. He said that the Citizen Information Group meeting was intended to brief public officials and representatives of public interest groups about the CAI so that they would be informed of the proposed action. He asked the group if other public officials needed to be invited to join the process and indicated that nine officials had been invited to this meeting. He said that scoping meetings are intended to receive comments for studies to be accomplished during the EIS.

With respect to the EIS, Mr. Watson described the ANG Northeast EIS experience and the mitigations that resulted. He described the history of the REDEYE Environmental Assessment (EA), indicating that it was stopped in 1992 and that discussions were begun with the Federal Aviation Administration (FAA) about nine months ago. He stated that the CAI is coordinated with the FAA. Mr. Robert Philleo, a Saguache County Commissioner, was concerned that since Dunes MOA was an alternative to the proposed action, the REDEYE complex was still under consideration. Mr. Watson assured him that the REDEYE EA had been discontinued but that the CAI EIS was required by law to assess all viable alternatives.

Mr. Watson stated, "No decisions are going to be made until the final [EIS] document," and that "we will take your comments right up until the time of the final [EIS] document." He explained the purpose of the Record of Decision (ROD), and further explained that the decision reflected in the ROD would not be changed without a revised EIS. Finally, he stated the decision in the ROD is a legal document that would prevent any deviations from the ROD. Mr. Watson stated that his objective was to have the CAI EIS be a Colorado product, and for all concerned to "buy in" to insure that all Colorado issues were properly addressed.

Maj. Steve Shiell of ANGRC presented a national perspective on airspace and the ANG, and background on the CAI using briefing materials that were given to each Citizen Information Group participant. He indicated that there were several beneficial results from the REDEYE EA process, including an increased awareness of public concern over noise. In addition, the ANG has focused on several goals for the EIS, which are to meet the needs of the people in the region, the Colorado (CO) ANG, and the FAA.

Maj. Buck Buckingham of the 140th FW presented a briefing on interim airspace measures and the CAI using briefing materials that were given to each participant. The interim measures include an 800 number for noise complaints. He noted that there would be a four percent net loss in airspace under the CAI and that VR-412 has been discontinued in the CAI. In addition, Maj. Buckingham provided a briefing on the existing and proposed Military Training Routes (MTRs) and Military Operations Areas (MOAs). The airspace selection process evaluated existing airspace, assessed what airspace could be modified, and then proposed new airspace. The search for available airspace was limited to 200 nautical miles due to costs associated with long distance flights. Maj. Buckingham indicated that no chaff would be dropped, flares would be deployed and assessed to 2,000 feet, and that LANTIRN/laser would be used in eye-safe mode only. Finally, Maj. Buckingham indicated that the airspace would be charted to 300 feet above ground level (AGL) but would only be flown to 500 feet AGL.

Several questions were addressed to Maj. Buckingham:

- The first question concerned airspace users other than the COANG. Maj. Buckingham indicated that he determines if the airspace use resulted in a valid noise complaint, attempts to identify the pilot and aircraft, and then notifies his supervisor who contacts the other unit. The other unit is responsible for the discipline of their pilots.
- The next question concerned the costs of the F-16 for a one hour flight. The fuel costs are about \$1,300 per hour and the total operation costs, which include salaries for all personnel involved, are \$5,000 to \$6,000 per hour.
- A question was asked concerning whether the 140th FW would be equipped with LANTIRN/Laser. The answer was no, but other units that may use the airspace are equipped and would use the LANTIRN/Laser in eye safe training mode only in which the target seeking mechanism is not activated.
- Several questions focused on the need to fly as low as 300 feet AGL. Maj. Buckingham emphasized that the COANG does not plan to fly below 500 feet AGL unless the training requirements change during a national emergency. In addition, the COANG plans to fly at 1,000 feet AGL in the San Luis Valley up to Route 17 at which point the aircraft would descend to 500 feet AGL.
- Additional concern was expressed over seeing Dunes MOA as an alternative. Maj. Shiell explained that Dunes MOA is a viable MOA and that the National Environmental Policy Act (NEPA) requires that all viable alternatives must be evaluated during the EIS.
- Mr. Philleo asked what the other alternatives were and if these MTRs and MOAs were separable. Mr. Watson indicated that each airspace action is separable.
- The question was asked concerning supersonic operations. All training in Colorado would be subsonic. It is true that pilots accidentally fly above the speed of sound causing sonic booms, however, those individuals are required to fill out paperwork and are disciplined.

Several questions were addressed to Maj. Shiell:

- The first question sought a clarification on who is the EIS decisionmaker for the CAI. Maj. Shiell indicated that the EIS decisionmaker is the Secretary of the Air Force or his designee. Mr. Watson emphasized that ongoing changes within DoD make it difficult to know who the decision maker will be at the conclusion of the EIS. Maj. Shiell explained decision making authority that is delegated for different NEPA studies.
- The second question involved accountability. Maj. Shiell indicated that "accountability is very stringent," and listed Federal agencies and laws to which the ANG and the CAI EIS is accountable.
- The third question involved the role of the governor. Mr. Peck answered this question. He stated that the COANG has both a state and Federal mission. Under the state mission the governor can direct the COANG flying operations. He can even direct the 140th FW to stop flying. However, the NGB can direct the 140th FW to continue flying under the Federal mission. Should such a confrontation develop, in all probability the National Guard Bureau would be forced to relocate the 140th FW to another state. The airspace initiative proposed by the 140th FW would be assumed by one of the other out of state units needing training on Airburst range, with the subsequent loss of scheduling and control of the airspace by people who live and work in Colorado and the State of Colorado. He concluded his answer by saying, "We cannot stop [the CAI] with a word."

Mr. Harry Knudsen of ANGRC presented an approach to the analysis of 12 environmental resources and cumulative impacts using briefing materials that were given to each participant. His presentation prompted several questions:

- The first question involved the ROUTEMAP model and its validation. Mr. Knudsen indicated that model results had been validated, including, to the best of his knowledge, in the mountainous terrain of Nevada and Utah. Mr. Watson offered to research the validation of model results in mountainous terrain, particularly with regard to the attenuation of noise echoing. In answer to this same question, Mr. Watson offered to research the effects of low altitude jet noise on buffalo. Mr. Watson promised the results of this research in 30 days.
- The second question involved land use analysis. Both Mr. Knudsen and Mr. Dick Masse responded. Mr. Knudsen indicated that the analysis would use data from Colorado Fish and Game. Mr. Masse indicated that he had received mylar maps of the locations of threatened and endangered species from the Colorado Department of Wildlife.
- The third question involved cultural resource analysis, and in particular, sacred areas. Mr. Knudsen responded that an example would include a Native American burial ground. Mr. Watson related his recent awareness of the valley areas being designated as sacred many years ago, and a participant noted that he was aware of some activity involving Native American traditions. It was suggested that the Indian Affairs office be contacted for input.
- The fourth question involved air quality analysis, and in particular, a North Atlantic Treaty Organization (NATO) study. Mr. Knudsen acknowledged the study, and indicated that it used a box model. He

noted that MAILES results had been validated as an accurate model for depicting air pollution emissions from an aircraft.

- A question was asked concerning whether the F-16 carries live munitions. The answer was no live bombs. The F-16 carries inert 25 pound bombs with a small explosive to facilitate target scoring. These practice bombs are deployed only on Airburst Range.
- The next question involved hazardous materials on board F-16 aircraft. Mr. Knudsen noted that in addition to munitions and jet fuel, hydrazine is used to start an auxiliary power generator. Hydrazine is self-contained on the F-16 and is found in quantities of about 6 gallons. Concern was expressed over contamination of water sources if the aircraft crashed. Mr. Knudsen indicated that no, it was not likely to pose a serious threat to water due to the small quantities present on the aircraft.

Following Mr. Knudsen's presentation, several additional questions were asked of various ANG staff:

- The first question involved the number of sorties to be flown by mission profile. Maj. Shiell explained how to read Table 3-8 of the Description of Proposed Action and Alternatives (DOPAA).
- The second question involved the term "other aircraft" in the DOPAA. Maj. Shiell and Mr. Knudsen responded, indicating that proposed airspace use by other aircraft is based on historical usage. In the absence of historical data, a 10 percent usage by other aircraft is assumed based upon knowledge of transient aircraft usage in ANG controlled airspace nationwide.
- The next question asked for clarification of Tables 3-37 and 3-38 on pages 76 and 77 of the DOPAA. The 140th FW has not decided what airspace would best satisfy all requirements. These tables simply address what airspace is available within a 300 mile radius of Buckley ANGB and how it meets the operational needs of the COANG. It does not address any of the environmental concerns to be developed in the scoping meetings.
- The next question involved the use of 3-D graphics to depict airspace components. Various ANG staff responded that the state-of-the-art for the 3-D depiction of airspace needs improvement, and that the current means of depicting 3-D airspace boundaries is difficult to interpret.
- The next question involved land use data collection, and in particular, the currency of data. The participant noted that a new state park had been established about 10 days earlier. Mr. Watson acknowledged it, and re-emphasized his desire to include all information in the scoping process.

Following these questions, Mr. Peck suggested that the Citizen Information Group re-convene after scoping and before the public comment period is concluded. One participant noted his concurrence with this suggestion. Mr. Watson offered to meet again in the first week of October after the scoping meetings and the end of the public comment period so that the results could be compiled, if the consensus of the group was to re-convene before the publication of the DEIS. A final question was asked

concerning a long distance telephone network to encourage the exchange of information.

The Citizen Information Group meeting adjourned at 10:20 pm.

**F.3 MEETING NOTES FROM THE TECHNICAL INFORMATION GROUP (TIG)  
MEETING ON JULY 13, 1993**

The meeting began at 9:45 am. A total of 30 persons were in attendance.

Mr. Ron Watson of the Air National Guard Readiness Center (ANGRC) opened the meeting with a welcome and a statement of purpose. He expressed his understanding that the ANG had not used "Colorado products" in the prior REDEYE Environmental Assessment (EA). He also expressed his desire to give leaders a "heads-up" on the CAI. He stated that the purpose of the Technical Information Group meeting was to solicit responses to the technical approaches of environmental resources. He introduced Mr. Douglas Murtland, who explained that the means would involve breaking into resource subgroups to receive information. Mr. Murtland's response elicited two comments that were addressed to Mr. Watson:

- First, Mr. Bob Senderhauf of Custer County Realty suggested that a representative of the Sangre de Cristo Mountain Action Council should be invited to future meetings.
- Second, one participant suggested that the Technical Information Group should reconvene after scoping meetings.

Mr. Watson noted that this same suggestion had been made in the Citizen Information Group meeting, and indicated his willingness to meet again in early October.

Maj. Steve Shiell of the ANGRC presented a national perspective on airspace and the ANG, and background on the CAI using briefing materials that were given to each Technical Information Group participant. He indicated that there were several beneficial results from the REDEYE EA process, including an increased awareness of public concern over noise. In addition, the ANG has focused on several goals for the Environmental Impact Statement EIS, which are to meet the needs of the people in the region, the Colorado (CO) ANG, and the Federal Aviation Administration (FAA). Maj. Shiell did not receive any questions.

Maj. Buck Buckingham of the 140th FW presented a briefing on interim airspace measures and the CAI using briefing materials that were given to each participant. The interim measures include an 800 number for noise complaints. He noted that there would be a four percent net loss in airspace under the CAI and that VR-412 has been discontinued in the CAI. In addition, Maj. Buckingham provided a briefing on the existing and proposed Military Training Routes (MTRs) and Military Operations Areas (MOAs). The airspace selection process evaluated existing airspace, assessed what airspace could be modified, and then assessed proposed new airspace. The search for available airspace was limited to 200 nautical miles due to costs associated with long distance flights. Maj. Buckingham indicated that no chaff would be dropped, flares would be deployed and assessed to 2,000 feet, and that LANTIRN/laser would be used in eye-safe mode only. Finally, Maj. Buckingham indicated that the airspace would be charted to 300 feet above ground level (AGL) but would only be flown to 500 feet AGL.



Several questions and comments were addressed to Maj. Buckingham:

- The first several questions were concerning clarification on VFR and the legalities of the airspace. Pilots can legally fly under 10,000 feet above ground level (AGL) if flying slower than 250 knots. In addition, the scheduling function performed by the COANG is legally binding.
- Frustration was expressed in dealing with the military, in particular, related to the handling of noise complaints. A suggestion was made to improve communication lines between the public, local and state government officials, and the COANG.
- Concern over dealing with noise before pilots fly in the region was expressed. Maj. Buckingham explained that each route is defined in FLIP, which provides information on the route and indicates noise sensitive areas. When the route is scheduled through the 140th FW, the unit is briefed on noise sensitive receptors.
- Noise complaints have been reduced to less than 1 per week whereas several months ago noise complaints occurred 3 or 4 times per day.
- Mr. Robert Philleo, a Saguache County Commissioner, was concerned that the region is receiving special treatment now that the process is under way and felt that after the EIS is approved the region would not get any attention. Mr. Watson explained the importance of national planning as well as the need to have local government officials involved with the planning process.
- Maj. Buckingham explained that other units will be able to use VR-413 after the EIS process, and if they create problems, the route will be closed to them.
- Mr. Neil Seitz of Saguache County Lodging and Planning asked how many aircraft would the COANG have using these routes. COANG is undergoing a reduction from 24 to 18 F-16 aircraft, with a corresponding decrease in the number of pilots and sorties. The COANG will fly about 7 to 8 sorties less per month.
- A question was asked concerning the F-117 aircraft. The response was that the F-117 aircraft is not a regular user of the airspace, but has been flying, recently, at high altitudes to the Airburst Range.
- A question was asked concerning the use of LANTIRN/laser. The COANG will not be equipped with LANTIRN. However, other units which may use Colorado airspace may be LANTIRN equipped and therefore, the EIS will assess the impacts of aircraft equipped with LANTIRN.
- A question was asked if LANTIRN is used in other parts of the US. LANTIRN is used in other parts of the U.S.
- The next question was if the COANG would be flying 7 days per week. Typically, the COANG flies Tuesday through Friday from 7 am to 10 pm, with one drill weekend per month.
- A question was asked concerning the use of the stealth fighter. The stealth fighter is used in Colorado but only on Airburst Range.
- It was noted that IR-409 will be assessed to 100 feet AGL.

- The next question concerned why Pinon Canyon MOA was not shown (on the map showing existing airspace, REDEYE airspace, and proposed airspace). The change to Pinon Canyon was minor and the airspace is scheduled by the Army and not the COANG.

Maj. Shiell continued the briefing on NEPA and the alternatives to the proposed action. He received several questions:

- The first question asked if the EIS decision maker for the CAI could be the Governor as appointed by the Secretary of the Air Force. The Secretary of the Air Force cannot appoint the Governor.
- Mr. Philleo asked if Dunes MOA could be selected from the alternatives and must they gear up to fight the proposal as they did with REDEYE. Mr. Watson explained that yes, Dunes MOA could be selected because it is a viable alternative and yes, they did need to re-document all of their concerns previously expressed about Dunes MOA during the REDEYE EA. The EIS documents technical facts concerning the impacts of the CAI. Mr. Jim Peck, with the Office of the Governor, explained that the MTRs and MOAs of the CAI are separable, in that if one piece is removed the other pieces could remain.
- A question was asked concerning the ROD and FAA review. The EIS is the first part of the process and the airspace review by the FAA is the second part of the process.
- A representative from BLM indicated concern over what type of commitment was expected from Federal agencies due to budget constraints. In particular would Federal and State agencies be required to brief the public. The response was that these agencies would not be expected to brief the public and that if the agencies needed assistance with tasks for the CAI, an agreement could be worked out at that time.
- Concern was expressed on the Academy MOA and would agencies be required to evaluate the Academy MOA as a separate process. Yes, the Academy MOA is separate from the CAI because that MOA does not meet the training requirements for the COANG.
- A question was asked concerning the average air time of the F-16. The average air time is 0.9 hour depending on the configuration of the aircraft, and the average length of the sorties is 1.3 hours.
- A question was asked concerning plans for mid-air refueling of aircraft during training. The costs would be prohibitive and the time constraints are prohibitive on the part-time COANG pilots.
- A question was asked on the use of flight simulators. The COANG does not have a simulator.
- A question was asked on simulator costs. The requirements which can be met through the use of simulators has already been considered. The CAI addresses those training requirements which can not be addressed using flight simulators.
- A question was asked on the capacity of the Green River Complex to meet the needs of the COANG. With the exception of the distance of 280 nautical miles, which is prohibitive, it would meet these needs.

- A question was asked concerning VR-413 and the airspeed. The airspeed was confirmed to be 480 Knots Indicated Air Speed. as shown in the DOPAA.
- Another question was asked concerning the Airburst Range and access to the range by IR-409. The response confirmed that weapons delivery sorties will use multiple MTRs.
- Mr. Jim Peck, with the Governors Office, presented a perspective on the Federal training requirement of the 140th FW.
- Another question was asked concerning Airburst Range. The response indicated that operations included in the EA will remain in effect until the EIS process is completed with the exception of the "racetrack" which has been eliminated.

After Maj. Shiells' presentation, the Technical Information Group had lunch from 12:00 pm until 1:00 pm. After lunch, Mr. Harry Knudsen of the ANGRC, presented an approach to the analysis of 12 environmental resources and cumulative impacts using briefing materials that were given to each participant. Following his presentation, he received several questions and comments:

- A question was asked concerning whether the noise model ROUTEMAP accounts for the effects of noise in a valley. Mr. Watson indicated that he will provide the answer to the group in 30 days.
- Mr. Watson also indicated that he will provide information regarding the effects of jet noise on buffalo, in particular, in relation to the "startle" effect.
- Another question was asked regarding if fuel dumping would be addressed. The response was that fuel dumping in the context of an emergency with an F-16 aircraft would be included in the analysis.
- A note was made that a draft air resource monitoring plan for national forest will be available from the U.S. Forest Service in September.
- Another question was asked concerning how the economic impacts to solitude could be addressed. Mr. Watson promised to provide a point paper within 30 days.
- A note was made concerning the Longwood study, which was an assessment of recreational value.
- Another note was made concerning a model available from the Colorado Division of Wildlife which assesses the economic impacts of hunting.

Following Mr. Knudsen's presentation at 2:45 pm, the Technical Information Group split into resource subgroups to discuss in detail the resource categories suggested for discussion in the EIS. Following is a listing of these subgroups and a synopsis of the key discussion points:

- Airspace Management and Noise--Maj. Shiell
- Socioeconomics and Land Use--Mr. Knudsen
- Environmental Impact Analysis Process--Mr. Murtland
- Hazardous Materials, Air, Water, and Earth Resources--Mr. Robinson
- Safety, Aesthetics, Biological, and Cultural Resources--Mr. Masse.

## Airspace Management and Noise

Concerns expressed in the Airspace Management and Noise subgroup were on the effects of/on:

- Cumulative noise impacts regarding wilderness areas, in particular related to noise issues.
- Concern that wilderness areas were not being addressed as a separate resource; this could mitigate the significance of impacts if wilderness areas are studied under several areas, such as land use and socioeconomics.
- Concern over the effects of terrain on the noise analysis.

## Environmental Impact Analysis Process (EIAP)

Concerns expressed in the Environmental Impact Analysis Process (EIAP) subgroup were on the effects of/on:

- Low altitude jet-noise on captive wolves
- Property values
- Fuel dumping, both accidentally and procedural.

In addition, BLM expressed interest in how to provide input into the EIAP.

## Hazardous Materials, Air, Water, and Earth

The Hazardous Materials, Air, Water, and Earth subgroup received the following input:

- Mr. Bill Wellman, Supt. of the Great Sand Dunes National Monument, National Park Service (NPS) reported that air quality had been monitored in the Great Sand Dunes National Park for the past four years and that data were available in the NPS Regional Office in Denver. Monitoring was for ozone, particulate, and visibility. Mr. Wellman also reported that complete water quality analysis had been accomplished in the Medano Creek Drainage Basin which forms the Rio Grande Aquifer by USGS in Albuquerque, NM. The USGS contact in Albuquerque is Mr. Sherman Ellis.
- Ms. Susan Nequette, Custer County Action Association expressed the following concerns:
  - How would a small community cope with an aircraft crash and the hazardous materials associated with such an incident when the community is not trained or equipped to handle a crash?
  - Air pollution emission by aircraft could be trapped in valleys and would build up over a period of time causing an air emission problem.
  - She also stated that a study of low flying military aircraft was accomplished in the 1963-1964 time frame. The study was to determine if air pollution was killing trees in the valley. Mr. Roger MacDonald of Westcliffe, CO was thought to have access to the study.

## Safety, Aesthetics, Biological, and Cultural

A number of concerns and questions were discussed in this subgroup. The major topics included:

- The Board of Indian Affairs, of the Lt. Governor's Office may be a source of information on archaeological/cultural resources located in the "Sacred Valley of Peace."
- Lynn Attebery of the South Central Tourism has an economic model from the Colorado Division of Wildlife (CDOW). Data are divided by county and include information on turnover. Another contact is Dan Jones in Salida.
- The Colorado State Tourism Board has statistics on tourism.
- John Hill of the Open Space Alliance may have previous studies concerning visitor use of Crestone.
- A new state park, the San Luis Lake State Park, which used to be a state wildlife refuge, has been established west of the Great Sand Dunes. This state park, with 52 campsites, is a sensitive area and should be avoided. In addition, CDOW wants to avoid the East Plains Reservoirs.
- Zapata Falls has been proposed as a state park historic trail or scenic highway. Information is available from the Alamosa County Commissioners.
- Bruce Goforth of the CDOW indicated that four major regions and one central region will be involved with the CAI. Mr. Goforth gave an overview of coordination activities with the CAI due to the magnitude of the proposal. The CDOW knows of major species of concern. In addition, the CDOW is conducting a flight inventory.
- The USFS has an overflight study. Marsha Kearney is the contact person.
- Sacred Indian sites are also located in the region. Mount Blanca may be a sacred Hopi site. The Rio Grande National Forest, NM has data on sacred grounds. Utes are located in Colorado and may have information on the valley. The Bureau of Indian Affairs may have more information.
- Randy Woods of the Custer County Action Association has information on Mission Wolf. Activities in Huerfano and Custer Counties may impact the captive gray wolf facility, in that noise from overflights may impact breeding and living. Mission Wolf is an educational facility.
- Concern was expressed over Wilderness Study Areas, located in the Wet Mountains, and the pending official status.
- Concerns were expressed over National Forest system grasslands, both from the perspective of grazing animal (domestic and wild) and from a recreational users point of view.
- The Mexican Spotted Owl was listed as an endangered species in mid-April. Habitat for the bird exists in areas that may be overflowed by the new proposal.

- The ANGRC promised response within 30 days on three issues:
  - Crestone
  - Bison
  - Noise in the valley.

Finally, a question was asked concerning VR-413 from Point E to Point D. The question concerned whether this segment was closer to the Great Sand Dunes National Monument or further away as a result of the proposal.

The Technical Information Group meeting adjourned at 3:30 pm.

**F.4 MEETING NOTES FROM THE CITIZEN INFORMATION GROUP (CIG)  
MEETING ON JANUARY 10, 1994**

The meeting began at 7:10 pm. A total of 44 persons were in attendance.

Mr. Mark Lowery of the Colorado Department of Local Affairs opened the meeting with a welcome statement and introduced himself as the meeting facilitator. He stated that the purpose of having a facilitator was to enhance the exchange of information between the Citizen Information Group (CIG) and the Air National Guard (ANG). Mr. Lowery noted that he would keep a list of items discussed and that video and audio tapes of the meeting were being recorded. He asked that each attendee introduce himself to the group.

Mr. Lowery urged the CIG to define the purpose of the meeting. Mr. Harry Knudsen of the Air National Guard Readiness Center (ANGRC) stated that it was his understanding that the ANG wanted to explain the addendum to the Description of the Proposed Action and Alternatives (DOPAA) in relation to the Colorado Wilderness Act; improve upon prior explanations of the DOPAA; address issues and concerns raised at the July 12, 1993 meeting; and have an open discussion to address any comments or questions. In addition, Mr. Knudsen noted that at the conclusion of the CIG meeting held in July, it was decided that a second meeting would be held after scoping meetings had taken place.

Mr. Lowery proceeded to facilitate by describing the purpose of the meeting and in establishing an agenda. He noted on poster board that the purpose of the meeting would be to provide the following:

- Information
- Explanation
- Clarification
- Discussion of issues.

He also asked that the CIG form and prioritize an agenda for the meeting. He noted on poster board the following agenda items, in order of presentation:

- Discussion of old business from the CIG meeting held on July 12, 1993
- Clarification of facts regarding the CAI
- Discussion of addendum
- Presentation by citizen coalition
- Identification of next step in the environmental impact analysis process
- List CIG and TIG members and clarification of the roles of the two groups.

Mr. Knudsen announced that Mr. Ron Watson had retired since the last CIG meeting and then proceeded to address the first agenda item. He stated that the three studies regarding solitude, actual noise measurement, and bison were still being pursued by the ANG. In addition, he provided an explanation of the contents in the CIG packets that were provided to attendees. An attendee requested that materials, such as those in the packets, be sent out earlier so that participants would have more time to review the information before the meeting(s).

Mr. Steve Wolf of the ANGRC Public Affairs Office presented a briefing on the clarification of facts about the CAI. Mr. Wolf's presentation focused on two main topics, sortie rates and airspace use and management.

- Mr. Wolf stated that the 140th Fighter Wing (FW) anticipates flying 3,538 sorties annually. Of these 3,538 sorties, 3,225 would occur in Colorado ANG managed airspace, and the remaining 313 would occur outside the state of Colorado. In addition, other military users anticipate flying 1,892 sorties annually in Colorado managed airspace. He also stated that aircraft can transit multiple Military Training Routes (MTRs) and Military Operations Areas (MOAs) on a single sortie. A participant asked if other non-ANG managed airspace was included in the sortie rates. LTC Steve Shiell of the ANGRC answered no. A participant also noted a concern that in a MOA, when an aircraft passes overhead several times, he counts the flight as multiple sorties, or incidents, instead of one sortie.
- Mr. Wolf explained that airspace in the CAI is primarily designed to meet the requirements of the Colorado ANG's 140th FW and commercial air traffic operating to and from the new Denver International Airport. He clarified the fact that the Colorado ANG manages airspace use and that outside (non-Colorado) users must adhere to ANG, Colorado ANG, and Federal Aviation Administration (FAA) flight rules. Mr. Wolf emphasized that the sortie rates presented in the DOPAA represent all known and anticipated users of the airspace. In addition, he stated that 79 percent of the total number of sorties occurring in the La Veta MOA would be the result of 140th FW activity. This presentation prompted several clarifying statements about enforcement of aircraft operating regulations.

Maj. Buck Buckingham of the 140th FW addressed the third agenda item in the form of a briefing on the addendum to the CAI DOPAA. He explained that the purpose of the addendum was to respond to the enactment of the Colorado Wilderness Act of 1993 and the ANG's policy to conduct military training operations at a minimum altitude of 2,000 feet above ground level over federally-designated wilderness areas whenever possible. In addition, Maj. Buckingham noted that the addendum was finalized in November 1993 and the Notice of Intent was published in the Federal Register on January 7, 1994. The addendum was mailed to initial DOPAA recipients, registered scoping meeting attendees, and CIG and Technical Information Group (TIG) members and attendees. Maj. Buckingham identified the Dunes MOA, La Veta MOA, Visual Route (VR) 413, Instrument Route (IR) 409, IR-415, XIR-424, and XVR-1427 as the airspace affected by the addendum. An attendee requested that materials being presented be sent out prior to the meeting so that participants would have the opportunity to review the information in advance. This presentation also prompted a clarifying statement about how pilots can visually avoid wilderness areas. A participant asked if other agencies implement flight restrictions over wilderness areas. Mr. Dick Masse of the ANGRC answered no.

The CIG meeting recessed for a five minute break.

Mr. Bob Senderhauf began the coalition presentation by introducing himself as a member of the Custer County Action Association (CCAA). He identified several

areas of concern regarding the CAI, including the environment, health and safety, quality of life, economic conditions, and airspace. Mr. Senderhauf acknowledged the ANG's recognition of wilderness areas and noted the coalition's appreciation. In addition, he reviewed the history of public involvement with the Colorado ANG and identified the coalition participants. Mr. Senderhauf made a request for five additional scoping meetings. He also identified several public interest groups, chambers of commerce, counties, cities, and others that are opposed to the continuance of aircraft operations in the La Veta MOA and stated that opposition to the CAI is growing. On behalf of Custer County landowners, Mr. Senderhauf presented a map of the county depicting the proposed airspace.

The coalition presentation continued with Ms. Pat Boutilier, President of the Huerfano Valley Citizens Alliance, as speaker. Ms. Boutilier responded to the list of ten misconceptions about the CAI that was published by the ANGRG Public Affairs Office and emphasized the coalition's continued concerns. They are as follows:

- Concern that the sortie rates presented in the DOPAA are not legally binding and concern about the process for monitoring sortie counts and the utilization of airspace by users other than the Colorado ANG
- Concern regarding public statements from U.S. Air Force leadership indicating that ANG fighter wings will be reduced
- Concern that VR-412 is included in the CAI
- Concern with respect to low-altitude operations in the La Veta MOA and the fact that an engineering company is conducting the environmental impact statement (EIS)
- Concern about the consideration of viable alternatives
- Concern regarding the impacts of supersonic flights (sonic booms) in that, although they are not allowed in the CAI, they do occur
- Concern that VR-413 abuts the Great Sand Dunes National Monument
- Concern about the impartiality of the EIS in light of the environmental assessment (EA) and Finding of No Significant Impact (FONSI) for the conversion from A-7 aircraft to F-16 aircraft at Buckley ANG Base
- Statement commending the ANG for not using chaff (concern not mentioned)
- Concern that non-Colorado ANG users will dominate flying operations in the CAI airspace components.

In conclusion, Ms. Boutilier stated that the area should be designated a no-fly zone and that alternatives with less impact should be considered. Maj. Buckingham and LTC Shiell stated that Buckley ANG Base is not scheduled for closing and cited an example of airspace that has been discontinued for use.

Mr. Ray Koch of the CCAA expressed concern that the definition of a sortie, as presented in the DOPAA, is misleading. He stated that each operation, or "intrusion", should be counted as a sortie. In addition, Mr. Koch explained that he considers the total number of proposed sorties to be 8,917, which represents a 70 percent increase in activity.

Ms. Kate Steichen of the San Luis Valley Open Space Alliance stated that she continued to be concerned about the CAI proposal and the addendum to the DOPAA.



Ms. Steichen stated that the addendum includes the addition of approximately 20 miles of airspace. She expressed concern regarding flight over/near the Great Sand Dunes National Monument, migratory corridors, the towns of Moffat and Villa Grove, three parks, and bison. Ms. Steichen stated that not enough advance notice of the meeting was provided to CIG members.

Mr. Neal Hughes, a representative of the Greenhorn Valley Coalition, stated that he was concerned about the social, legal, and environmental impacts of the CAI. Mr. Hughes explained that he conducted a survey regarding public opposition and support for the La Veta MOA. The survey consisted of three questions. Responses to the questions ranged from strongly favor to strongly oppose. The results of the survey were presented at the meeting and are summarized as follows:

- Question 1 asked respondents to indicate support for or against the proposed La Veta MOA. Of 224 responses, 198 (or 88 percent) indicated that they strongly opposed the proposed La Veta MOA.
- Question 2 asked respondents to indicate support for or against the existing La Veta MOA. Of 217 responses, 154 (or 71 percent) indicated that they strongly opposed the existing La Veta MOA.
- Question 3 asked respondents to indicate support for or against the joint statement of the southern Colorado citizens groups. Of 219 responses, 189 (or 86 percent) indicated that they strongly favored the joint statement.

Mr. Hughes informed the CIG attendees that 1,300 surveys were sent out to households in Colorado City, Rye, and San Isabel. The response rate was 16 percent. The cost of conducting the survey was \$332.00. In addition, Mr. Hughes noted that the ANG's presentation was well done; however, the public does not want the proposal.

Ms. Jill Schwartz of the La Veta No MOA Association read a letter requesting a scoping meeting in La Veta. She stated that a copy of the letter had been mailed to the ANG on January 6, 1994.

Ms. Mary Anne Flood, a speaker for the Huerfano Valley Citizens Alliance, expressed concerns regarding the consideration of alternatives to the proposed action. She stated that utilization of Fort Carson and Pinon Canyon areas could be increased and that the La Veta MOA could be eliminated. Ms. Flood also expressed concern regarding scoping meetings. In particular, in order for the public to provide comments, she would like to re-do scoping at prior locations and have an additional scoping meeting in Gardner. Citing the University of Nebraska Press as a source, Ms. Flood stated that 60 to 70 percent of the citizens of Colorado consider themselves environmentalists. Ms. Flood also noted that tourism is an important factor in the state economy.

Mr. Randy Woods, a member of the CCAA, began his statement by explaining that Section 2, Part A of the Wilderness Act provides for "outstanding opportunities for solitude". Mr. Woods recognized the ANG for attempting to limit noise exposure to wilderness areas; however, he expressed concern that VR-413 abuts the Great Sand Dunes National Monument. In addition, Mr. Woods stated that more scoping meetings should be held to allow for greater public involvement in the environmental impact analysis process. He also requested copies of the original La Veta MOA, VR-412, and VR-413 EAs, transcripts, and documents. Mr. Knudsen responded by stating that the information requested had been provided, but he would send new copies.

Mr. Senderhauf concluded the coalition presentation. He reiterated the public's opposition to the CAI. In addition, Mr. Senderhauf requested additional time before the Fort Garland meeting, which is scheduled to take place on February 1, 1994.

Mr. Lowery prompted a discussion of the final agenda item. Mr. Knudsen offered to send another list of the CIG and TIG members to Mr. Senderhauf. Mr. Knudsen also informed the CIG attendees that the Draft EIS would be available approximately four to six months after completion of the last scoping meeting. An attendee inquired as to what the next step would be in the EIS process. Mr. Knudsen responded by explaining that the Draft EIS could include changes to the proposed action if the environmental analysis indicates a potential impact. He added that the process allows for Draft EIS hearings and a comment and review period.

A discussion of the EIS process under the National Environmental Policy Act of 1969 ensued, as well as the role of the CIG and TIG in the overall process. An attendee stated that input from the CIG and TIG should be included prior to the preparation of the Draft EIS. Mr. Knudsen offered to convene additional CIG and TIG meetings after the last scoping/information meetings, which are scheduled to take place February 1, 2, and 3, 1994. An additional meeting was scheduled for mid-April to further discuss the EIS process and allow time for CIG members to review materials from ANG in advance. The meeting will be convened by a smaller working group that evolved from the full CIG and TIG members. A participant asked how the public can learn about FAA regulations. Maj. Buckingham offered to provide information and assistance regarding this request. A journalist stated that the press wants to be included at all meetings.

The CIG meeting adjourned at 10:50 pm.

#### **F.5 MEETING NOTES FROM THE TECHNICAL INFORMATION GROUP (TIG) MEETING ON JANUARY 11, 1994**

The meeting began at 9:10 am. A total of 33 persons were in attendance.

Mr. Mark Lowery of the Colorado Department of Local Affairs opened the meeting with a welcome statement and introduced himself as the meeting facilitator. He stated that the purpose of having a facilitator was to enhance the exchange of information between the Technical Information Group (TIG) and the Air National Guard (ANG). Mr. Lowery noted that he would keep a list of items discussed. Before establishing the purpose and agenda for the meeting, he asked that each attendee introduce himself to the group.

Mr. Lowery prompted the group to define the purpose of the meeting. LTC Steve Shiell of the Air National Guard Readiness Center (ANGRC) explained that the purpose of the TIG meeting was to relate and share technical approaches for the environmental impact statement (EIS). LTC Shiell further stated that the ANG is anticipating that agencies will help address and implement their laws and regulations. Mr. Dick Masse of the ANGRC expanded on the stated purpose by noting the ANG is seeking Federal, state, and local agency input on the CAI and impacts as a result of the proposal.

Mr. Lowery proceeded to facilitate in developing an agenda. He noted on poster board that the meeting agenda would be the following:

- Description of how the addendum has changed the CAI
- Presentation by citizen coalition
- Summary of CIG meeting

- Validation of EIS process and discussion of ANG's ability to accommodate comments received to date
- Development of an interactive exchange of information and group process
- Evaluation of post-EIS economic conditions.

Maj. Buck Buckingham of the 140th Fighter Wing (FW) addressed the first agenda item in the form of a briefing on the addendum to the CAI Description of the Proposed Action and Alternatives (DOPAA). He explained that the purpose of the addendum was to respond to the enactment of the Colorado Wilderness Act of 1993 and the ANG's policy to conduct military training operations at a minimum altitude of 2,000 feet above ground level over federally-designated wilderness areas whenever possible. In addition, Maj. Buckingham noted that the addendum was finalized in November 1993, and the Notice of Intent was published in the Federal Register on January 7, 1994. The addendum was mailed to initial DOPAA recipients, registered scoping meeting attendees, and Citizen Information Group (CIG) and TIG members and attendees. Maj. Buckingham identified the Dunes Military Operations Area (MOA), La Veta MOA, Visual Route (VR) 413, Instrument Route (IR) 409, IR-415, XIR-424, and XVR-1427 as the airspace affected by the addendum. An attendee asked if the Dunes MOA alternative that was dropped from the DOPAA would be replaced with another alternative. Maj. Buckingham answered no.

Mr. Bob Senderhauf began the coalition presentation by introducing himself as a member of the Custer County Action Association (CCAA). He reviewed the history of public involvement with the Colorado ANG and identified public interest organizations opposed to the CAI, including chambers of commerce, associations, spiritual groups, local governments, town councils, and other entities. He emphasized that organized opposition to the CAI is growing. Mr. Senderhauf also noted that the coalition responded to the ANGR's list of top ten misconceptions about the CAI during the CIG meeting. In addition, he stated that a news release had announced that there would be no aircraft flights in the San Luis and Wet Mountain Valleys. On behalf of Custer County landowners, Mr. Senderhauf also presented a map of the county depicting the proposed airspace. In addition, he reiterated Maj. Buckingham's statement during the CIG meeting that VR-412 would not be flown. Mr. Senderhauf expressed concern that there would not be adequate opportunity for the CIG and TIG to work together and provide input regarding the CAI prior to the review of the Draft EIS. An attendee asked how the ANG can assure the public that flight violations will not occur. Maj. Buckingham responded by stating that the 140th FW has a toll free phone number for receiving complaints and investigates each complaint on a case-by-case basis. An attendee asked if cumulative impacts would be addressed in the EIS. Maj. Buckingham and LTC Shiell responded yes.

Mr. Steve Arveschoug, a representative of Congressman Scott McGinnis, and Mr. Jim Peck, a representative of Governor Roy Romer, jointly related the results of the CIG meeting to the TIG attendees. A desire to "re-define" the environmental impact analysis process by expanding the decision-making process was expressed. It was proposed that the CIG, TIG, and ANG would work together to "move lines" and satisfy the requirements of the National Environmental Policy Act of 1969. Specifically, a Working Group, also referred to as a steering committee, would be formed to work towards resolving issues and validating the process. The first meeting would occur in mid-April after completion of scoping, scoping analysis, and preparation of materials by the ANG. It was also stated that the steering committee would focus the agenda and foster enhanced accomplishments regarding the CAI.

Maj. Buckingham related his perspective to the summary presentation of the CIG meeting. He noted that the approach described would result in a new direction for the project. In addition, he emphasized the fact that Dunes MOA had been eliminated from further consideration as an alternative and that use of VR-412 had been discontinued. He expressed the importance of working together and his concern

regarding the La Veta MOA. Maj. Buckingham also noted the need for additional meetings. A discussion of media involvement ensued. Mr. Peck offered to pursue an opinion from the state Attorney General as to whether or not the press could be included or excluded from future meetings. Mr. Dennis Roberts, an aeronautics representative from the Colorado Department of Transportation, noted his familiarity with a similar working group. He explained that the process is time consuming and mentioned that a group with which he was involved met twice a week, four hours for each meeting, for six weeks. The end result was that potential "show stoppers" were identified. Mr. Roberts also noted that preliminary discussions were not published. In response, LTC Shiell commented that the EIS process should continue, the EIS addresses environmental impacts, and the document must be legally sound. Mr. Dick Masse stated that alternatives cannot be eliminated from consideration without analyzing resultant impacts.

Mr. Lowery prompted the TIG to discuss the membership of the Working Group. A steering committee was formed to direct the efforts of the Working Group. The members are listed as follows:

- Mr. Steve Arueschoug
- Ms. Doris Morgan
- Mr. Jim Peck
- Mr. Dennis Roberts
- Mr. Ray Koch
- Ms. Kate Steichen
- Mr. Harry Knudsen
- Maj. Buck Buckingham.

An attendee commented that the purpose of the Working Group was to focus on the process, not the issues. Mr. Arveschoug offered to coordinate with Mr. Knudsen via a conference call and/or during the scoping/information meetings scheduled February 1, 2, and 3, 1994.

The TIG meeting recessed for a five minute break.

In addressing the final agenda item, Mr. Neil Seitz of the Saguache County Planning Commission expressed a desire for a post-EIS economic study that would analyze conditions five to ten years after completion of the EIS. The purpose of the study would be to determine if the current EIS accurately forecasted economic impacts. LTC Shiell noted that this subject may be a mitigation measure and suggested that it be re-addressed in the EIS process, most likely at the time of the record of decision (ROD). LTC Shiell further stated the difficulty in determining the "environmental" factors that are related to socioeconomic conditions. He provided an example using a waste water facility at an Air Force Base. An attendee commented that a post-EIS study may be out of scope for the current project. Mr. Masse suggested that the TIG may want to continue to meet after the ROD is complete. LTC Shiell stated that no Department of Defense economic studies have been, or are currently being, conducted of possible airspace impacts in Colorado. An attendee noted that the legislative issue of automatically updating and reviewing EISs could be discussed via the Working Group. An attendee expressed a desire for a health related post-EIS study. An attendee asked about the submission of additional scoping information after the scoping deadline--in particular, species data for Alamosa County from the U.S. Fish and Wildlife Service. LTC Shiell noted that the ANG will continue to accept information after the official comment period is concluded.

Mr. Arveschoug suggested a date for the first steering committee meeting. The meeting is scheduled for February 2, 1994, at 1:00 pm in Westcliffe. The meeting will take place at the residence of Mr. Ray Koch.

The TIG meeting adjourned at 12:00 pm.

#### **F.6 MEETING NOTES FROM THE WORKING GROUP MEETING ON MARCH 7, 1994**

The CAI Working Group meeting began at approximately 1:00 PM. A total of 20 persons were in attendance.

Mr. Jim Peck and Ms. Kate Steichen opened the meeting with a welcome statement and stated that they would serve as joint facilitators. They explained that the purpose of having a facilitator was to enhance the exchange of information among group participants. Each participant introduced his or her self to the group. In addition, LTC Steve Shiell briefly reviewed administrative business, including lodging arrangements, the list of attendees, and the location of future meetings.

Ms. Steichen explained that the Working Group would need to use a systematic approach in identifying objectives and addressing issues regarding the CAI. She explained that issues must be resolved, or, if not resolved, an understanding must be reached that provides an explanation as to why a particular issue can not reach closure in a cohesive manner. In addition, she stated the importance of defining conditions for participating in a group process and explained that airspace training would be the focus of discussion.

Ms. Steichen identified the parties involved in the CAI process, such as ANGRC, the Federal Aviation Administration (FAA), media, community groups, and Federal, State, and local governments. She also cited the success of the CAI participants to date and noted that the Working Group meeting was the first of its kind in the Environmental Impact Analysis Process (EIAP).

The facilitators, Ms. Steichen and Mr. Peck, prompted a discussion of "conditions for participation" during the meeting. The conditions identified by the group are as follows:

- The group will be self-managing in nature with all members participating on an equal basis
- Participants will be fully involved during the meeting
- Group participants will not give speeches and will recognize that the session is not a scoping meeting
- Participants will avoid disturbances during the meeting by refraining from making phone calls, running errands, leaving early, etc.
- The group will become a social island during the meeting
- Breaks will occur on an as needed basis
- Note taking will be conducted.

The facilitators also emphasized the importance of active listening and asked that each group participant be open minded. The facilitators noted that their roles would change to participants as appropriate.

Mr. Peck reviewed the meeting agenda and distributed copies to attendees. He stated the need for a fluid, or flexible, agenda. In addition, Mr. Peck explained that the role of the Steering Committee is to manage the group process and that the role of the Working Group is to deal with specific issues and attempt to reach resolution. He also prompted the group to begin identifying objectives.

Mr. Steve Arveschoug noted that the formation of the Steering Committee is an outgrowth of the former CIG and TIG. In addition, Ms. Steichen stated that the Working Group would not attempt to resolve issues at this meeting and that the group would only identify and prioritize issues.

Mr. Arveschoug distributed a list of objectives developed by the Working Group during the February 2, 1994, meeting. These objectives are listed as follows:

- Establish a two-way information/communication system that also serves the grassroots
- Establish a follow-up/ongoing feedback process to monitor environmental impacts after the Record of Decision and charting are completed and flying in the revised airspace begins
- Act as a place to resolve issues
- Channel recommendations from the communities and resource agencies regarding the EIS scientific work
- Work on CAI issues throughout the plan one-by-one, reach some resolution, and develop recommendations for the preferred alternative that will be part of the Draft EIS
- Attempt to increase levels of trust among all parties
- Seek a preferred alternative that meets ANG training objectives and addresses community and environmental concerns.

The following objectives were added to the existing list of objectives by the Working Group:

- Ensure that all members of the group are provided with factual information
- Review viable and attainable objectives on an on-going basis
- Identify resources that can be used to clarify issues
- Reach a win/win solution versus a victory for a particular entity.

Ms. Steichen provided an explanation of a future search process, stating that the process is intended to serve as an examination of past, present, and future conditions. She asked participants to divide into three sub-groups and note, by decade, important world, military, and individual events. The following issues were identified:

#### **Issues in the world**

- Sex, violence, money, and the environment.

## **Issues in the military**

- Build-ups and draw-downs.

## **Issues in individuals**

- Starting careers, families, loss of family, and change in family values.

A discussion regarding participation in the Working Group ensued. Mr. Arveschoug reiterated the Steering Group discussion regarding participants and alternates and their respective roles. LTC Shiell provided a brief overview of Federal and State sunshine laws and noted that he would obtain additional related information.

Ms. Steichen resumed the future search process and asked the Working Group to divide into three sub-groups, military, public, and government. She asked each sub-group to sketch the CAI in the form of a house. In addition, each group developed a list of positive (i.e., proud) and negative (i.e., sorry) attributes regarding the CAI.

The military sub-group sketched a log cabin with air-to-air training upstairs and air-to-ground training downstairs. The drawing also depicted constraints, such as a mortgage/budget, deed restrictions, accountability, and pilot and public safety. The positive and negative items identified are as follows:

### **Positive**

- Professionalism of the ANG
- ANG safety record
- ANG contribution to Desert Storm, communities, and end of the cold war, nuclear cloud, and the wall.

### **Negative**

- REDEYE proposal and lack of sensitivity
- Accountability/miscommunication
- Complexity of Federal rules and regulations
- Mistrust.

The public sub-group presented five mobile homes configured in the shape of a pentagon. The homes contained an Officers Club, an Enlisted Club, administrative and training facilities, and several headquarters buildings. The center of the pentagon included a recreation area. The public (i.e., citizens) and the "enemy" were depicted outside the mobile home pentagon. The sub-group stated that there was a perception of "fun and games" in the military, although there was also recognition of the military's ability to respond to serious problems. In addition, the sub-group noted that the mobile homes represented (1) a temporary structure that could be disassembled and (2) that the ANG was mobile and able to provide protection around the world. The positive and negative attributes that were identified are as follows:

### **Positive**

- ANG technical skills
- ANG dedication to mission
- ANG sacrifice
- Job opportunity.

### **Negative**

- Economic impact
- Abuse of power
- Accountability.

The government sub-group depicted a home with many doors leading into and out of the house. Each door represented an entity that is involved in the CAI EIAP, such as the ANG, citizens, politicians, wildlife, recreation areas, and the environment. Only the ANG door had a door knob, representative of the feeling that the flow of communication in the environmental process was influenced and controlled by the military. The middle part of the house depicted a mountainous scene with an aircraft flying across the view and pilots looking through windows. Bedrooms were shown on the upstairs level, representing the people. The positive and negative attributes identified are as follows:

### **Positive**

- Involvement
- ANG accomplishments and respect for citizens and mission
- Citizens
- Active people and involvement.

### **Negative**

- Bad start
- Turf battles
- Media
- Misinformation
- Planning
- EIS process antiquated
- Previous problems with REDEYE proposal.

Ms. Steichen asked the Working Group to identify items that are considered important in continuing the environmental process. The list is as follows:

- Involvement and input from all sides
- Communication and the feeling that what someone says is important
- Commitment
- Professionalism
- Participation in a democratic process
- Respect for each other in terms of needs, concerns, and constraints
- ANG readiness
- "Cross talk" where there is acknowledgment of time and resources
- Put the past behind everyone.

Ms. Steichen resumed the meeting by asking each group member to participate in an open-ended visionary exercise by imagining an ideal future scenario for airspace training. Ms. Steichen prompted each member to draw a symbol representing their ideal vision of the year 2000 in the context of military training and the environment. The Working Group divided into four sub-groups and each decided on a representative symbol of the future. The resulting symbols are described as follows:

- The first group created a symbol consisting of three hands held together representing people, an airplane representing pilots, and a bird



representing silence. The combination of the three symbols resulted in a sign for peace.

- The second group stated their desire for changes in aircraft and training technology and a smaller military force. This group did not sketch a symbol.
- The third group presented two symbols. The first symbol was a bird with its wings spread open representing freedom. The second symbol was the planet earth symbolizing peace.
- The fourth group presented the endangered bald eagle and the American flag. It was noted that both the military and the public had previously used the bald eagle as a symbol. A green stripe was added to the American flag representing the environment. The combination of the signs symbolized hope.

Ms. Steichen prompted the group to summarize the main themes of the future. The following themes were identified:

- Peace
- Healthy environment and safe technology
- Readiness
- Personal freedom and satisfaction
- Advanced technology/virtual reality
- Cooperation/partnering
- Harmony/balance in nature and people.

The meeting concluded with a brief discussion of administrative business. LTC Shiell provided assistance for group members staying on base. Steering Committee members were asked to remain to discuss additional business. The Working Group stated that the session would reconvene on March 8, 1994, at 8:30 am.

The meeting adjourned at approximately 5:30 PM.

#### **F.7 MEETING NOTES FROM THE WORKING GROUP MEETING ON MARCH 8, 1994**

The CAI Working Group meeting began at approximately 9:00 am. A total of 20 persons were in attendance.

Mr. Jim Peck opened the meeting with a brief introduction and outline of the agenda. He stated that the following items were included on the agenda:

- Discussion of parameters for designing training airspace
- Identification of issues for Working Group consideration
- Prioritization of issues for Working Group consideration
- Discussion of timeline for the process
- Discussion of commitments from Working Group members for continuing the process
- Determination of the next meeting date, time, and location.

In addition, it was noted that Mr. Steve Arveschoug would assist in facilitating the group meeting.

Mr. Peck reviewed the Working Group objectives. He stated that the purpose of the Working Group was to identify and address issues in order to develop a preferred alternative for the EIS. Mr. Peck reiterated objectives set forth during the previous day's meeting as follows:

- Establish a two-way information/communication system that also serves the grassroots
- Establish an ongoing, follow-up feedback process to monitor environmental impacts after the Record of Decision (ROD) is complete and flying in the modified airspace commences
- Act as a place to resolve issues
- Channel recommendations and information from communities and resource agencies regarding the EIS
- Work on CAI issues throughout the process, reach some resolution, and develop recommendations for the preferred alternative that will be part of the Draft EIS
- Attempt to increase trust among all parties
- Seek a preferred alternative that meets Colorado ANG training objectives and addresses community and environmental concerns.

Mr. Randy Woods stated that he would prefer to serve as a Working Group participant versus an alternate. Mr. Woods requested that he and Mr. Charles Proctor, a Working Group alternate, reverse roles at the commencement of the afternoon portion of the meeting.

LTC Steve Shiell, Maj. Buck Buckingham, Mr. Paul McConnellogue, and Mr. Dennis Roberts began a discussion of parameters for establishing training airspace. LTC Shiell stated that changes in airspace are driven by operational requirements which must be considered. He stated that the FAA owns and controls all airspace and that utilization of airspace is based on daily permission granted by the FAA. In addition, LTC Shiell stated that the FAA can define limitations on hours of use and altitudes on a daily basis. He explained that the following requirements must be considered whenever an ANG unit identifies a new airspace training need:

- Existing airspace must be examined in terms of availability, accessibility, restrictions, etc. and utilized if possible
- Existing airspace must be modified if it can not be used in its current design
- New airspace may be created if existing and/or modified airspace does not meet training requirements.

It was also stated that Special Use Airspace (SUA) is established for safety reasons. If the FAA mandates changes in SUA, the ANG must still consider the aforementioned requirements. The creation of the new Denver International Airport (DIA) was used as an example of this situation. LTC Shiell stated that the Colorado ANG has a requirement to modify training airspace as a direct result of the establishment of the DIA.

LTC Shiell noted that the ANG spent approximately nine months working with the FAA to identify an aeronautically feasible proposed action for the CAI. He explained that the ANG first identified airspace that was "off limits" and then examined remaining airspace areas. In addition, he stated that the ANG must adhere to all USAF regulations and Federal Aviation Regulations (FARs). A member noted that USAF flying regulations are either as strict as or more strict than FAA regulations. The ANG policy for flying over wilderness areas at a minimum altitude of 2,000 feet above ground level was cited as an example. LTC Shiell stated that the ANG will submit the CAI EIS to the FAA for an aeronautical review after the EIAP is complete.

Ms. Steichen asked how specific requirements for the Colorado ANG are established and how the ANG determines between what it wants versus what it needs in terms of airspace. LTC Shiell responded by explaining that the process begins with annual Department of Defense (DoD) authorization and appropriation of funds, as mandated by Congress and approved by the President. He stated that each ANG unit is notified of the number of sorties it will be allowed to fly based on input from the Secretary of Defense and the President's Cabinet. It was noted that Regulation ACCR 116-28 describes requirements for F-16 units. The ANGRC tailors ACCR 116-28 to ANG unit requirements on an annual basis, and ANG units are rated in terms of combat readiness.

Maj. Buck Buckingham provided an explanation of 140th FW aircraft and sortie numbers. He explained that a sortie includes an aircraft flight from takeoff to landing and that the average sortie duration is approximately one hour fifteen minutes per aircraft. Maj. Buckingham also stated that IFR and VFR are defined as Instrument Flight Rules and Visual Flight Rules, respectively. In addition, he noted that aircraft speeds above 10,000 feet AGL range from 450 to 480 knots and that the minimum airspeed for an F-16 is typically 360 knots.

Maj. Buckingham stated that the Colorado ANG has 24 Primary Assigned Aircraft (PAA) and two spare aircraft, which accounts for 26 aircraft, 4,600 flying hours, and 3,500 sorties. As of October 1, 1994, the unit will have 18 PAA and two spare aircraft, meaning that 20 aircraft will be funded but the unit will continue to maintain 26 aircraft. The 20 aircraft account for 3,450 flying hours and 2,653 sorties. As a result of additional force structure changes, the unit will be reduced to 15 PAA and two spare aircraft as of October 20, 1994, which will result in 2,852 flying hours and 2,193 sorties. Maj. Buckingham noted that the unit will continue to be responsible for maintaining the original 26 aircraft.

A participant asked what is the average duration of an aircraft in a MOA. Maj. Buckingham responded that the maximum duration for an aircraft in a MOA is 45 minutes.

Maj. Buckingham provided a temporal description of a MOA and a MTR. He explained that aircraft must not exceed the horizontal and vertical walls, or boundaries, of airspace. He explained that a violation occurs when an aircraft is operated outside designated boundaries of an active airspace component. He also explained that SUA, such as a MOA, only exists during certain hours of each day as granted by the FAA. In addition, Maj. Buckingham noted that the 140th FW incurred three violations during the past year. Maj. Buckingham noted that the current minimum altitude flown by Colorado ANG aircraft is 500 feet AGL.

LTC Shiell further described force structure changes that have been announced and impact Buckley ANGB. Assuming a linear relationship between the number of aircraft and the number of sorties, he compared sortie numbers that are presented in the CAI DOPAA with sortie numbers based on force structure changes (i.e.,

26 aircraft versus 17 aircraft). The comparison of DOPAA and force structure sortie numbers is summarized as follows:

- 140th FW: 3,538 versus 2,211
- 150th FW: 620 versus 388
- 27th FW: 458 versus 458
- Aggressors: 539 versus 337
- Other: 296 versus 296
- Total: 5,400 versus 3,690.

LTC Shiell noted that numbers had been rounded and were approximate for purposes of discussion. In addition, current and proposed utilization tables were distributed to the Working Group.

LTC Shiell listed consequences of using the DOPAA sortie numbers versus incorporating force structure sortie numbers into the EIAP. The list is as follows:

#### **DOPAA Sortie Numbers**

- Would not be indicative of actual/real utilization
- Would be based on a worst case scenario and stricter mitigations
- Would account for emergency conditions.

#### **Force Structure Sortie Numbers**

- Would re-start the EIAP in terms of time, effort, and funds
- Would reflect actual impacts, if any
- Would reflect realistic conditions.

A member noted that the size of a MOA is not proportional to the number of sorties and that an aircraft requires a certain amount of physical airspace in order to operate, regardless of the number of sorties flown.

A discussion ensued regarding the use of sortie numbers in light of possible additional force structure changes, the Base Realignment and Closure (BRAC) Act, and the DOD budget. Mr. Harry Knudsen commented that there are three possible scenarios regarding sortie numbers: force structure changes; base closures; and budget constraints.

Ms. Mary Anne Flood inquired as to the need for airspace expansions given the downsizing of the military. LTC Shiell reiterated the relationship between an aircraft operating within a MOA and the frequency of aircraft utilization of a MOA. He noted that the need for airspace is based on stated requirements and that downsizing is not a factor.

A participant asked if the number of CAI proposed MOAs could be reduced in light of military downsizing. LTC Shiell replied that the ANG philosophy involves distributing aircraft flights across several MOAs in order not to concentrate any impacts in a given area. A discussion ensued regarding noise related impacts.

Mr. Scott Hamilton asked if the CIA EIS noise analysis would account for sortie numbers and the duration of sorties. A member responded that the analysis would account for such parameters and that the National Environmental Policy Act (NEPA) states that a reasonable worst case scenario should be used.

Mr. Neal Hughes asked if the minimum number of aircraft considered for a viable ANG unit is 15. A member responded in the affirmative and noted that there are currently 96 units in the ANG. A participant also noted that Buckley ANGB is the only Colorado ANG unit in the state, and, therefore, the base most likely will not be closed. In addition, the base may receive aircraft from other units.

Ms. Steichen asked if the ANG was requesting the maximum amount of airspace and the maximum number of sorties and if it were possible to reduce the amount of airspace needed. A member responded that the DOPAA reflects a worst case scenario. Maj. Buckingham also noted that the CAI would reduce the total amount of training airspace.

Mr. Jonathan James commented that the group needs to decide what numbers to use.

Mr. Paul McConnellogue provided a description of the territory controlled by the FAA Denver Center and the role and jurisdiction of the FAA in terms of airspace and the EIAP. He explained that the FAA is not officially involved in the process until the ANG presents a formal airspace proposal. In addition, Mr. McConnellogue stated that the FAA reviews the airspace proposal on an aeronautical basis. He noted that the FAA does not approve or disapprove of the ANG proposal on an environmental basis.

Mr. McConnellogue described the types of airspace in the Denver Center area, including ATCAA areas, victor airways, jet routes, MOAs, MTRs, etc. He noted that several ATCAA areas exist immediately above certain airspace components included the CAI and that the ANG has a letter of agreement with the FAA regarding the use of such high altitude areas. Mr. McConnellogue noted that the Denver Center region includes 15 MOAs, 10 ATCAA areas, 44 MTRs, and several Strategic Training Range Complexes. He noted that the current Denver Stapleton Airport is the fifth busiest airport in the U.S. and the seventh busiest airport in the world. In addition, Mr. McConnellogue stated that the new DIA involved 842 airspace actions. He offered to provide copies of FAA regulations regarding MOAs and MTRs at the next Working Group meeting.

Mr. Dennis Roberts noted the Colorado Division of Aeronautics' review of the CAI EIS with respect to general aviation. In addition, he noted that the DIA has six banks, or peaks, of aircraft traffic each day and that these banks affect the availability of training airspace for the ANG. Mr. Roberts also explained that he had assisted in coordinating informal airspace meetings and provided input regarding possible impacts on commercial, general, and corporate jet operations on a similar project.

LTC Shiell reiterated Mr. McConnellogue's statement that the FAA will review the ANG proposal after the EIS is complete and the ROD has been published. In addition, he noted that negotiations are being conducted that could result in an airspace proposal being submitted to the FAA at the same time as the Draft EIS.

Maj. Buckingham stated that the CAI would result in an overall loss of four percent of airspace on a three dimensional basis. A member also stated that the FAA can audit airspace utilization and requirements on an annual basis. It was noted, as an example, that the FAA had revoked the Flagger MOA from Luke AFB.

Ms. Flood asked if the FAA was dealing with base closures. A participant commented that the Northwest Mountain Region FAA representative would be able to answer the question. Mr. Arveschoug stated that the EIS is not based on base closures.

Mr. Hamilton stated that a FAA representative from the Northwest Mountain Region should be in attendance at the Working Group meetings. Mr. Roberts commented that a representative would be present at the next meeting.

Mr. Peck asked if the ANG accounts for the BRAC Act by returning airspace to the FAA. A member responded that NEPA requires that airspace be returned.

A member commented that other airspace should be considered. Maj. Buckingham stated that any airspace within 250 miles of Buckley AFB could be considered.

Ms. Flood asked about the advance notice given to the ANG regarding a base closure. LTC Shiell and Mr. Peck explained the process and the necessary review of bases that must be considered. In addition, it was noted that the DoD is required to submit a list of realignment and closure recommendations to the BRAC Commission by April 1, 1995.

Mr. Peck suggested that the Working Group consider a date and location for the next meeting. The group proposed Monday, March 28, 1994, from 9:00 am to 5:30 PM in Pueblo, CO.

Mr. Mike Lucas presented an explanation of noise metrics and methodology in the context of the CAI. He distributed a briefing highlighting the main topics of the presentation and displayed a sound level meter device for the Working Group. In addition, Mr. Lucas defined the following noise metrics:

- **SEL**: The sound exposure level (SEL) is the A-weighted sound level integrated or summed over the entire noise event and is normalized to a reference duration of one second. The SEL may be thought of as the maximum A-weighted sound level of an event that lasts exactly one second and contains the same total sound energy as the measured event. The SEL is frequently used to describe single event noise levels.
- **Ldn**: The day-night average sound level (Ldn or DNL) averages aircraft sound levels at a location over a complete 24 hour period and adds a ten decibel (dB) weighting to those noise events that take place between 10:00 PM and 7:00 am the following morning. The ten dB penalty represents the added intrusiveness of sounds that occur during those hours since ambient sound levels during nighttime are typically about ten dB lower than during daytime hours. The Ldn is often used to assess noise levels at civil and military airports.
- **Ldnmr**: The onset rate-adjusted monthly day-night average A-weighted sound level (Ldnmr) accounts for the unique noise environment that is associated with MTRs (i.e., sporadic events). The metric includes a zero to five dB penalty in order to compensate for the startle effect of low altitude overflight. Ldnmr is similar to the Ldn metric in that it is an averaged metric that adds a ten dB penalty for events occurring at night. In addition, Ldnmr represents an average noise level for an entire month versus a 24 hour period.

Mr. Lucas stated that there are three noise models used to analyze noise emissions: NOISEMAP, ROUTEMAP, and MRNMAP. He explained that NOISEMAP is typically used to assess noise levels at an airport. He stated that ROUTEMAP is used to assess noise levels along route corridors, such as a MTR. Mr. Lucas also explained that MRNMAP is a new noise model that is designed for assessing MOA, route, and airport related noise in a given environment.

Ms. Flood asked if the noise analysis will be averaged over a period of time. Mr. Lucas responded that the noise analysis will include an average metric and a SEL metric.

Mr. Roberts inquired as to how ambient noise levels will be calculated and how the delta between ambient levels and Ldn 65 dB will be addressed in the EIS. In addition, Mr. Woods stated a concern regarding the penalty of Ldn in a rural area, noting that rural areas are more sensitive in nature. Mr. Woods commented that all noise levels in the Northeast EIS were below Ldn 65 dB. Mr. Knudsen stated that ambient data for rural areas are not readily available and offered to provide Ldnmr, Ldn, SEL, and other metrics. Mr. Lucas noted that the main sources of ambient noise include humans, wind, and insects.

Ms. Flood cited a U.S. Department of Agriculture Forest Service study dated January 1992 and asked if the document would be utilized in the CAI EIS. A member responded that the study would be used. A participant reiterated the concern regarding the use of Ldn and Ldnmr in a rural area. Mr. Knudsen stated that the Federal Interagency Committee on Noise (FICON) met in 1992 and made no changes to the stated noise metrics. In addition, Mr. Lucas offered to provide reports about MTR noise and metrics. Mr. Lucas noted that Ldn is a widely accepted metric. LTC Shiell stated that he is a member of the FICON and that the U.S. Forest Service, Department of Housing and Urban Development, Environmental Protection Agency, FAA, and Department of Veteran's Affairs use the Ldn metric.

Mr. John Kenney asked how pilots can meet mission requirements given horizontal restrictions and limitations. He commented that bomber aircraft can avoid noise sensitive areas but fighter jets have difficulty accomplishing the same type of avoidance. A member stated that once noise sensitive areas are identified, pilots can avoid these areas.

Mr. Lucas continued his noise presentation by stating that noise measurement programs attempt to separate aircraft noise from ambient noise. He noted that noise modeling in the CAI would include actual measurements of aircraft flyovers at specific sites.

Mr. Woods requested advance notice of the flyovers and stated that the Colorado School of Mines had proposed to conduct a parallel noise study. Mr. Knudsen noted that two monitoring studies may not be necessary. Mr. Lucas stated that if a parallel study were conducted, there could be no interference with the ANG study. In addition, a participant noted that noise measurements could not be conducted under proposed conditions (i.e., within proposed airspace).

A participant inquired about the amplitude effect of noise in a valley. Mr. Lucas responded that the USAF had recently examined this issue and that no further or added noise impacts were experienced.

Ms. Steichen requested a copy of the SEL data that would be generated as a result of the CAI noise monitoring study. She also asked if a user's guide for interpreting the data could be provided. A participant noted that the data could be provided.

Ms. Flood requested that an aircraft training scenario be conducted in a MOA for purposes of the noise monitoring study.

Mr. Peck suggested that the Working Group begin identifying a list of issues that need special consideration. He stated that the purpose of the list was to identify issues. Issues identified by the Working Group are as follows:

1. Horizontal and vertical separation to avoid noise sensitive areas

2. Communication: sortie counts (with mission profiles), mission scheduling, and the relationship between the two issues
3. Discuss the Sodbuster MOA as an alternative to the Two Buttes MOA
4. Composition of the Working Group
5. What is the need/requirement for the CAI
6. Reasons for changing Instrument Route 409 to fly over Rye
7. Why lower the La Veta MOA floor
8. Canon City Instrument Landing System
9. MOAs as obstacles to civil VFR flight
10. Potential for mid-air collision with crop spraying aircraft
11. Long term viability of the Airburst Range
12. Working Group decision process and negotiations
13. Appropriateness of Ldnmr penalty relating to livestock and wildlife
14. Quality of life issues
15. Environmental issues
16. Safety (i.e., fire, bird hazards, etc.)
17. Explanation of F-16, B-1, B-52, and crop duster scheduling (especially in southeast Colorado): deconfliction
18. Relocate VR-413, commence a meeting in the valley, develop alternatives, and consult with residents
19. Draft EIS hearing format
20. Altitudes and sortie counts
21. Can airspace boundaries be changed (i.e., move lines on a map)
22. How are cumulative impacts assessed
23. Real time utilization of the MOAs and MTRs
24. Accountability -- what constitutes violations and how are they handled
25. What change in requirements resulted in the proposal for Airburst B and C MOAs
26. Conduct of noise verification study
27. Bison study
28. Peregrine Falcon study



29. Assessment of Mexican Spotted Owl
30. Socioeconomic assessment
31. Compensation
32. Emergency response and training for rural organizations
33. Cooperation between branches of the military
34. Air pollution monitoring
35. Impact of closing Fort Carson on the CAI
36. Impact of potential abandonment of the VOR (very high frequency omnidirectional range) system
37. Out-of-state users (i.e., cut out the fat)
38. Re-visit with the FAA the Pinon Canyon MOA configuration
39. ANG policy for wilderness area avoidance
40. La Veta MOA
41. Configuration of Airburst A MOA
42. South only entrance into Airburst Range
43. State park overflights
44. Point G in La Veta MOA
45. Complaints and communication
46. Accountability and monitoring
47. Working Group objectives
48. ANG preparedness and quality of training
49. Scheduling and managing of airspace
50. Discipline of pilots and consequences of violations
51. Overflight of "Bent's Old Fort"
52. No-Action Alternative
53. Relationship of issues identification to the EIS process.

Mr. Jonathan James asked why the CAI proposal was needed if the FAA had already accounted for airspace changes involving the new DIA. Mr. McConnellogue stated that airspace that could be modified in advance had been changed. Mr. McConnellogue further stated that, as a result of the new DIA action which impacted existing ANG airspace, the ANG is now proposing to modify airspace based on mission requirements. Mr. McConnellogue reiterated that the FAA will review the proposal once the EIS is complete. In addition, Mr. McConnellogue stated that the FAA will determine

if adjustments to the flow of air traffic are needed once the airport is actually open and that further changes may be made based on that determination.

A member stated that the list of issues identified will need to be prioritized at the next Working Group meeting. A member noted that the Steering Group is tasked with process related issues.

The Working Group meeting adjourned at approximately 4:00 PM.

#### **F.8 MEETING NOTES FROM THE WORKING GROUP MEETING ON APRIL 14, 1994**

The CAI Working Group meeting began at approximately 9:00 am. A total of 20 persons were in attendance.

Mr. Steve Arveschoug opened the meeting with a welcome statement and asked each participant to introduce his or her self to the Working Group. Representatives for ANG, Mr. Harry Knudsen, LTC Steve Shiell, and LTC Buck Buckingham, noted that their role during the meeting would be to serve as Resource Specialists for the Working Group. In addition, a participant noted that the preferred alternative being developed for the CAI Draft EIS by the Working Group would not be presented to the Governor's office as an "ANG" alternative.

Mr. Arveschoug proposed the following agenda to the Working Group:

- Review expectations for recommendations
- Discuss top five issues
- Discuss solutions
- Establish agenda for the next meeting
- Determine date, time, and place for the next meeting.

In addition, Mr. Arveschoug asked if any of the participants would like to add to the agenda. A participant noted that the Working Group could adjust the agenda during the meeting, as necessary.

Mr. Arveschoug prompted the Working Group to begin discussion of the first agenda item, and the following topics were identified in terms of expectations for recommendations:

- Recommendations regarding the CAI will be provided directly to the Governor's office
- The preferred alternative will be embodied in the ANG's Draft EIS
- The due date for the preferred alternative is June 1, 1994.

A participant asked if the bison and noise studies would be included in the Draft EIS since the two studies had not yet been conducted. Mr. Harry Knudsen stated that the studies would be conducted in mid-May and would then be incorporated into the document. In addition, a participant inquired about delaying the EIS schedule in order to provide time for citizens to learn about NEPA. Mr. Knudsen explained that the ANG is planning to file an NOI for the EIS by September 1, 1994, and that Draft EIS hearings would occur in mid- to late-September. External (i.e., public) review of the document is scheduled to take approximately two to six weeks and would begin in July 1994. Internal review of the Draft EIS by the ANG would occur during June 1994. It was also noted that the format for the Draft EIS hearings would need to be discussed.

A participant stated that B-1B aircraft are flown in the Two Buttes MOA, proposed VR-1427, and IR-409 areas and that these areas should be studied in the EIS. Mr. Arveschoug noted that these issues were not directly related to the current agenda item and suggested that the Working Group address the concern at a later point during the meeting.

Mr. Arveschoug summarized the expectations for recommendations by stating that Working Group alternative would be provided to the Governor's office, submitted by June 1, 1994, and included in the Draft EIS.

A participant inquired as to the extent of the ANG's commitment to the Working Group preferred alternative. LTC Shiell stated that the alternative needs to meet training requirements, minimize potential environmental impacts, and address quality of life issues. In addition, LTC Shiell stated that the alternative must meet other agency criteria, such as recommendations and/or requirements set forth by the U.S. Fish and Wildlife Service. He commented that recommendations in addition to the Working Group's alternative were being provided for the EIS and that the Working Group's recommendations would not necessarily become the final decision regarding the CAI. Mr. Arveschoug noted that the Working Group preferred alternative would be considered more credible with ANG involvement.

Mr. Arveschoug prompted the Working Group to address the second agenda item, discussion of the top five issues. It was noted that the Working Group had identified the following key issues regarding the CAI since the March 7-8, 1994, meeting:

1. The need/requirement for the CAI
2. The need/requirement for lowering the floor of La Veta MOA
3. The long term viability of Airburst Range
4. Pilot accountability, violations, recording, and discipline
5. Out of state airspace users.

A discussion regarding the identification of the top five issues ensued. A participant suggested that Issue 2 be changed to address the La Veta MOA in its entirety instead of the lowering of the floor. In addition, a participant asked about the possibility of moving IR-409. It was stated that the Working Group had voted on the aforementioned five issues, but that any issues related to each of the five concerns could be jointly addressed.

LTC Buckingham offered to address Issue 1. He noted that Page 1, Paragraph 4 of the DOPAA states the need and requirement for the CAI. LTC Buckingham explained that establishment of the new DIA necessitates changes to certain airspace components used by the 140th FW. In addition, he stated that the 140th FW F-16 pilots cannot adequately meet all training requirements. LTC Buckingham detailed changes to airspace located north of the DIA and explained that establishment of the Cougar MOA from the New Raymer MOA results in a critical loss of training airspace. As a result, airspace actions are being proposed south of the DIA and in proximity of the Airburst Range. A discussion ensued regarding the use of MOAs and MTRs for training purposes.

LTC Shiell stated that past ANG experience indicates that the use of several MOAs versus a single MOA helps to alleviate high levels of military training over one area. A participant stated that the state of Colorado seems to have a proportionately larger amount of airspace than other states. LTC Shiell responded by noting that Colorado is physically a large state which allows enough area for several MOAs to overlie state boundaries. In addition, he explained that states in the northeast region of the country are physically smaller and, therefore, may not have enough area for several MOAs to overlie state boundaries but may actually have a higher percentage of airspace

overlying each state. LTC Shiell noted that airspace should be considered in terms of a national perspective and is a federal asset that does not belong to each state.

A participant asked how the ANG determines the number of miles needed for each MTR. It was stated that the U.S. Air Force Master Plan provides guidelines according to aircraft types and mission requirements and that no specific numbers are calculated. In addition, LTC Buckingham noted that the range of an F-16 (i.e., how far the aircraft can fly without running out of fuel) is a major factor in determining airspace requirements. In response to a question regarding the narrowing criteria on Page 27 of the DOPAA, LTC Buckingham provided a general explanation of the different types of training requirements and aircraft operations that need to be accomplished by the 140th FW. A participant asked about the frequency of aircraft refueling activity in training airspace. LTC Buckingham stated that about ten percent of the aircraft sorties involve refueling exercises and that there are two refueling tracks in the state of Colorado.

A participant asked about the possibility of eliminating VR-413. LTC Buckingham noted that the use of VR-413 has not resulted in substantial noise complaints, sensitive areas have been identified for avoidance, and the MTR is the only route that occurs over mountainous terrain.

A participant commented that the Governor has suggested entry into the Airburst Range from the east. A participant responded by stating that Mr. Paul McConnellogue explained at the March 7-8, 1994 meeting that entry into the range from the east was not feasible due to major flyways, the Pueblo and Colorado Springs airports, and the location of Fort Carson as a military training site.

A participant asked how many aircraft are based at Buckley ANG Base. LTC Buckingham reviewed aircraft numbers and flying hours that were presented at the March 7-8, 1994, Working Group meeting. He stated that the 140th FW has 26 aircraft, of which 24 are PAA and two are reserve aircraft. He explained that the unit will be funded for 18 aircraft as of October 1, 1994, and 15 aircraft as of October 30, 1994. LTC Buckingham reiterated the fact that the unit must continue to maintain all 26 F-16 aircraft. LTC Buckingham noted that approximately 11 percent of 140th FW aircraft activity occurs out of state.

A participant asked if aircraft could enter the Airburst Range from the west off VR-413. LTC Buckingham responded that he thought the idea was a viable possibility.

A participant stated that there was concern about the La Veta area and out of state users. In particular, concern was noted regarding the channeling of MTRs into the La Veta MOA. It was also stated that the CAI would result in approximately a four percent reduction in airspace.

A participant asked if there were any guidelines in determining the use of flat terrain versus mountainous terrain. LTC Buckingham explained that providing a combination of flat and mountainous terrain is optimal since units may be deployed anywhere in the world but that there are no specific guidelines. In addition, he noted not all training requirements necessitate low altitude airspace utilization. He said for some training requirements, the 140th FW trains over flat and mountainous terrain since the geographic features of the state provide the opportunity to do so. LTC Buckingham noted that the minimum altitude for aircraft conducting air combat training (ACBT) over flat and mountainous terrain is 5,000 and 10,000 feet AGL, respectively.

A participant asked if training operations could be shifted to the north and northwest areas of Colorado. LTC Buckingham reiterated the affects of the new DIA on

available airspace for the 140th FW. He stated that the Cougar MOA was smaller in size than the New Raymer MOA and that these changes had already occurred. In addition, LTC Buckingham explained that there is no range in the northern part of the state and reiterated the need for airspace in terms of meeting training requirements in proximity to a range.

A participant asked why the Two Buttes MOA would be designated as high/low but not the La Veta MOA. It was stated that no Victor routes traverse the La Veta MOA area and, therefore, there is no need for a high/low designation.

The Working Group noted that entry into the Airburst Range from the east may not be viable but entry from the west may be viable. In addition, it was noted that any options that may not be considered viable by the ANG may still be included in the Working Group's preferred alternative.

A participant asked if airspace could be moved away from the town of Rye. It was noted that perhaps some MTR activity, such as IR-409, could be adjusted to the east of La Veta MOA. A participant noted that most utilization of IR-409 occurs by out of state users. In addition, a participant noted that the La Veta area may experience growth and an increase in population in the future. A brief discussion of the long term viability of Airburst Range ensued.

Mr. Arveschoug suggested that the Working Group reserve discussion of Airburst Range for Issue 3 and prompted the group to begin addressing Issue 2, lowering the floor of the La Veta MOA. LTC Buckingham stated that the location of Airburst Range is a critical factor in terms of the location and design of other airspace components. He described two styles of airspace training, including Viet Nam (low altitude) and Desert Storm (high altitude) and noted that the type of enemy threat dictates the approach to the Airburst Range. It was noted that LANTIRN (i.e., night training) also needs to be considered.

A participant asked what impact a westward entrance into the Airburst Range would have on the La Veta MOA proposed action. LTC Buckingham responded that there would be no impact. He stated that a MOA allows for aircraft to defend an area while a MTR does not. He stated that a MTR, such as IR-409, allows an aircraft to enter the Airburst Range but with no maneuverability. In addition, LTC Buckingham stated that aircraft cannot avoid detection at very high altitudes when operating on MTRs.

A participant reiterated that an option to relieve sensitive areas in the La Veta area from out of state F-111 activity would be to move the affected portion of IR-409 to the east of La Veta MOA.

A participant asked if out of state F-111 aircraft would use the La Veta MOA. A participant responded yes. In addition, LTC Buckingham stated that the minimum altitude for aircraft is 500 feet AGL, except for F-111 aircraft that may operate at 100 feet AGL. He noted that all aircraft may operate at altitudes below 500 feet AGL in the Airburst Range.

A participant asked if the 140th FW is required to allow out of state users to train in "Colorado" airspace and if out of state sorties are deducted from 140th FW sorties. The response was that the Colorado ANG is not required to do so and that such arrangements are established through letters of agreement and memoranda of understanding. LTC Buckingham stated that the ANG could prevent out of state users from training in airspace if such users abuse the area. LTC Shiell noted that airspace is not a state owned asset. In addition, LTC Buckingham stated that out of state sorties do not count against 140th FW sorties. A brief discussion regarding current and

proposed utilization tables in the DOPAA ensued. It was noted that the tables provide the number of sorties per year by aircraft type for each airspace component.

A participant asked what affect a minimum altitude of 1,500 versus 500 feet AGL has on training. LTC Buckingham stated that depth perception is affected and that lower altitude training is optimal for radar avoidance and terrain masking. A participant asked if the La Veta MOA floor could be 1,500 feet AGL instead of 500 feet AGL and the proposed action still be viable. LTC Buckingham responded that it may be possible.

The Working Group recessed for approximately 45 minutes.

Ms. Doris Morgan and Mr. Charlie Taylor reconvened the Working Group meeting and prompted the group to begin addressing Issue 3, long term viability of the Airburst Range. LTC Buckingham stated that the Airburst Range will eventually move to another location but that a specific time and place are not known. It was stated that the general time frame is estimated at five to ten years. LTC Buckingham stated that the ANG needs to resolve the short term situation regarding the Airburst Range while working on a long term plan that includes a new range. He noted that the Airburst Range is approximately 20 square miles in length and width and is owned by the Department of Defense. In order to establish a different range, a new site must be identified and acquired.

A participant asked if the La Veta MOA is viable without the Airburst Range. LTC Buckingham responded no. LTC Buckingham stated that the ANG needs to acquire land and would like to move out of the Airburst area. A participant suggested Fort Carson as a possible location for a new range. It was stated that training that is conducted at Fort Carson is not compatible with ANG training. A participant suggested that the Working Group recommend short and long term plans for the Colorado ANG.

A participant asked about the viability of Buckley ANGB. LTC Buckingham and LTC Shiell reiterated the explanation provided at the March 7-8 Working Group meeting. It was stated that the probability of closing the base is very low due to the fact that each state maintains at least one ANG unit. The state of Colorado has only one ANG unit. States having more than one ANG unit may incur a consolidation prior to states with one unit. In addition, it was stated that the minimum number of aircraft that is viable in terms of force structure draw downs is 15 F-16 aircraft.

Ms. Morgan prompted the Working Group to begin addressing Issue 4, accountability, violations, recording, and discipline. It was stated that the FAA provides regulations and guidelines regarding violations and that these parameters are not necessarily the same as those defined by citizens (i.e., an aircraft flying over a house at low altitude is not an FAA violation). LTC Buckingham provided an example of a violation by noting that a person driving a car may get a ticket for speeding, which is illegal, and have to pay a fine. He stated that an aircraft pilot may exceed speed or altitude parameters and be notified that a violation has occurred but the pilot may not automatically be prevented from flying. The seriousness of the violation impacts the determination regarding discipline, ranging from a verbal reprimand to being grounded. In addition, it was noted that areas that have been identified as sensitive may be designated as simulated surface-to-air missile (SAM) sites and pilots will train to avoid those areas. LTC Buckingham noted that two out of state pilots from South Carolina flew over the Crestone SAM site at low altitude and are no longer allowed to train in Colorado. A participant stated that aircraft broke the sound barrier a few weeks ago in the Huerfano Valley. LTC Buckingham noted that he is aware of and looking into the incident with the participant.

A participant asked what is the key to pilot accountability. LTC Buckingham stated that the key to accountability is the fact that 140th FW pilots live in Colorado

and are local residents. The pilots are not planning to move away from the area and do not want to cause problems. A participant suggested that noise sensitive areas be pre-designated whenever airspace is being modified or established. A participant from the Custer County area stated that she had provided the 140th FW with a such a list and suggested that all participants do the same. In addition, LTC Buckingham provided examples in the Flight Information Publication (FLIP) of special operating procedures that direct pilots away from sensitive areas along MTRs.

A participant asked what are the requirements for low altitude training. It was stated that detection, attack, and negating an attack are the primary requirements.

Ms. Morgan prompted the Working Group to address Issue 5, out of state users. A participant commented that total sortie counts presented in the DOPAA include out of state users. LTC Buckingham presented tables depicting current and proposed utilization in terms of sorties by airspace component to the Working Group. The 140th FW records the number of sorties performed by the unit, and, once the maximum number of sorties funded/scheduled is achieved, the airspace is not flown again until a new year begins. A participant suggested that the number of sorties be limited. In addition, it was noted that the Two Buttes Low MOA is scheduled for use 12 days per year. It was also noted that the ANG visited each out of state unit that utilizes the CAI airspace in order to determine and confirm sortie counts that are presented in the DOPAA.

In order to address the next agenda item, solutions, several participants stated that input from the FAA would be needed and that a representative should be present. Ms. Morgan asked the Working Group how it would like to proceed and suggested that a date, time, and place be set for the next meeting. The Working Group decided to have a meeting on Thursday, April 21, 1994, or Tuesday, April 26, 1994, with Mr. Paul McConnellogue of the FAA-Denver Air Route Traffic Control Center and Mr. Dennis Roberts of the Colorado Division of Aeronautics in attendance. It was decided that the meeting will take place at the University of Southern Colorado in Pueblo, Colorado, in the same facility and that ANG representatives would not need to attend this meeting. In addition, the Working Group decided to have a meeting on Thursday, May 5, 1994, and Friday, May 6, 1994, and that ANG representatives will be in attendance. This two day meeting will be held at Peterson Field AFB in Colorado Springs, CO. LTC Shiell offered to provide arrangements for individuals interested in staying on base.

The Working Group recessed for approximately 15 minutes.

Ms. Morgan prompted the Working Group to identify any other concerns not included in the list of the top five issues. A participant stated concern regarding VR-413 in terms of state parks, recreation areas, and wildlife. LTC Buckingham noted that only seven percent of the sorties occur on VR-413 and referred to Page 67 of the DOPAA. He added that only two sensitive areas, Crestone and Moffat, have been identified and are avoided. In addition, a participant stated concern regarding the potential for impacts on migratory birds. LTC Buckingham noted that no bird aircraft strikes have occurred on the route.

A participant noted that the Working Group needs to consider who will prepare the preferred alternative document that will be submitted to the Governor's office.

In order to summarize the status of the Working Group's development of a preferred alternative, a participant presented the following list of "no objections" and "issues/objections":

### No Objections

- IR-416, XIR-426, and IR-415 to Point D
- New Raymer/Cougar MOA
- Kit Carson/Cheyenne MOA
- VR-412 deletion
- Pinon Canyon MOA.

### Issues/Objections

- Airburst A and B MOAs
- Lowering the floor of La Veta MOA
- Moving "Point G"
- VR-413
- Two Buttes MOA
- MTR floors
- XVR-1427, XIR-424, IR-415 after Point D, and IR-409 after Point G
- Noise sensitive areas.

In addition, a participant noted that subjects such as wildlife and agriculture need to be considered. It was stated that the EIS would address these topics.

A participant suggested that a stenographer be present for the remaining meetings as the preferred alternative is developed.

The Working Group meeting concluded at approximately 3:00 PM.

## **F.9 MEETING NOTES FROM THE WORKING GROUP MEETING ON MAY 5, 1994**

The CAI Working Group meeting began at approximately 9:00 am. A total of 26 persons were in attendance.

Mr. Steve Arveschoug opened the meeting with a welcome statement and presented the following meeting agenda:

- I. Introductions
- II. Housekeeping matters
  - Lunch accommodations
  - Other
- III. Working Group questions to ANG
  - Actual utilization: 140th FW from 1991 to 1993
  - F-16 aircraft conversion Environmental Assessments (EAs)
  - Noise and bison study updates and timelines
- IV. Recommendations for the main objectionable issues
- V. Draft recommendations
- VI. Agenda for the next meeting
- VII. Adjourn.



Mr. Arveschoug prompted each participant to introduce his or her self to the Working Group. In addition, it was decided that a working lunch would be appropriate and that food would be delivered to the meeting facility. No other items were presented for housekeeping matters.

Mr. Arveschoug prompted the Working Group to begin discussion of the next agenda item, questions to the ANG, and requested that LTC Buck Buckingham and LTC Steve Shiell address the issue of aircraft utilization. LTC Buck Buckingham provided a copy of an airspace training manual to the Working Group. In addition, he distributed aircraft utilization tables for MOAs from 1991 to 1993. LTC Buckingham noted that aircraft utilization numbers for 1992 are higher than 1990 figures but lower than 1991 operations. He stated that the fluctuation reflects the unit's conversion to F-16 aircraft. LTC Buckingham also noted that a decline in utilization occurred from 1992 to 1993 and that the unit flew one-third the normal level of aircraft operations in 1994 due to an increase in maintenance requirements. He also stated that the numbers in the utilization report do not reflect use of the Chama ATCAA, which is located above the La Veta MOA. In addition, it was noted that aircraft utilization numbers shown in the CAI DOPAA represent a worst case scenario for purposes of the EIS.

Mr. Bob Senderhauf inquired as to how aircraft utilization numbers for MTRs could be obtained. Mr. Paul McConnellogue stated that the FAA tracks IR usage but not aircraft types or VR utilization. He noted that the Denver ARTCC records data for routes originating through the Denver ARTCC. In addition, Mr. McConnellogue offered to develop utilization estimates for CAI related MTRs. Mr. John Kenney noted that he had obtained MTR data for B-1B aircraft.

In terms of the Working Group's request for copies of prior EAs, LTC Shiell provided the *Environmental Assessment of an Aircraft Conversion, 140th Tactical Fighter Wing, Buckley Air National Guard Base, Aurora, Colorado*, dated March 1991 and the *Environmental Assessment of the Effects of the Conversion of the 140th Fighter Wing along IR-409 and at the Airburst Range, Colorado*, dated February 1993. In addition, LTC Shiell stated that a Categorical Exclusion (CATEX) had been prepared for the Cougar MOA. Mr. Senderhauf requested that copies of the EAs be sent to each of the CAI coalition groups. Mr. Arveschoug responded that citizens may use copies of the EAs from his office or the Working Group documents provided by the ANG.

Ms. Pat Boutilier asked if MOAs would be used on a daily basis. LTC Buckingham responded by saying no, and said that training would occur in a MOA on days that the MOA is active, but that MOAs would not be used every day.

LTC Shiell updated the Working Group regarding the bison and noise studies. He noted that the bison study is being conducted in two phases. The first phase, data collection, data searches, and expert interviews, is approximately 95 percent complete. LTC Shiell stated that the second phase of the bison study is embodied in a noise study. He stated that a bison ranch owner has been contacted regarding participation in a study. In addition, LTC Shiell commented that the contractor, Science and Engineering Associates, Inc. (SEA) has subcontracted a noise measurement study to Wyle Laboratories and discussion of a technical approach is in process. He added that the noise measurement study will occur in the Kit Carson MOA and will involve multiple F-16 and F-111 aircraft passes at low altitude. LTC Shiell stated that the aircraft overflights will be measured by noise equipment and a special "Colorado" noise file will be developed. In a second noise study, noise monitors will be placed along MTRs. He stated that this noise study will involve the determination of SELs for single events. Two noise models, ROUTEMAP and MRNMAP, will be used in both studies. LTC Shiell summarized by stating that the noise studies will involve noise measurement and the creation of a Colorado noise file, noise monitoring, ROUTEMAP, MRNMAP, and SELs.

Mr. Kenney requested that bombers (i.e., B-1 aircraft) be included in the noise study. LTC Buckingham noted that the request should be feasible.

Mr. Senderhauf asked if the noise measurement study would occur in the La Veta MOA and account for valleys and mountainous terrain. LTC Shiell and LTC Buckingham responded that this noise study would not occur in the La Veta MOA due to the existing minimum (i.e., low) altitudes. LTC Shiell added that noise monitoring would occur on VR-413, which includes mountainous terrain. Mr. Senderhauf asked if bison in mountainous areas would be studied and requested the locations of bison ranches. LTC Shiell commented that the Dunes and San Luis Lake areas would be included in the monitoring study but did not know the specific bison ranch being contacted.

Mr. Neil Hughes requested that noise curves be presented in the analysis. LTC Shiell responded that the curves would be provided.

Mr. Jim Peck inquired as to the target completion date for the bison and noise studies. LTC Shiell responded that the completion date is not yet known but is tentatively scheduled for late May 1994.

Mr. Senderhauf asked if the Working Group and other representatives would be allowed to participate in the noise studies. LTC Shiell noted that Wyle Laboratories should provide input regarding the extent of additional involvement regarding the conduct of the studies. In addition, LTC Shiell noted that Mr. Mike Lucas of Wyle Laboratories has been in contact with representatives of the Colorado School of Mines (COSOM).

Mr. Peck inquired as to how the attendance of additional participants would affect the noise measurement and monitoring processes. Mr. Senderhauf noted that there are individuals with experience in the field of noise who want to be involved in the studies. LTC Shiell stated that past experience has shown that additional involvement is not conducive to such studies (i.e., artificial inflation of noise levels and excessive media attention). A participant noted that the equipment used during the noise studies involves the use of sensitive devices.

Mr. Arveschoug suggested that the Working Group prepare a letter for the ANG requesting that three individuals be allowed to observe the noise measurements, with expectations that a positive response would be given.

Mr. Peck noted that the request to observe the noise measurement is valid, as is the ANG's concern regarding the potential for impacting both the noise measurement and monitoring processes. Mr. Peck emphasized that the Working Group's desire is to have a good noise test.

Mr. Senderhauf concurred that a media event regarding the noise study was not desirable. He noted that additional participants, such as the COSOM, would have a better understanding of the noise studies and would be able to use their own equipment. LTC Shiell requested that the issue regarding the use of additional participants and equipment be deferred to Wyle Laboratories.

Mr. Arveschoug suggested that the Working Group prepare two letters. The first letter would request that the ANG allow observers to be present during the noise measurements. The second letter would request that additional noise measurements and monitoring be allowed by another organization. In addition, he prompted the Working Group to review the agenda.

Mr. Neil Seitz suggested that the Working Group request that the COSOM be present and participate in the study.

Mr. Peck noted that, although "review by colleagues" may be productive for purposes of scientific analysis, he was not informed as to the desires or capabilities of the COSOM and noted that the study is not dealing with the more common issues of noise in urban areas and around airports.

Mr. Neal Hughes stated an objection to the noise monitoring device that was presented at the March 7-8, 1994 Working Group meeting. He noted that the issue regarding noise in the context of the CAI is human behavior and response/reaction and expressed concern that Mr. Lucas and Mr. Harry Knudsen are physical scientists versus social scientists. In addition, he commented that the ANG's approach lacks credibility. LTC Shiell concurred that the study of noise transcends beyond a physical science and into the field of psycho acoustics. LTC Shiell noted that the noise monitoring device presented by Mr. Lucas was a small, easily transportable sample device. In addition, he stated that Wyle Laboratories employs several physical scientists and psycho acoustic technicians who will be working on the noise study. LTC Shiell also stated that the EIS will discuss the correlation between noise levels and human annoyance/response and will be tied to other related studies that have been published. LTC Shiell further stated that the Ldn (day-night, average sound level) is a widely accepted noise metric used for interpretation by many agencies. LTC Shiell offered the Working Group the opportunity to provide another methodology or metric to be used in the study.

Mr. Arveschoug prompted the Working Group to review the meeting agenda and highlighted the following action items for the Working Group:

- Mr. Peck would determine the current status of the COSOM's involvement regarding the noise study
- LTC Shiell would contact Mr. Lucas in order to review any discussions with the COSOM
- The Working Group would prepare a written request regarding observers of and active participants in the noise study.

In terms of the written requests to the ANG, Mr. Arveschoug summarized the Working Group's position as follows:

- The COSOM would participate in the noise study
- Three Working Group participants would serve as observers during the noise study
- The Working Group would prepare a written request regarding the above-mentioned items, as well as the inclusion of B-1 aircraft in the study.

Mr. Arveschoug prompted the Working Group to begin discussion of the next agenda item, recommendations for the main objectionable issues. Ms. Doris Morgan distributed copies of CAI recommendations that were submitted at the meeting held on April 21, 1994. Participants briefly presented written and verbal CAI alternatives and recommendations to the Working Group.

Mr. Senderhauf stated that he has continued concern regarding the CAI and noted that 125 organizations and political groups, including Congressman McGinnis and Governor Romer, were opposed to the proposed action. He noted that the Custer County Action Association supports the reduction of F-16 aircraft assigned to the 140th FW from 24 to 15. In addition, he questioned the ANG's need for additional airspace

and stated that the 140th FW is able to accomplish mission training requirements under current conditions.

Mr. Kenney noted that Congressman Allard intends to defer making a statement regarding the CAI until later in the process. He added that Congressman Allard has not stated that he concurs with Congressman McGinnis' statement at this point in time. In addition, Mr. Kenney commented that he was attempting to work on positive aspects of the environmental process.

In order to summarize the Working Group's status regarding the CAI, Mr. Scott Hamilton presented the following list of objectionable issues and corresponding suggested solutions:

**Objectionable Issues:**

1. Airburst B and C MOAs and the southern boundary of Airburst A MOA
2. Moving "Point G", IR-409/VR-413 westward, La Veta Low MOA/conduct of LOWAT/intercept training
3. Southeast Colorado: IR-409/XVR-1427/Two Buttes Low MOA (unless counterbalanced with reduction in B-1 activity)
4. Need for 1.5 NM "bubbles" over noise sensitive areas (NSAs) (i.e., residential, recreational, agricultural, and wildlife areas)
5. Wildlife: need to cross Arkansas and South Platte Rivers with one NM or above 2,500 feet AGL
6. Potential conflict with crop spraying aircraft along Arkansas River and in extreme southeast Colorado areas.

**Suggested Solutions:**

1. Delete Airburst B and C MOAs, move southern boundary of Airburst A MOA northward, establish eastern entry route near Ordway to Airburst Range, status quo
2. Delete La Veta MOA, delete Airburst A MOA, leave IR-409 and VR-413 where they are, delete VR-413 and do terrain masking training on IR-416, mandatory fly 2,000 feet MSL minimum over wilderness areas, status quo
3. Sortie number cap on IR-409 and XVR-1427 (relative to out of state users, number of aircraft)
4. Implement SOPs for 1.5 NM bubbles, with maximum opportunity for citizen and wildlife management agency input
5. Implement SOPs, except on IR-409/VR-413 on final leg run-in to the Airburst Range
6. Delete IR-415/XIR-424 southwest of Point D, replace with eastern entry into Airburst Range, raise floors of IR-409 from Point A to Point E, XVR-1427 from Point C to Point E to 1,500 feet AGL.

In addition, Mr. Hamilton identified the following general issues:

### General Issues:

1. Noise study standards and methodology (reliance on Ldn, sonic boom concerns)
2. Limit CAI to Colorado ANG use only
3. Preclude F-111s from using Airburst Range
4. DOPAA sortie numbers to reflect 15 aircraft.

A detailed discussion ensued regarding the list of objectionable issues and suggested solutions.

Mr. Peck began by noting that a purpose of establishing the Airburst B MOA is to relieve the town of Penrose of excessive overflights in that the B MOA allows aircraft to turn east or west. He asked participants to consider this information when discussing deleting the B MOA.

LTC Buckingham noted that a "give and take" had occurred with the Working Group and thanked everyone for their continued involvement and participation. In addition, he presented an aeronautical chart depicting the components of the CAI. LTC Buckingham noted that the Airburst C MOA and the final portion of IR-409 are comprised of the same airspace. He explained that a MOA allows for multiple aircraft runs and attacks, whereas a MTR does not because a route is basically a one-way track. He added that the Airburst B and C MOAs allow for low altitude (LOWAT) entries into the range. LTC Shiell added that the primary emphasis for the Airburst B MOA was safety. LTC Buckingham and LTC Shiell also noted that entry into and exit from the range from the north is not viable due to the geography (i.e., ridge line) and location of other military training facilities. It was also noted that moving MTRs to the west and/or north are not viable. A discussion of tactical ingress and egress for the Airburst Range ensued.

Mr. Skip Dyer and Mr. Baird inquired as to the viability of shaving, or deleting, the southern portions of the Airburst A MOA in order to provide adequate navigation to and from Fremont County Airport. Mr. McConnellogue responded by stating that shaving the southern corners the Airburst A MOA would have no aeronautical impact from an FAA perspective. LTC Buckingham commented that the suggestion seemed viable. In addition, Mr. McConnellogue stated that the Restricted Area associated with the Airburst Range is owned by the FAA. He noted that the U.S. Army leases a small portion of the land, which is used for firing missiles and is not safe for aircraft overflights.

A discussion ensued regarding an eastern entry into the Airburst Range by moving MTRs north of Pueblo and south of Colorado Springs. Mr. McConnellogue commented that general aviation may be impacted by such a change. Mr. Don Reed of Pueblo Approach stated that such a change may not be aeronautically feasible because of traffic patterns at Pueblo and Colorado Springs. Mr. Hamilton noted that a representative from the Colorado Springs Airport should be present at the Working Group meeting.

Mr. Hamilton inquired as to the impact on training requirements resulting from deleting the Airburst C MOA. LTC Buckingham responded that the impact would be significant and added that the Fremont MOA is not considered low with a minimum altitude of 1,500 feet AGL.

LTC Shiell noted that threatened and endangered species are located west of the range area and that existing restrictions limit flight to 1,500 feet AGL, which precluded considering a MTR from the west.

LTC Andy Love noted that eastern entry into the range was permitted approximately 20 years ago but the ANG was asked to relocate to the south. Mr. McConnellogue responded that he was not aware of the reason for the redirection. It was also noted that departures from the range would be at altitudes up to 8,500 feet AGL.

Ms. Boutilier commented that the DOPAA does not identify Special Operating Procedures (SOPs). LTC Buckingham explained that the DOPAA reflects a worst case scenario for aircraft utilization and that SOPs are detailed in the Flight Information Publication.

A discussion of the long term viability of the Airburst Range ensued. Mr. Senderhauf stated that it was his understanding that the Airburst Range had a remaining life of one to three years. Mr. Kenney stated that his notes from the April 14, 1994 Working Group meeting stated approximately five years. Mr. Peck stated that his recollection of previous conversations with LTC Buckingham was that after a new range was charted, the viability of the Airburst Range would be three to five years. In addition, Mr. Peck noted that Fort Carson had been reviewed for base realignment and closure. LTC Buckingham responded that a specific date had not been set but that the general time frame would involve at least several years once a site is selected. LTC Shiell commented that the development of a range at a new location would require another EIS, and the full process would require approximately ten years to complete. He used the proposed Idaho Training Range as an example. In addition, LTC Buckingham emphasized that a new range location must still be determined.

Ms. Boutilier stated that no LOWAT activity in the La Veta MOA is strongly desirable. Mr. Neal Hughes concurred with her statement. LTC Buckingham stated that shifting portions of MTRs out of the La Veta MOA is a feasible alternative. In addition, he stated that establishing a minimum altitude of 1,500 feet AGL in the La Veta MOA is possible and that operations conducted at altitudes of 1,500 feet AGL or lower are considered LOWAT. He noted that without LOWAT capabilities, training would be degraded. In terms of the availability of other MOAs, it was noted that the Two Buttes MOA would only be used 12 day a year and that the Cheyenne MOA would have no proximate range capabilities for weapons delivery. He stated that the unit currently practices LOWAT training outside the state of Colorado, with the exception of the Kit Carson MOA.

Mr. Hughes stated that the town of Rye should be excluded from LOWAT training operations.

Mr. Hamilton noted that, with the exception of XVR-1427, moving MTRs and shaving the Airburst A MOA are feasible actions. He added that the Working Group still has objections regarding the Airburst and La Veta MOAs. LTC Buckingham added that the IR-409 and VR-413 no-action alternatives are feasible in relation to moving Point G and avoiding the Greenhorn Wilderness Area.

Mr. Bruce Goforth stated that the Colorado Division of Wildlife (CDOW) has submitted comments to the ANG through the scoping process.

Mr. Seitz stated that VR-413 combines several undesirable features for aircraft overflight. LTC Buckingham noted that utilization on VR-413 has declined on a historical basis.

Mr. Seitz noted concern regarding state parks underlying VR-413, Segment D-E. In addition, he inquired as to the viability of an aircraft flying a MTR with an excessive number of NSAs versus raising the entire floor of the MTR. LTC Buckingham stated that there are only two NSAs along VR-413, Crestone and Moffat, and that state parks could easily be identified and also avoided. LTC Shiell commented that one of the purposes of the EIS process is to conduct scientific analysis and determine if bubbles are needed over NSAs.

Mr. Seitz inquired as to the protection of the White Ranch National Wildlife Refuge. LTC Shiell and Buckingham stated that they were not aware of any comments from the U.S. Fish and Wildlife Service regarding the refuge.

Ms. Boutilier and Mr. Kenney inquired as to the possibility of 140th FW sorties being absorbed by other units when the 140th FW is debusted from 24 to 15 aircraft. LTC Shiell and Buckingham responded that sorties assigned to the 140th FW may not be transferred to other units. LTC Shiell briefly reviewed the scenario of an ANG unit squadron being reduced in terms of the number of aircraft. In addition, he noted that General Sheppard is in the process of reviewing a point paper that presents the possibility of proceeding with the EIS in terms of a 24 aircraft alternative as well as an 18 aircraft alternative. The 18 aircraft alternative could result in mitigations based on 24 aircraft and an analysis based on 18 aircraft. It was also noted that if the Buckley ANGB is reduced to 15 aircraft, other similar units are also reduced as part of total force policy.

Mr. Peck stated that he concurs with a worst case approach in the EIS but noted concern that the aircraft utilization figures presented in the EIS, which will be published in the ROD, will increase the potential for the total number of sorties that can actually be flown.

A discussion of out of state users of Colorado airspace ensued. In addition, LTC Shiell explained that each unit receives the same amount of flying hours and funds. He added that if the ROD states that utilization is based on 15 aircraft and the unit is robusted to 24 aircraft at a later date, then the ROD remains intact or a new EIS is prepared. LTC Buckingham also stated that if the unit is robusted to 24 aircraft, then the unit will increase sorties to support the increased number of aircraft. LTC Shiell and LTC Buckingham emphasized that out of state units may not absorb unused Colorado ANG sorties. A participant noted that the Working Group needs to consider if the EIS should "validate" 24 F-16 aircraft and corresponding sorties. LTC Shiell responded no.

Mr. Seitz commented that base closures have not resulted in military airspace terminations. He noted that this situation would appear to make flying more difficult for general aviation pilots. LTC Buckingham responded that military training airspace is either "hot" or "cold" (i.e., active or inactive) and that active airspace is usually only hot for a few hours a day. He explained that pilots should be checking activity at Flight Service Stations (FSSs) before take-off as a standard procedure and that base closures have no impact on general aviation. In addition, LTC Buckingham stated that other military aircraft types still have requirements to train and need special use airspace.

A discussion ensued regarding avoidance of NSAs by means of establishing bubbles. LTC Buckingham noted concern regarding the establishment of 1.5 NM lateral avoidance procedures around NSAs in addition to no direct overflights of NSAs. Mr. Goforth stated that a 1.5 NM radius avoidance procedure had already been negotiated with the ANG. He also noted that lateral avoidance was a positive procedure, although the issue of noise would not be fully addressed since LOWAT operations would still occur. A participant clarified the definition of "bubble" by stating that the avoidance procedure is defined as a cylinder, versus a bubble, with a 1.5 NM radius and a

designated minimum altitude. Upon clarification, LTC Buckingham noted that a 1.5 NM radius avoidance around NSAs, such as towns and parks, with a designated altitude over the NSAs would be more feasible. In addition, LTC Shiell noted that altitudes of 3,000 feet AGL and higher may be categorically excluded from analysis. He emphasized that the purpose of the EIS is to identify and analyze impacts to NSAs and establish bubbles and SOPs as appropriate. In addition, LTC Shiell noted concern that establishing a list of NSAs regardless of the potential for impacts appeared to be premature. Mr. Goforth responded by stating that early identification and resolution of issues would result in a more effective EIS process and preferred alternative. Mr. Peck stated that additional information regarding NSAs, such as Moffat, San Luis Park, towns, and wildlife areas, is needed. LTC Shiell stated that the EIS would include citizen and agency comments and address these issues in the Draft EIS. He also stated that public review is part of the process. Mr. Goforth stated that the Colorado Division of Wildlife was providing input through the environmental impact analysis process in order to provide early identification of sensitive areas so that impacts could be mitigated and issues resolved prior to the Draft EIS phase. LTC Shiell and Mr. Hamilton stated that a provision for bubbles will be included in the Draft EIS. As an example, LTC Shiell added that a Bird Avoidance Model (BAM) would also be used to analyze the potential for bird aircraft strike hazard. Mr. Peck stated that comments from state agencies and the scoping meetings will be automatically included in the EIS.

LTC Buckingham commented that he is not prepared to state a specific minimum altitude regarding NSAs and suggested that the EIS be used to determine where minimum altitudes may be needed and what mitigations would be necessary. A participant noted that mitigations become official in the ROD. Mr. Goforth asked at what point in the EIS process agencies would be allowed to review mitigative measures. LTC Shiell stated that mitigations would not be included in the Draft EIS since they are developed later in the environmental process. Mr. Goforth stated that he does not concur with the approach of identifying concerns without presenting mitigations in the Draft EIS. In addition, he noted that his agency had reviewed Draft EISs that included mitigations.

LTC Shiell stated that if a given area is determined not to need a bubble (i.e., there would be no impacts), then the EIS would not necessarily identify the area--that is, areas needing bubbles would be defined as NSAs and a SOP would be recommended. Mr. Goforth stated that he would like to further discuss agency related concerns regarding the CAI prior to completion of the Draft EIS and that through the scoping process the CDOW had only identified general concerns. In addition, LTC Shiell stated that the scoping process serves two purposes: (1) identify issues and concerns from citizens and agencies and (2) focus the EIS on those issues and concerns. He further stated that the EIS is required to analyze all issues and will focus on concerns identified during the scoping process.

Mr. Peck commented that the absence of mitigations in the Draft EIS will leave the public with the perception that the ANG does not intend to address impacts. LTC Shiell responded by stating that an environmental impact can be determined to be adverse and the project can continue. However, if an impact is adverse and significant, then the project can not proceed until mitigations are addressed. He added that the Final EIS will include an environmental alternative that incorporates mitigative measures. Mr. Goforth requested that the CDOW be allowed to discuss issues and alternatives with the EIS contractor prior to the completion of the Final EIS. Mr. Goforth added that, to the extent problems can be foreseen, solutions can be provided early in the process resulting in a better EIS. LTC Shiell responded that such a discussion may be feasible within the context of the National Environmental Policy Act (NEPA).

Mr. Seitz asked if the ANG would be able to review and edit the Draft EIS prior to public review. LTC Shiell responded yes and stated that the document would



be reviewed for readability, technical and structural content, and analysis. Mr. Seitz asked if the ANG is allowed to delete portions of the Draft EIS. LTC Shiell responded yes to the extent that editorial changes are necessary but noted that issues identified during the scoping process are required to be addressed in the EIS.

In discussing crop spraying issues and the potential for flying conflicts, Mr. Hamilton requested that the minimum altitude on IR-415, Segment C-D, and IR-409, Segments C-D and D-E, be 1,000 feet AGL. LTC Buckingham commented that general aviation pilots should call their FSS in order to find out if a MOA or MTR is hot (i.e., active), which is usually only a few hours a day. LTC Buckingham noted that the minimum altitude over IR-409, Segment D-E is already 1,000 feet AGL due to a SOP for the town of Fowler. In addition, LTC Buckingham noted that, although the minimum altitudes requested by Mr. Hamilton were feasible, pilots should coordinate flight plans by contacting FSSs as a standard safety procedure.

Mr. Kenney noted that he and LTC Buckingham had recently been involved in a conversation with a crop duster pilot. Mr. Kenney commented that the pilot was not responsive to coordinating flight plans and indicated that he felt that it was the military's responsibility to notify pilots of their flying activities. Ms. Doris Morgan suggested that an education program regarding flight safety and military activities be considered by the pilots' association. Mr. Hamilton concurred with the idea of an education program and noted that the organization had already considered the idea with some resistance. LTC Shiell noted that the FAA will review the EIS on an aeronautical basis.

In terms of limiting the CAI EIS to the Colorado ANG, LTC Shiell and LTC Buckingham stated that such an approach was not viable and would not be accepted. It was emphasized that airspace is a Federal asset. They stated that other aircraft using the airspace must be included in the process. In addition, they stated that it was not possible to preclude F-111s from using the airspace. A participant noted that F-111s could not use airspace if it was designed in such a way that it would not be practicable for F-111 training purposes.

Mr. Baird noted a concern regarding economic impacts associated with the CAI. LTC Shiell stated that socioeconomic impacts will be addressed in the EIS to the extent possible. LTC Shiell referred to the Council on Environmental Quality (CEQ) Regulations contained in 40 CFR 1500-1508 in relation to the fact that there must be a direct link between the environment and economic impacts. LTC Shiell cited the Chanute military base as example and explained that the closure directly impacted the waste water treatment plant which resulted in economic and environmental affects. LTC Shiell stated that, unless there is a direct economic link, the analysis is concluded.

Mr. Baird inquired as to how the process will ensure that socioeconomic issues are included. Mr. Peck stated that it is very difficult to present economic impacts when there is no tangible or physical link. He stated that the Governor's office could provide additional information and noted that some related work had been conducted at Colorado State University (CSU). Mr. Kenney also noted that agriculture is an economic based activity. LTC Shiell stated that livestock, such as cattle, will be described in the biological section of the EIS and that a direct economic link must be established.

Mr. Senderhauf stated that relatively large cities and military bases are often inter-related economically and that this relationship results in positive economic impacts. He stated that towns and residents located in rural areas along MOAs and MTRs have negative impacts in terms of military operations. Mr. Senderhauf noted that the mission of the people residing in outlying areas is to sustain the quality of life in the mountains. He commented that the ANG, as a good neighbor, should consider economic impacts.

Ms. Mary Ann Flood noted that the town of Gardner has a national award winning school that will likely be closed if families move out of the area. Ms. Flood inquired as to the economic impact that the CAI would have on the town in relation to the school. LTC Shiell responded that it is possible to link anything in an indirect manner but very difficult to pinpoint specific factors to an event. In addition, he stated as an example that socioeconomic issues presented in the Northeast EIS were very important, and the analysis did not determine that there was a link between the proposal and economic conditions.

Mr. Goforth suggested that human dimension surveys may be useful in measuring the social psychology of people in the affected environment. He noted that the Working Group may want to consider conducting a survey. Mr. Peck noted that Dr. Haas at CSU may be able to provide information. Mr. Peck suggested that economic resource specialists be invited to the next meeting.

The Working Group summarized the list of feasible, or doable, items as follows:

- Move the southern boundary of Airburst A MOA to avoid Canon City and Penrose
- IR-409 and VR-413 as the no-action alternative in relation to the old Point G/Cedarwood (not all MTRs will go to the new Point G)
- Move IR-409 out of the La Veta MOA and review moving the other MTRs to new Point G
- Bubbles/cylinders over and around NSAs (Moffat, San Luis Lakes Park, towns, wildlife areas) with a 1.5 NM lateral avoidance but allow the EIS to determine a minimum altitude; 1.5 NM lateral avoidance or minimum altitude overflight avoidance, but not both
- Crop sprayer avoidance of 1,000 feet AGL during the growing season
- Wildlife sensitive areas will be discussed before the EIS and within the context of NEPA
- VR-412 to be dropped.

The Working Group summarized the list of issues that are at an impasse as follows:

- Airburst C MOA
- Conduct of LOWAT in the La Veta MOA
- Whether or not MTRs within the La Veta MOA may include any towns
- VR-413, Segment D-E, through the San Luis Valley.

A participant noted that VR-412, by law, must remain charted if the no-action alternative is adopted.

Mr. Senderhauf asked if the ANG intends to abide by the inter-agency agreement establishing 2,000 feet AGL as the requested minimum altitude for aircraft flying in airspace over lands administered by the National Park Service, Fish and Wildlife Service, and Bureau of Land Management. LTC Shiell stated that the ANG policy includes a 2,000 foot AGL minimum altitude over federally designated wilderness areas and scenic areas. In addition, LTC Shiell stated that the ANG could not, as policy, follow the inter-agency agreement when they were not signatories. Mr. McConnellogue stated that the FAA's position is that the addendum to the DOPAA

follows the intent and letter of the inter-agency agreement. Mr. Senderhauf provided LTC Shiell a copy of the agreement.

Mr. Arveschoug prompted the Working Group to address the next agenda item by determining a date and location for the next meeting. It was decided that two additional meetings would be necessary. The Working Group would meet on May 19, 1994 without the ANG resource specialists for the purpose of drafting the proposal. In addition, the Working Group would meet on May 25, 1994 to present the alternative to the ANG resource specialists. Both meetings are scheduled to begin at 9:00 am and will take place at the University of Southern Colorado in Pueblo.

LTC Buckingham noted that the ANG did not decline to attend the April 21, 1994 meeting and clarified that the Working Group had agreed to have a meeting without the ANG resource specialists.

The Working Group meeting concluded at approximately 3:00 PM.

**F.10 MEETING NOTES FROM THE WORKING GROUP MEETING  
ON MAY 25, 1994**

The CAI Working Group meeting began at approximately 11:35 AM. A total of 23 persons were in attendance.

Mr. Steve Arveschoug began and apologized to the attendees of the open portion of the meeting for the delayed start time. He stated that the closed portion of the Working Group meeting, consisting solely of the community representatives, had lasted longer than was originally intended. Mr. Arveschoug presented the following meeting agenda:

- I. Working Group presentation of their recommendations for alternatives to the CAI
- II. Discussion
- III. Adjourn.

Mr. Arveschoug distributed draft copies of the Working Group's recommendations for alternatives to the CAI.

Mr. Neil Seitz provided a brief explanation of the draft cover letter that will accompany the Working Group's recommendations. Mr. Seitz read the cover letter aloud, and highlighted changes which were incorporated during the closed portion of the meeting.

Mr. Scott Hamilton presented the draft Working Group's recommendations to ANG. Mr. Hamilton read the recommendations aloud, and highlighted the changes which were incorporated during the closed portion of the meeting.

LTC Steve Shiell requested that the Working Group's recommendation for Visual Route (VR) 412 be changed from "Delete VR-412 as recommended in the DOPPA" to "Delete VR-412 as proposed in the DOPPA." He stated that the DOPPA proposes alternatives, it does not make recommendations. LTC Shiell inquired whether the Two Buttes MOA recommendation was intended for the Two Buttes High or Two Buttes Low MOA, or both. LTC Shiell also asked the Working Group where VR-413's 254 annual sorties would be re-routed if VR-413 were deleted as part of their recommendations.

A participant stated that the Two Buttes MOA recommendation was intended for the Two Buttes Low MOA, and that the Two Buttes High MOA was satisfactory as proposed in the DOPPA. A discussion ensued concerning the Working Group's recommendation to delete VR-413. LTC Shiell added that if VR-413 were deleted, the 254 annual sorties proposed for VR-413 would have to be re-assigned to other MTRs in order to fulfill Colorado ANG's training requirements. He requested that the Working Group investigate the sortie re-assignments and amend their findings to the recommendations.

Mr. Seitz asked the ANG representatives if the Working Group's recommendations for alternatives to the CAI were clear. LTC Shiell responded that the recommendations were clear, as long as the ANG comments were incorporated.

Mr. Arveschoug invited other resource personnel, such as those from the FAA, CDOW, and the Colorado ANG to provide additional comments on the Working Group's recommendations for the CAI.

Mr. Bruce Goforth stated that CDOW had thoroughly analyzed the CAI. He added that VR-413 had the potential to impact wildlife more than any other portion of the proposed airspace. Mr. Goforth also stated that access to the Airburst Range from the west could impact peregrine falcons nesting in the area. Mr. Goforth added that CDOW participation in the scoping process merely highlighted NSA and only identified general concerns. He requested that CDOW be given the opportunity to meet with the EIS contractor to provide more specific information. He stated that the Ldn (i.e., average day-night noise metric) to be used in the proposed noise studies will not satisfy CDOW's concerns involving the startle effect of wildlife. Mr. Goforth commented that the Working Group's recommendations to delete portions of the CAI (i.e., Two Buttes Low MOA) were in response to human interests and that proper consideration was not given to wildlife.

A participant asked Mr. Goforth if there was a minimum altitude that CDOW would find acceptable for VR-413. Mr. Goforth responded by stating that lateral avoidance was more important than vertical avoidance. He added that there was a specific concern involving the impacts to the Mexican spotted owl and that this concern was forwarded to Mr. Lee Carlson of the US Fish and Wildlife Service. Mr. Goforth also stated that there were multiple waterfowl and raptor concentration areas, state wilderness and recreation areas (SWAs), and bighorn sheep lambing and winter concentration areas along VR-413. He added that avoidance measures for all of these areas would be unmanageable for Colorado ANG. Mr. Goforth stated that CDOW had provided ANG with an assessment of NSAs for IR-409 in detail, but did not provide the same level of detail for the entire CAI.

A participant added to the concern of the apparent difficulty in avoiding the numerous NSAs, especially those along VR-413. The participant then asked Mr. Goforth if CDOW was providing detailed information to the EIS process. Mr. Goforth responded by stating that he was confused as to what point in the EIS process CDOW's input was needed, and asked ANG when further information from CDOW would be required. Mr. Harry Knudsen responded by stating that comments from all relevant Federal and state agencies were solicited during the scoping process, but that additional comments would be accepted. Mr. Arveschoug thanked Mr. Goforth for his comments.

Mr. Arveschoug requested that Mr. Mike Lucas of WYLE Laboratories provide the Working Group with the specifics of the noise analyses to be conducted for the EIS. Mr. Lucas stated that approximately 15 noise monitors will record ambient noise levels in the areas underlying VR-412 and VR-413 for 30 days. The data generated from this study will be used to establish baseline conditions. Mr. Lucas added that a separate study will involve the recording of noise levels for F-16 and F-111 aircraft flying

predetermined, controlled, low-altitude flight patterns in an area underlying the Kit Carson MOA. These noise levels will be used to better quantify the noise impacts resulting from the CAI.

A participant asked why the F-16 and F-111 noise level recordings were being conducted in Kit Carson MOA and not in areas with mountains or valleys, such as the areas underneath VR-413. Mr. Lucas explained that the purpose of the "prairie study" was to record F-16 and F-111 noise levels in a "sanitized" setting. Mr. Lucas provided an additional explanation of the two noise programs. He stated that the "prairie study" will record a noise signature, process that signature, and create a sanitized sound level for each type of aircraft which can then be applied to all available noise models. Mr. Lucas stated that echo could not be mathematically accounted for in the noise model technologies available at the present time. However, the noise monitoring that will occur in the areas underlying VR-412 and VR-413 will capture aircraft overflights and record their noise levels in mountains and valleys.

Mr. Seitz inquired about the schedule of the noise study, specifically whether the measurements would be taken before or after the EIS is completed. Mr. Lucas responded by stating that the noise data and analyses would be included in the EIS. The data will provide a baseline from which ambient levels can be evaluated and compared to the proposed noise levels. Mr. Lucas added that the ambient noise monitoring would commence on Monday, May 31, 1994 at midnight and continue for 30 days. A discussion ensued concerning the locations of the noise monitors.

Mr. Jim Peck asked how the noise signature of an aircraft will be compared to ambient levels recorded. Mr. Lucas explained the noise studies in further detail. LTC Buckingham added that Colorado ANG was not planning to alter their flights in any way during the noise monitoring study. He emphasized that Colorado ANG does not fly over any large community. Mr. Lucas requested that the Working Group compile a list of NSAs in which to place noise monitors. A participant asked if noise monitors could be placed in wilderness areas. Mr. Lucas responded by stating that he is prepared to place monitors in wilderness areas as long as the areas were accessible by car. Mr. Knudsen commented that ANG is currently flying over wilderness areas at 2,000 feet above ground level and that the placement of monitors in these areas would not benefit the study. A participant commented that overflights at 2,000 feet have a substantial impact on wilderness areas and, therefore, should be monitored.

Mr. Arveschoug asked if the noise studies will include the aircraft and flight levels proposed in the CAI. LTC Shiell stated that "prairie study" will be conducted utilizing F-16 and F-111 at the minimum altitudes allowed for these aircraft in the Kit Carson MOA. A participant asked if B-1B aircraft would be included in the "prairie study." LTC Buckingham stated that inclusion of B-1B aircraft would be feasible.

A participant asked if the cumulative impacts of all aircraft utilizing the airspace would be assessed. Mr. Peck stated that those concerns had been addressed at previous meetings. Mr. Peck then prompted the Working Group to assist Mr. Lucas in identifying NSAs to be included in the noise monitoring study, especially those in remote, under-developed areas. Mr. Knudsen commented that wilderness areas need to be accessible by car, and added that he could not commit to monitoring extremely remote areas due to the additional costs involved.

Mr. Arveschoug requested that the FAA present their comments to the Working Group recommendations. Mr. Don Reed of the Pueblo Memorial Airport commented that the Working Group recommendation to extend the northeast boundary of the La Veta Low MOA northeastward to coincide with IR-409 would encroach upon FAA airspace. Mr. Reed explained that the CAI proposed location of IR-409 was acceptable. He stated that protection of an active MTR is limited and involves a single "run" (i.e., flight operation) through that airspace in one direction. MOA protection,

however, requires shutting down all air traffic through the airspace during the entire time the MOA is active, whether or not an aircraft is utilizing the MOA. Mr. Reed stated that any action that involves the encroachment of a MOA toward FAA airspace always presents a concern, but added that the Working Group recommendations involving airspace in the Pueblo area were feasible. Mr. Paul McConnellogue of the FAA Denver Center added that the Working Group's recommendation to remove the Airburst C MOA from the CAI could raise several potential safety issues, but added that he was not prepared to provide further comment at this time.

Mr. Arveschoug opened the floor to address general comments. A participant asked Mr. Goforth if CDOW's comments were made in conjunction with U.S. Fish and Wildlife Service, or if CDOW solely identified NSAs. Mr. Goforth responded that other agencies may have additional concerns. LTC Shiell stated that the U.S. Fish and Wildlife Service, the Bureau of Land Management, the US Forest Service, and several other Federal and state agencies have submitted comments identifying their concerns.

Mr. Arveschoug thanked everyone for their participation in the Working Group meetings. He requested that all attendees who participated in the closed portion of the meeting remain to discuss the new information presented. Mr. Arveschoug informed the ANG representatives that the final Working Group recommendations will be forwarded to the ANG upon completion. The open forum of the Working Group meeting concluded at approximately 2:00 PM.

## **F.11 WORKING GROUP RECOMMENDATIONS**

The Working Group recommendations, as transmitted to ANGRC and the 140th FW, are shown in the letter attached as the following pages.

# COLORADO AIRSPACE INITIATIVE WORKING COMMITTEE

Contact Person: Neil Seitz, PO Box 175, Villa Grove, CO 81155

VOICE: (719) 256-4319 (Home) FAX: (719) 256-4315 (Please call before faxing.)

May 27, 1994

Lt. Col. Steve Shiell  
National Guard Bureau/CE  
2500 Army Drive Pentagon  
Washington, DC 20310

Dear Lt. Col. Shiell,

Since the inception of the proposed Colorado Airspace Initiative (CAI), citizens living within several of the areas that would lie directly under Military Training Routes (MTR) or within the boundaries of Military Operations Areas (MOAs) have documented their opposition to the proposal. In some areas of the state opposition to the Colorado Airspace Initiative has been more pronounced than in other areas. Citizens' concerns primarily have focused toward negative environmental impact on sensitive areas including small communities, state and federal lands, wildlife populations, migratory bird routes, endangered species, the safety of both civilian and military personnel, wilderness areas, and curtailment of rural economic viability and growth.

In order to move beyond a stalemate between the National Guard Bureau's agenda for expanded military airspace as proposed in the Colorado Airspace Initiative and civilian opposition to many facets of the proposal, citizens from throughout the impacted areas agreed to join together as a Working Committee to reach a consensus that could meet the current training needs of the Colorado Air National Guard (COANG) while protecting the rights and interests of Colorado's civilian populations. This Working Committee has consisted of representatives for Civil Aviation, Citizen Organizations, and Regional Economic Interests. The Colorado Air National Guard appointed three citizens to serve on the Committee. (See Appendix A for listing of organizations and individuals.)

Several federal and state agencies have provided technical assistance and expertise throughout these sessions: Air National Guard Readiness Center, Bureau of Land Management, Colorado Air National Guard, Colorado Department of Natural Resources, Colorado Division of Wildlife, Federal Aviation Administration, Great Sand Dunes National Monument, and US Fish and Wildlife Service. The Working Committee appreciates their contributions.

The concept for the Working Committee surfaced in January 1994. A Steering Committee, composed of COANG personnel and civilian representatives, met in early February to identify the agenda and to establish the format for the sessions. The Working Committee convened for eight full day sessions during a three month period with a target date of June 1, 1994, for submission of a recommendation to be included in the Draft Environmental Impact Statement (EIS). Most meetings utilized the facilities at University of Southern Colorado in Pueblo. Staff members from the offices of Governor Romer, Representative McInnis, and Representative Allard facilitated the Working Committee's deliberations.

The agenda for these deliberations, as presented by the Steering Committee, has been to identify an Alternative to the CAI proposal that accommodates the Colorado Air National Guard's need for airspace that will provide adequate flight training for national defense priorities while seeking a solution that protects the interests and rights of the various civilian populations.

Factors taken into consideration in the formulation of this recommendation include avoidance of specific sensitive areas as identified by civilian populations, elected officials, and state and federal agencies. One major area of concern discussed by the Working Committee is the status of the Airburst Range. Considering that long-term use of the Airburst Range deserves further scrutiny and that the use of the La Veta MOA links directly to the location and use of the Airburst Range, this recommendation, as related to the La Veta MOA, is presented as a temporary solution to Colorado Air National Guard's current airspace needs. If the Airburst Range is discontinued, the La Veta MOA should be deleted.

Another area of concern to the Working Committee is the existing and continuing impact upon Southeastern Colorado residents already subjected to considerable military training activity through the United States Air Force (USAF) Air Combat Command (ACC). The Working Committee urges the Colorado Air National Guard to coordinate with the USAF to minimize the cumulative impact upon this sector of the civilian population and agricultural interests. (See figure 4.)

The Working Committee's recommendation also reflects the concerns expressed by civilians, the governor's office, and state and federal agencies about the environmental impact upon the mountain areas and adjoining valleys of south central Colorado. The recommendation of the Working Committee for MTRs 412 and 413 takes into consideration the following criteria: the value of nature tourism to the economic stability of southern Colorado's mountain communities, the purposes of wilderness areas as stated in US Forest Service guidelines, the fact that mountain training is not an ANG requirement, solitude as a basic need for spiritual retreat centers, the migratory bird routes that follow along both the eastern and western flanks of the Sangre de Cristo Mountains, the San Luis Valley's arc of wetlands that provide habitat for extensive bird populations including numerous endangered or sensitive species, and maneuvering high speed aircraft to avoid numerous protective airspace bubbles that would be required along MTR 413 south of the Arkansas River.



This recommendation reflects economic considerations based upon data from information and reports from federal, state, and regional agencies, Bill Weida, Colorado College, and others. The recommendation to eliminate Airburst C primarily reflects concerns raised about the use of the Cañon City airport. The safety of civilian pilots as well as the potential loss of business opportunities within the Cañon City area if civilian pilots do not have access to this airport have been cited as reasons for eliminating proposed Airburst C from the Colorado Airspace Initiative. Continuation of Airburst C might increase traffic within the La Veta MOA by a factor of twelve because aircraft could circulate between these two MOAs.

The following recommendation is the result of the Working Committee's attempts to harmonize the Colorado Air National Guard's current airspace training needs and the interests of the impacted civilian populations. The Working Committee, in a spirit of cooperation and mutual respect, unanimously agreed with all but one facet of this recommendation. The only point of this recommendation failing to receive unanimous consensus was the elimination of Airburst C. Three members of the Working Committee believe Airburst C is essential to COANG's training agenda.

The enclosed recommendation is being submitted for further study and analysis within the EIS process and may be subject to review or change after the release of the Draft EIS. The Working Committee requests that you give your attention to the enclosed recommendation for consideration and review as an Alternative to the Colorado Airspace Initiative.

Respectfully submitted,

**COLORADO AIRSPACE INITIATIVE WORKING COMMITTEE**  
(See Appendix A for listing of members.)

# COLORADO AIRSPACE INITIATIVE WORKING COMMITTEE

May 27, 1994

## RECOMMENDATION

**I. LONG-RANGE:** Rapid development along Colorado's Front Range, together with wilderness preservation efforts in this same area are rapidly rendering the Airburst Range an unsuitable location for the conduct of aerial bombardment activities. The Working Committee recommends that highest priority should be given to identifying and acquiring a new site for a bombing range to replace the Airburst Range by the earliest possible date.

In that light, the Working Committee recommends that the Colorado Airspace Initiative be considered a temporary, stopgap solution to be implemented only over the short term to accommodate Colorado Air National Guard training requirements until a suitable alternative to the Airburst Range is available. The Working Committee recommends that a similar civilian Committee be established to identify this alternative as soon as possible.

**II. SHORT-RANGE:** In order to accommodate the Guard's training needs over the short term until a suitable replacement for the Airburst Range becomes available, the Working Committee recommends the following actions on the Colorado Airspace Initiative.

### A. Military Training Routes:

#### 1. IR-409.

Route: As proposed in the Final Description of Proposed Action and Alternatives (DOPAA), except follow present alignment from Point F (in Piñon Canyon MOA) to current Point G (at Cedarwood), thence via existing routing to the Airburst Range. (See Figures 1, 2 & 3)

Width: As proposed in the DOPAA, except from Current Point G (Cedarwood) to the Airburst Range, along which segments the width should remain at the existing 3.0 NM either side of center line.

Altitude: As proposed in the DOPAA, except from Point C to Point D to be charted and flown no lower than 1,000 feet AGL during growing season for avoidance of crop spraying aircraft and no lower than 500 feet AGL from Point D to the Airburst Range.

Sortie Count: Sorties should be reduced to 14 per year to accommodate the needs of the Colorado Air National Guard as set forth in the DOPAA.

#### 2. VR-412.

Delete VR-412 as proposed in the DOPAA.

3. VR-413.

Route: Configure the route to provide entrance into the Airburst Range from the West without crossing the Arkansas River (as depicted in Figure 1). If a western approach to the Airburst Range from VR-413 is not feasible, VR-413 should be deleted in its entirety and the sorties proposed for VR-413 assigned to VR-416.

Width: 3 NM either side of center line.

Altitude: 500 feet AGL to 1,500 feet AGL.

4. IR-415.

Route: As proposed in the DOPAA to Point D, thence via existing routing to Cedarwood and to coincide with current IR-409 from Cedarwood to the Airburst Range.

Width: As proposed in the DOPAA from Point A to Point D, then 3 NM either side of center line to the Airburst Range.

Altitudes: Minimum altitude over the Arkansas River should be 2,500 feet AGL. No portion of IR-415 should be charted or flown lower than 500 feet AGL.

5. XIR-424

Route: As proposed in the DOPAA from Point A to Point D, thence direct to Cedarwood to coincide with current IR-409 from Cedarwood to the Airburst Range.

Width: As proposed in the DOPAA from Point A to Point D.

Thereafter 3 NM either side of center line to the Airburst Range.

Altitudes: No portion of XIR-424 should be charted or flown lower than 500 feet AGL. An area 5 NM either side of the Arkansas River should be charted and flown no lower than 2,500 feet AGL.

6. XVR-1427

Route: As proposed in the DOPAA from Point A to Point F, thence direct to Cedarwood to coincide with current IR-409 from Cedarwood to the Airburst Range.

Width: As proposed in the DOPAA from Point A to Point F, then 3 NM either side of center line from Point F to the Airburst Range.

Altitudes: As proposed in the DOPAA, except to be charted and flown no lower than 500 feet AGL over the entire route with no flights below 1,000 feet AGL between Points C and D during growing season, for avoidance of crop spraying aircraft.

## B. Military Operations Areas:

### 1. Cheyenne MOA.

As proposed in the DOPAA.

### 2. La Veta MOA. (See Figure 2.)

Lateral Boundaries: As proposed in the DOPAA, except that the northeast boundary should be extended northeastward to coincide with the northeast boundary of existing IR-409. The current La Veta low MOA should be re configured to coincide with the boundaries of existing IR-409 from Cedarwood to the northern boundary of the La Veta MOA. The town of Wetmore and vicinity, as a sensitive area, should be excluded from the La Veta MOA. The boundary of the high La Veta MOA should be changed to coincide with the recommendation for the low La Veta MOA.

Altitudes: The La Veta High MOA floor would remain at 13,000 feet MSL. The La Veta Low MOA floor should be 1,500 feet AGL.

### 3. Airburst MOAs.

Airburst A: As proposed in the DOPAA, except that the southern boundary should be modified as depicted in Figure 3 to exclude Cañon City and the town of Penrose.

Airburst B: As proposed in the DOPAA.

Airburst C: Should not be established. Rather, the existing IR-409, to coincide with IR-415, XIR-424 and XVR-1427 should be used to access the Airburst Range. After entering the Range, maneuvering should be confined to Airburst A and B and Restricted Area R-2601, by coordination with the scheduling agency. The Working Committee believes that such interservice cooperation will allow more efficient utilization of existing special use airspace and allow the Air National Guard to meet its requirements without burdening other interests by the establishment of proposed Airburst C. This is the one point on which the Working Committee did not reach unanimous consensus with three members considering proposed Airburst C advisable.

#### 4. Two Buttes Low MOA.

This area of southeastern Colorado is already subjected to a heavy noise burden by USAF Air Combat Command (ACC) B-1 bomber low-level flight operations on MTRs not included in the Colorado Airspace Initiative. Operating 255 days per year, these bombers fly 2,596 sorties per year throughout the proposed Two Buttes MOA at this time. The Working Committee recommends that the Two Buttes Low MOA be implemented as proposed in the DOPAA if and only if the ACC will reduce bomber operations in the area to a maximum of 2,000 sorties per year, to be flown on no more than 200 days per year at 4 days per week, 50 weeks per year. This will provide residents of this area with some relief from the bomber noise in consideration of the imposition of COANG's additional burden of fighter noise. Colorado Air National Guard should advise communities under the Two Buttes Low MOA by news media of the weekend flight training schedule. (See figure 4.)

#### 5. Two Buttes High MOA.

As proposed in the DOPAA.

### C. Other Issues:

#### 1. Avoidance of Sensitive Areas.

The Working Committee recommends that provision be made to identify, chart and brief flight crews to avoid sensitive areas and activities by a 1.5 NM lateral radius or an altitude sufficient to accomplish a noise reduction at the surface equal to that accomplished by a 1.5 NM lateral offset. These sensitive areas should be determined by agency and citizen input and may include (but should not be limited to) towns, residences, spiritual retreat centers, noise-sensitive livestock operations, migratory routes, breeding sites for endangered species, etc.

## 2. Reporting.

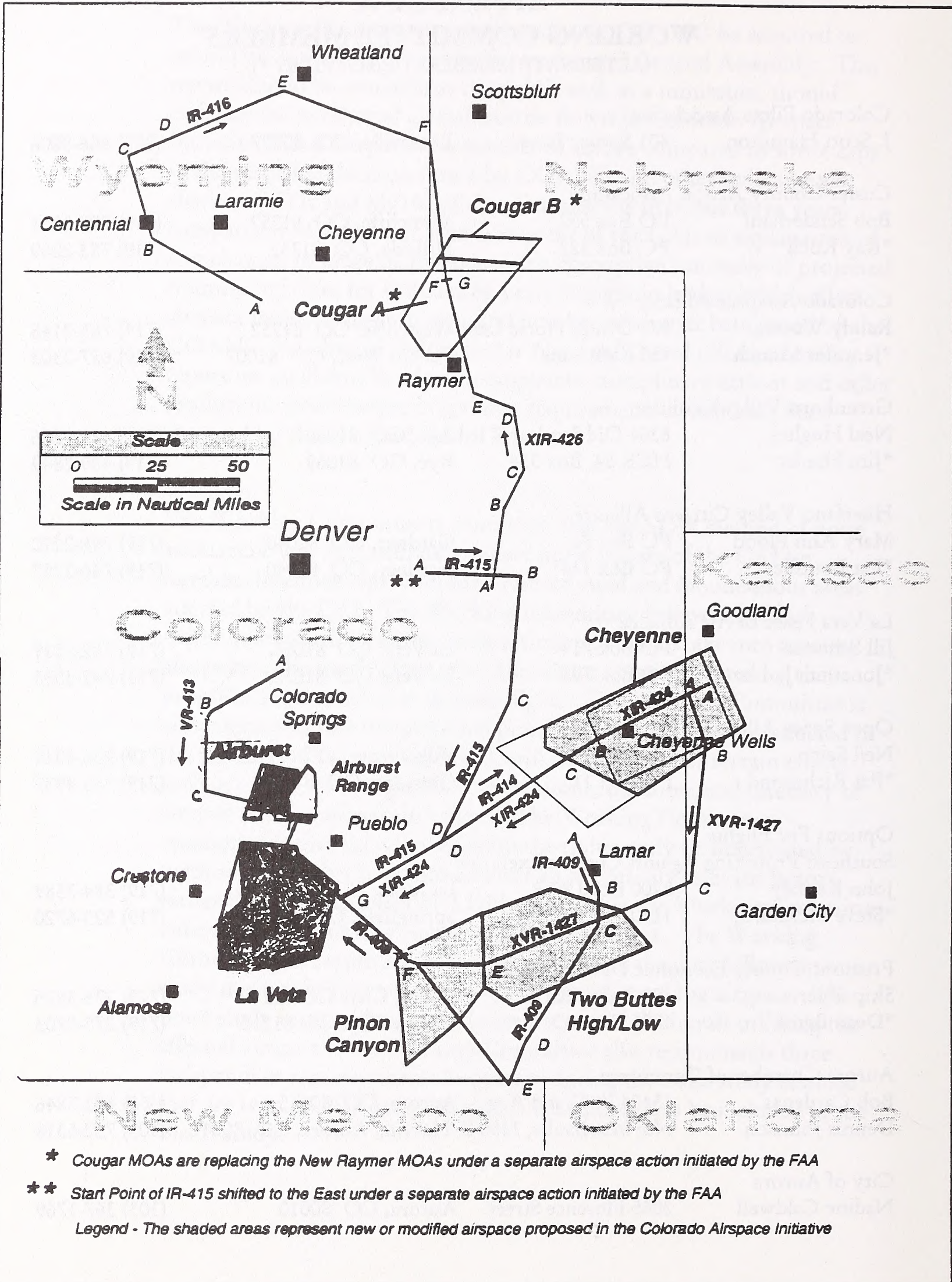
The Working Committee recommends that COANG be required to submit an annual report to the Governor and General Assembly. This report should be available to the public and, as a minimum, should contain: the number of aircraft sorties flown in Colorado Airspace Initiative (CAI) airspace; the number of sorties compared to sortie caps in the record of decision flown by COANG and other units in each element (MTR and MOA) of that airspace; the previous three years' comparison of actual use of each element of the CAI; an explanation of any changes in usage of any element; a descriptive summary of projected training activities for the coming year; changes in budget which affect airspace usage; changes in type and number of aircraft being used by the COANG; number of Colorado Air National Guard pilots; summary report on accidents, incidents, complaints, disciplinary actions and other resolutions, and changes in training requirements which have been imposed by the National Guard Bureau.

## 3. Noise Study.

The Working Committee is concerned that the LDN method of noise assessment will not accurately reflect noise impact of the CAI on humans, livestock and wildlife in remote rural and mountainous areas affected by the CAI. The Working Committee believes that such methodology will seriously underestimate or fail to take into account altogether, the startle effect of sudden onset noise generated by the proposed high speed, low altitude flights. The Working Committee is also concerned that the proposed prairie noise study to be conducted in the Kit Carson (Cheyenne) MOA will not account for terrain effects such as echoes that might affect the volume, duration, and intensity of aircraft noise in mountain valleys. The Working Committee recommends that data derived from the noise study be interpreted by methodologies that take into account all potentially relevant factors, rather than relying solely on LDN criteria that the Working Committee believes would not thoroughly assess noise impact. The Working Committee recommends that COANG should conduct follow-up noise study during the first two years of full operation of the airspace. The noise study must address cumulative impact of all aircraft utilizing the affected airspace. The Working Committee also recommends three independent representatives be present during the noise study sessions that are used for EIS data, and that B-1 Bombers also be included in the Bison Study.

**APPENDIX A**  
**WORKING COMMITTEE MEMBERS**  
 (ALTERNATE MEMBERS DENOTED BY \*)

Colorado Pilots Association			
J. Scott Hamilton	401 Spruce Street	Louisville, CO 80027	(303) 666-8906
Custer County Action Association			
Bob Senderhauf	PO Box 552	Westcliffe, CO 81252	(719) 783-9221
*Ray Koch	PO Box 222	Hillside, CO 81232	(719) 783-2069
Colorado Airspace Alliance			
Randy Woods	578 Drunk Horse Lane	Westcliffe, CO 81252	(719) 783-2148
*Jennifer Munch	953 Kyle Lane	Pueblo West, CO 81007	(719) 657-2303
Greenhorn Valley Coalition			
Neal Hughes	8364 Old San Isabel Rd	Rye, CO 81069	(719) 489-2206
*Jim Hanks	HCR 54, Box 358	Rye, CO 81069	(719) 489-2849
Huerfano Valley Citizens Alliance			
Mary Ann Flood	PO Box 82	Gardner, CO 81040	(719) 746-2210
*Pat Boutilier	PO Box 144	Gardner, CO 81040	(719) 746-2257
La Veta Peace of Air Alliance			
Jill Schwarz	PO Box 714	La Veta, CO 81055	(719) 742-5319
*Jonathan James	PO Box 793	La Veta, CO 81055	(719) 742-3532
Open Space Alliance			
Neil Seitz	PO Box 175	Villa Grove, CO 81155	(719) 256-4319
*Pat Richmond	PO Box 113	Crestone, CO 81131	(719) 256-4937
Options For Flights			
Southeast Protesting Against Combat Exercises			
John Kenney	8200 Road 80 A	La Junta, CO 81050	(719) 384-7589
*Steve McEndree	11707 CR SS	Springfield, CO 81073	(719) 523-6720
Fremont County Economic Development Council			
Skip Dyer	402 Valley Rd	Cañon City, CO 81212	(719) 275-3875
*Dean Baird	1836 Flora Ct	Cañon City, CO 81212	(719) 275-0703
Aurora Chamber of Commerce			
Bob Cardenas	15404 E. Grand Ave	Aurora, CO 80015	(303) 693-7846
Dennis Johnson	Norwest Banks, 1450 S. Havana,	Aurora, CO 80012	(303) 752-6318
City of Aurora			
Nadine Caldwell	2065 Florence Street	Aurora, CO 80010	(303) 367-1769



\* Cougar MOAs are replacing the New Raymer MOAs under a separate airspace action initiated by the FAA  
 \*\* Start Point of IR-415 shifted to the East under a separate airspace action initiated by the FAA  
 Legend - The shaded areas represent new or modified airspace proposed in the Colorado Airspace Initiative

Figure 1  
 F-62



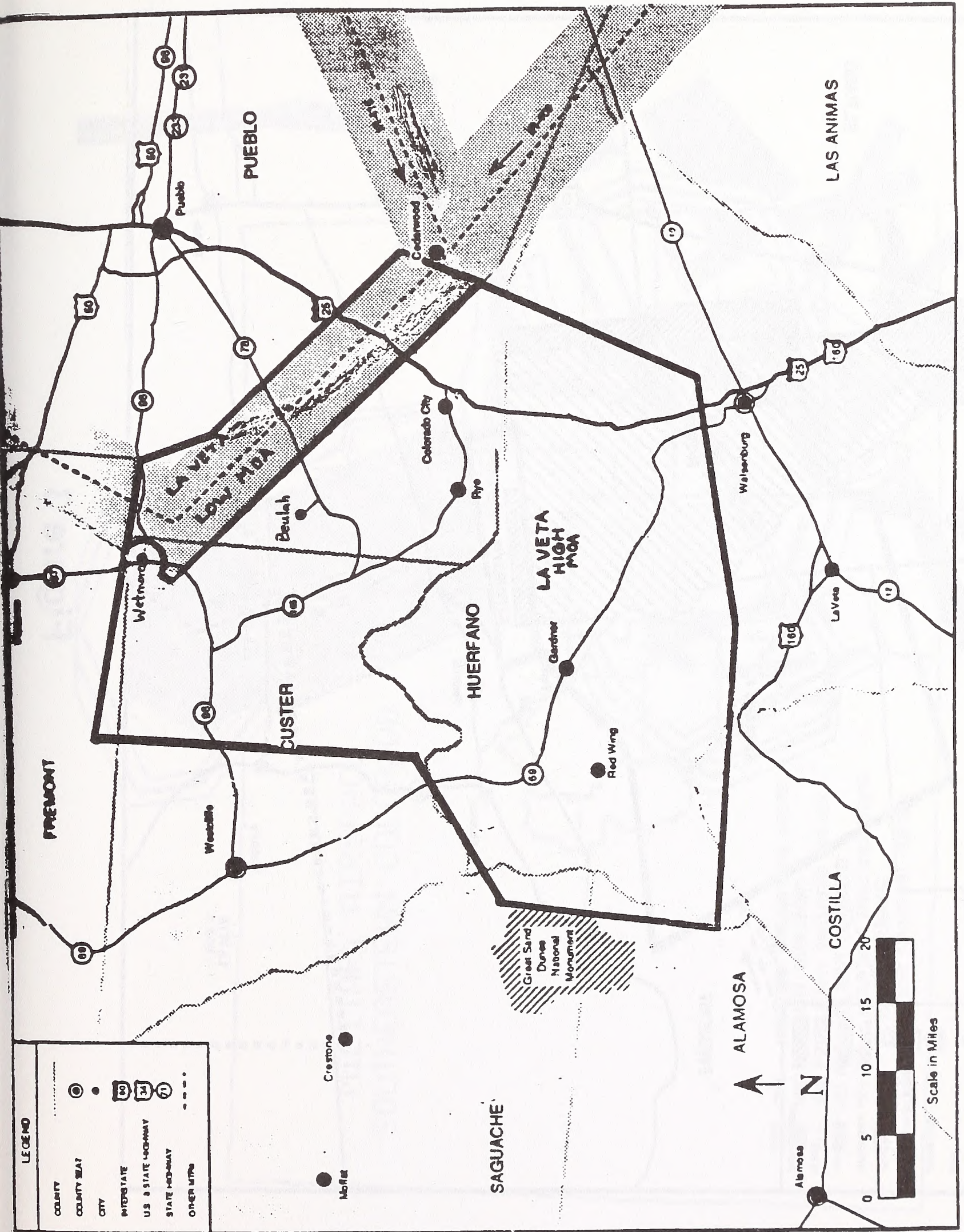


Figure 2

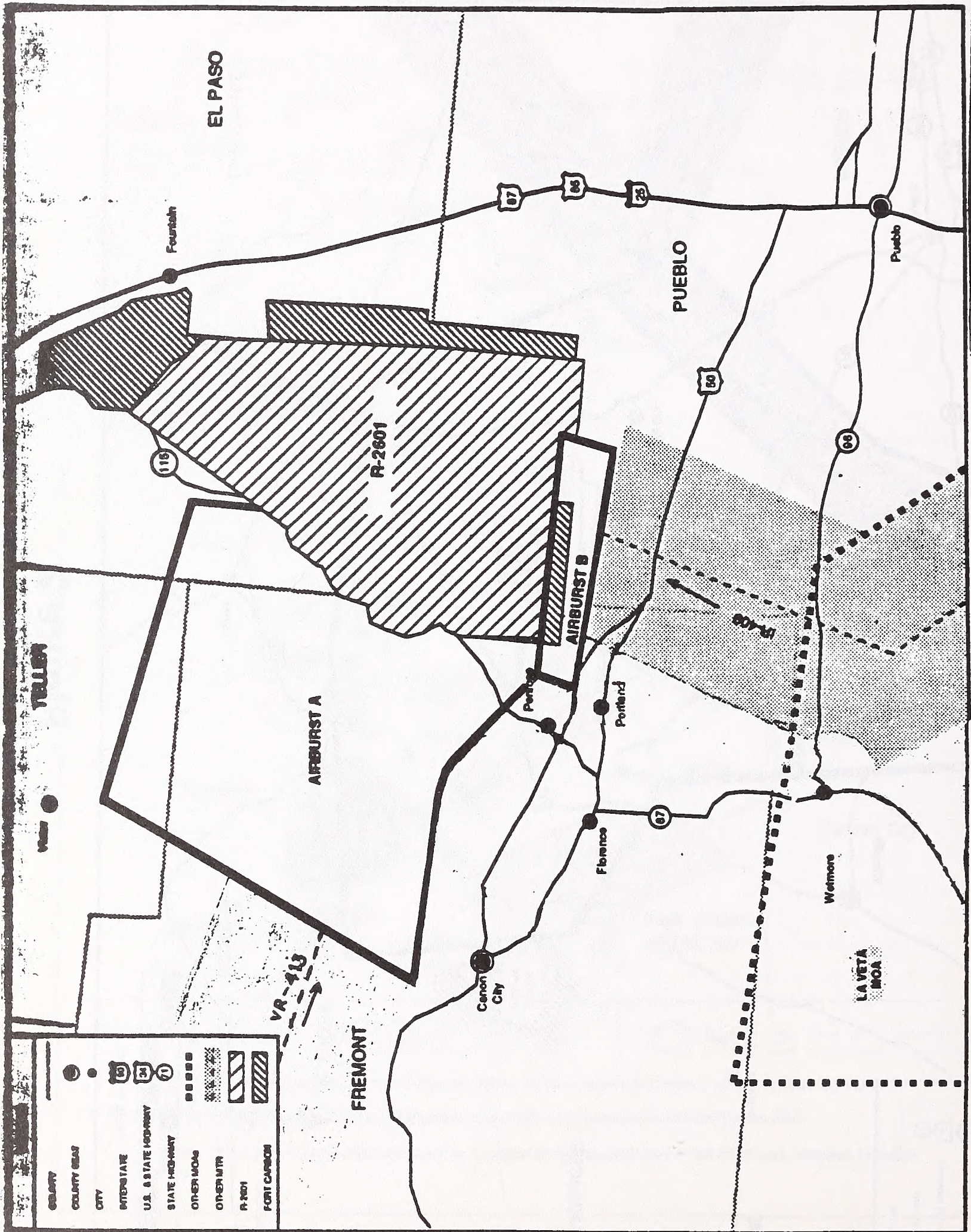


Figure 3

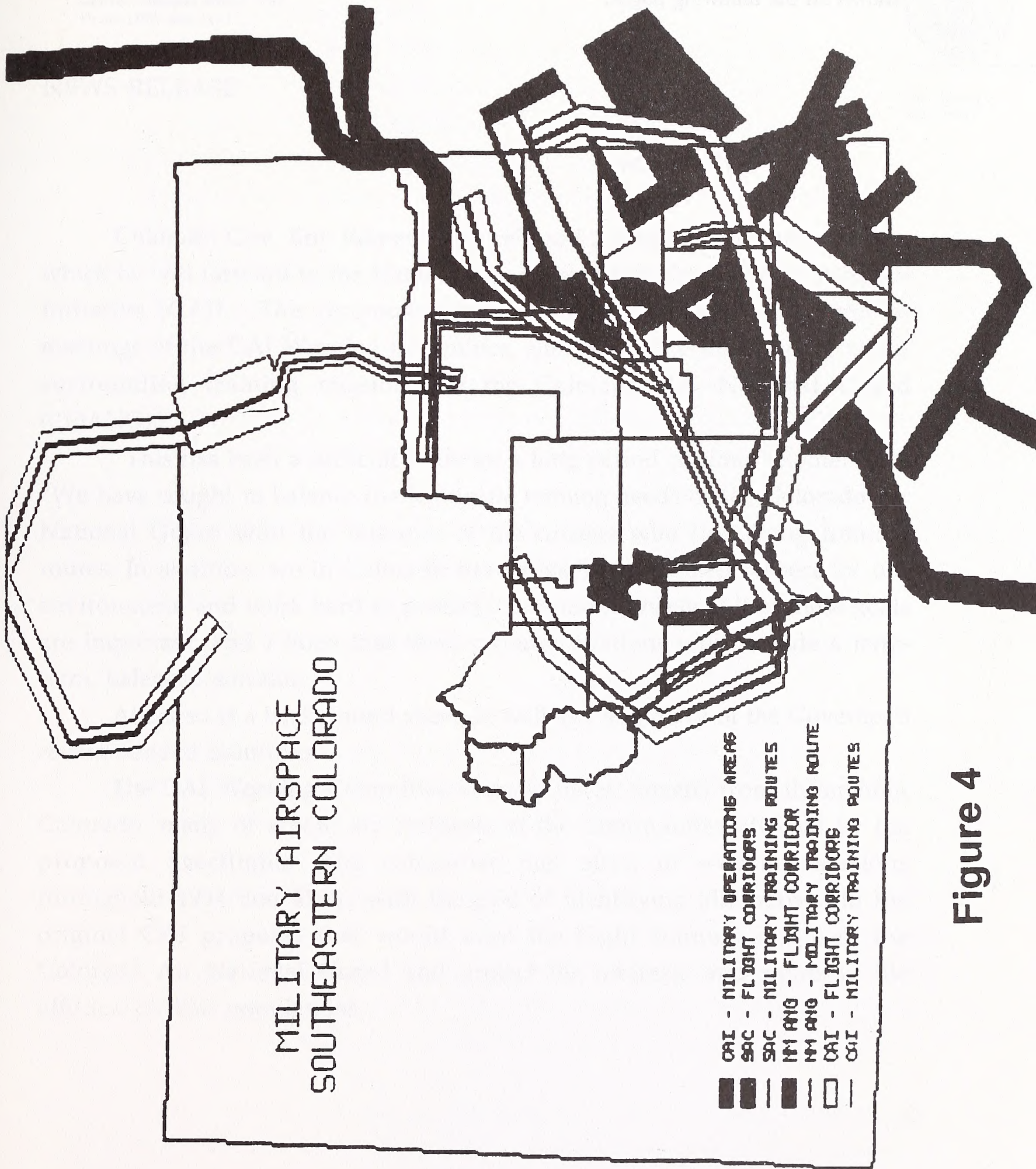


Figure 4

**F.12 RECOMMENDATIONS FROM GOVERNOR ROMER**

On May 30, 1995, Colorado Governor Roy Romer provided recommendations regarding the Colorado Airspace Initiative. The news release from the Governor's office is shown on the following pages.



# STATE OF COLORADO

## EXECUTIVE CHAMBERS

136 State Capitol  
Denver, Colorado 80203-1792  
Phone (303) 866-2471



## NEWS RELEASE

Roy Romer  
Governor

May 30, 1995

Colorado Gov. Roy Romer today released a series of recommendations which he will forward to the National Guard regarding the Colorado Airspace Initiative (CAI). The recommendations, which came out of a series of meetings of the CAI Working Committee, should resolve the airspace issues surrounding training missions by the Colorado Air National Guard (COANG).

"This has been a difficult issue for a long period of time," Romer said. "We have sought to balance the legitimate training needs of the Colorado Air National Guard with the interests of the citizens who live along training routes. In addition, we in Colorado have always had a deep respect for our environment, and work hard to protect it and use it wisely. All of these goals are important, and I hope that these recommendations will provide a long-term, balanced solution."

Attached is a background sheet, as well as a summary of the Governor's recommended solutions.

The CAI Working Committee is made up of citizens from throughout Colorado, many of whom are residents of the communities affected by the proposed overflights. The committee met often in working sessions throughout 1994 and 1995 with the goal of identifying alternatives to the original CAI proposal that would meet the flight training needs of the Colorado Air National Guard and protect the interests and rights of the affected civilian populations.

Page Two

These recommendations must still pass approval of the National Guard Bureau, which is working to complete a Draft Environmental Impact Statement (DEIS) as required by the National Environmental Policy Act (NEPA). In addition, the Federal Aviation Administration (FAA) must approve these proposed changes in airspace usage.

Contact: Jim Carpenter  
Governor's Press Office  
(303) 800-4572

Attachments:

- Summary of Governor's Recommended Solutions
- Background
- Summary of Specific Recommendations and Solutions
- Map of Existing Airspace
- Map of National Guard's Original Proposal
- Map of Governor's Proposed Solution

## Summary of Governor's Recommended Solution

- The LaVeta Military Operations Area (MOA) will remain as currently charted with a minimum altitude of 13,000 feet mean sea level (msl) and 1,500 feet above ground level (agl). The number of sorties planned for the La Veta MOA will remain as planned in the DOPAA.
- The National Guard Bureau in Washington DC will conduct a feasibility study regarding the long range viability of the Airburst Range located on Fort Carson and the MOAs and MTRs (military training routes) associated with the range. The study will determine the future of the Airburst Range for the Colorado Air National Guard.
- The Airburst "C" MOA will remain a part of the proposal. The MOA will be as proposed in the DOPAA. The Airburst "C" is both an operational requirement and most importantly an issue of safety for military, commercial and general aviation.
- VR 412 will be eliminated.
- VR 413 will be moved to avoid wilderness areas and noise sensitive areas. The minimum altitude for VR 413 will be raised from 100 ft. agl and established at 500 ft. agl.
- Low level training routes accessing the Airburst Range will do so through the existing IR 409 point G (Cedarwood) through point I (Airburst Range) and the minimum altitude will be 500 ft. agl.
- The Draft Environmental Impact Statement (DEIS) will initially identify noise sensitive areas. Others will be identified as the airspace is used and appropriate avoidance measures will be taken. The COANG will conduct annual visits to mutually agreed upon sites to determine the success of their noise avoidance program.
- The Governor will hold the Colorado Air National Guard accountable for an effective low altitude noise avoidance program in the airspace under their control. The Governor will assign one of his staff offices the responsibility of overseeing the success of the COANG in their goal

of avoiding designated areas. Citizens would be able to voice complaints to this office if the COANG is not able to resolve the noise complaint issue.

- The Annual Airspace Utilization report prepared by the COANG will be made available to the Governor and will be releasable to the public upon request.
- A noise study conducted for the DEIS has been completed and independent representatives participated in this study. The Governor will request that follow-up noise studies be conducted once the airspace is utilized as a part of the mitigation measures. If approved, this request will be included in the Record of Decision signed by the Secretary of the Air Force or her representative.

Colorado has historically understood and supported our nation's need for a strong and prepared defense. We have both active duty military personnel and many retirees living in this state. Our citizens have served and died for our country and the military contributes significantly to the economy of the state.

In addition, Coloradans have always had a deep respect and love of the land. We value our natural environment and work hard to protect it and use it wisely.

Although the Cold War is over, the world in which we live is still a very dangerous place. This is evidenced by the COANG 140th Fighter Wing's recent deployment to Turkey to enforce the United Nations "no-fly zone" over Iraq. This recommended solution will address most of the environmental and noise issues raised by the Working Committee and will continue to provide the necessary training for an effective response by the COANG to worldwide wartime situations.



## Background

- In 1990 the COANG recognized the need to change their airspace needs as a result of the construction of Denver International Airport (DIA) and the conversion of the 140th Fighter Wing to F-16 aircraft from A-7s. This conversion was completed in 1992. As a result of the opening of DIA in February, 1995, this need became crucial as arriving and departing commercial aircraft routes changed to fit the new location of Denver's airport.
- The Colorado Airspace Initiative was proposed by the National Guard Bureau in July, 1993 as a modification to the existing airspace and the addition of new airspace. The proposed changes decreased airspace in Colorado by approximately four percent (4%).
- Following the introduction of the *Description of Proposed Action and Alternatives* (DOPAA), a series of Scoping Hearings were held throughout Colorado to allow citizens to comment on the document. As a result of these hearings many concerns and questions were raised involving the potential environmental impact of overflights on people and wildlife, noise sensitive areas and accountability of the Air National Guard to the people of Colorado on these issues.
- These hearings led Governor Romer in coordination with Congressmen Allard and McInnis to form the Colorado Airspace Initiative Working Committee to look at the proposal from the COANG and the concerns of the citizens. This committee was to make recommendations to the Guard as a part of the NEPA process. This voluntary citizens' group met several times in 1993-94 and formulated their recommendations in June, 1994. These recommendations were sent to the Congressional delegation, the Governor and the National Guard Bureau. These recommendations and the response by the Guard are the basis for the Governor's recommended solution.



AIRCRAFT NOISE ANALYSIS

1.1.1.1

1.1.1.2

The first part of the analysis is to determine the noise levels from the aircraft. This is done by measuring the noise levels at various distances from the aircraft. The noise levels are then compared to the noise levels from other sources, such as traffic and industry. The noise levels are then compared to the noise levels from other sources, such as traffic and industry. The noise levels are then compared to the noise levels from other sources, such as traffic and industry.

The second part of the analysis is to determine the noise levels from the aircraft. This is done by measuring the noise levels at various distances from the aircraft. The noise levels are then compared to the noise levels from other sources, such as traffic and industry. The noise levels are then compared to the noise levels from other sources, such as traffic and industry. The noise levels are then compared to the noise levels from other sources, such as traffic and industry.

The third part of the analysis is to determine the noise levels from the aircraft. This is done by measuring the noise levels at various distances from the aircraft. The noise levels are then compared to the noise levels from other sources, such as traffic and industry. The noise levels are then compared to the noise levels from other sources, such as traffic and industry. The noise levels are then compared to the noise levels from other sources, such as traffic and industry.

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The fifth part of the analysis is to determine the noise levels from the aircraft. This is done by measuring the noise levels at various distances from the aircraft. The noise levels are then compared to the noise levels from other sources, such as traffic and industry. The noise levels are then compared to the noise levels from other sources, such as traffic and industry. The noise levels are then compared to the noise levels from other sources, such as traffic and industry.

**APPENDIX G**

**AIRCRAFT NOISE ANALYSIS**



## APPENDIX G

### AIRCRAFT NOISE ANALYSIS

#### G.1 NOISE

##### G.1.1 General

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Aircraft are not the only sources of noise in an urban or rural surrounding, where interstate and local vehicular traffic, rail, industrial, and neighborhood sources also intrude on the everyday quality of life. Nevertheless, aircraft are readily identifiable to those affected by their noise and are typically singled out for special attention and criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Whether that sound is interpreted as pleasant (for example, music) or unpleasant (for example, automobile horn noise) depends largely on the listener's current activity, past experience, and attitude toward the source of that sound. It is often true that one person's music is another person's noise.

The measurement and human perception of sound involves two basic physical characteristics – intensity and frequency. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder the perception of that sound. The second important physical characteristic is sound frequency which is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.

The loudest sounds that can be detected comfortably by the human ear have intensities that are 1,000,000,000,000 times larger than those of sounds which can just be detected. Because of this vast range, any attempt to represent the intensity of sound using a linear scale becomes very unwieldy. As a result, a logarithmic unit known as the decibel (abbreviated dB) is used to represent the intensity of a sound. Such a representation is called a sound level.

A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

$$\begin{aligned}60 \text{ dB} + 60 \text{ dB} &= 63 \text{ dB, and} \\80 \text{ dB} + 80 \text{ dB} &= 83 \text{ dB.}\end{aligned}$$

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

$$60.0 \text{ dB} + 70.0 \text{ dB} = 70.4 \text{ dB.}$$

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as "decibel addition" or "energy addition". The latter term arises from the fact that what we are really doing when we add decibel values is first converting each decibel value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its decibel equivalent.

An important facet of decibel addition arises later when the concept of time-average sound levels is introduced to explain Day-Night Average Sound Level. Because of the logarithmic units, the time-average sound level is dominated by the louder levels that occur during the averaging period. As a simple example, consider a sound level that is 100 dB and lasts for 30 seconds, followed by a sound level of 50 dB that also lasts for 30 seconds. The time-average sound level over the total 60-second period is 97 dB, not 75 dB.

The minimum change in the time-averaged sound level of individual events that an average human ear can detect is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound intensity but only a 50 percent decrease in perceived loudness because of the nonlinear response of the human ear (similar to most human senses).

Sound frequency is measured in terms of cycles per second (cps), or hertz (Hz), which is the preferred scientific unit for cps. The normal human ear can detect sounds which range in frequency from about 20 Hz to about 15,000 Hz. All sounds in this wide range of frequencies, however, are not heard equally well by the human ear, which is most sensitive to frequencies in the 1000 Hz to 4000 Hz range. In measuring community noise, this frequency dependence is taken into account by adjusting the very high and very low frequencies to approximate the human ear's lower sensitivity to those frequencies. This is called "A-weighting" and is commonly used in measurements of community environmental noise.

Sound levels measured using A-weighting are most properly called A-weighted sound levels while sound levels measured without any frequency weighting are most properly called sound levels. However, since most environmental impact analysis documents deal only with A-weighted sound levels, the adjective "A-weighted" is often omitted, and A-weighted sound levels are referred to simply as sound levels. In some instances, the author will indicate that the levels have been A-weighted by using the abbreviation dBA or dB(A), rather than the abbreviation dB, for decibel. As long as the use of A-weighting is understood to be used, there is no difference implied by the terms "sound level" and "A-weighted sound level" or by the units dB, dBA, and dB(A). In this document, all sound levels are A-weighted sound levels and the adjective "A-weighted" has been omitted.

Sound levels do not represent instantaneous measurements but rather averages over short periods of time. Two measurement time periods are most common — 1 second and one-eighth of a second. A measured sound level averaged over 1 second is called a slow response sound level; a level averaged over one-eighth of a second is called a fast response sound level. Most environmental noise studies use slow response measurements, and the adjective "slow response" is usually omitted. It is easy to understand why the proper descriptor "slow response A-weighted sound level" is usually shortened to "sound level" in environmental impact analysis documents.

## **G.1.2 Noise Metrics**

A "metric" is defined as something "of, involving, or used in measurement." As used in environmental noise analyses, a metric refers to the unit or quantity which quantitatively measures the effect of noise on the environment. Noise studies have typically involved a confusing proliferation of noise metrics as individual researchers have attempted to understand and represent the effects of noise. As a result, past literature describing environmental noise or environmental noise abatement has included many different metrics. Recently, however, various Federal agencies involved in environmental noise mitigation have agreed on common metrics for environmental impact analysis documents, and both the Department of Defense and the Federal Aviation Administration have specified those which should be used for federal aviation noise assessments. These metrics are as follows.

### **G.1.2.1 Maximum Sound Level**

The highest A-weighted sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight) is called the maximum A-weighted sound level or maximum sound level, for short. It is usually abbreviated by ALM,  $L_{max}$ , or  $L_{Amax}$ . The maximum sound levels of typical events are shown in Figure G-1. The maximum sound level is important in judging the interference caused by a noise event with conversation, TV or radio listening, sleep, or other common activities.

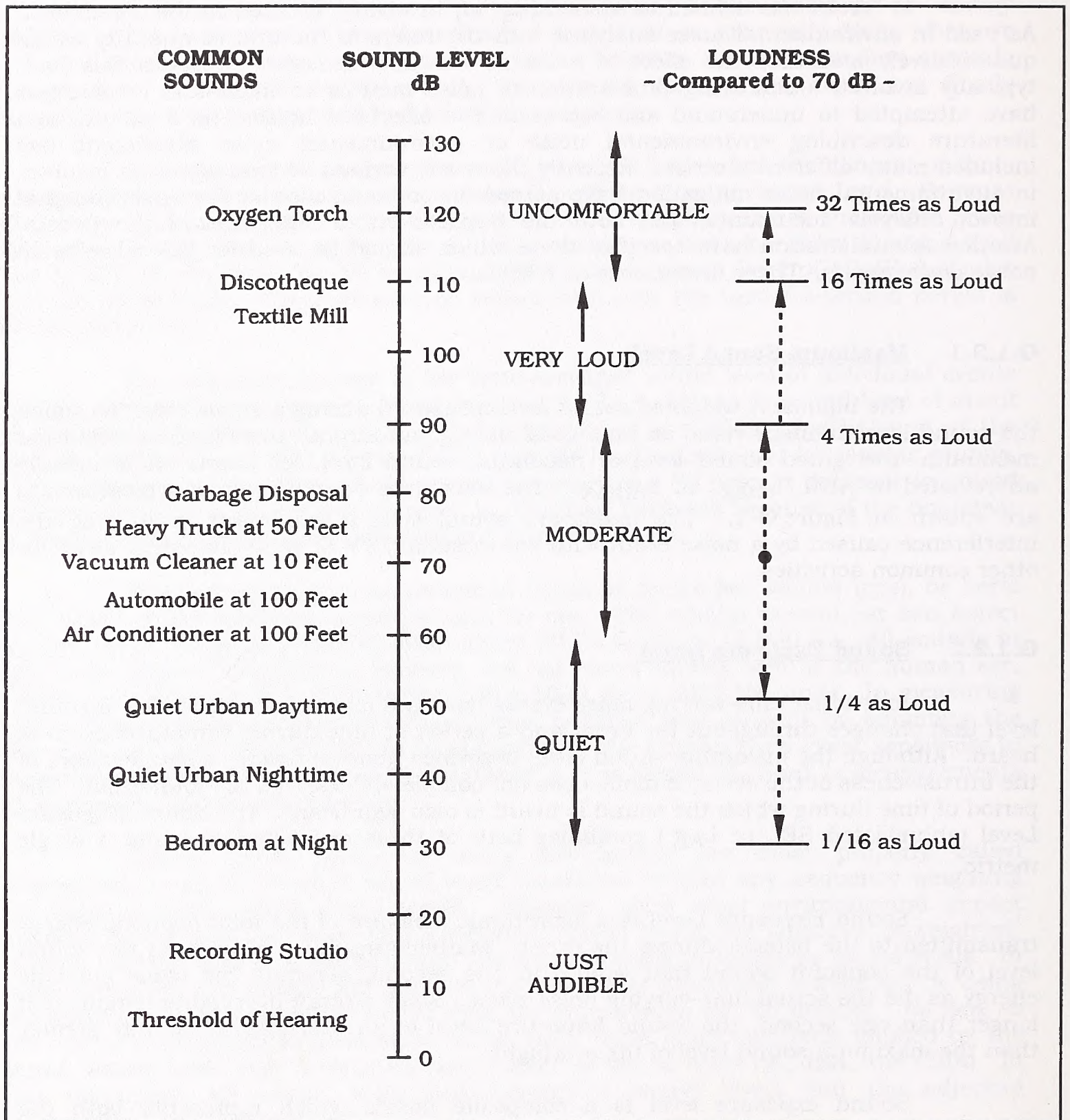
### **G.1.2.2 Sound Exposure Level**

Individual time-varying noise events have two main characteristics – a sound level that changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The Sound Exposure Level (abbreviated SEL or LAE) combines both of these characteristics into a single metric.

Sound Exposure Level is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of the constant sound that would, in one second, generate the same acoustic energy as did the actual time-varying noise event. Since aircraft overflights usually last longer than one second, the Sound Exposure Level of an overflight is usually greater than the maximum sound level of the overflight.

Sound exposure level is a composite metric which represents both the intensity of a sound and its duration. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that Sound Exposure Level measures this impact much more reliably than just the maximum sound level.

Because the sound exposure level and the maximum sound level are both A-weighted sound levels expressed in decibels, there is sometimes confusion between the two, so the specific metric used should be clearly stated.



Source: Harris 1979

Figure G-1. Typical A-Weighted Sound Levels of Common Sounds



### **G.1.2.3 Day-Night Average Sound Level**

Equivalent Continuous Sound Level ( $L_{eq}$ ), which is the same as the average sound level, is the measurement of sound levels which are averaged over a specified length of time. The Equivalent Continuous Sound Level provides a measure of the average sound energy during the measurement period.

For the evaluation of community noise effects, and particularly aircraft noise effects, the Day-Night Average Sound Level (abbreviated DNL or  $L_{dn}$ ) is used. Day-Night Average Sound Level averages aircraft sound levels at a location over a complete 24-hour period, with a 10-decibel adjustment added to those noise events which take place between 10:00 p.m. and 7:00 a.m. (local time) the following morning. This 10-decibel "penalty" represents the added intrusiveness of sounds which occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours.

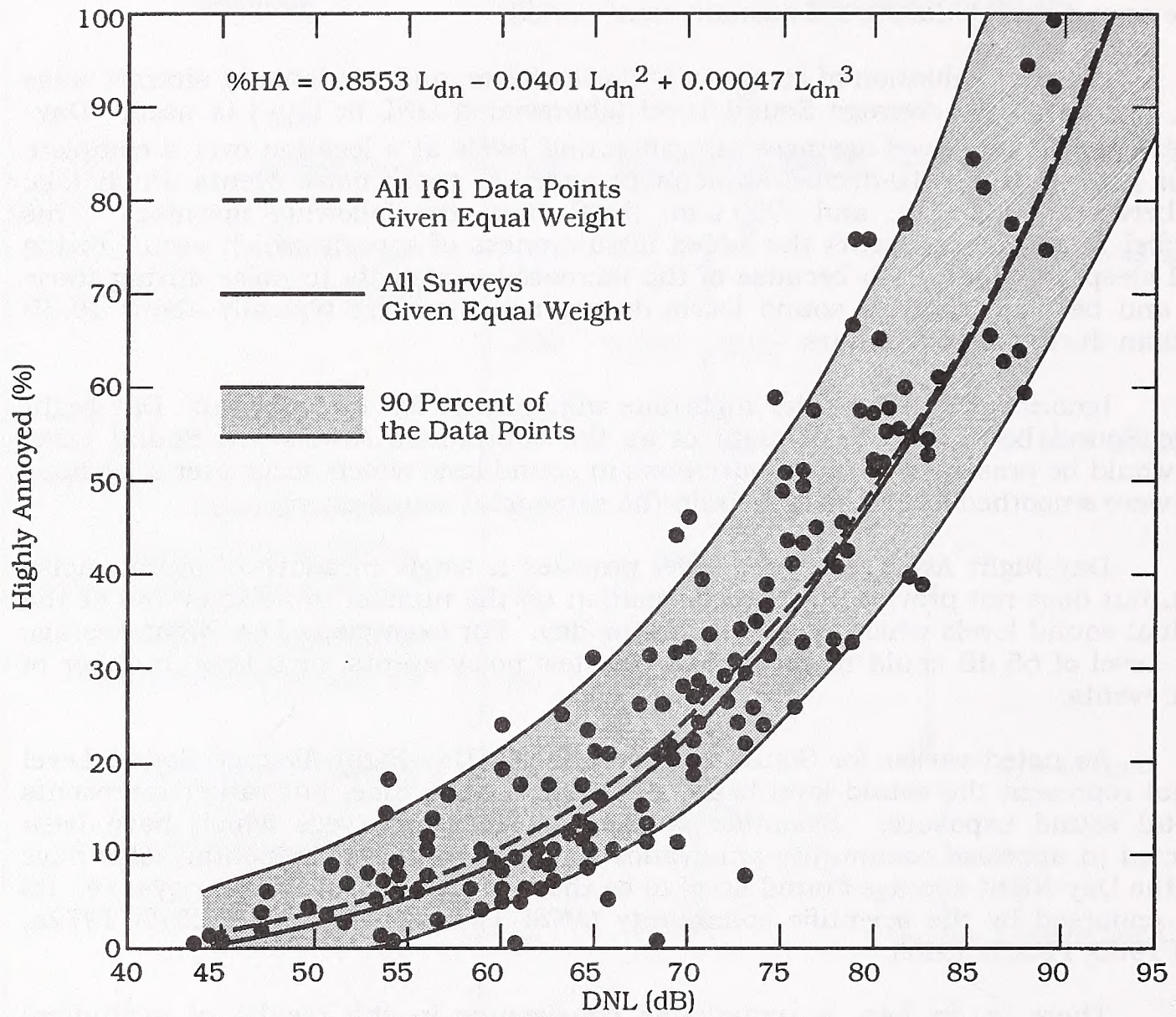
Ignoring the 10-decibel nighttime adjustment for the moment, Day-Night Average Sound Level may be thought of as the continuous A-weighted Sound Level which would be present if all of the variations in sound level which occur over a 24-hour period were smoothed out so as to contain the same total sound energy.

Day-Night Average Sound Level provides a single measure of overall noise impact, but does not provide specific information on the number of noise events or the individual sound levels which occur during the day. For example, a Day-Night Average Sound Level of 65 dB could result from a very few noisy events, or a large number of quieter events.

As noted earlier for Sound Exposure Level, Day-Night Average Sound Level does not represent the sound level heard at any particular time, but rather represents the total sound exposure. Scientific studies and social surveys which have been conducted to appraise community annoyance to all types of environmental noise have found the Day-Night Average Sound Level to be the best measure of that annoyance. Its use is endorsed by the scientific community (ANSI 1980; ANSI 1988; USEPA 1972a; FICUN 1980; FICON 1992).

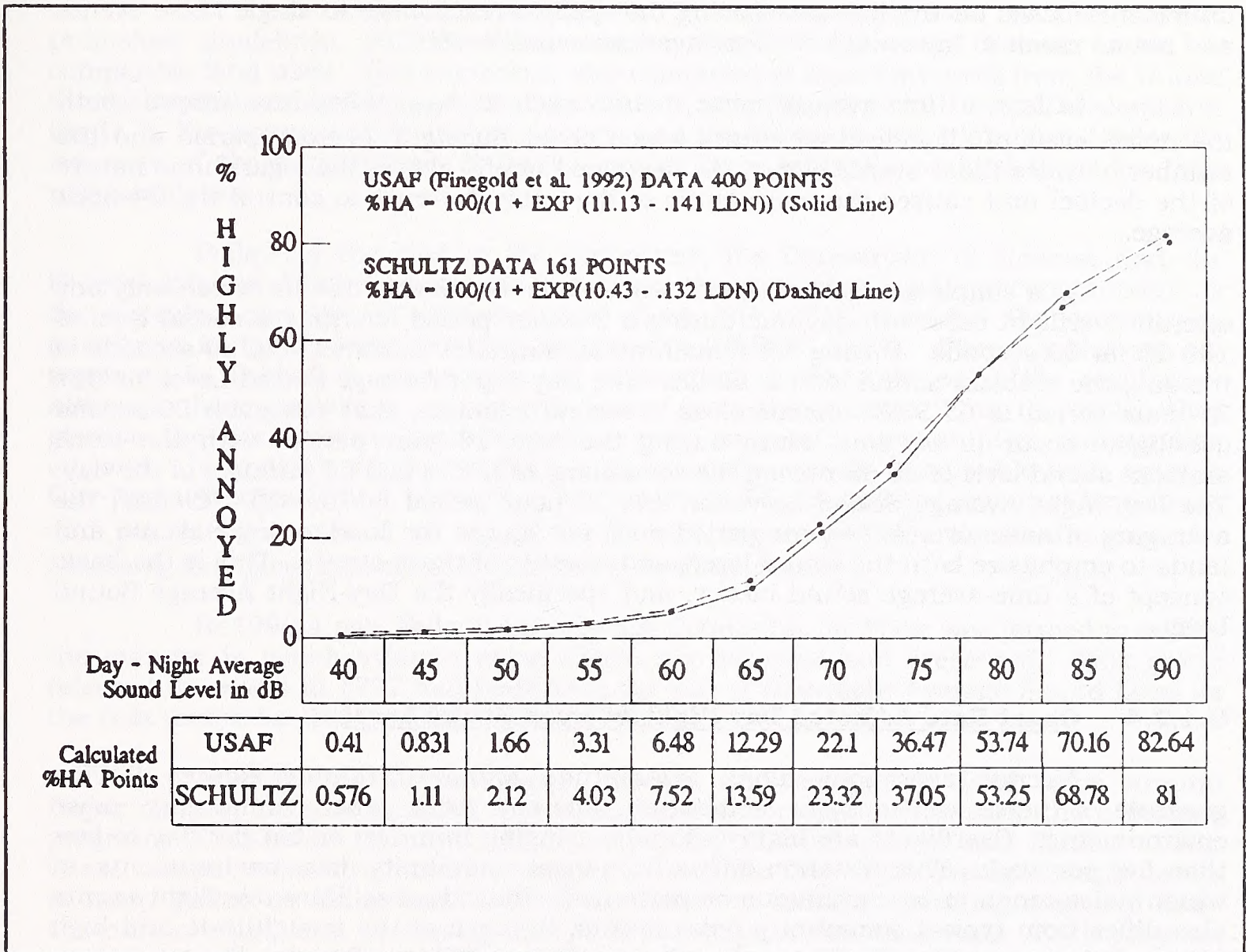
There is, in fact, a remarkable consistency in the results of attitudinal surveys about aircraft noise conducted in different countries to find the percentages of groups of people who express various degrees of annoyance when exposed to different levels of Day-Night Average Sound Level. This is illustrated in Figure G-2, which summarizes the results of a large number of social surveys relating community responses to various types of noises, measured in Day-Night Average Sound Level.

Figure G-2 was taken from a 1978 publication (Schultz 1978), and shows the original curve fit. A more recent study has reaffirmed this relationship (Fidell et al. 1991). Figure G-3 (FICON 1992) shows an updated form of the curve fit (Finogold et al. 1994) in comparison with the original. The updated fit, which does not differ substantially from the original, is the current preferred form. In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.50 or less. This is not surprising, considering the varying personal factors that influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using Day-Night Average Sound Level.



Source: Schultz 1978

**Figure G-2. Community Surveys of Noise Annoyance**



**Figure G-3. Response of Communities to Noise; Comparison of Original (Schultz 1978) and Current USAF (Finegold et al. 1994) Curve Fits**

This relation between community annoyance and time-average sound level has been confirmed, even for infrequent aircraft noise events. A NASA study (Fields and Powell 1985) reported the reactions of individuals in a community to daily helicopter overflights, ranging from one to 32 per day. The stated reactions to infrequent helicopter overflights correlated quite well with the daily time-average sound levels over this range of numbers of daily noise events.

The use of Day-Night Average Sound Level has been criticized recently as not accurately representing community annoyance and land-use compatibility with aircraft noise. Much of that criticism stems from a lack of understanding of the basis for the measurement or calculation of Day-Night Average Sound Level ( $L_{dn}$ ). One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to "meaningless" time-average sound levels.

In fact, a time-average noise metric, such as  $L_{dn}$ , takes into account both the noise levels of all individual events which occur during a 24-hour period and the number of times those events occur. As described briefly above, the logarithmic nature of the decibel unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The Day-Night Average Sound Level for this 24-hour period is 65.5 dB. Assume, as a second example, that ten such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The Day-Night Average Sound Level for this 24-hour period is 75.4 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events. This is the basic concept of a time-average sound metric, and specifically the Day-Night Average Sound Level.

#### **G.1.2.4 Onset-Rate Adjusted Day-Night Average Sound Level**

Aircraft operations along low-altitude Military Training Routes (MTRs) generate a noise environment somewhat different from other community noise environments. Overflights are highly sporadic, ranging from five or ten per day to less than five per week. This situation differs from most community noise environments, in which noise tends to be continuous or patterned. Individual military overflight events also differ from typical community noise events, because of the low altitude and high airspeed characteristics of military aircraft operating on Military Training Routes.

To represent these differences, the conventional Day-Night Average Sound Level metric is adjusted to account for the "surprise" (or "startle") effect of the sudden onset of aircraft noise events on humans (Plotkin et al. 1991; Stusnick et al. 1992; Stusnick et al. 1993). For aircraft exhibiting a rate of increase in sound level (called onset rate) of from 15 to 150 dB per second, an adjustment or penalty ranging from 0 to 11 dB is added to the normal Sound Exposure Level. Onset rates above 150 dB per second require an 11 dB penalty, while onset rates below 15 dB per second require no adjustment. The Day-Night Average Sound Level is then determined in the same manner as for conventional aircraft noise events and is designated as the Onset-Rate Adjusted Day-Night Average Sound Level (abbreviated  $L_{dnr}$ ). Because of the sporadic occurrences of aircraft overflights along Military Training Routes, the number of average daily operations is determined by using the calendar month with the highest number of operations along the Military Training Route. The monthly average is denoted  $L_{dnmr}$ .

### G.1.3 Land-Use Compatibility

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the Day-Night Average Sound Level or Onset-Rate Adjusted Day-Night Average Sound Level for military overflights.

In June 1980, an *ad hoc* Federal Interagency Committee on Urban Noise published guidelines (FICUN 1980) relating Day-Night Average Sound Levels to compatible land uses. This committee was composed of representatives from the United States Departments of Defense, Transportation, and Housing and Urban Development; the U. S. Environmental Protection Agency; and the Veterans Administration. Since the issuance of these guidelines, Federal agencies have generally adopted them for their noise analyses.

Following the lead of the committee, the Department of Defense and the Federal Aviation Administration (FAA) adopted the concept of land-use compatibility as the accepted measure of aircraft noise effect. The FAA included the committee's guidelines in the Federal Aviation Regulations (USDOT 1984). These guidelines are reprinted in Table G-1, along with the explanatory notes included in the regulation. Although these guidelines are not mandatory (note the footnote "\*" in the table), they provide the best means for determining noise impact in communities surrounding airports. In general, residential land uses normally are not compatible with outdoor Day-Night Average Sound Levels ( $L_{dn}$  values) above 65 dB, and the extent of land areas and populations exposed to  $L_{dn}$  of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions.

In 1990 a new Federal Interagency Committee on Noise was formed to review the manner in which aviation noise effects are assessed and presented. This group released its report in 1992 and reaffirmed the use of Day-Night Average Sound Level as the best metric for this purpose (FICON 1992).

Analyses of aircraft noise impacts and compatible land uses around Department of Defense facilities and airspaces are normally made using the computer programs NOISEMAP (Moulton 1992) and/or ROUTEMAP (Lucas and Plotkin 1988). These computer-based simulation programs calculate Day-Night Average Sound Levels at many points on the ground around an airfield or military operating area and draw contours of equal level for overlay onto land-use maps of the same scale. Each program mathematically calculates the Sound Exposure Levels of all aircraft operations for a 24-hour period, taking into consideration the number and types of aircraft, their flight paths and engine thrust settings, the time of day (daytime or nighttime) that each operation occurs, and the onset rate, as appropriate. NOISEMAP and ROUTEMAP utilize the same physical models and aircraft performance data and are collectively referred to as "NOISEMAP technology" or simply "NOISEMAP".

Day-Night Average Sound Levels may also be measured directly around an airfield, rather than calculated with NOISEMAP; however, the direct measurement of annualized Day-Night Average Sound Level is difficult and costly since it requires year-round monitoring or statistically valid seasonal sampling.

**Table G-1. Land-Use Compatibility With Yearly Day-Night Average Sound Levels**

Land Use	Yearly Day-Night Average Sound Level (L <sub>dn</sub> ) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
<b>Residential</b>						
Residential, other than mobile homes and transient lodgings .....	Y	N(1)	N(1)	N	N	N
Mobile home parks .....	Y	N	N	N	N	N
Transient lodgings .....	Y	N(1)	N(1)	N(1)	N	N
<b>Public Use</b>						
Schools .....	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes .....	Y	25	30	N	N	N
Churches, auditoria, and concert halls .....	Y	25	30	N	N	N
Governmental services .....	Y	Y	25	30	N	N
Transportation .....	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking .....	Y	Y	Y(2)	Y(3)	Y(4)	N
<b>Commercial Use</b>						
Offices, business and professional .....	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware, and farm equipment .....	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general .....	Y	Y	25	30	N	N
Utilities .....	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication .....	Y	Y	25	30	N	N
<b>Manufacturing and Production</b>						
Manufacturing, general .....	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical .....	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry .....	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding .....	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction .....	Y	Y	Y	Y	Y	Y
<b>Recreational</b>						
Outdoor sports arenas and spectator sports... ..	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters .....	Y	N	N	N	N	N
Nature exhibits and zoos .....	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps .....	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation .....	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

\* The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

**KEY TO TABLE G-1**

SLUCM = Standard Land-Use Coding Manual.

Y (Yes) = Land Use and related structures compatible without restrictions.

N (No) = Land Use and related structures are not compatible and should be prohibited.

NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35 = Land Use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structures.

**NOTES FOR TABLE G-1**

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal level is low.

(5) Land-use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

NOISEMAP provides an accurate projection of aircraft noise around airfields. NOISEMAP also has the flexibility of calculating sound levels at any specified ground location so that noise levels at representative points under flight paths can be ascertained. NOISEMAP is most accurate for comparing "before and after" noise impacts that would result from proposed airfield changes or alternative noise control actions, so long as the various impacts are calculated in a consistent manner.

## **G.2 NOISE EFFECTS ON HUMANS, ANIMALS, AND STRUCTURES**

### **G.2.1 Hearing Loss**

Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal workplace standards for protection from hearing loss allow a time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-hour period. Even the most protective criterion (no measurable hearing loss for the most sensitive portion of the population at the ear's most sensitive frequency, 4000 Hz, after a 40-year exposure) suggests a time-average sound level of 70 dB over a 24-hour period (USEPA 1972a). Since it is unlikely that airport neighbors will remain outside their homes 24 hours per day for extended periods of time, there is little possibility of hearing loss below a Day-Night Average Sound Level of 75 dB, and this level is extremely conservative.

### **G.2.2 Nonauditory Health Effects**

Nonauditory health effects refers to disease (such as hypertension or nervous disorders) other than hearing loss which might be attributable to noise. There is no published evidence that such effects have ever occurred at noise exposure levels below those protective against noise-induced hearing loss, described above. Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institute of Health Conference on Noise and Hearing Loss, held on 22-24 January 1990 in Washington, D.C., which states the following:

"The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an eight-hour day). At the recent (1988) International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous. Consequently, one comes to the conclusion that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place." (von Gierke 1990; parenthetical wording added for clarification.)

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous, at

best, and often contradictory. Yet, even those studies which purport to find such health effects use time-average noise levels of 75 dB and higher for their research.

For example, in an often-quoted paper, two University of California at Los Angeles (UCLA) researchers apparently found a relation between aircraft noise levels under the approach path to Los Angeles International Airport and increased mortality rates among the exposed residents by using an average noise exposure level greater than 75 dB for the "noise-exposed" population (Meecham and Shaw 1979). Nevertheless, three other UCLA professors analyzed those same data and found no relation between noise exposure and mortality rates (Frerichs et al. 1980).

As a second example, two other UCLA researchers used this same population near Los Angeles International Airport to show a higher rate of birth defects during the period of 1970 to 1972 when compared with a control group residing away from the airport (Jones and Tauscher 1978). Based on this report, a separate group at the U.S. Centers for Disease Control performed a more thorough study of populations near Atlanta's Hartsfield International Airport for 1970 to 1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Edmonds 1979).

A recent review of health effects, prepared by a Committee of the Health Council of The Netherlands (CHCN 1996) reviewed currently available published information on this topic. They concluded that the threshold for possible long term health effects was a 16-hour (0600 to 2200)  $L_{eq}$  of 70 dB. Projecting this to 24 hours and applying the 10 dB nighttime penalty used with  $L_{dn}$ , this corresponds to  $L_{dn}$  of about 75 dB. The study also affirmed the risk threshold for hearing loss, as discussed earlier.

In summary, there is no scientific basis for a claim that potential health effects exist for aircraft time-average sound levels below 75 dB.

### **G.2.3 Annoyance**

The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the U.S. Environmental Protection Agency as any negative subjective reaction on the part of an individual or group (USEPA 1972a). As noted in the discussion of Day-Night Average Sound Level above, community annoyance is best measured by that metric.

Because the EPA Levels Document (USEPA 1972a) identified  $L_{dn}$  of 55 dB as "...requisite to protect public health and welfare with an adequate margin of safety", it is commonly assumed that 55 dB should be adopted as a criterion for community noise analysis. From a noise exposure perspective, that would be an ideal selection. However, financial and technical resources are generally not available to achieve that goal. Most agencies have identified  $L_{dn}$  of 65 dB as a criterion which protects those most impacted by noise, and which can often be achieved on a practical basis (FICON 1992). This corresponds to about 13 percent of the exposed population being highly annoyed.

Although  $L_{dn}$  of 65 dB is widely used as a benchmark for significant noise impact, and is often an acceptable compromise, it is not a statutory limit and it is appropriate to consider other thresholds in particular cases. In this EIS, no specific threshold is used. The noise in each affected area is evaluated on the basis of the information presented in this Appendix and in the body of the EIS. Particular attention is given to the ideal 55 dB identified by EPA.



#### **G.2.4 Speech Interference**

Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities such as radio or television listening, telephone use, or family conversation gives rise to frustration and irritation. The quality of speech communication is also important in classrooms, offices, and industrial settings and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that the use of the Sound Exposure Level metric will measure speech interference successfully, and that a Sound Exposure Level exceeding 65 dB will begin to interfere with speech communication.

#### **G.2.5 Sleep Interference**

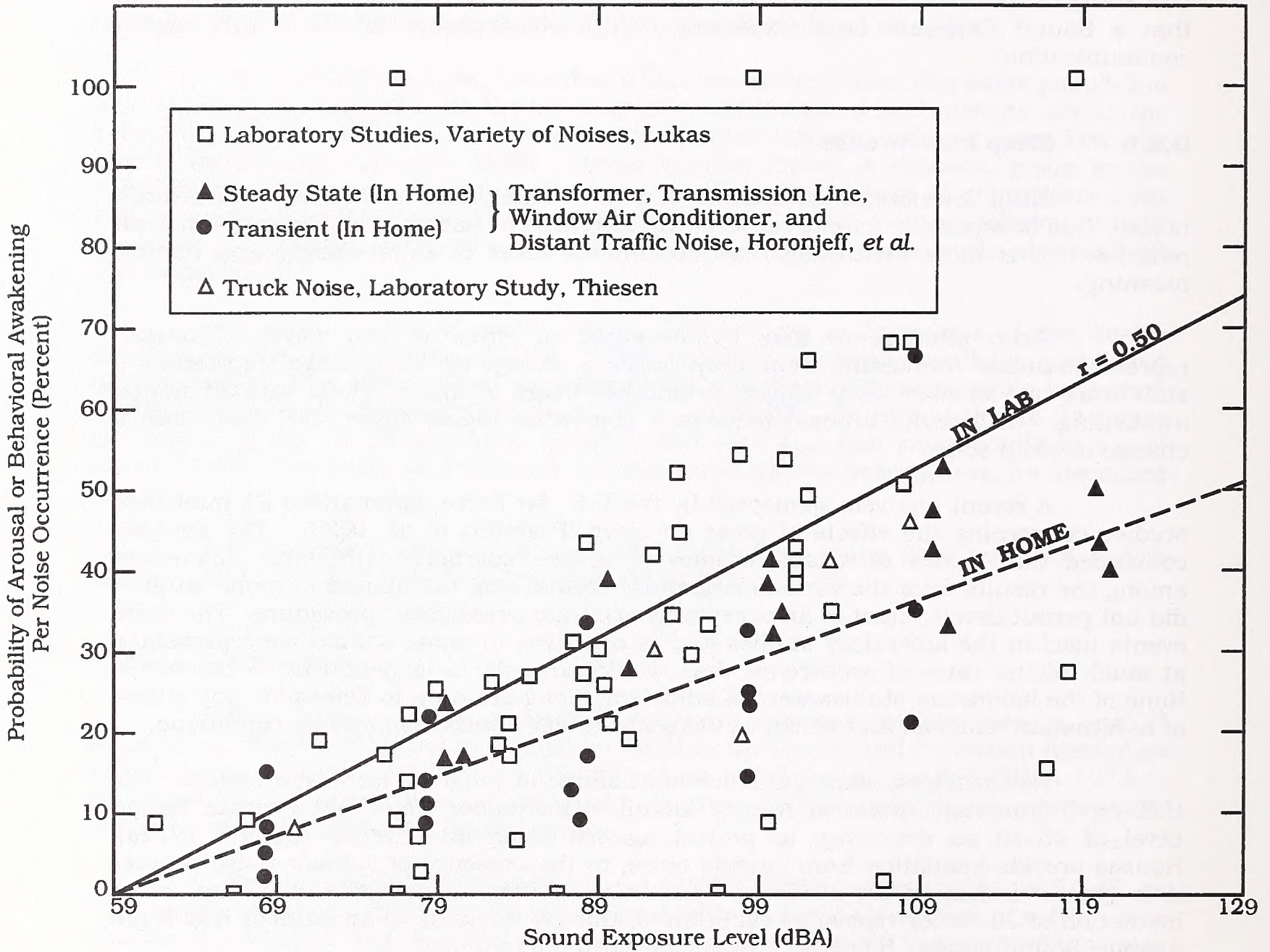
Sleep interference is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning.

Sleep interference may be measured in either of two ways. "Arousal" represents actual awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to another stage of lighter sleep without actual awakening. In general, arousal requires a somewhat higher noise level than does a change in sleep stage.

A recent analysis sponsored by the U.S. Air Force summarized 21 published studies concerning the effects of noise on sleep (Pearsons et al. 1989). The analysis concluded that a lack of reliable studies in homes, combined with large differences among the results from the various laboratory studies and the limited in-home studies, did not permit development of an acceptably accurate assessment procedure. The noise events used in the laboratory studies and in contrived in-home studies were presented at much higher rates of occurrence than would normally be experienced in the home. None of the laboratory studies were of sufficiently long duration to determine any effects of habituation, such as that which would occur under normal community conditions.

Nevertheless, some guidance is available in judging sleep interference. The U.S. Environmental Protection Agency identified an indoor Day-Night Average Sound Level of 45 dB as necessary to protect against sleep interference (USEPA 1972a). Houses provide insulation from outside noise; in the presence of outdoor noise sources it is quieter indoors than outdoors. Assuming a very conservative structural noise insulation of 20 dB for typical dwelling units, this corresponds to an outdoor Day-Night Average Sound Level of 65 dB as minimizing sleep interference.

A 1984 publication reviewed the probability of arousal or behavioral awakening in terms of Sound Exposure Level (Kryter 1984). Figure G-4, extracted from Figure 10.37 of Kryter 1984, indicates that an indoor Sound Exposure Level of 65 dB or lower should awaken less than 5 percent of those exposed. These results do not include any habituation over time by sleeping subjects. Nevertheless, this provides a reasonable guideline for assessing sleep interference and corresponds to similar guidance for speech interference, as noted above.



Source: Kryter 1984

**Figure G-4. Probability of Arousal or Behavioral Awakening in Terms of Sound Exposure Level**

## **G.2.6 Noise Effects on Domestic Animals and Wildlife**

Animal species differ greatly in their responses to noise. Each species has adapted, physically and behaviorally, to fill its ecological role in nature, and its hearing ability usually reflects that role. Animals rely on their hearing to avoid predators, obtain food, and communicate with and attract other members of their species. Aircraft noise may mask or interfere with these functions. Secondary effects may include nonauditory effects similar to those exhibited by humans – stress, hypertension, and other nervous disorders. Tertiary effects may include interference with mating and resultant population declines.

There are available many scientific studies regarding the effects of noise on wildlife and some anecdotal reports of wildlife "flight" due to noise. Few of these studies or reports include any reliable measures of the actual noise levels involved. However, in the absence of definitive data on the effect of noise on animals, the Committee on Hearing, Bioacoustics, and Biomechanics of the National Research Council has proposed that protective noise criteria for animals be taken to be the same as for humans (NRC NAS 1977).

## **G.2.7 Noise Effects on Structures**

Normally, the most sensitive components of a structure to airborne noise are the windows and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressures impinging on the structure is normally sufficient to determine the possibility of damage. In general, at sound levels above 130 dB, there is the possibility of the excitation of structural component resonances. While certain frequencies (such as 30 Hz for window breakage) may be of more concern than other frequencies, conservatively, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (NRC NAS 1977).

A recent study, directed specifically at low altitude high-speed aircraft on Military Training Routes, showed that there is little probability of structural damage from such operations (Sutherland 1989). One finding in that study is that sound levels at damaging frequencies (e.g., 30 Hz for window breakage or 15 to 25 Hz for whole-house response) are rarely above 130 dB.

Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or "rattle", of objects within the dwelling – hanging pictures, dishes, plaques, and bric-a-brac. Window panes may also vibrate noticeably when exposed to high levels of airborne noise, causing homeowners to fear of breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally incompatible with residential land use. Thus, assessments of noise exposure levels for compatible land use should also be protective of noise-induced secondary vibrations.

## **G.2.8 Noise Effects on Terrain**

Members of the public often perceive that noise from low-flying aircraft can cause avalanches or landslides by disturbing fragile soil or snow structures, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such effects, and it is considered improbable that such effects will result from routine, subsonic aircraft operations.

### G.2.9 Noise Effects on Historical and Archaeological Sites

Because of the potential for increased fragility of structural components of historical buildings and other historical sites, aircraft noise may affect such sites more severely than newer, modern structures. Again, there are few scientific studies of such effects to provide guidance for their assessment.

One study involved the measurements of sound levels and structural vibration levels in a superbly restored plantation house, originally built in 1795, and now situated approximately 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport. These measurements were made in connection with the proposed scheduled operation of the supersonic Concorde airplane at Dulles (Wesler 1977). There was special concern for the building's windows, since roughly half of the 324 panes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning within the building itself.

As noted above for the noise effects of noise-induced vibrations of normal structures, assessments of noise exposure levels for normally compatible land uses should also be protective of historic and archaeological sites.





## APPENDIX H

### Ambient Noise Monitoring Survey

#### H.1 BACKGROUND

A study has been made of the baseline noise environment in southern Colorado. The primary approach was to measure existing noise levels for 30 days at 17 locations. The monitoring sites were located in noise-sensitive areas, most located near the San Isabel and Sangre de Cristo National Forests. This report summarizes the results of this monitoring project.

#### H.2 NOISE MONITOR SITES

Noise monitoring was conducted during the period from 1 June 1994 through 3 July 1994 at 17 locations in southern Colorado. These locations were chosen to include noise-sensitive sites under the airspace currently being evaluated in the Colorado Airspace Initiative EIS. Monitoring locations were selected through a coordinated effort with the local citizen groups. All the monitoring sites were located on private property and permission was obtained from the property owners before installing the instruments. Each site is described below with additional information presented in Table H-1 and Figure H-1.

Site 1 was located in the San Luis Valley on the Cotton Wood Ranch Field Number 3, approximately 5 statute miles east of the existing VR-413 centerline. The site was located in a remote area in a wheat field. No farm machinery was operated near the noise monitor.

Site 2 was located in the San Luis Valley near the City of Moffat, 1.5 miles east of the existing VR-413 centerline. The noise monitor was located in a junk yard approximately one-quarter mile from County Road U-60.

Site 3 was located in the San Luis Valley on T road, approximately 1.8 miles west of Highway 17. The site was 3 miles west of the existing VR-413 centerline. The monitor was located in an unused pasture behind the Harmony Ranch.

Site 4 was located in the San Luis Valley near Crestone, approximately 11 miles east of the existing VR-413 centerline. The monitor was located

Table H1  
Noise Monitoring Sites

Site No.	Point of Contact	Location	Latitude	Longitude
1	John Mattingly	Saguache Co., Cotton Wood Ranch	38.1324° N	105.8452° W
2	John Albert	Saguache Co. Road U-60	38.0273° N	105.8399° W
3	Lix Washburn	Saguache Co., Harmony Ranch	37.9981° N	105.9422° W
4	Mike Ehardt	Creston, Baca Grande Lot 557	37.9868° N	105.6671° W
5	Ken Klemm	Saguache Co., High Meadow Buffalo	37.7214° N	105.6963° W
6	Ken Klemm	Saguache Co., High Meadow Buffalo	37.6783° N	105.6855° W
7	Jerry Canterbury	South of Coaldale	38.3443° N	105.7373° W
8	Harry Nuhn	Custer County Road 193	38.2178° N	105.6298° W
9	Bob Pratt	Custer County, Buck Mountain	38.2408° N	105.5501° W
10	Dan Whitehouse	Custer County, Wolf Spring Ranch	37.8821° N	105.3563° W
11	Dan Whitehouse	Custer County, Wolf Spring Ranch	37.8512° N	105.3544° W
12	Pat Boutilier	Red Wing	37.7301° N	105.2617° W
13	Dr. Ken Danychuk	Rye, Canyon Ranch	37.9938° N	105.9759° W
14	John Kenny	16 Miles South of La Junta	37.7802° N	103.2500° W
15	Ray Koch	Custer County Road 191	38.2255° N	105.5856° W
16	Nelson Kelm	1475 17th St., Penrose	38.3953° N	104.9707° W
17	Nelson Kelm	1421 East 3rd St., Penrose	38.4514° N	104.9828° W



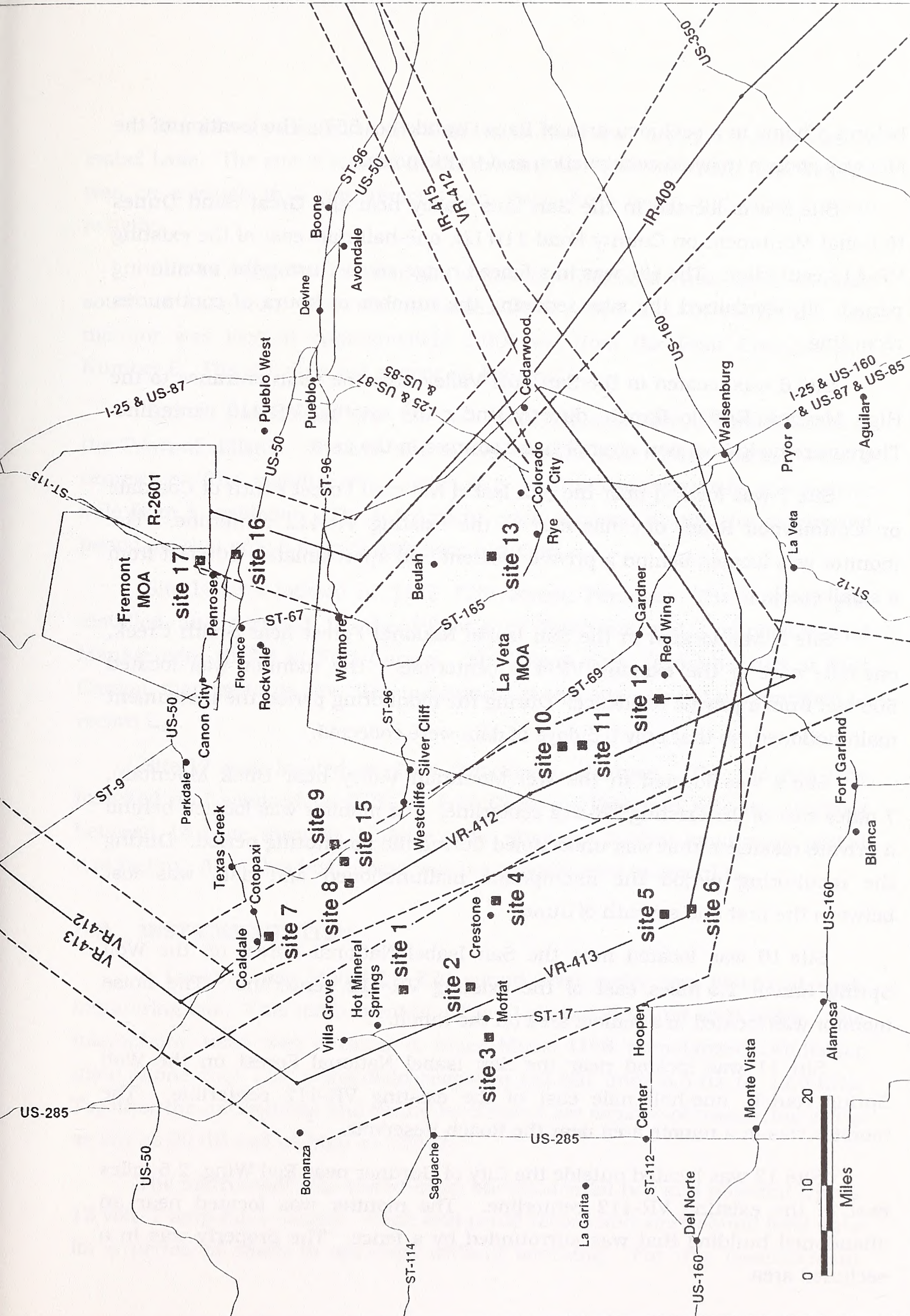


Figure H1. Map Showing Noise Monitoring Locations.

behind a home in a secluded area of Baca Grande Lot 557. The location of the site was chosen to avoid construction and traffic noise.

Site 5 was located in the San Luis Valley near the Great Sand Dunes National Monument on County Road 11N LN, one-half mile east of the existing VR-413 centerline. The site was in a fenced range area. During the monitoring period, elk vandalized the site, reducing the number of hours of continuous recording.

Site 6 was located in the San Luis Valley near the main entrance to the High Meadow Buffalo Ranch, directly under the existing VR-413 centerline. There were no known non-aircraft noise sources in the area.

Site 7 was located near the San Isabel National Forest south of Coaldale on Cottonwood Road, one mile east of the existing VR-412 centerline. The monitor was located behind a private resident and approximately 500 feet from a small creek.

Site 8 was located in the San Isabel National Forest near Smith Creek, one mile east of the existing VR-412 centerline. The monitor was located 500 feet from a private residence. During the monitoring period the instrument malfunctioned, so that only 5.5 days of data were collected.

Site 9 was located in the Wet Mountain Valley near Buck Mountain, 7 miles east of the existing VR-412 centerline. The monitor was located behind a private residence that was unoccupied during the monitoring period. During the monitoring period the microphone malfunctioned and data was lost between the first and seventh of June.

Site 10 was located near the San Isabel National Forest on the Wolf Spring Ranch 1.5 miles east of the existing VR-412 centerline. The noise monitor was located in a remote area on the ranch.

Site 11 was located near the San Isabel National Forest on the Wolf Spring Ranch, one-half mile east of the existing VR-412 centerline. The monitor was in a remote area near the Roach Reservoir.

Site 12 was located outside the City of Gardner near Red Wing, 2.5 miles east of the existing VR-412 centerline. The monitor was located near an abandoned building that was surrounded by a fence. The property was in a secluded area.

Site 13 was located in the San Isabel National Forest, 3.5 miles east of Isabel Lake. The site is located in the existing La Veta Low MOA. The monitor was on a ranch in a very remote area, away from roads and other human activity.

Site 14 was located near the Comanche National Grassland, 16 miles south of La Junta. The site is under IR-177/501 and IR-150/500. The monitor was located approximately 1,000 feet from the Bent County Road Number 5. The site does not appear on Figure H1.

Site 15 was located near the San Isabel National Forest, 4 miles south of the Town of Hillside. The site was located 4 miles east of the existing VR-412 centerline. The monitor was located in a pasture approximately one-quarter mile from a residence. The instrument malfunctioned during the monitoring period, so that only 8 days of data were acquired.

Site 16 was located at 1475 17th Street, Penrose. The monitor was installed and serviced by the Director of Environmental Compliance and Management (ECM) at Fort Carson. Mr. Nelson Kelm, Branch Chief at Fort Carson, managed this site. The instrument at this site was not programmed to record  $L_{99}$ .

Site 17 was located at 1421 3rd Street, Penrose. The monitor was installed and serviced by ECM at Fort Carson. This unit was not working between 14 June through 27 June 1994, after the 30-day monitoring period had begun. Also, this instrument was not programmed to record  $L_{99}$ .

### **H.3 INSTRUMENTATION**

A Larson-Davis Model LD-820 sound level meter was placed at each monitoring site. This instrument is a Type 1 precision sound level meter. The microphone used was a Bruel & Kjaer Model 4176 prepolarized condenser microphone that has a free-field response ( $\pm 2$  dB) from 6.5 Hz to 12.5 kHz. Together the microphone and sound level meter are capable of measuring levels as low as 20 dB and as high as 130 dB.

The instrument was stored in an environmental box and powered with a 12 volt, 7 amp-hour battery. Each unit could record and store sound level data for a period of seven to ten days without servicing. For this measurement

program, each unit was visited every five to seven days. The instrument was programmed to measure and record the following information:

1. Hourly and daily mean, maximum, and minimum A-weighted sound levels, along with hourly and daily statistical summaries of A-weighted sound levels which exceeded 1 percent, 10 percent, 50 percent, 90 percent, and 99 percent of the measurement period. (Sites 16 and 17 did not record the 99 percent level.)
2. Time, maximum A-weighted sound levels, sound exposure level, and duration of individual noise events which exceeded a set threshold (usually 65 decibels). This information was used to document the noise levels of individual aircraft operations (sites 1 to 15 only).

When the instrument was serviced, recorded information was transferred to a portable computer for permanent retention and subsequent laboratory analysis. Before-and-after calibration recordings were made for each instrument during servicing, using a Bruel & Kjaer Type 4230 calibrator.

#### **H.4 AIRCRAFT OPERATION**

During the monitoring period, the 140th Fighter Wing at Buckley ANGB retained aircraft operational data for the military aircraft using VR-409, VR-412, and VR-413. The 140th FW recorded the mission date, the aircraft call sign, the number of aircraft in the mission, the route used by the aircraft, route entry and exit times, the airspeed, the AGL altitude, and the power settings. This information is presented in Table H-2.

During the monitoring period there were a total of 22 missions; 14 missions were flown on VR-413 and 8 missions were flown on VR-412. All of these missions were flown by 140th FW F-16 aircraft. Not shown in the table are the operations on VR-412 and VR-413 from other USAF commands.

Local residents and working group members participating in the study were asked to make field observations of military overflights and to record the date, time, and type of military aircraft. Table H-3 shows a summary of these field observations. Only sites 8, 10, and 11 supplied records. At site 13, the field crew observed three groups of F-16s using the La Veta MOA. This was the only observation made by the field crew during the 30-day monitoring period.

Table H2

## Summary of Air National Guard F-16C Operations

Date	Call Sign	No. of Aircraft	VR Route	Entry Time	Exit Time	Airspeed Flown (kts)	Altitude Flown (Ft AGL)	Power Setting
1 June 94	Snake	2	413/409	10:10	10:30	480	500	92%
1 June 94	Anvil	3	413/409	10:15	10:35	480	500	92%
1 June 94	Snake	2	413/409	14:10	14:40	480	500	92%
1 June 94	Anvil	3	413/409	14:00	14:30	480	500	92%
2 June 94	Snake	2	413/409	09:10	09:30	480	500-1,500	93%
2 June 94	Snake	2	413/409	13:10	13:30	480	500-1,000	92%
3 June 94	Snake	2	413/409	13:10	13:30	480	500-1,500	92%
3 June 94	Snake	2	413/409	13:40	14:05	480	500	93%
7 June 94	Snake	3	412/409	10:15	10:40	480	500	97%
7 June 94	Snake	3	412/409	14:10	14:35	480	500	97%
8 June 94	Snake	4	412/409	09:40	10:00	480	500	98%
22 June 94	Regi	2	413/409	08:30	10:00	450	500	94%
22 June 94	Snake	3	413/409	13:25	13:50	450	500	94%
23 June 94	Viper	4	413/409	10:00	10:25	450	300	95%
23 June 94	Snake	2	412/409	10:35	11:00	450	500	94%
23 June 94	Snake	2	412/409	13:55	14:20	450	500	94%
23 June 94	Viper	4	413/409	13:55	14:30	450	500	95%
24 June 94	Regi II	2	413/409	09:10	09:35	480	500	95%
27 June 94	Viper	4	413/409	15:15	15:40	450	500	94%
28 June 94	Viper	2	412/409	10:15	10:40	450	500	95%
29 June 94	Viper	4	412/409	15:20	15:55	450	500	94%
30 June 94	Viper	4	412/409	15:25	16:00	450	500	95%

Table H3

## Summary of Observations Made by Local Residents and Field Crew

<b>Date</b>	<b>Time</b>	<b>Location (Sites)</b>	<b>Aircraft Type</b>
8 June 94	09:50	8	3 Unknown
8 June 94	10:05	8	2 Unknown
9 June 94	13:35	8	Unknown
9 June 94	14:00	8	Unknown
9 June 94	15:00	8	Unknown
21 June 94	09:55	10, 11	Unknown
22 June 94	12:20	10, 11	Unknown
22 June 94	12:40	10, 11	Unknown
22 June 94	12:55	10, 11	Unknown
22 June 94	13:30	10, 11	Unknown
22 June 94	13:33	10, 11	Unknown
23 June 94	10:40	10, 11	Unknown
23 June 94	14:15	10, 11	Unknown
23 June 94	13:55	13	2 F-16
23 June 94	13:59	13	2 F-16
23 June 94	14:15	13	2 F-16

Several of the entries in Table H-3 correlate with those in Table H-2. For example, the 140th FW reports that four F-16 aircraft entered VR-412 at approximately 9:40 a.m. and on the same date a resident saw two groups of F-16 aircraft using VR-412 at approximately the same time. Not reported in Table H-2 are operations made on 9, 21, and 22 June. These aircraft are possibly from other sources.

## **H.5 NOISE MEASUREMENTS AND ANALYSIS**

Data were collected continuously throughout the noise monitoring period at each of the 17 locations. As mentioned previously, instrumentation problems reduced the number of hours of data collected at sites 5, 8, 15, and 17. Figures H-2 through H-18 show the hourly noise levels at each of the seventeen monitoring locations. Each hourly data point represents an energy average summation for that hour over the 30-day monitoring period. Shown in the figures are the energy-equivalent sound level, the 1-percentile, 10-percentile, 50-percentile, and 90-percentile A-weighted sound levels. The 1-percentile exceeded sound level, which is the sound level exceeded 1 percent of the time during the monitoring period, generally represents the noisiest events which occurred during that time. The 50-percentile exceeded sound level is the sound level exceeded 50 percent of the time. The 90-percentile exceeded sound level, which is the sound level exceeded 90 percent of the time, generally represents the ambient or background sound level in the absence of identifiable noise sources.

The ambient levels at each monitoring location were influenced primarily by wind and insect noise. At site 7 (Figure H-8) the ambient noise level may have been increased due to the monitor's proximity to the nearby creeks. Other than these noise sources, no other identifiable non-aircraft sources were observed at any of the locations.

Table H-4 is a summary of the noise levels averaged over the 30-day period. This table identifies the 17 locations, the number of hours of usable data at each location, the energy-equivalent sound level for a 24-hour period, the energy-equivalent sound level for the 15 daytime hours (7:00 a.m. to 10:00 p.m.), the energy-equivalent sound level for the 9 nighttime hours (10:00 p.m. to 7:00 a.m.), the day-night average sound level, the 1-percentile,

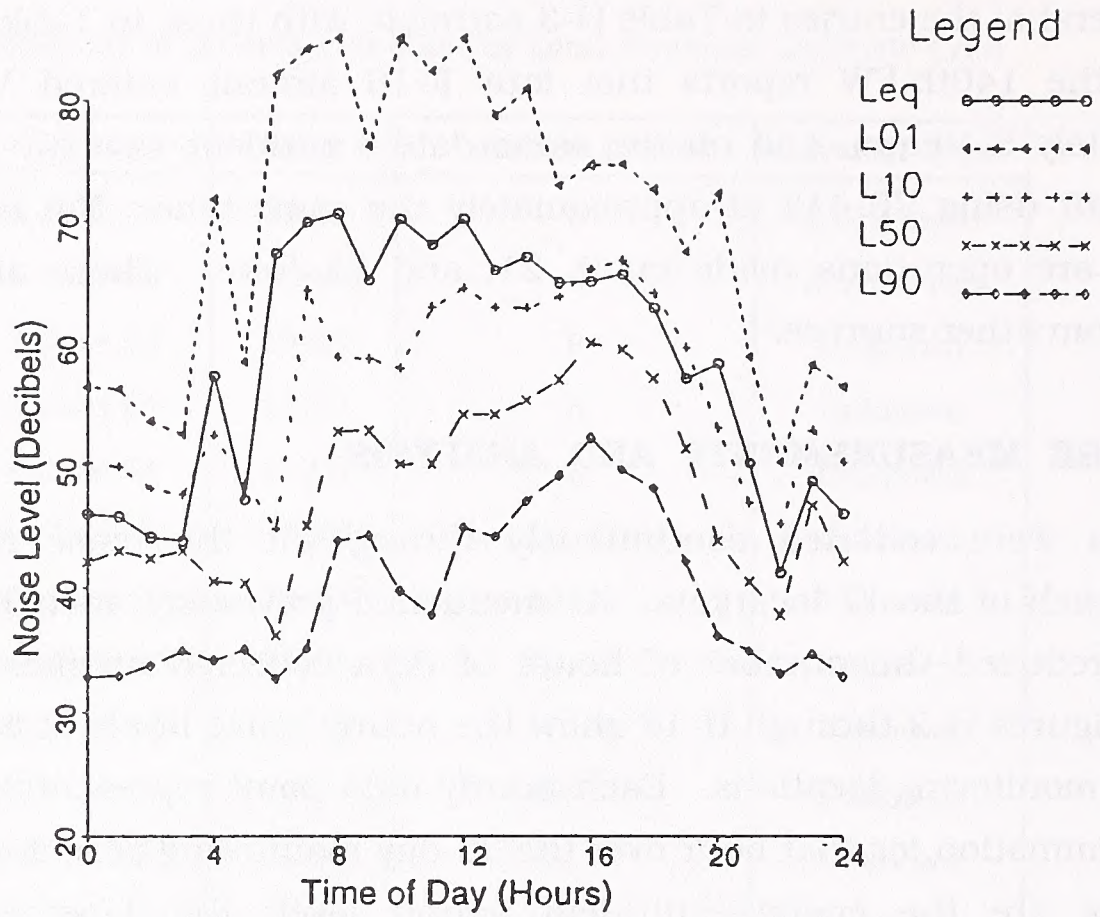


Figure H-2. Hourly Noise Levels at Site 1.

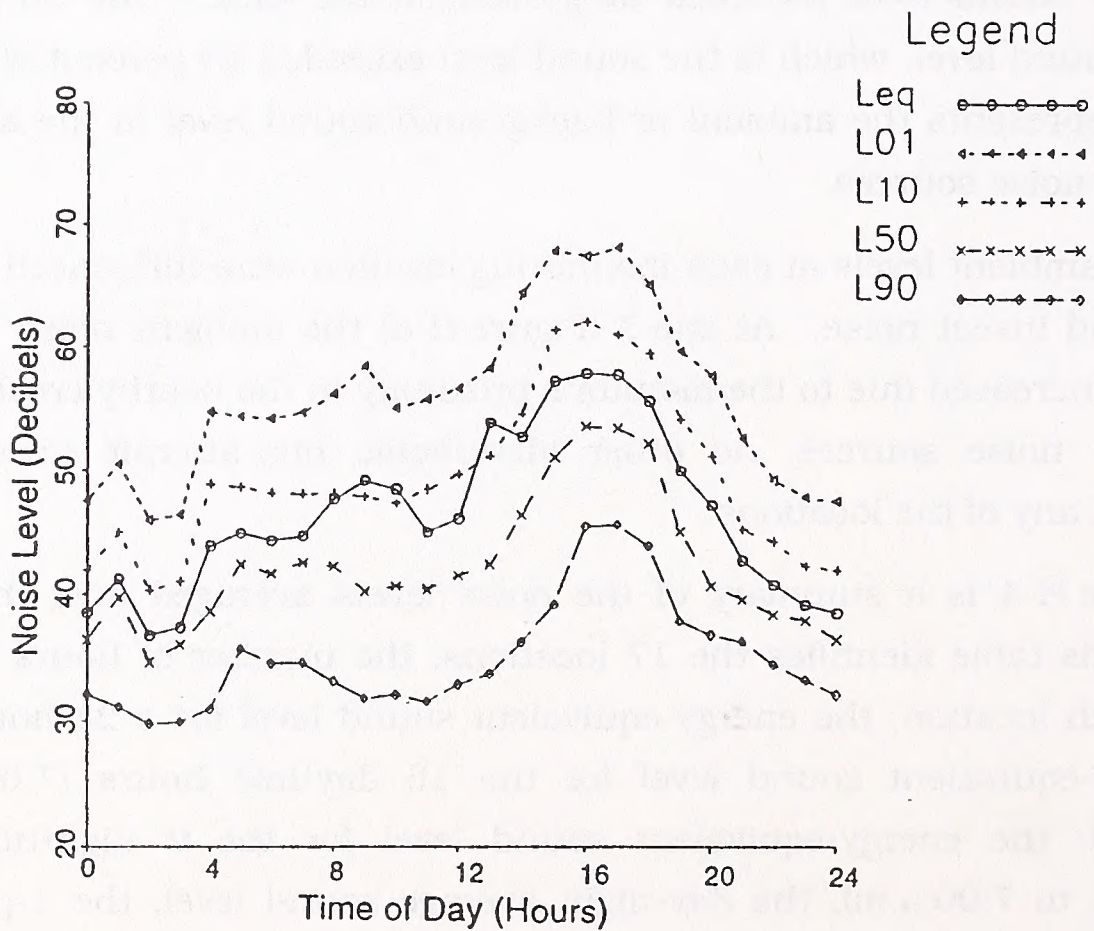


Figure H-3. Hourly Noise Levels at Site 2.



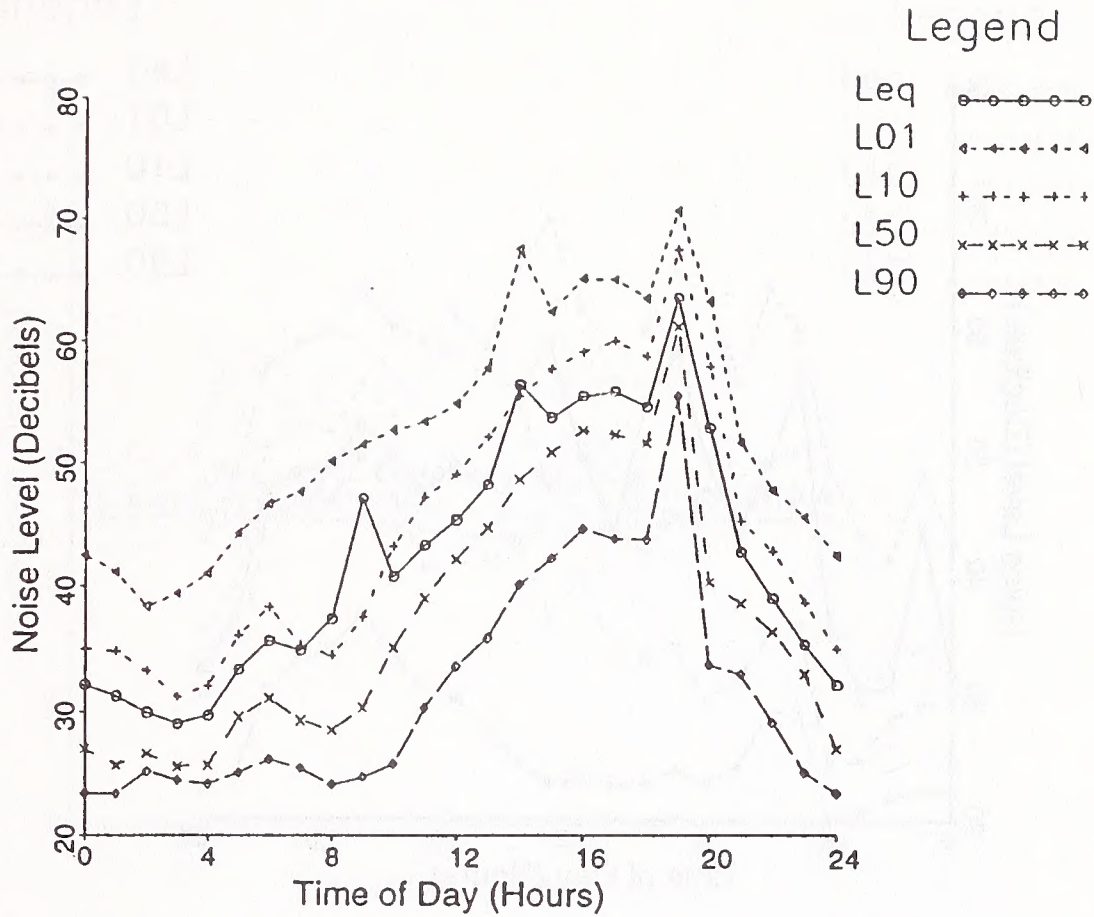


Figure H-4. Hourly Noise Levels at Site 3.

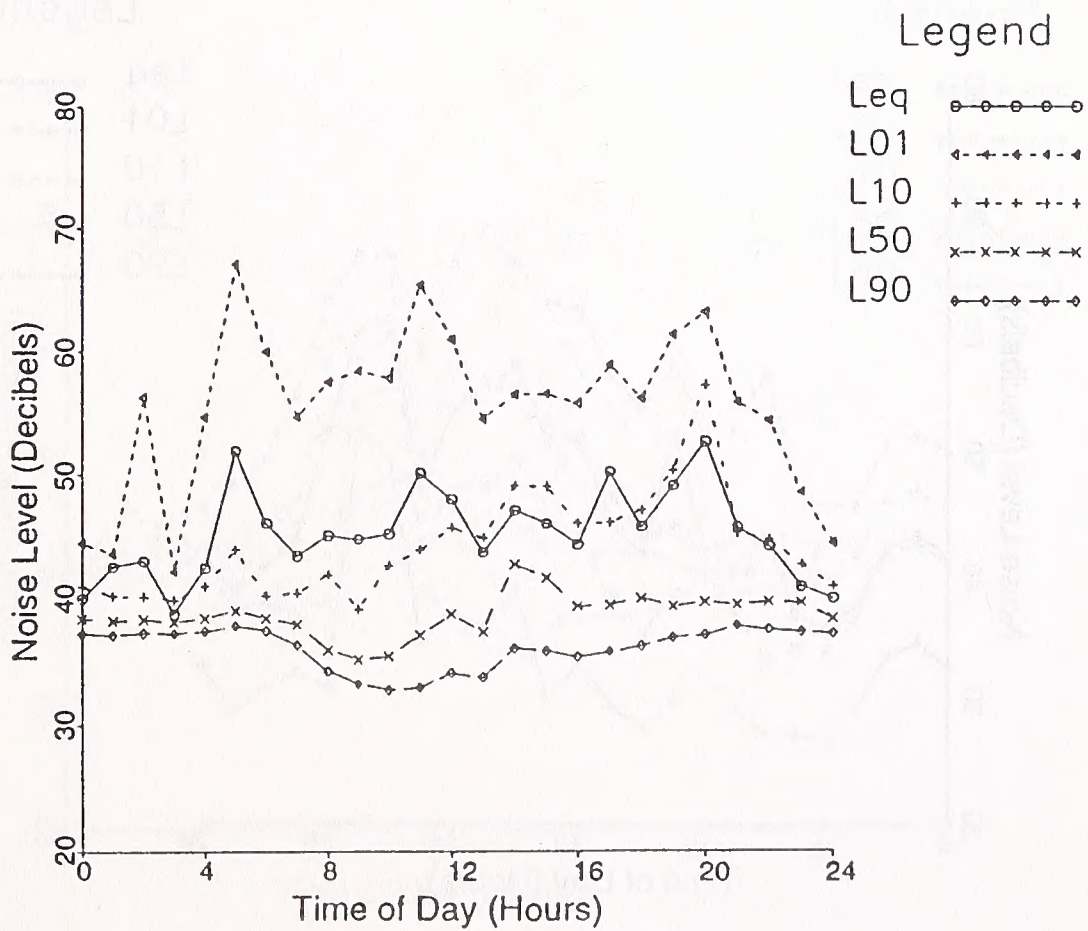


Figure H-5. Hourly Noise Levels at Site 4.

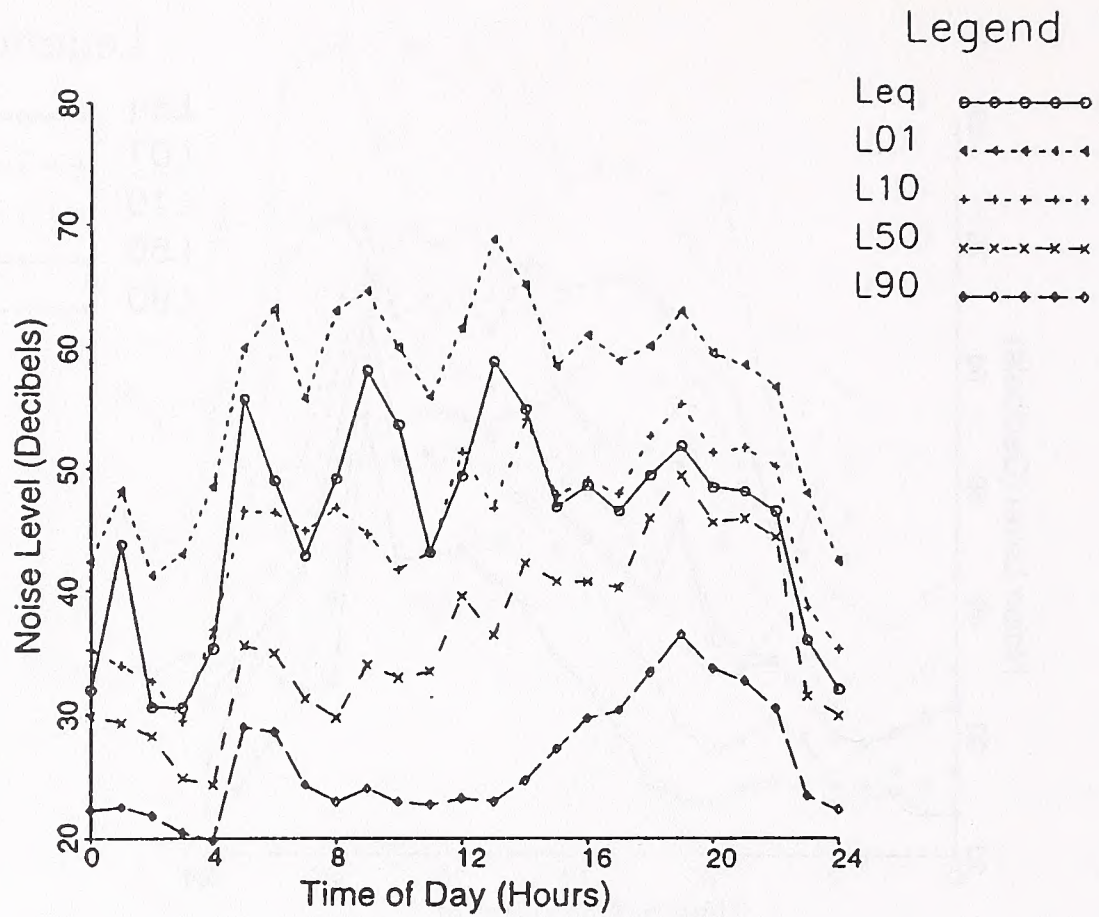


Figure H-6. Hourly Noise Levels at Site 5.

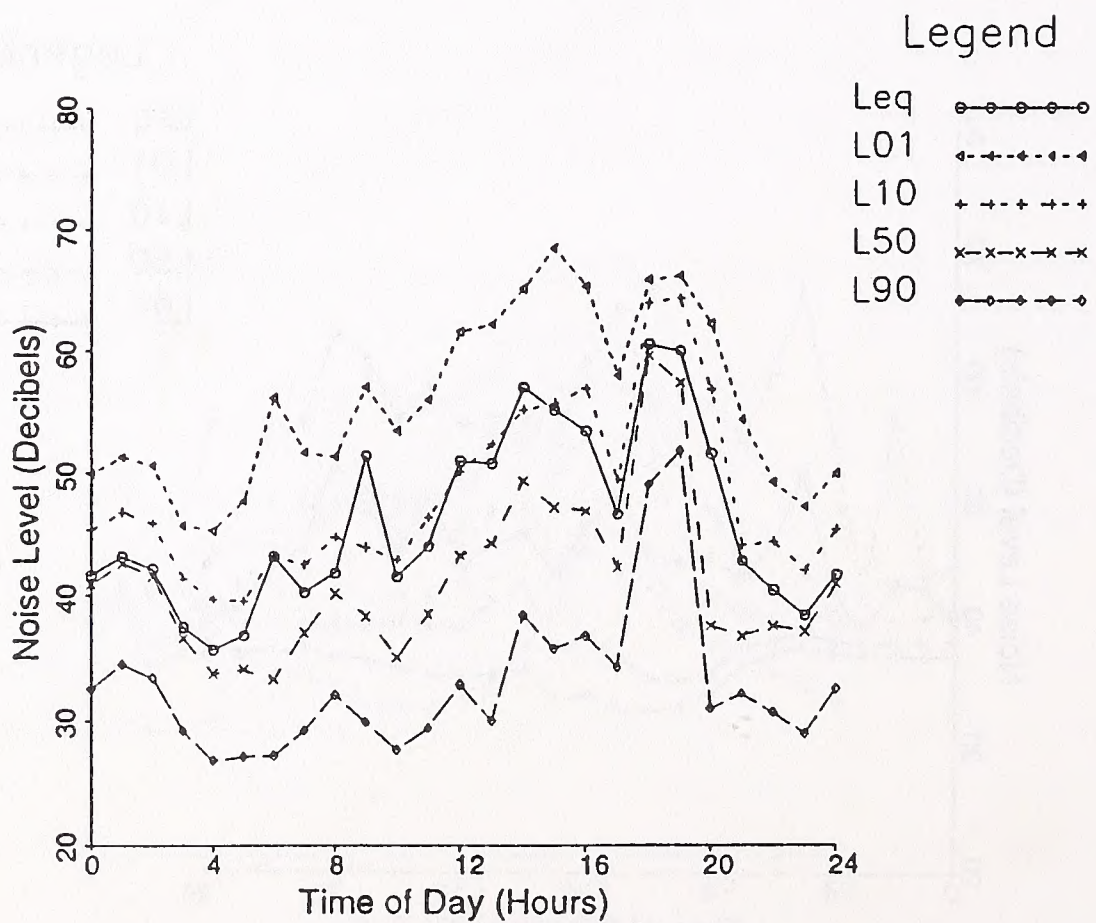


Figure H-7. Hourly Noise Levels at Site 6.

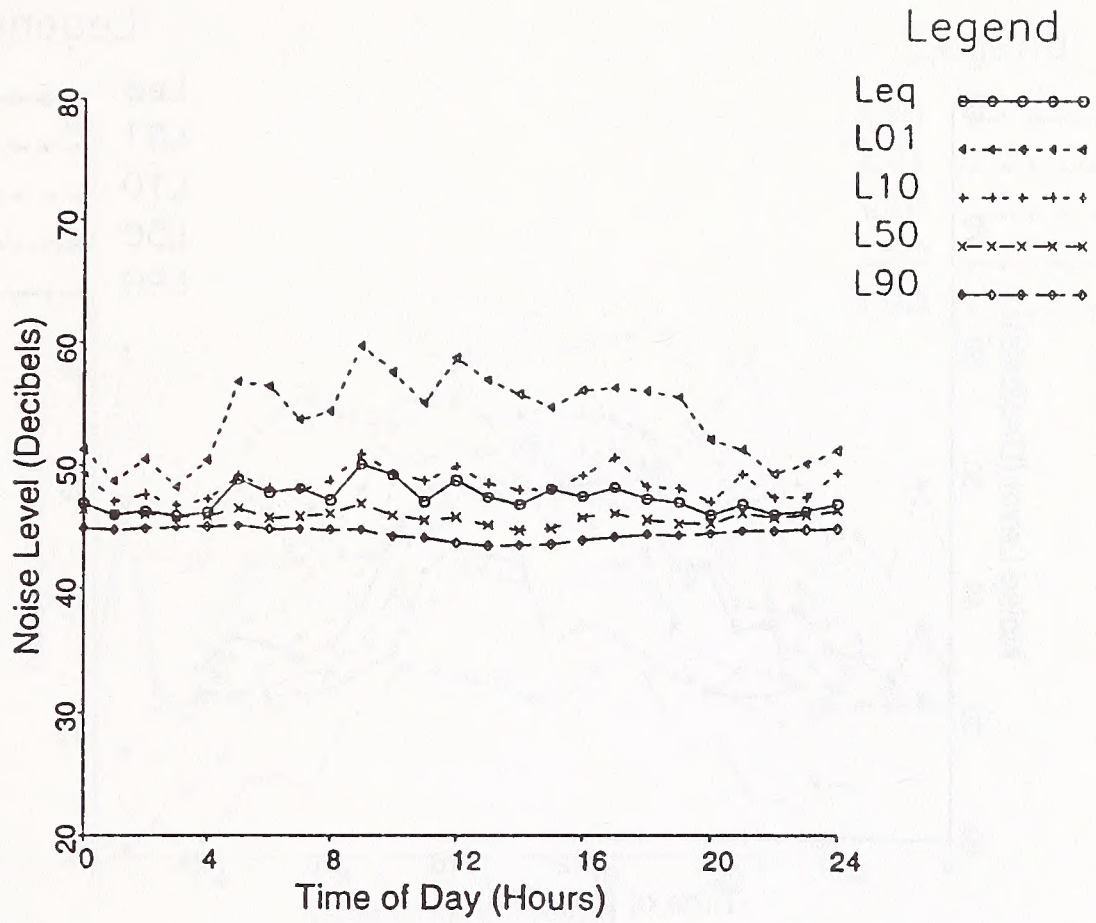


Figure H-8. Hourly Noise Levels at Site 7.

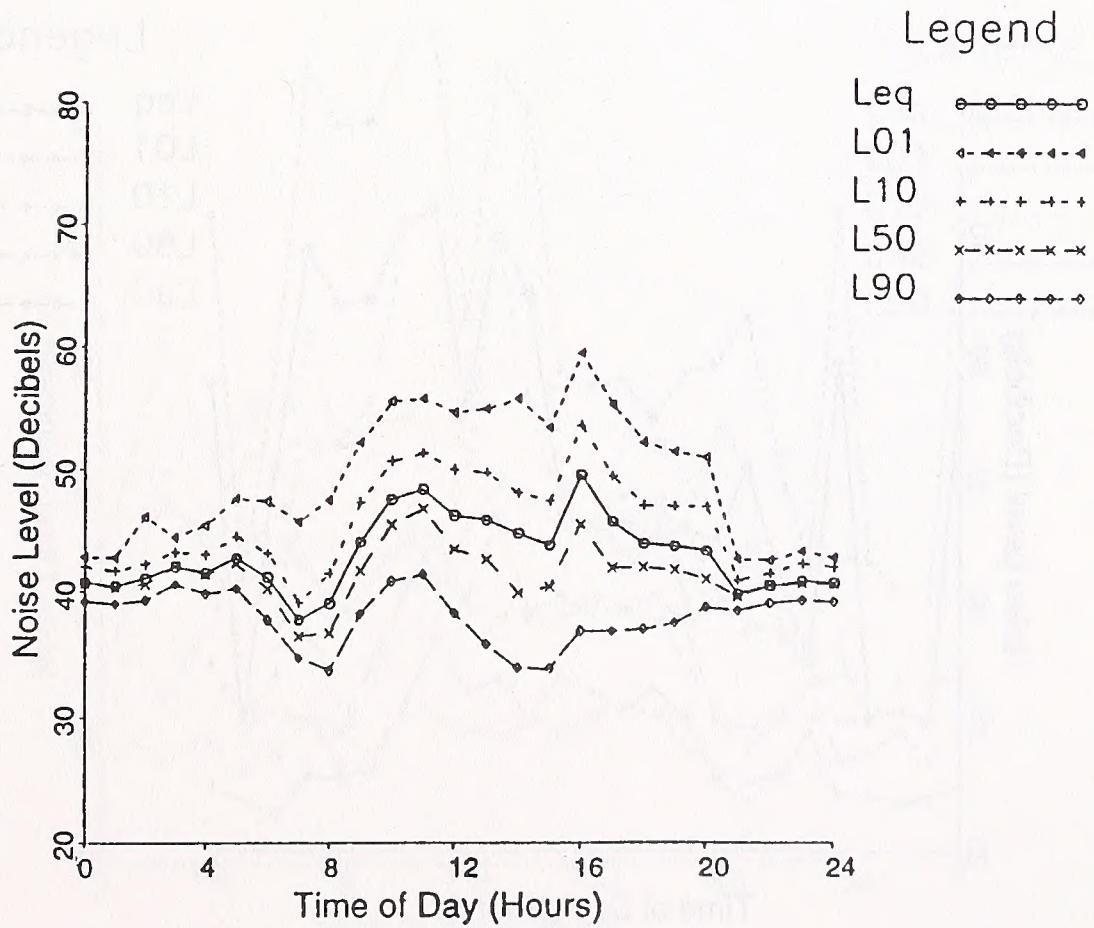


Figure H-9. Hourly Noise Levels at Site 8.

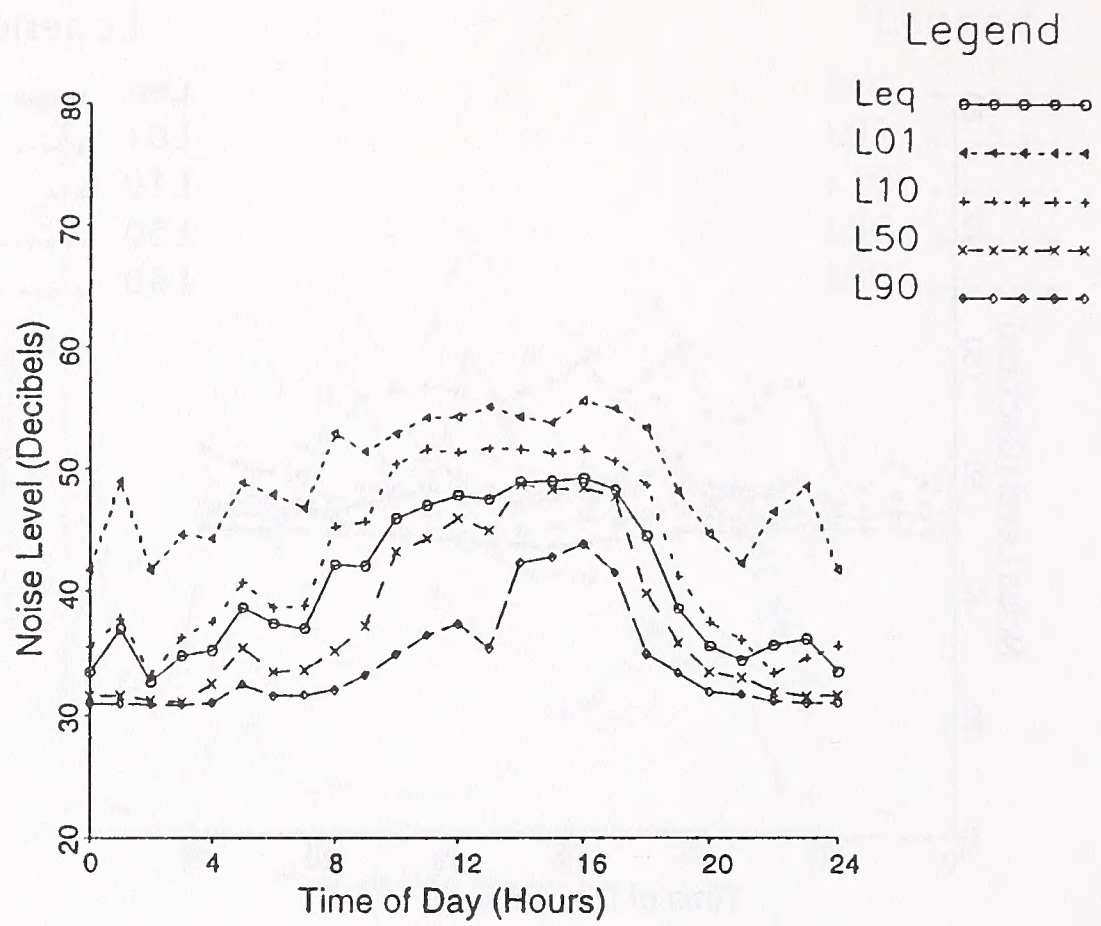


Figure H-10. Hourly Noise Levels at Site 9.

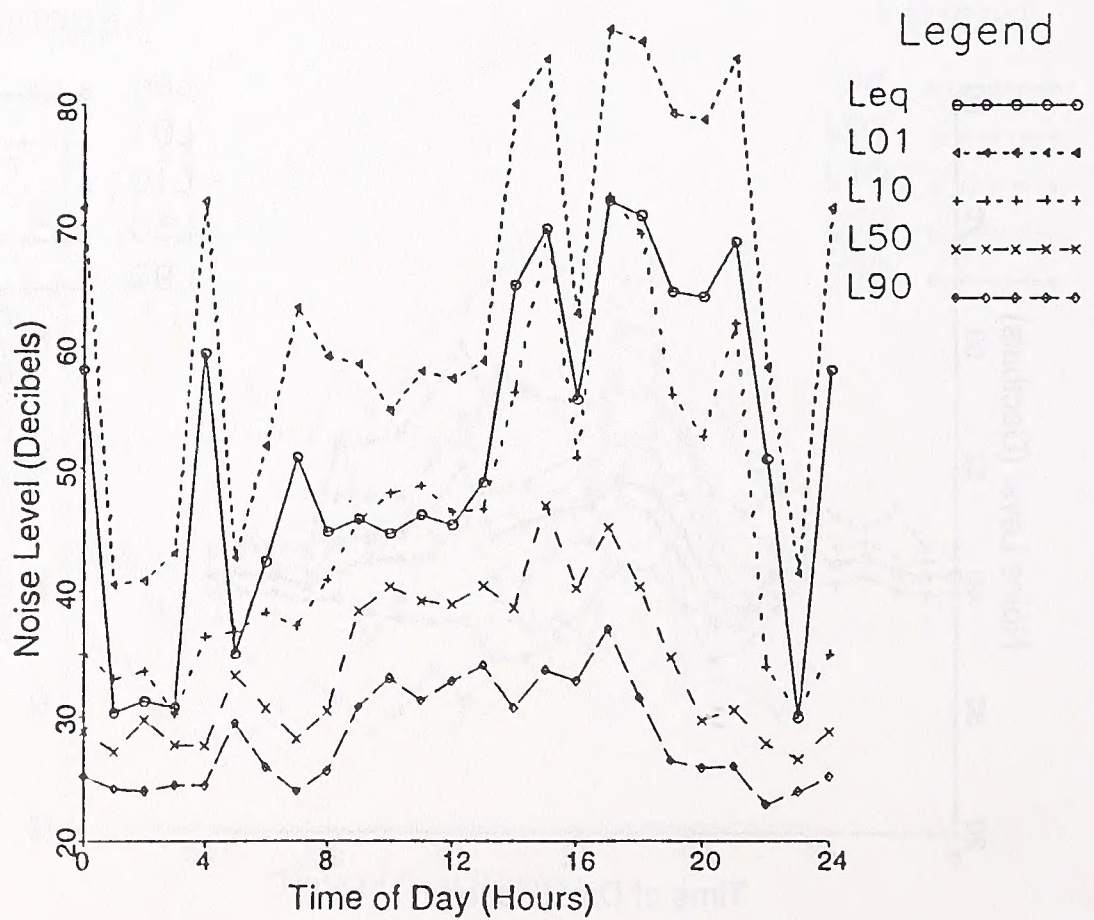


Figure H-11. Hourly Noise Levels at Site 10.

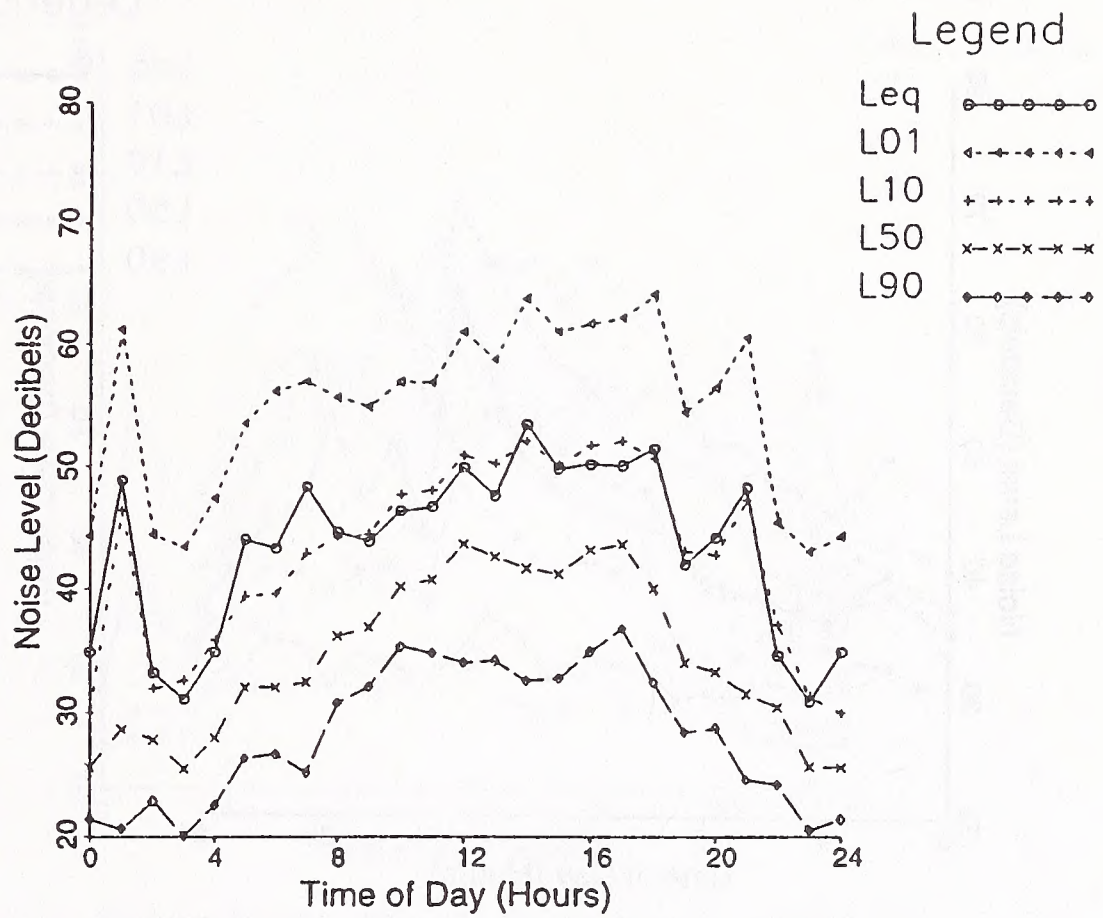


Figure H-12. Hourly Noise Levels at Site 11.

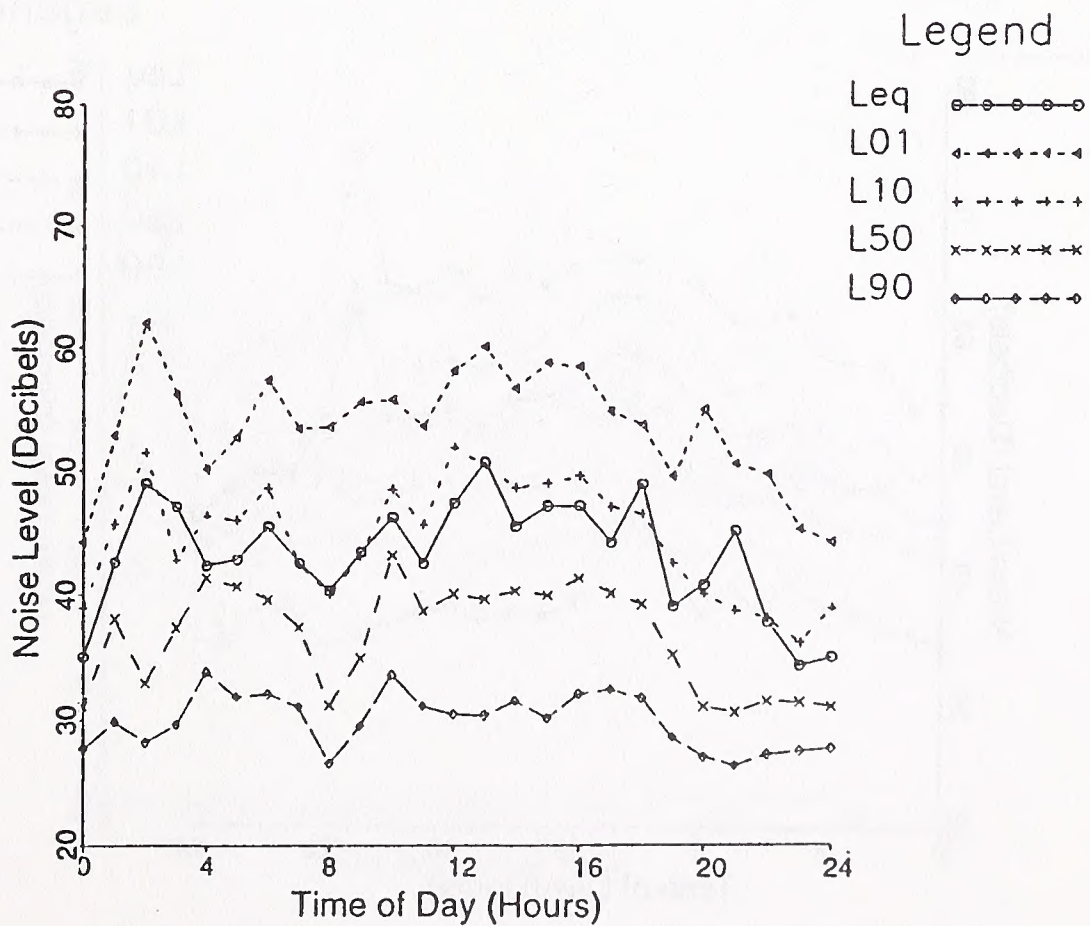


Figure H-13. Hourly Noise Levels at Site 12.

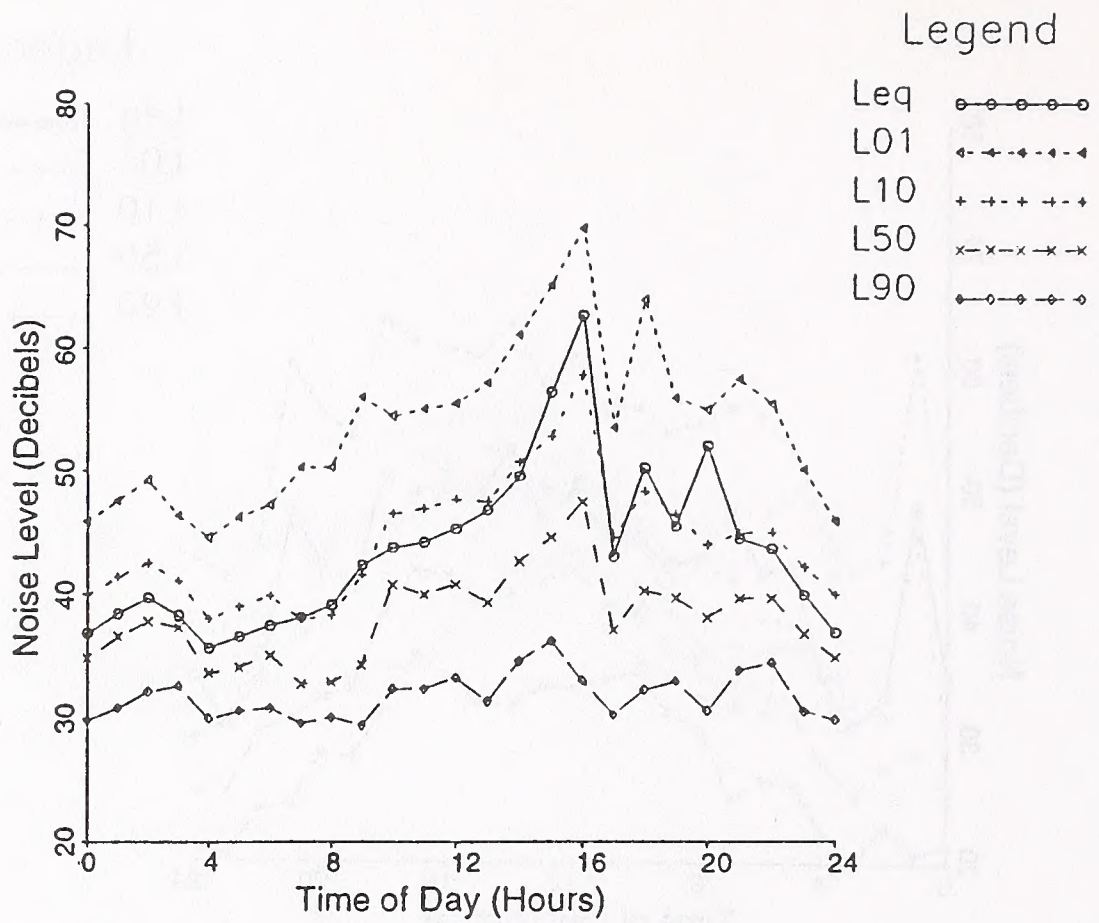


Figure H-14. Hourly Noise Levels at Site 13.

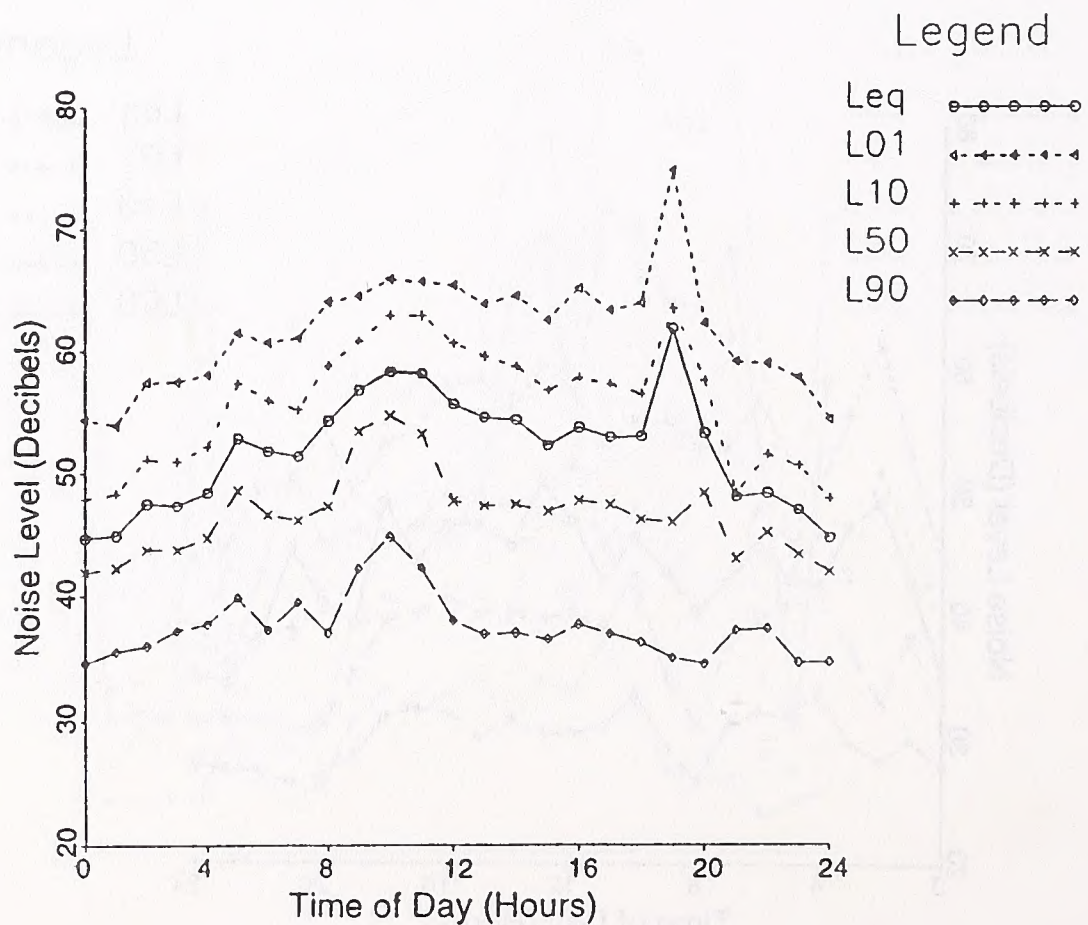


Figure H-15. Hourly Noise Levels at Site 14.

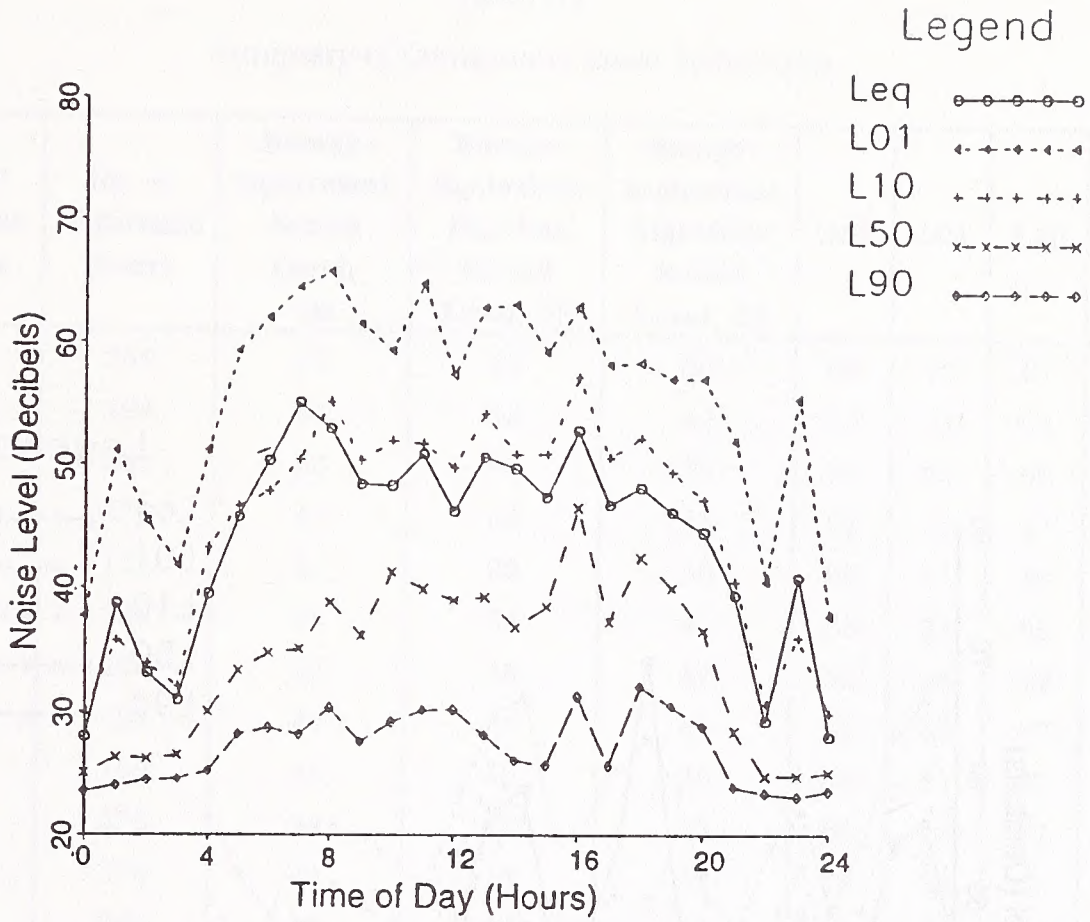


Figure H-16. Hourly Noise Levels at Site 15.

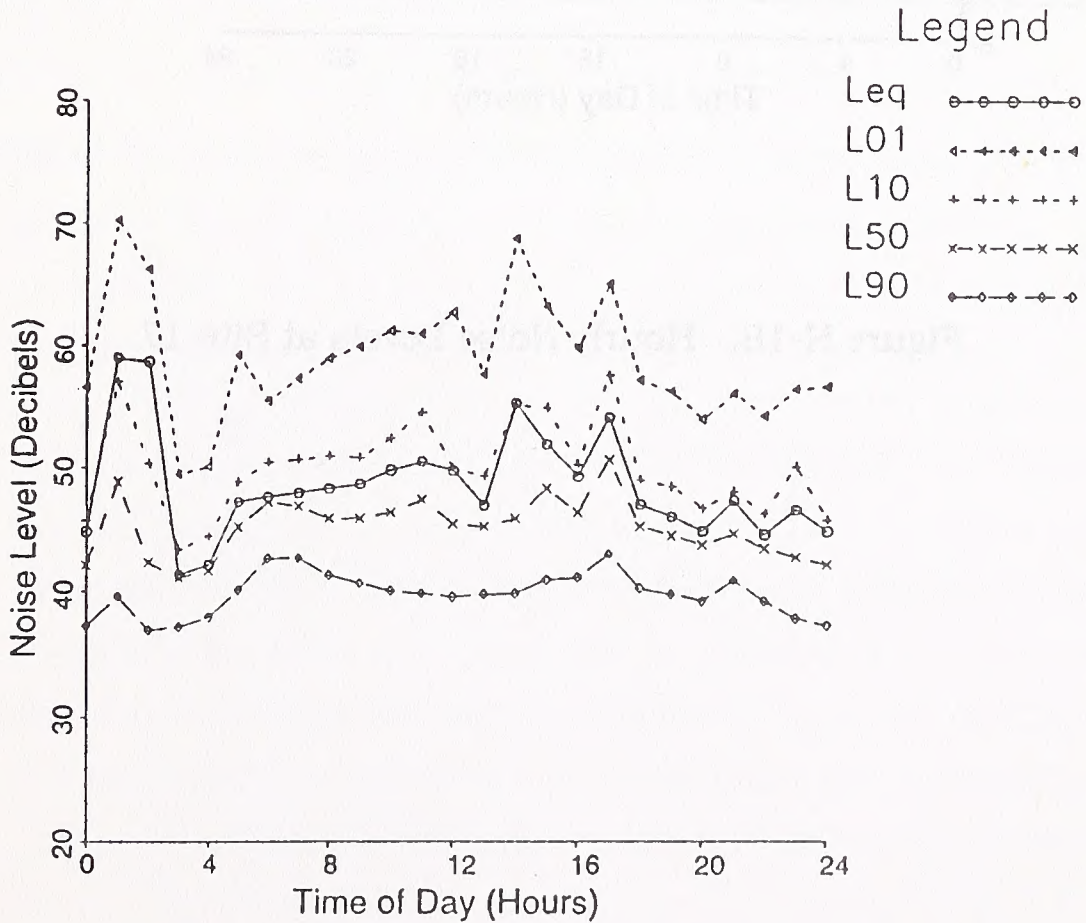


Figure H-17. Hourly Noise Levels at Site 16.

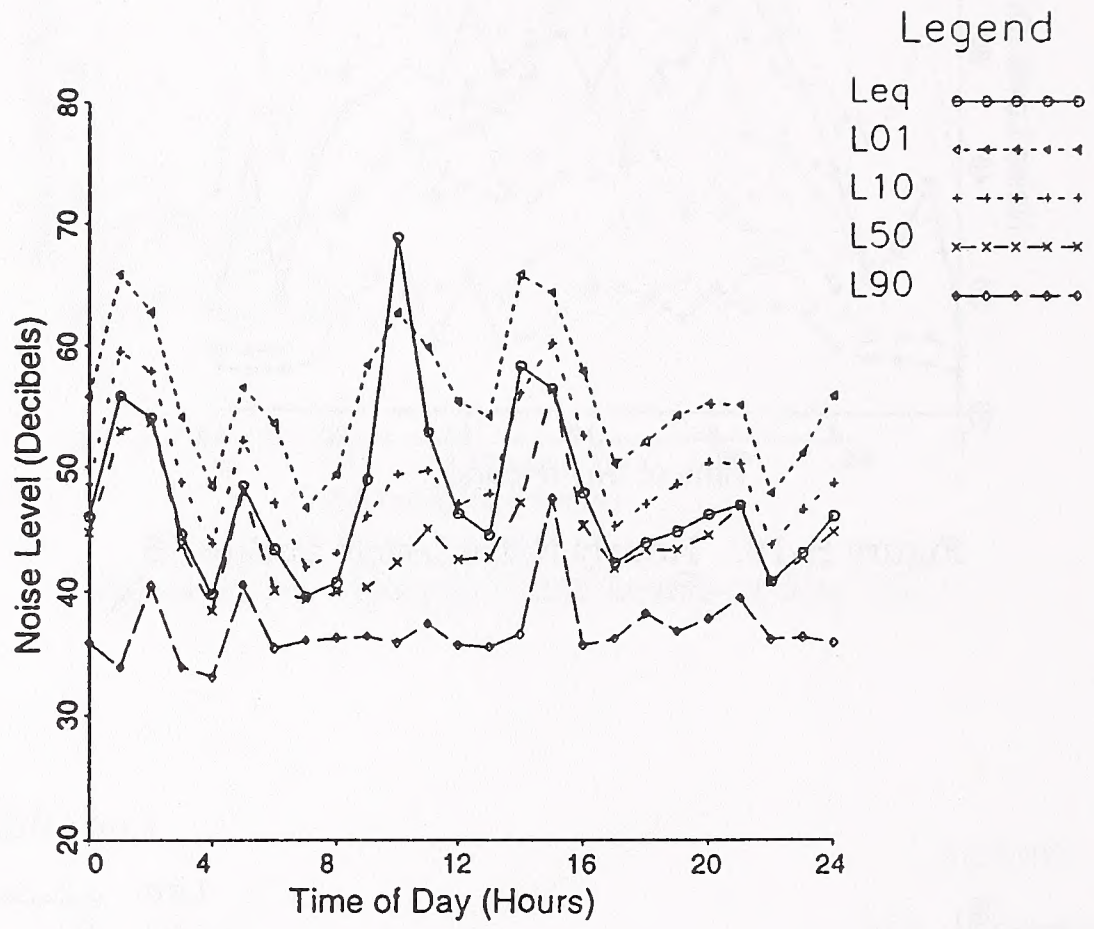


Figure H-18. Hourly Noise Levels at Site 17.



Table H4

## Summary of Continuous Noise Monitoring

Site No.	Total No. of Hours	No. of Daytime Hours	No. of Nighttime Hours	Energy-Equivalent Sound Level, dB	Energy-Equivalent Daytime Sound Level, dB	Energy-Equivalent Nighttime Sound Level, dB	DNL	L01	L10	L50	L90	L99
01	688	429	259	65	67	58	68	79	61	53	44	38
02	754	460	294	51	53	42	53	61	54	46	38	33
03	805	503	302	53	55	34	53	61	56	50	43	33
04	708	435	273	47	48	45	52	59	47	39	36	33
05	310	197	113	51	52	48	55	61	49	41	29	21
06	688	421	267	52	54	41	53	61	55	49	41	27
07	668	416	254	47	48	47	53	55	49	46	45	43
08	130	76	54	44	45	41	49	52	47	42	38	37
09	483	303	180	44	46	36	46	51	47	43	37	33
10	714	441	273	64	66	53	65	78	62	38	30	26
11	740	461	279	47	49	42	50	59	47	38	31	28
12	666	421	245	45	46	44	51	56	47	39	31	26
13	719	449	270	51	53	39	52	59	48	40	32	29
14	721	451	270	54	56	49	57	65	58	48	38	32
15	192	120	72	48	50	43	51	60	50	38	28	25
16	697	434	263	51	50	53	59	62	52	46	40	--
17	341	213	128	56	58	50	59	59	53	47	38	--

10-percentile, 50-percentile, 90-percentile, and 99-percentile exceeded sound levels. The energy-equivalent sound level evaluated over a 24-hour period varies from a low of 44 dB to a high of 65 dB. The 1-percentile exceeded sound level varies from a low of 51 dB to a high of 79 dB and the 90-percentile exceeded sound level varies from a low of 29 dB to a high of 44 dB.

The range of outdoor noise levels measured at 15 of the 17 locations is presented in Figure H-19. The  $L_{99}$  sound level was not recorded at Sites 16 and 17; therefore they have been excluded from the figure. The locations of the sites are listed with a brief description of the site and a bar graph showing the noise levels. This figure gives a cross-section of the noise environment in the rural areas of southern Colorado. Sites 10 through 13 consistently had the lowest background noise levels. These sites are located in Huerfano County between the Sangre De Cristo Mountains and the Wet Mountains. The average background level for this area was found to be 31 dB. In the San Luis Valley the average background level was found to be 40 dB.

Individual event data from the monitors were correlated with the 140th FW schedule information. Table H-5 presents a summary of this analysis. The table shows the date and time for each measured operation, the route number, the sites that detected the noise event, the time the noise level was above the exceedance threshold level, the maximum A-weighted sound level, the peak unweighted sound level, and the A-weighted sound exposure level.

The event data appearing in Table H-5 is plotted in Figures H-20(a) and H-20(b). Figure H-20(a) shows the probability distribution for the A-weighted sound exposure levels. The height of the rectangles equals the number of aircraft events having the same SEL. For example, during the 30-day monitoring period, an aircraft event having an SEL of 98 dB was detected eight times. Figure H-20(b) is the cumulative distribution of measured aircraft noise events. The graph is calculated by summing the rectangles in Figure H-20(a), dividing the summation by the total number of measured events appearing in Table H-5 (a value of 65), and multiplying the result by 100. From this figure, it is concluded that 50 percent of the aircraft events recorded during the monitoring period had a level at or below an SEL of 95 dB; and 90 percent of the events were below an SEL of 105 dB.

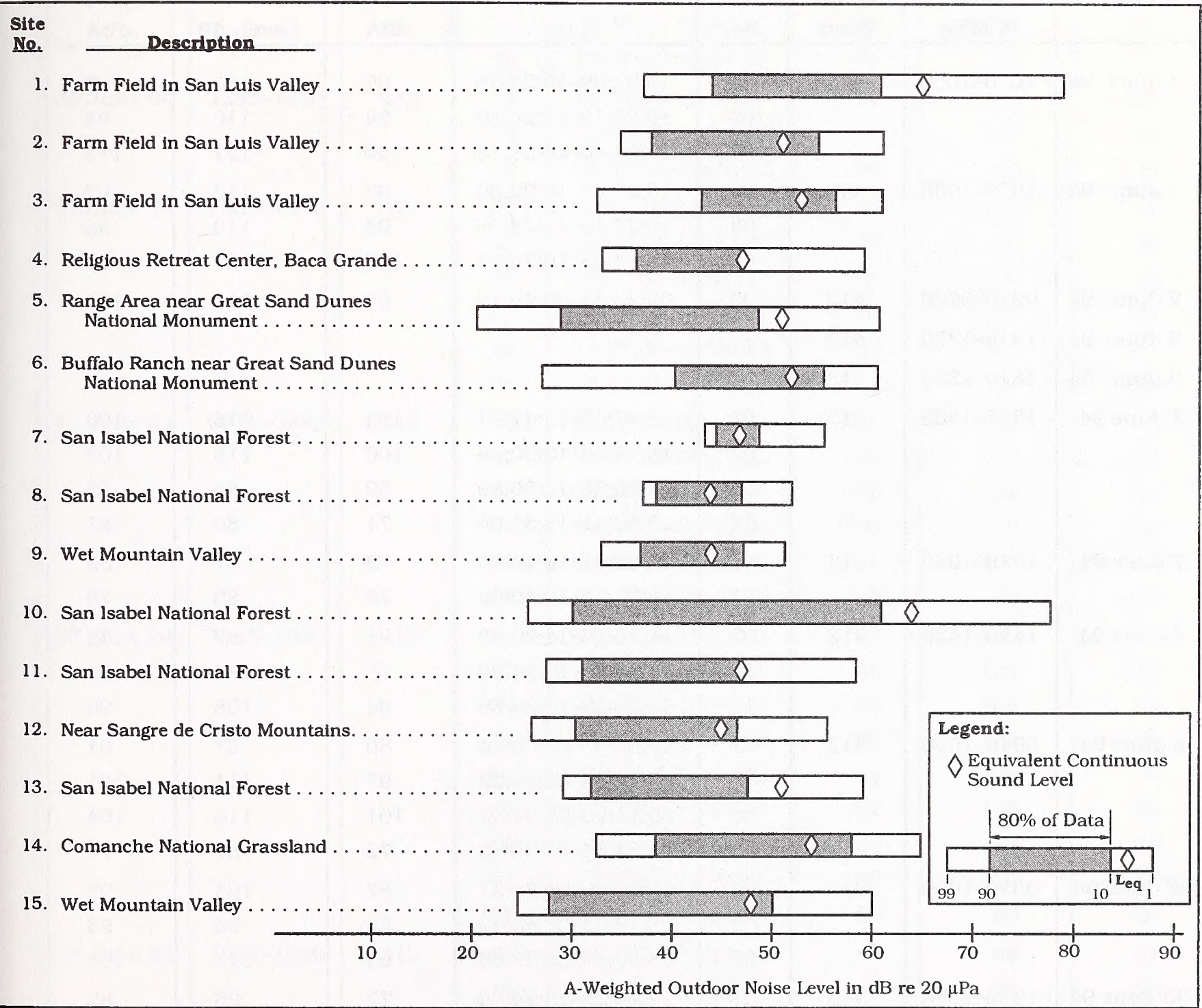


Figure H-19. Outdoor Noise Levels.

Table H5

Summary of Events Recorded Due to  
Air National Guard Operations

Date	Time in MTR	Flight Track	Site No.	Event Time	Lmax, dBA	Peak Level, dB	SEL, dBA
1 June 94	1010-1030	413	02	10:22:09-10:22:39	92	110	97
			05	10:24:18-10:24:39	94	110	98
			06	10:24:43-10:25:13	110	127	114
1 June 94	1015-1035	413	02	10:22:09-10:22:39	92	110	97
			05	10:24:18-10:24:39	94	110	98
			06	10:24:43-10:25:13	110	127	114
2 June 94	0910-0930	413	06	09:28:44-09:29:13	95	111	101
2 June 94	1310-1330	413	--				
3 June 94	1310-1330	413	--				
3 June 94	1340-1405	413	02	13:47:28-13:47:51	102	116	106
			05	13:49:55-13:50:18	100	116	103
			06	13:50:26-13:50:39	69	86	78
			06	13:50:41-13:51:09	71	86	81
7 June 94	1015-1040	412	07	10:25:41-10:26:05	73	87	83
			11	10:29:54-10:30:02	70	85	76
7 June 94	1410-1435	412	07	14:20:16-14:20:40	73	87	82
			10	14:24:22-14:24:39	76	89	84
			11	14:24:16-14:24:39	94	108	99
8 June 94	0940-1000	412	07	09:53:47-09:54:34	80	97	91
			08	09:51:08-09:51:22	97	114	101
			08	09:51:28-09:51:43	101	118	104
			11	09:54:34-09:54:42	72	87	78
22 June 94	0830-1000	413	02	08:33:42-08:34:21	87	103	95
			05	08:42:33-08:43:40	82	98	93
			06	08:36:43-08:37:85	95	114	104
22 June 94	1325-1350	413	01	13:24:25-13:24:36	77	95	82
			01	13:27:23-13:27:42	82	98	89
			02	13:25:01-13:25:29	99	116	103
			05	13:33:38-13:33:59	81	98	87
			05	13:37:16-13:37:34	83	99	89
			06	13:27:46-13:28:00	80	98	87
23 June 94	1000-1025	413	03	10:18:25-10:18:34	68	85	75
			03	10:18:44-10:19:15	75	91	84
			05	10:27:15-10:27:36	88	105	95
			06	10:21:20-10:22:00	88	106	98

Table H5 (Continued)

Date	Time in MTR	Flight Track	Site No.	Event Time	Lmax, dBA	Peak Level, dB	SEL, dBA
23 June 94	1035-1100	412	07	10:36:49-10:37:09	78	94	87
			11	10:40:52-10:41:12	76	95	84
			12	10:37:21-10:37:30	74	89	80
23 June 94	1355-1420	412	13	13:59:14-13:59:27	94	98	105
			13	13:59:39-14:00:10	94	111	98
			13	14:01:16-14:01:28	94	97	105
23 June 94	1355-1430	413	02	14:02:16-14:02:43	84	101	91
			02	14:07:43-14:08:56	73	93	95
			05	14:10:54-14:11:27	87	106	96
			05	14:11:27-14:12:26	77	92	87
			06	14:05:00-14:05:49	94	111	101
			06	14:10:48-14:11:45	83	99	93
24 June 94	0910-0935	413	02	09:18:01-09:18:23	74	91	98
			02	09:26:56-09:27:23	90	105	107
			03	09:24:14-09:24:40	85	104	92
			05	09:26:47-09:27:09	100	116	104
			06	09:20:51-09:21:33	91	108	98
			06	09:29:56-09:30:16	74	90	82
27 June 94	1515-1540	413	01	15:25:12-15:25:22	97	110	99
			01	15:25:26-15:25:35	96	109	98
			01	15:25:45-15:25:44	95	109	97
			01	15:26:03-14:26:12	96	109	98
			01	15:26:20-15:26:29	94	106	96
			01	15:27:02-15:27:11	97	109	99
			02	15:18:49-15:19:05	69	85	78
			05	15:27:42-15:27:56	80	97	87
28 June 94	1015-1040	412	07	10:15:13-10:15:32	84	99	91
			11	10:19:04-10:19:28	97	91	83
29 June 94	1520-1555	412	07	15:20:06-15:20:20	88	105	93
			11	15:24:33-15:24:47	84	98	89
			12	15:25:53-15:26:10	80	95	87
30 June 94	1525-1600	412	--				

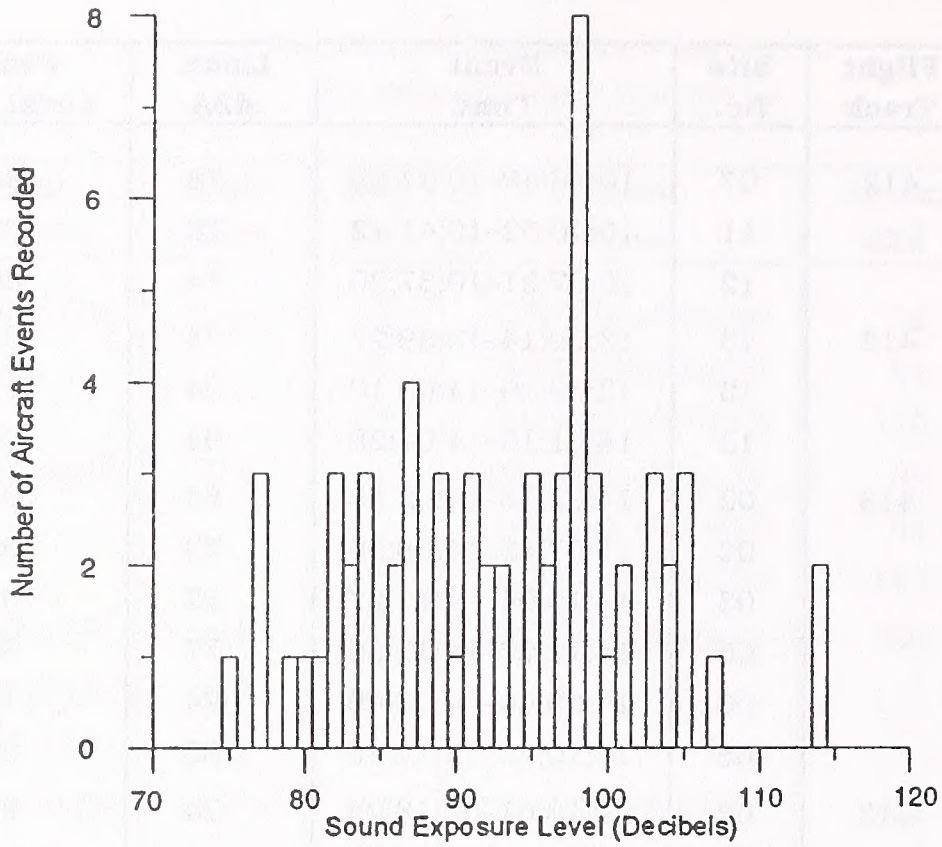


Figure H-20(a). Probability Distribution of A-Weighted Sound Exposure Levels.

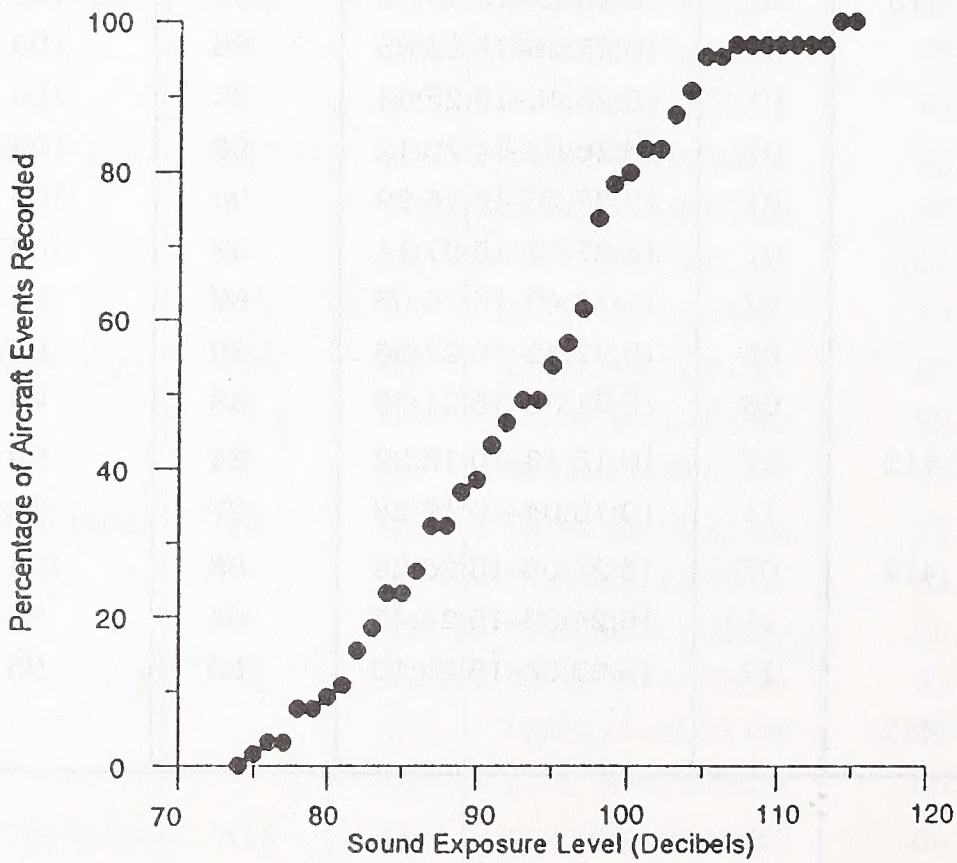


Figure H-20(b). Cumulative Distribution of A-Weighted Sound Exposure Levels for Measured Aircraft Noise Events.

Appendix I  
Aircraft Noise Measurement  
Profile Data Base

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**APPENDIX I**

**AIRCRAFT NOISE MEASUREMENT  
PROFILE DATA BASE**





## APPENDIX I

### Military Aircraft Dedicated Over Flight Noise Survey

Acoustical recordings of the noise from F-16C, F-111F, and B-1B military aircraft were made under control flight conditions. These tests were conducted from 28 June 1994 through 30 June 1994 at a ranch located in Cheyenne Wells, CO. The test plan followed procedures previously available in the literature (Bishop and Galloway 1975). The test matrix used for this study is shown in Tables 1 through 3. After completing the tests, the analog and digital recordings were sent to the U.S. Air Force, AL/OEBN, Wright-Patterson Air Force Base, OH. AL/OEBN performed the data processing and analysis of the noise recordings. Results of AL/OEBN analysis is a NOISEFILE data set that can be used as source level input to computer programs that model the noise from low-flying military aircraft. For example, these NOISEFILE data sets are in a format suitable for input into the ROUTEMAP computer program and were used, as such, to evaluate the noise impacts under the baseline and proposed action conditions. Tables 4 through 16 are a complete listing of the NOISEFILE data set generated from this noise survey. These tables are as presented by NOISEMAP's OMEGA10R program. Only the "air to ground" noise levels are relevant for the purpose of this survey.

Table 1  
Test Matrix for F-16

Flight No.	True Speed (kts)	Altitude (Ft AGL)
1	480	1,000
2	480	500
3	480	200
4	440	500
5	460	500
6	480	500
7	500	500
8	520	500
9	540	500
10	560	500

Table 2  
Test Matrix for F-111F

Flight No.	True Speed (kts)	Altitude (Ft AGL)
1	480	1,000
2	480	500
3	480	200
4	420	500
5	440	500
6	460	500
7	480	500
8	500	500
9	520	500
10	540	500
11	600	500

Table 3  
Test Matrix for B-1B

Flight No.	True Speed (kts)	Altitude (Ft AGL)
1	540	1,000
2	540	500
3	540	200
4	500	500
5	520	500
6	530	500
7	540	500
8	550	500
9	560	500
10	580	500

Table 4  
B-1B Sound Exposure Levels, dB, High-Speed Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	123.6	123.6	
125	122.1	122.1	
160	120.7	120.7	
200	119.2	119.2	SOUND EXPOSURE LEVELS (SEL)
250	117.7	117.7	B-1B            580 KTS
315	116.2	114.6	HIGH SPD TRAINING RT    102.5 % RPM
400	114.6	111.7	59 DEG F        70 % REL HUMIDITY
500	113.0	109.2	
630	111.4	106.8	
800	109.7	104.6	
1000	108.0	102.3	
1250	106.2	100.2	DISTANCE IN FEET
1600	104.3	98.2	
2000	102.3	96.1	
2500	100.3	94.1	
3150	98.0	92.1	
4000	95.7	90.1	
5000	93.1	87.8	
6300	90.4	85.4	
8000	87.3	82.6	
10000	84.0	79.4	
12500	80.3	75.3	
16000	76.2	70.6	
20000	71.5	65.2	
25000	66.3	59.2	

Table 5  
B-1B Sound Exposure Levels, dB, Low-Speed Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	123.2	123.2	
125	121.7	121.7	
160	120.2	120.2	
200	118.7	118.7	SOUND EXPOSURE LEVELS (SEL)
250	117.2	117.2	B-1B            500 KTS
315	115.6	114.8	LOW SPD TRAINING RT    100 % RPM
400	114.0	112.4	59 DEG F        70 % REL HUMIDITY
500	112.4	110.0	
630	110.7	107.5	
800	108.9	105.1	
1000	107.1	102.7	
1250	105.2	100.3	DISTANCE IN FEET
1600	103.2	98.2	
2000	101.0	96.0	
2500	98.8	93.9	
3150	96.4	91.7	
4000	93.8	89.6	
5000	91.1	87.1	
6300	88.1	84.5	
8000	84.8	81.4	
10000	81.3	77.9	
12500	77.4	73.4	
16000	73.1	68.2	
20000	68.4	62.5	
25000	63.1	56.2	

Table 6  
B-1B Sound Exposure Levels, dB, Low-CRU Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	122.5	122.5	
125	121.0	121.0	
160	119.5	119.5	SOUND EXPOSURE LEVELS (SEL)
200	118.0	118.0	
250	116.5	116.5	B-1B            550 KTS
315	114.9	114.0	
400	113.3	111.6	LOW CRUISE TRAINING RT            92 % RPM
500	111.7	109.2	
630	110.0	106.8	59 DEG F        70 % REL HUMIDITY
800	108.2	104.3	
1000	106.4	101.9	
1250	104.5	99.6	DISTANCE IN FEET
1600	102.5	97.4	
2000	100.4	95.3	
2500	98.1	93.2	
3150	95.7	91.0	
4000	93.2	88.9	
5000	90.4	86.4	
6300	87.5	83.8	
8000	84.3	80.7	
10000	80.7	77.3	
12500	76.9	72.8	
16000	72.6	67.6	
20000	67.9	61.9	
25000	62.8	55.6	

Table 7  
B-1B Sound Exposure Levels, dB, Mid-Speed Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	122.0	122.0	
125	120.6	120.6	
160	119.1	119.1	SOUND EXPOSURE LEVELS (SEL)
200	117.6	117.6	
250	116.1	116.1	B-1B            550 KTS
315	114.6	113.2	
400	113.0	110.3	MID SPD TRAINING RT            101 % RPM
500	111.5	107.8	
630	109.8	105.5	59 DEG F        70 % REL HUMIDITY
800	108.1	103.2	
1000	106.4	101.0	
1250	104.6	98.8	DISTANCE IN FEET
1600	102.7	96.8	
2000	100.7	94.8	
2500	98.6	92.8	
3150	96.3	90.8	
4000	93.9	88.7	
5000	91.3	86.4	
6300	88.5	84.0	
8000	85.4	81.2	
10000	81.9	78.0	
12500	78.1	73.8	
16000	73.8	68.9	
20000	69.0	63.3	
25000	63.7	57.1	

Table 8

F-111F Sound Exposure Levels, dB, High-Speed Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	124.3	124.3	
125	122.8	122.8	
160	121.3	121.3	SOUND EXPOSURE LEVELS (SEL)
200	119.8	119.8	
250	118.3	118.3	F-111F 610 KTS
315	116.7	115.5	
400	115.1	112.8	HIGH SPD TRAINING RT 97 % RPM
500	113.5	110.4	
630	111.8	107.9	59 DEG F 70 % REL HUMIDITY
800	110.0	105.6	
1000	108.2	103.2	
1250	106.3	100.8	DISTANCE IN FEET
1600	104.4	98.7	
2000	102.3	96.6	
2500	100.1	94.4	
3150	97.8	92.4	
4000	95.4	90.3	
5000	92.7	88.0	
6300	89.9	85.5	
8000	86.8	82.7	
10000	83.3	79.5	
12500	79.5	75.3	
16000	75.1	70.5	
20000	70.2	64.9	
25000	64.6	58.7	

Table 9

F-111F Sound Exposure Levels, dB, Low-Speed Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	111.4	111.4	
125	109.9	109.9	
160	108.4	108.4	SOUND EXPOSURE LEVELS (SEL)
200	106.8	106.8	
250	105.3	105.3	F-111F 450 KTS
315	103.7	103.1	
400	102.1	100.9	LOW SPD TRAINING RT 88 % RPM
500	100.4	98.5	
630	98.6	96.0	59 DEG F 70 % REL HUMIDITY
800	96.8	93.5	
1000	94.9	91.0	
1250	92.9	88.5	DISTANCE IN FEET
1600	90.8	86.2	
2000	88.6	84.0	
2500	86.3	81.7	
3150	83.8	79.5	
4000	81.1	77.2	
5000	78.3	74.7	
6300	75.3	71.9	
8000	72.2	68.6	
10000	68.8	64.9	
12500	65.1	60.1	
16000	61.3	54.8	
20000	57.1	49.1	
25000	52.7	43.0	

Table 10

## F-111F Sound Exposure Levels, dB, Low-CRU Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	119.6	119.6	
125	118.1	118.1	
160	116.6	116.6	SOUND EXPOSURE LEVELS (SEL)
200	115.1	115.1	F-111F 490 KTS
250	113.6	113.6	LOW CRUISE TRAINING RT 94 % RPM
315	112.1	110.8	59 DEG F 70 % REL HUMIDITY
400	110.5	108.0	
500	108.9	105.5	
630	107.2	103.1	
800	105.5	100.8	
1000	103.7	98.6	
1250	101.8	96.3	DISTANCE IN FEET
1600	99.9	94.3	
2000	97.9	92.3	
2500	95.7	90.3	
3150	93.4	88.2	
4000	90.9	86.2	
5000	88.3	83.9	
6300	85.3	81.5	
8000	82.1	78.7	
10000	78.5	75.4	
12500	74.4	71.1	
16000	69.7	66.1	
20000	64.4	60.3	
25000	58.3	53.6	

Table 11

## F-111F Sound Exposure Levels, dB, Mid-Speed Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	114.4	114.4	
125	112.9	112.9	
160	111.4	111.4	SOUND EXPOSURE LEVELS (SEL)
200	109.9	109.9	F-111F 500 KTS
250	108.3	108.3	MID SPD TRAINING RT 90 % RPM
315	106.7	106.1	59 DEG F 70 % REL HUMIDITY
400	105.1	103.9	
500	103.4	101.4	
630	101.7	99.0	
800	99.9	96.5	
1000	98.0	94.1	
1250	96.0	91.6	DISTANCE IN FEET
1600	93.9	89.4	
2000	91.7	87.2	
2500	89.4	85.0	
3150	86.9	82.8	
4000	84.3	80.6	
5000	81.4	78.0	
6300	78.4	75.2	
8000	75.1	72.0	
10000	71.6	68.2	
12500	67.8	63.4	
16000	63.8	58.0	
20000	59.5	52.1	
25000	54.9	45.8	

Table 12  
F-111F Sound Exposure Levels, dB, High-CRU Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	120.6	120.6	
125	119.2	119.2	
160	117.7	117.7	
200	116.2	116.2	SOUND EXPOSURE LEVELS (SEL)
250	114.6	114.6	F-111F            540 KTS
315	113.1	112.0	
400	111.5	109.4	HIGH CRUISE TRAINING RT        93 % RPM
500	109.9	107.0	
630	108.2	104.6	59 DEG F        70 % REL HUMIDITY
800	106.4	102.2	
1000	104.6	99.9	
1250	102.7	97.6	DISTANCE IN FEET
1600	100.7	95.6	
2000	98.6	93.5	
2500	96.4	91.5	
3150	94.0	89.4	
4000	91.5	87.3	
5000	88.7	84.9	
6300	85.7	82.4	
8000	82.4	79.4	
10000	78.7	76.0	
12500	74.5	71.5	
16000	69.8	66.2	
20000	64.5	60.2	
25000	58.7	53.4	

Table 13  
F-16 Sound Exposure Levels, dB, High-Speed Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	119.1	119.1	
125	117.7	117.7	
160	116.2	116.2	SOUND EXPOSURE LEVELS (SEL)
200	114.6	114.6	
250	113.1	113.1	F-16(G1            585 KTS
315	111.5	110.7	
400	109.9	108.4	HIGH SPD TRAINING RT        101 % NC
500	108.2	106.0	
630	106.5	103.5	59 DEG F        70 % REL HUMIDITY
800	104.7	101.1	
1000	102.8	98.6	
1250	100.8	96.2	DISTANCE IN FEET
1600	98.8	94.0	
2000	96.6	91.8	
2500	94.3	89.6	
3150	91.9	87.4	
4000	89.3	85.2	
5000	86.5	82.8	
6300	83.4	80.1	
8000	80.1	77.0	
10000	76.5	73.4	
12500	72.5	68.9	
16000	68.1	63.7	
20000	63.1	57.9	
25000	57.5	51.5	

Table 14  
F-16 Sound Exposure Levels, dB, Low-Speed Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	109.9	109.9	
125	108.5	108.5	
160	106.9	106.9	
200	105.4	105.4	SOUND EXPOSURE LEVELS (SEL)
250	103.8	103.8	F-16(G1      465 KTS
315	102.2	101.8	
400	100.6	99.8	LOW SPD TRAINING RT      94 % NC
500	98.9	97.4	
630	97.1	94.9	59 DEG F      70 % REL HUMIDITY
800	95.2	92.3	
1000	93.3	89.7	
1250	91.3	87.1	DISTANCE IN FEET
1600	89.1	84.9	
2000	86.8	82.6	
2500	84.4	80.3	
3150	81.8	78.0	
4000	79.1	75.7	
5000	76.1	73.1	
6300	73.0	70.2	
8000	69.7	66.8	
10000	66.1	63.0	
12500	62.3	58.1	
16000	58.3	52.5	
20000	53.9	46.6	
25000	49.3	40.2	

Table 15  
F-16 Sound Exposure Levels, dB, Mid-Speed Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	113.9	113.9	
125	112.4	112.4	
160	110.9	110.9	
200	109.4	109.4	SOUND EXPOSURE LEVELS (SEL)
250	107.9	107.9	F-16(G1      500 KTS
315	106.3	105.6	
400	104.7	103.2	MID SPD TRAINING RT      95.4 % NC
500	103.0	100.7	
630	101.3	98.4	59 DEG F      70 % REL HUMIDITY
800	99.6	96.0	
1000	97.7	93.7	
1250	95.8	91.4	DISTANCE IN FEET
1600	93.7	89.3	
2000	91.5	87.2	
2500	89.2	85.1	
3150	86.7	83.0	
4000	84.0	80.8	
5000	81.1	78.3	
6300	77.9	75.6	
8000	74.3	72.4	
10000	70.3	68.6	
12500	65.9	63.6	
16000	61.1	57.8	
20000	55.9	51.3	
25000	50.4	43.9	



Table 16

F-16 Sound Exposure Levels, dB, High-CRU Training Route

DISTANCE	AIR TO GROUND	GROUND TO GROUND	
100	116.6	116.6	
125	115.1	115.1	
160	113.6	113.6	SOUND EXPOSURE LEVELS (SEL)
200	112.1	112.1	F-16(G1 540 KTS
250	110.6	110.6	HIGH CRUISE TRAINING RT 99 % NC
315	109.0	108.1	59 DEG F 70 % REL HUMIDITY
400	107.4	105.7	
500	105.7	103.2	
630	104.0	100.8	
800	102.2	98.4	
1000	100.4	96.0	DISTANCE IN FEET
1250	98.5	93.7	
1600	96.4	91.6	
2000	94.3	89.5	
2500	92.0	87.4	
3150	89.6	85.3	
4000	87.0	83.2	
5000	84.2	80.7	
6300	81.1	78.1	
8000	77.7	75.0	
10000	73.9	71.5	
12500	69.7	66.8	
16000	64.9	61.4	
20000	59.7	55.3	
25000	53.9	48.3	



OBSERVATIONS OF BEHAVIORAL RESPONSES OF  
THE AMERICAN BISON TO F-16 LOW-ALTITUDE OVERFLIGHTS

EXECUTIVE SUMMARY

The purpose of this study was to determine the behavioral responses of American bison to low-altitude overflights by F-16 fighter jets. The study was conducted in the summer of 1998 in the Wind River Basin, Wyoming. The study area was divided into three zones: Zone 1 (low density), Zone 2 (medium density), and Zone 3 (high density). The study was conducted during the summer months when bison are most active. The study was conducted during the summer months when bison are most active. The study was conducted during the summer months when bison are most active.

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**APPENDIX J**

**OBSERVATIONS OF BEHAVIORAL RESPONSES  
OF THE AMERICAN BISON TO  
F-16 LOW-ALTITUDE OVERFLIGHTS**



## **APPENDIX J**

### **OBSERVATIONS OF BEHAVIORAL RESPONSES OF THE AMERICAN BISON TO F-16 LOW-ALTITUDE OVERFLIGHTS**

#### **EXECUTIVE SUMMARY**

At the Technical Information Group meeting for the Colorado Airspace Initiative (CAI), July 12, 1993, the Air National Guard Readiness Center representatives agreed to conduct an observational examination to identify the effects of low-altitude aircraft noise on American bison herds. An observational examination was conducted from June 18 to June 27, 1994 as part of the CAI Environmental Impact Statement (EIS) process. Herd observations utilized the F-16 aircraft of the 140th Fighter Wing of the Colorado Air National Guard stationed at Buckley Air National Guard Base, Colorado. Observational and noise monitoring data were gathered and analyzed to assess these effects. The site location was chosen from several bison ranches that occur under the airspace currently utilized by the 140th Fighter Wing. After receiving consent from the ranch owner, Rocky Mountain Bison, Inc. located near Mosca, Colorado was chosen for the observational examination. The ranch underlies the Military Training Route (MTR) Visual Route (VR) 413.

A herd of approximately 2,800 bison, representing the largest herd in Colorado, was the subject of the observations. Three distinct bison sub-herds within the larger herd were observed; a bison female (cow)/calf herd consisting of approximately 2,200 animals, a small herd of two-year old bulls in a feed-lot, and a herd consisting of approximately 500 one-year old animals. Also, due to their presence on the ranch, seven horses were placed in a paddock adjacent to the feedlot to observe the horses' responses to the overflights.

In summary, behavioral responses of American bison to low-altitude F-16 aircraft overflights were limited. Free-ranging bison juvenile and adult females with calves did not exhibit any behavioral responses to the F-16 aircraft overflights. The bison bulls contained in a feedlot exhibited minor to major behavioral reactions to F-16 aircraft overflights conducted at altitudes 500, 1,000 and 1,500 feet above ground level directly overhead. The yearling bison herd, free-ranging separately from other animals in the herd, was observed to have a major reaction to overflights at an altitude of 500 feet above ground level directly overhead. However, this reaction may have, at least in part, been the result of the herd's heightened anxiety level due to the close proximity of the ground crew. Additional observations may be necessary before any definitive conclusions can be reached concerning the impacts of military aircraft overflights of yearling bison. The horses contained in a paddock did not exhibit any behavioral responses to the F-16 aircraft overflights conducted.

#### **ACKNOWLEDGMENTS**

Funding for this project was provided by the Air National Guard. The F-16 aircraft utilized for this observational examination were provided by the 140th Fighter Wing of the Colorado Air National Guard stationed at Buckley Air National Guard Base, Colorado. Rocky Mountain Bison, Inc. located in Mosca, Colorado provided the observation area and bison for this project. Special thanks are extended to Mr. Ken Klemm, ranch manager of Rocky Mountain Bison, Inc. during the observational examination, for his invaluable guidance throughout the observations.

## **J.1 INTRODUCTION**

The National Guard Bureau is proposing to modify existing and to create new military training airspace for the 140th Fighter Wing at Buckley Air National Guard Base, Colorado. This proposal is called the Colorado Airspace Initiative.

At the Technical Information Group meeting for the Colorado Airspace Initiative, July 12, 1993, Air National Guard representatives agreed to perform literature reviews and conduct an observational examination to identify the effects of aircraft noise on American bison herds. The specific concern expressed to Air National Guard was that the sudden onset of aircraft noise could potentially cause a herd of bison to stampede.

This report provides specific details of the observations that were conducted by the Air National Guard involving low-altitude F-16 aircraft operations in close proximity to bison herds to evaluate the behavioral response of bison to the sudden onset of aircraft noise.

### **J.1.1 Goal and Objective**

The purpose of the observational examination was to evaluate the effects of noise generated from low-altitude F-16 overflights on American bison. Observational and noise monitoring data were used to assess these effects.

### **J.1.2 American Bison**

The American bison (*Bison bison*) has traditionally been associated with the prairies, but it has also occurred in mountainous areas and open forests. Males average larger than females, standing 5 to 6 feet at the shoulder and often weighing more than a ton. Hair on the head, neck, shoulders, and forelegs is shaggy and brownish-black. The remainder of the body is covered with short hairs of a lighter color. The forehead is short and broad, the head is heavy, and the shoulders have a high hump (Nowak 1991). Both sexes have horns that are short, upcurving, and sharp. Bison are herd-oriented animals. Mature males move about alone or in small groups for most of the year, but join the females during mating season. Mating season begins in late summer. Reddish-brown calves weighing approximately 50 pounds are born in the spring.

Bison frequently wallow in dust or mud and rub against boulders, tree trunks, and other objects to rid themselves of parasites. Feeding is often done in the morning and at dusk. Bison feed mainly on grass, and will migrate an average of 1.5 miles daily in search of food (Bauer 1986). The animals often quicken their gait in cases of danger, from a walk to a trot and then to a gallop, reaching maximum speeds of about 30 miles per hour. The position of a bison's tail is an indicator of the animal's temperament. A calm animal's tail is down. Vertical elevation of the tail indicates that the animal is extremely agitated (ABA 1993).

### **J.1.3 Prior Research**

A literature review into the effects of aircraft noise on bison has yielded one study (Frazier 1972). The effects of aircraft noise on a 1,000 head herd of bison were documented by a USAF study at the Ft. Sill Military Reservation, OK in 1972 (referred to as "the Oklahoma Study"). The purpose of the Oklahoma Study was to "quantitate environmental noise levels which would be produced by F-105 aircraft overflights" especially at "locations thought to be of major interest from a noise standpoint." One of these locations was the Wichita Mountain Wildlife Refuge. The Refuge encompasses

59,000 acres, and adjoins the Quanah Weapons Range on the Ft. Sill Military Reservation in southwestern Oklahoma. At the time of the study, the bison herd was one of the largest in existence.

The study utilized octave band analyzers, sound level meters, sound level calibrators, and other equipment to measure noise levels in proximity to the bison. The maximum noise level measured at Camp Boulder was 89 A-weighted decibels (dBA). As stated in the study, "that level occurred during a flyby of four F-105s flying in formation. On that particular pass the aircraft were in the process of acquiring the target area and were flying inside of the nominal flight path. For that condition the calculated maximum perceived noise level (PNdB) was 99 PNdB."

The Oklahoma Study results indicate that the aircraft noise did not elicit or produce any reaction from bison. Specifically, the Camp Boulder Study stated that "the noise appeared to have absolutely no visible effect on the buffalo [which were observed and within 10 yards of where the noise measurements were made]. The noise elicited no response such as head movement, leg movement, etc. The buffalo appeared oblivious to the aircraft noise and continued grazing throughout all aircraft passes. In fact, the noise generated by the firing of [a] missile (which caused the ground to shake and which sounded like a very loud thunder clap) had no visible effect upon the buffalo herd."

#### **J.1.4 Telephone Survey Data Supplement**

To supplement published material, a brief telephone survey was conducted to collect anecdotal information from individuals experienced in bison management on the effects of jet aircraft overflights on American bison. This telephone survey was done prior to the observational examination and also served as a means to identify candidate bison herds. Table J-1 provides a list of those individuals contacted during the survey. A majority of the individuals contacted managed herds located in relatively close proximity to military air bases. Other sources of noise (i.e., locomotives, small propeller-driven aircraft, military helicopters, commercial airliners, etc.) were also documented.

The information gathered on the impacts of aircraft operations in the vicinity of bison herds indicates a consensus of opinion from most bison breeders that bison do not react adversely to jet aircraft. All of the herd owners and managers were in unanimous agreement that aircraft overflights did not solicit behavioral responses among their respective herds. This is in contrast to commonly voiced opinions of negative impacts from wildlife biologists. It was the opinion of the wildlife biologists that military aircraft operations may significantly impact bison, especially during breeding and calving seasons.

#### **J.1.5 Observational Examination Site Location and Herd Disposition**

The observational examination site location was chosen from several bison ranches that occur under the airspace currently utilized by the 140th Fighter Wing. Rocky Mountain Bison, Inc. located near Mosca, Colorado underlies VR-413. Rocky Mountain Bison, Inc. manages 104,000 acres of land in Alamosa and Sagauche Counties. This parcel of land is comprised of two contiguous ranches: the Zapata Ranch and the Medano Ranch. Figure J-1 details the location of the ranches.

The High Meadow Bison herd, managed by Rocky Mountain Bison, Inc., contains approximately 2,800 bison, representing the largest herd in Colorado. The free-ranging herds are rotated through several large, fenced pastures totaling over 15,000 acres. The bison were turned out to the pasture in April 1994. The pastures receive water from a network of creeks and streams originating in the Sangre de Cristo Mountains and

manually via irrigation ditches. This dual system ensures the growth of ample foodstock for the bison. The herd has experienced low-altitude aircraft overflights for approximately the past 20 years.

#### **J.1.6 Ground Crew Personnel**

The individuals that served as members of the ground crew are listed below as well as a summary of their responsibilities during the observational examination.

Ken Klemm (Rocky Mountain Bison, Inc. Herd Manager during the observational examination) - Mr. Klemm was responsible for assessing the location of each herd observed prior to each overflight. Mr. Klemm was also responsible for assessing when the animals resumed normal behavior after each overflight if a behavioral response was solicited.

Richard Masse (Air National Guard Natural Resources Staff Officer) - Mr. Masse was responsible for oversight of the entire observational examination.

Brian Hoppy (Science and Engineering Associates, Inc. Biologist/Environmental Scientist) - Mr. Hoppy was responsible recording the observations of the bison herds during the control and overflight portions of the observational examination. Mr. Hoppy was also responsible for analyzing the observational data generated.

LTC Stephen Shiell (Air National Guard Environmental Protection Specialist) - LTC Shiell was responsible identifying and contacting the F-16 aircraft en-route to the observation locations and guiding the aircraft to the desired flight specifications.

LTC Buck Buckingham (140th Fighter Wing Buckley Air National Guard Base Airspace Manager) - LTC Buckingham was responsible for the scheduling of the F-16 aircraft participating in the observational examination.

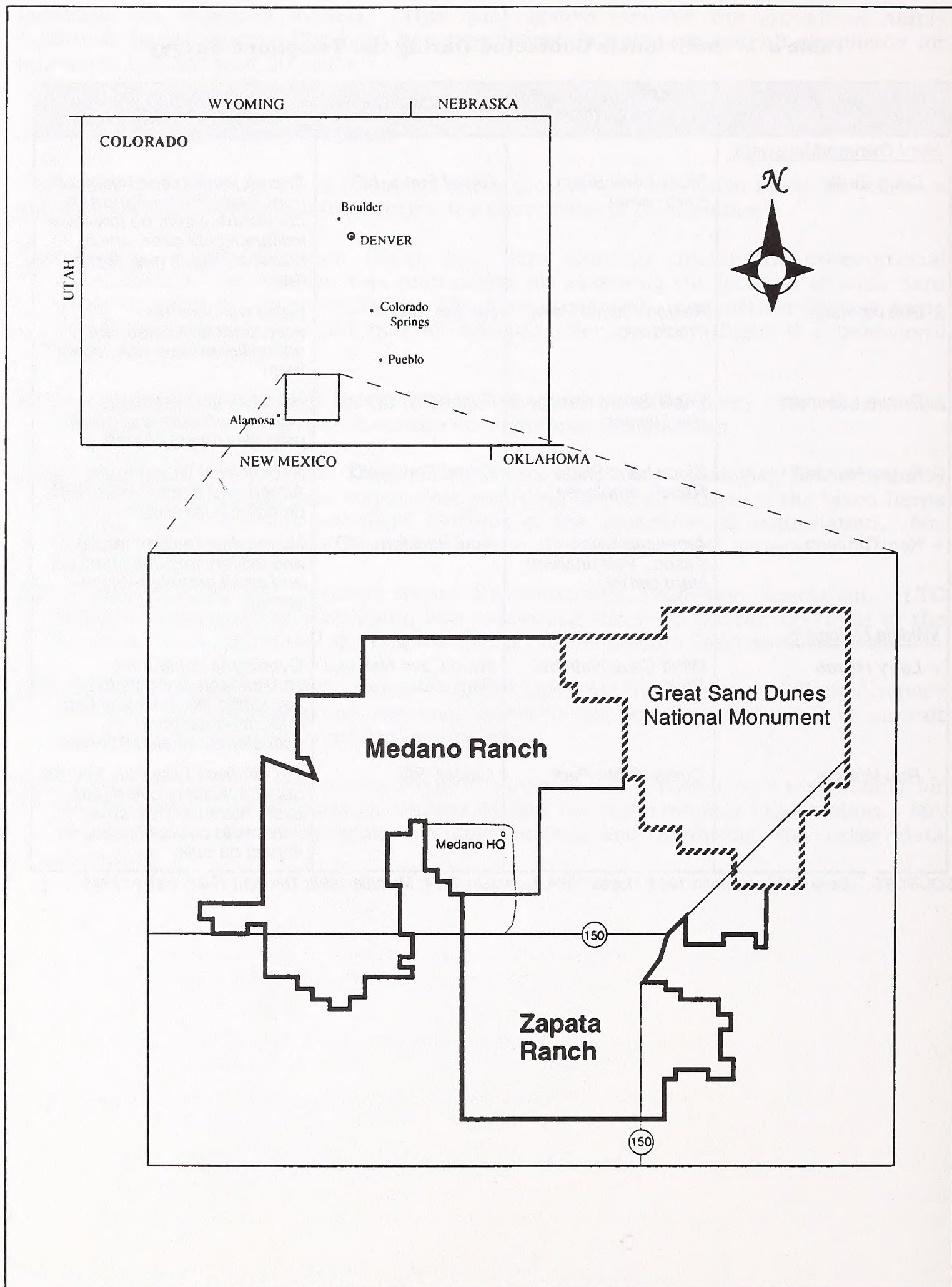
Kevin Bradley (WYLE Laboratories Noise Engineer) - Mr. Bradley was responsible for positioning the noise monitors utilized during the observational examination. Mr. Bradley was also responsible for downloading and analyzing the noise data generated.



**Table J-1. Individuals Contacted During the Telephone Survey**

NAME	AFFILIATION/ POSITION	LOCATION	SUMMARY OF STATEMENT
<u>Herd Owners/Managers:</u>			
- Doug Earle	Sioux Land Bison, Herd owner	Grand Forks, ND	Aircraft landing and taking off from Grand Forks Airport do not disturb bison, no low-level military flights over ranch, however, flights may "spook" them
- Bob Johnson	Reston Animal Park, President	Reston, VA	Bison will become accustomed to noise, but unfamiliar noises may "spook" them
- Duane Lammars	Triple Seven Ranch, Herd owner	Rapid City, SD	No adverse reactions to military helicopters or small propeller-driven aircraft
- Roger Murchie	Sioux Land Bison, Ranch employee	Grand Forks, ND	Aircraft from Grand Forks Airport and Grand Forks AFB do not disturb bison
- Ken Throlson	American Bison Assoc., Veterinarian/ Herd owner	New Rockford, ND	No reaction to commercial and military jets, locomotives, and small propeller-driven aircraft
<u>Wildlife biologists:</u>			
- Larry Hayes	Wind Cave National Park	Wind Cave National Park, SD	Overflights could have considerable impacts to cow/calf pairs, no impact on bulls, may become accustomed to aircraft noise
- Ron Walker	Custer State Park	Custer, SD	Aircraft from Ellsworth AFB do not effect bison, overflights could have considerable impacts to cow/calf pairs, no impact on bulls

SOURCES: Earle 1994; Johnson 1994; Hayes 1994; Lammars 1994; Murchie 1994; Throlson 1994; Walker 1994



**Figure J-1. Location of Rocky Mountain Bison, Inc.**

## **J.2 OBSERVATIONAL EXAMINATION APPROACH**

The behavioral responses of three distinct bison sub-herds within the larger 2,800 animal herd were observed; a herd of approximately 2,200 animals comprised primarily of bison females and calves (referred to as the "cow/calf herd"), a herd of 62 two-year old bulls in a feedlot (referred to as the "feedlot herd"), and a herd consisting of approximately 500 yearling animals (referred to as the "yearling herd"). Also, due to their presence on the ranch, seven horses were placed in a paddock adjacent to the Medano Ranch Headquarters to observe the horses' responses to the overflights. At the request of the herd manager, heart- and metabolic-rate measuring instruments were not used on the animals.

Reactions of the different bison sub-herds, as well as individual bison, to F-16 overflights were evaluated based on varying combinations of altitudes and lateral displacements from the herd. The overflights occurred at varying times each day throughout the examination. Overflights were comprised of one to four aircraft based upon their scheduling availability from Buckley Air National Guard Base. Four aircraft flown in formation represented the worst case flight scenario that would occur on VR-413. (Flight operations occurring on VR-413 normally employ two to four aircraft.) Aircraft power and speed settings ranged from 85-102 percent and 450-480 knots, respectively, representing conditions normally flown and expected to be flown on VR-413.

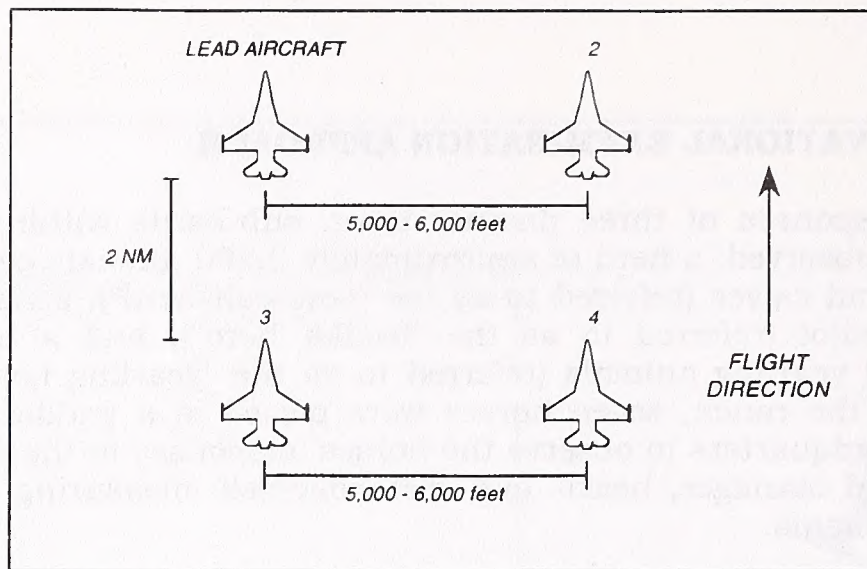
Low-altitude overflights were defined as those which are flown less than 1,500 feet above ground level. Altitudes of 300-, 500-, 1,000-, and 1,500-feet were chosen for this observational examination. In accordance with Air National Guard policy, aircraft will not be flown on VR-413 below 500 feet above ground level during peacetime conditions. However, VR-413 will be charted to 300 feet above ground level to provide adequate training airspace in the event that pilots must prepare for imminent wartime tasking. Special permission was received to conduct overflights at 300 feet above ground level to evaluate the behavioral responses of the bison herd during wartime training conditions.

Flight paths within MTRs may utilize the entire width of the flight corridor. The width of the portion of VR-413 that overlies the herd is 9 nautical miles as specified in the Colorado Airspace Initiative Original Proposal and Preferred Alternative. A direct pass of the lead aircraft in formation (see Figure J-2) over the herd is expected to represent the worst case scenario. Lateral displacements of 0-, 1-, and 2-nautical miles of the lead aircraft away from each herd were chosen for this examination.

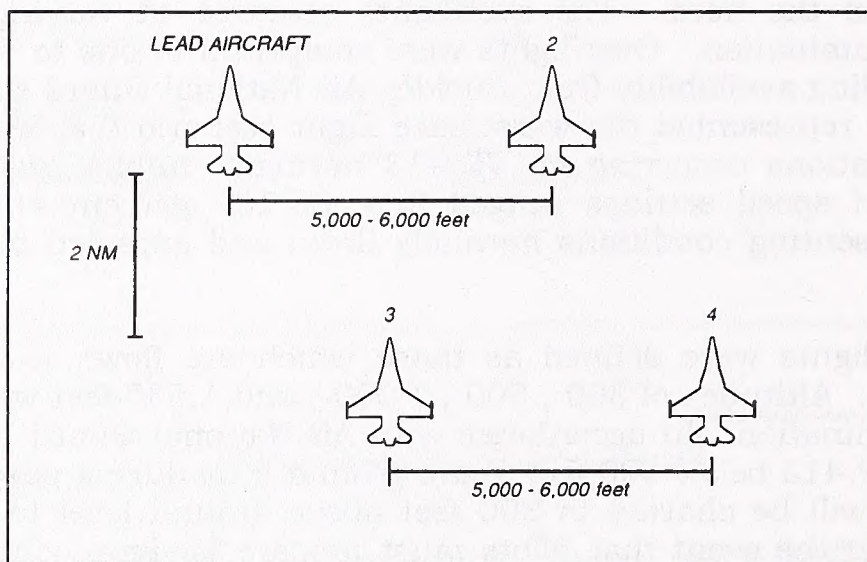
The altitude and lateral displacements of each overflight occurrence were randomly chosen throughout the observational examination from the above pre-selected values.

### **J.2.1 Noise Measurements/Monitoring**

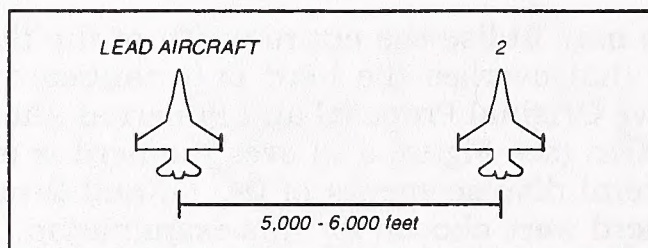
Noise levels were recorded using two of the Larson Davis-Model 820 noise monitors that were part of the Ambient Noise Monitoring Study conducted as part of the Colorado Airspace Initiative EIS process (see Appendix H). One noise monitor was placed near the main entrance of the Medano Ranch (Site 06 in Appendix H). The second noise monitor was placed near the fence line south of the herd (Site 05 in Appendix H). Figure J-3 details the locations of the two noise level meters in relation to the herds studied. The two noise level meters recorded data continuously throughout the overflight observations. The behavior of the bison herd was visually monitored and logged in a bound notebook. Still photographs and video recordings were also utilized.



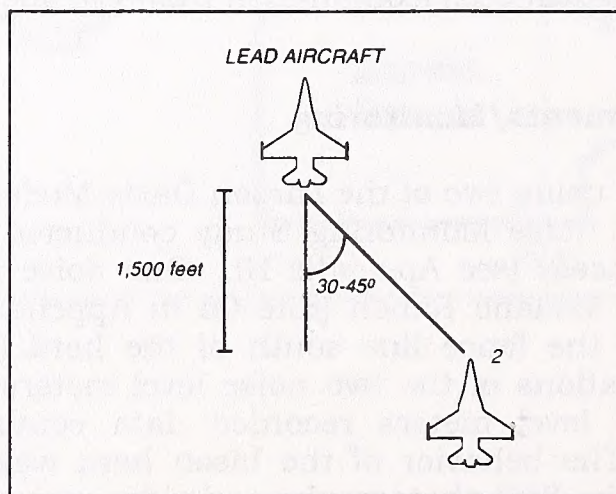
BOX



OFFSET BOX



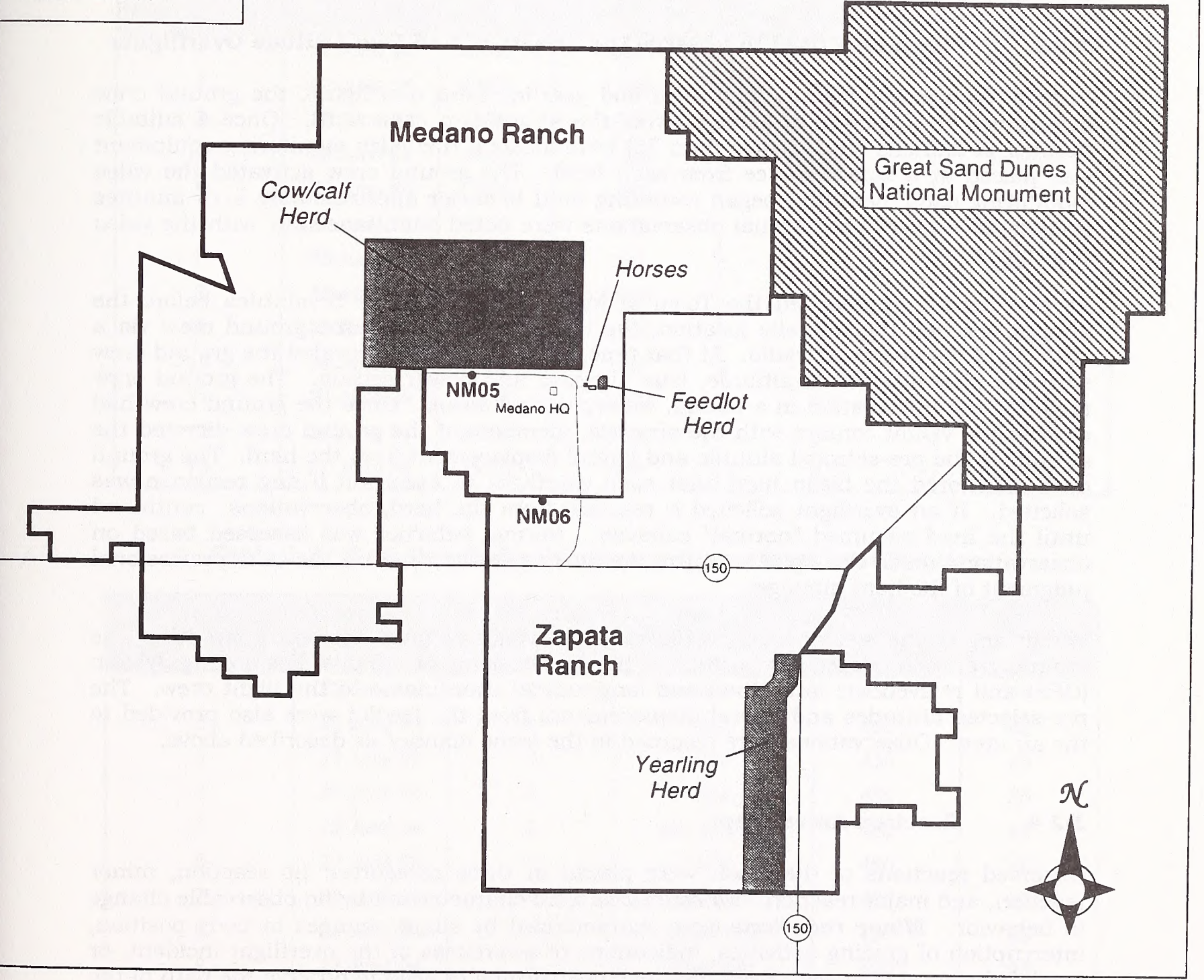
LINE ABREAST



FIGHTING WING

Figure J-2. F-16 Aircraft Formations Flown During the Observational Examination

KEY:  
 • - Noise Monitor  
 NM05 - Site 05  
 NM06 - Site 06



**Figure J-3. Herd Position and Noise Monitoring Instrument Locations**

## **J.2.2 Monitoring of the Control Groups**

The 140th Fighter Wing conducted training outside of the State of Colorado during the week of June 13, 1994. The control portion of the observational examination involved monitoring and assessing each sub-herd's behavior for a period of four days during the absence of F-16 overflights. The daily control monitoring was conducted at varying times during sunlight hours. Each herd was monitored for approximately 8 hours.

## **J.2.3 Procedures Used to Observe the Effects of f-16 Low-Altitude Overflights**

Prior to monitoring the cow/calf herd and yearling herd overflights, the ground crew determined the position of a majority of the animals in each herd. Once a suitable number of animals (i.e., greater than 75) were located, the video monitoring equipment was placed at a safe distance from each herd. The ground crew activated the video monitoring equipment and began recording herd behavior approximately 5-15 minutes prior to each overflight. Visual observations were noted simultaneously with the video recordings.

As the aircraft approached the Town of Moffat, approximately 5 minutes before the aircraft reached the test site location, the lead aircraft alerted the ground crew via a UHF-band air-to-ground radio. At that time, the lead aircraft provided the ground crew with the aircraft's actual altitude, true airspeed and power setting. The ground crew recorded the information in a bound, waterproof notebook. Once the ground crew had established visual contact with the air crew, members of the ground crew directed the aircraft to the pre-selected altitude and lateral displacement from the herd. The ground crew monitored the bison herd after each overflight to ascertain if any response was solicited. If an overflight solicited a reaction from the herd, observations continued until the herd assumed "normal" behavior. Normal behavior was assessed based on observations made during the control monitoring period, and on the best professional judgment of the herd manager.

Monitoring of the feedlot herd overflights employed a slightly different approach. The ground crew determined the position of the feedlot using of a Global Positioning System (GPS) and relayed the latitudinal and longitudinal coordinates to the flight crew. The pre-selected altitudes and lateral displacements from the feedlot were also provided to the air crew. Observations were recorded in the same manner as described above.

## **J.2.4 Reaction Assessment**

Observed reactions of the bison were placed in three categories: no reaction, minor reaction, and major reaction. **No reactions** were characterized by no observable change in behavior. **Minor reactions** were characterized by slight changes in body position, interruption of grazing activities, indications of awareness of the overflight incident, or small behavioral changes. Examples included turning of head to observe the path of the plane or the origin of noise if the plane was not visible, slight elevation of the tail, twitching the ears, or increases in vocal activity. **Major reactions** were characterized by gross changes in behavior, body location, vertical elevation of the tail, or exhibitions of panic or extreme stress.

## **J.2.5 Observational Examination Chronology**

The observational examination was conducted from June 18 to June 27, 1994. A total of eight days of monitoring took place; four days of control monitoring and four days of overflight monitoring. During the observation period, the herd experienced thirteen low-

altitude overflights of F-16 aircraft utilizing VR-413. Tables J-2 and J-3 summarize these overflights.

**Table J-2. Summary of the F-16 Overflight Occurrences**

OVERFLIGHT OCCURRENCE	DATE	TIME	ALTITUDE (feet above ground level)	LATERAL DISPLACEMENT (nautical miles)	HERD OVERFLOWN
1	22 June 94	08:42	500	0	cow/calf
2	22 June 94	13:02	1,500	2	cow/calf
3	22 June 94	13:05	1,500	1	cow/calf
4	22 June 94	13:08	1,500	0	cow/calf
5	22 June 94	13:32	1,000	0	feedlot
6	22 June 94	13:37	500	0	feedlot
7	23 June 94	10:27	300	0	cow/calf
8	23 June 94	14:15	1,000	0	cow/calf
9	23 June 94	14:20	1,000	1	cow/calf
10	24 June 94	09:27	500	1	feedlot
11	24 June 94	09:36	1,500	0	feedlot
12	24 June 94	09:51	2,000	0	feedlot
13	27 June 94	15:28	500	0	yearling

**Table J-3. F-16 Overflight Occurrence Operational Specifications**

OVERFLIGHT OCCURRENCE	DATE	NUMBER OF AIRCRAFT	AIRCRAFT FORMATION <sup>1</sup>	TRUE AIRSPEED (knots)	POWER SETTING (%)
1	22 June 94	2	line abreast	450	94
2	22 June 94	4	box	450	85
3	22 June 94	4	box	450	85
4	22 June 94	4	box	450	85
5	22 June 94	2	line abreast	480	95
6	22 June 94	1	N/A	480	102
7	23 June 94	4	offset box	450	95
8	23 June 94	4	offset box	450	95
9	23 June 94	4	offset box	450	95
10	24 June 94	2	line abreast	450	96
11	24 June 94	2	fighting wing	450	96
12	24 June 94	2	fighting wing	450	92
13	27 June 94	4	box	450	98

NOTE:  
1. See Figure J-2.

## J.2.6 Data Analysis

Members of the ground crew reviewed the video tapes at the completion of the overflight test period. Recorded and noted reactions were then categorized as described in Section J.2.1. Simple percentages were calculated for the numbers of no reactions, minor reactions, and major reactions recorded. Response times were summarized and averaged for each reaction category.

Sound exposure levels (SEL) and average day-night noise levels (Ldn) were downloaded from the two noise monitoring instruments at the completion of the Ambient Noise Monitoring Study as detailed in Appendix H. These data are presented in Attachment A. The SEL data generated from both noise level meters was averaged for each overflight occurrence and is presented in Section J.3.0. The noise data and flight specifications (i.e., altitude and lateral displacements) were compared with the reaction data to determine which F-16 aircraft flight conditions solicited bison behavioral responses.



## **J.3 RESULTS OF FIELD OBSERVATIONS AND DATA COLLECTION**

### **J.3.1 Cow/Calf Herd**

The cow/calf herd, containing approximately 2,200 bison adult and juvenile females and calves, was the largest free-ranging group of bison on the ranch property.

#### **J.3.1.1 Control Observations**

The herd grazed in over 15,000 acres of pastures. The herd was observed grazing as a single unit and spread out in smaller groups of 75 to 500 animals. The animals migrated slowly through the pastures. If single animals became separated from a herd and the herd began to move to another area, the individuals separated from the herd would quicken their gait, sometimes to a trot to join the herd.

In general, calves were more active than the adult and juvenile females. Single calves were often observed indiscriminately running among the older animals. There was very little interaction noted between older animals in the herd. However, cow and calf pairs were observed to be in almost constant contact. The animals were vocally active with grunting and belching noises continuously emanating from the herd. Animals were observed to lie on the ground for long periods of time once they were finished feeding.

All of the animals observed had their tails in constant motion, swinging back and forth across their hind quarters to rid themselves of insects. Animals were often observed rolling on the ground, kicking dust onto themselves. The herds would leave the pasture after one to two hours of grazing even though there was an ample food supply in the area. This movement was attributed to insect irritation. A number of different parasitic insects were noted as being a persistent nuisance on the ranch property, including mosquitoes, gnats, deer flies, and horse flies. A solitary female was observed kicking its hind legs up into the air and running approximately 20 to 30 feet. After the animal stopped, it turned its head towards its hind section. This abrupt movement was, again, attributed to insect irritation.

Two thunderstorms occurred during the control monitoring period. The animals did not exhibit any behavioral changes during the adverse weather. The animals continued grazing during the downpours and through each lightning and thunder episode.

If the animals were approached too closely by the herd manager or the ground crew, either on foot or especially by motorcycle, they would move from the area. Animals lying down would stand. The ground crew took extreme caution when approaching a herd so that the herd would not be disturbed prior to overflights.

#### **J.3.1.2 Effects of Overflights**

**June 22, 1994.** A group of approximately 500 animals were observed. Observations were made 300 to 400 yards from the closest animals in the herd. Half of the animals in the herd were lying down, the other half were grazing. Random animals throughout the herd were observed rising up off of and lying down on the ground. The animals were observed for 20 minutes prior to the overflight occurrence. At 8:42 AM, two F-16 aircraft in line abreast formation flying toward the south passed directly over the herd at an altitude of 500 feet above ground level. The SEL for the overflight was measured at 98.5 dBA. No reactions were observed from 100 percent of the herd. Although there was some movement of animals in the herd, this movement was consistent with observations made prior to the overflight and during the control monitoring period. A

few animals were observed standing up during and shortly after the overflight. Most of the animals that were lying on the ground prior to the overflight remained stationary.

**June 22, 1994.** A group of approximately 150 animals were observed. Observations were made 350 yards from the closest animals in the herd. Half of the animals in the herd were grazing in a pasture, the other half were scattered in the shrub. Random animals throughout the herd were observed rising up off of and lying down on the ground. The animals were observed for 20 minutes prior to the overflight occurrences. At 1:02 PM, four F-16 aircraft in box formation flying toward the south passed 2 nautical miles west of the herd at an altitude of 1,500 feet above ground level. No reactions were observed from 100 percent of the herd. The aircraft continued south for approximately 2 nautical miles at which point the aircraft circled north. The four F-16 aircraft passed 1 nautical mile east of the herd at 1:05 PM at an altitude of 1,500 feet above ground level. No reactions were observed from 100 percent of the herd. A few calves were observed indiscriminately running among the rest of the herd. This movement, however, was consistent with movements observed during the control monitoring period. The aircraft continued north for approximately 2 nautical miles at which point the aircraft turned and headed south. At 1:08 PM, the four F-16 aircraft passed directly over the herd at an altitude of 1,500 feet above ground level. Major reactions were noted in a small group of 10 animals, representing 7 percent of the animals in the herd, that were grazing approximately 50 feet away from the rest of the bison in the pasture. As the aircraft made the third overflight directly overhead, the ten animals ran toward the larger group and stopped. After approximately ten seconds, the 10 animals continued grazing. No reactions were noted among the rest of the animals observed, approximately 97 percent of the animals in the herd. Noise level data were not recorded during these overflight occurrences.

It should be noted that the circling of the aircraft was performed specifically for this observational examination. The noise event experienced was far longer in duration than a typical noise event underneath an MTR. The reactions observed during the third overflight of the F-16 aircraft were attributed to this.

**June 23, 1994.** A group of approximately 1,900 animals were observed. Observations were made 350 to 400 yards from the closest animals in the herd. A majority of the animals were grazing, while approximately 25 percent of the animals were lying on the ground. Several calves were observed nursing. Several other calves were observed running among the herd. The animals were observed for 25 minutes prior to the overflight occurrence. At 10:27 AM, four F-16 aircraft in offset box formation flying toward the south passed directly over the herd at an altitude of 300 feet above ground level. The SEL for the overflight was measured at 96.5 dBA. No reactions were observed from a majority of the herd. Several animals, approximately 3 percent of the herd, directly under the flight paths of the F-16 aircraft exhibited major reactions. These animals scattered randomly, running approximately 20 to 30 feet. Once the animals stopped running, they began grazing. After approximately thirty seconds, these animals resumed normal behavior.

**June 23, 1994.** A group of approximately 1,500 to 1,900 animals were observed. Observations were made 350 to 400 yards from the closest animals in the herd. At 2:15 PM, as the ground crew was preparing to observe the animals, four F-16 aircraft in offset box formation passed directly over the herd flying toward the south at an altitude of 1,000 feet above ground level. The SEL for the overflight was measured at 98.5 dBA. No reactions were observed from 100 percent of the herd. The ground crew then established communications with the air crew and directed the aircraft to circle back to perform another overflight. The aircraft circled and passed the herd flying toward the north approximately 5 to 6 nautical miles west of the herd. At 2:20 PM, the four F-16 aircraft in offset box formation passed 1 nautical mile west of the herd flying toward the

south at an altitude of 1,000 feet above ground level. The SEL for the overflight was measured at 90 dBA. No reactions were observed from 100 percent of the herd.

### **J.3.2 Feedlot Herd**

The feedlot herd was composed of 62 two-year old bison bulls. The animals were contained in a 30 acre feedlot.

#### **J.3.2.1 Control Observations**

The feedlot had very little natural vegetation. Food was supplied to the animals by ranch employees and placed in a number of feed bins. This group of animals was in daily contact with humans and heavy machinery.

The bulls were extremely interactive with one another. Most of the animals observed displayed some form of aggressive behavior. A definite dominance hierarchy was noted. Two or three bulls were dominant in the group. These dominant animals were observed on a number of occasions mounting other bulls, pushing other bulls from the feed bins with their heads, and locking horns with other bulls until the submissive bulls retreated. One of the dominant bulls was observed harassing another bull that was lying on the ground. The dominant bull continued until the submissive bull rose up and trotted away. The dominant bull then laid in the same spot from which the submissive bull was displaced.

All of the animals observed had their tails in constant motion, swinging back and forth across their hind quarters to rid themselves of insects. Animals were often observed rolling on the ground, kicking dust onto themselves. The animals were vocally active with mild grunting and belching noises continuously emanating from the herd. At several times, loud grunts were noted during periods of heightened activity. Most of the activity focused around the feed bins. Once the animals were through feeding, they would move away from the feed bins and lay down.

#### **J.3.2.2 Effects of Overflights**

**June 22, 1994.** A majority of the animals were lying down near the northwest corner of the feedlot. The animals were observed for ten minutes prior to the overflight occurrence. At 1:32 PM, two F-16 aircraft in line abreast formation passed directly over the feedlot flying in a southern direction at an altitude of 1,000 feet above ground level. The SEL for the overflight was measured at 87 dBA. Major reactions were exhibited by approximately 50 percent of the herd. The animals rose up from their lying positions and moved toward the east in a trot. Several other animals exhibited minor reactions by turning their heads toward the animals that stood up. The rest of the herd remained lying down and exhibited no reaction to the overflight.

At 1:37 PM, a single F-16 aircraft passed directly over the feedlot flying in a southern direction at an altitude of 500 feet above ground level. The SEL for the overflight was measured at 89 dBA. Major reactions were observed from all of the animals. All of the animals that remained lying down after the first overflight occurrence stood up. Some of the animals walked from their location, while other animals trotted toward the east. A majority of the animals began to walk along the northern fence line. After approximately five minutes, some of the animals began to lay down. After ten minutes the animals resumed normal behavior.

**June 24, 1994.** A majority of the animals were lying down near the northwest corner of the feedlot. The animals were observed for 15 minutes prior to the overflight occurrence. At 9:27 AM, two F-16 aircraft in line abreast formation passed 1 nautical mile west of the feedlot flying in a southern direction at an altitude of 500 feet above ground level. The SEL for the overflight was measured at 104 dBA. A minor reaction was observed from one bull in the herd. The bull picked up its head, but immediately placed it back down on the ground. No reactions were observed from 98 percent of the herd.

At 9:36 AM, two F-16 aircraft in fighting wing formation passed directly over the feedlot flying in a southern direction at an altitude of 1,500 feet above ground level. The SEL for the overflight was measured at 98 dBA. A major reaction was observed from one bull in the herd, representing 2 percent of the animals in the herd. The bull trotted from a feed bin toward the animals lying in the northwest corner of the feedlot. Once the bull reached the other animals, it turned and walked back toward the feed bin. A minor reaction was observed from two bulls, approximately 3 percent of the herd. The animals stood up from a lying position as the aircraft flew overhead. No reactions were observed from 95 percent of the herd.

At 9:51 AM, two F-16 aircraft in fighting wing formation passed directly over the feedlot flying in a southern direction at an altitude of 2,000 feet above ground level. The SEL for the overflight was measured at 82 dBA. A minor reaction was observed from one bull in the herd, representing 2 percent of the animals in the herd. The bull picked up its head, but immediately placed it back down on the ground. No reactions were observed from 98 percent of the herd.

### **J.3.3 Yearling Herd**

The herd was comprised of approximately 500 one-year old bison.

#### **J.3.3.1 Control Observations**

The yearling animals were kept in a separate pasture due to their sometimes rambunctious behavior. The herd manager noted that the yearlings are extremely playful. This behavior trait may elicit aggressive responses from females protecting their calves, if the yearlings were placed with the cow/calf herd.

This group of bison were the most active. The herd was continually moving, pausing briefly to graze. There was a lot of playful interaction among the animals in the herd. Animals would bump into each other and chase each other, often running for short distances.

All of the animals observed had their tails in constant motion, swinging back and forth across their hind quarters to rid themselves of insects. Animals were often observed rolling on the ground, kicking dust onto themselves. The animals were vocally active with grunting and belching noises continuously emanating from the herd.

#### **J.3.3.2 Effects of Overflights**

**June 27, 1994.** While trying to acquire the yearling bison herd's position, the herd manager informed the ground crew that a majority of the yearlings were not in the pasture the animals were supposed to be in. The gate closure had been damaged, probably by an elk, and the bison had moved into an adjacent pasture.

Approximately 400 animals were located and the ground crew prepared to observe the animals. The yearling bison herd was walking toward the ground crew's position. The animals began running toward the north as the lead bison came within 50 yards of the ground crew. As the animals slowed their gait to a walk, the ground crew circled approximately 300 yards away from the northern-most animals in the herd. The bison again began moving toward the ground crew. As the animals approached the ground crew, the herd split and began encircling and moving closer to the ground crew's position. The closest animals very tentatively approached the ground crew within 15 feet. The animals were observed taking steps forward and back. All of the animals in the immediate vicinity of the ground crew had their eyes opened wide. When communications were established with the air crew, a member of the ground crew abruptly stood up. This caused several animals to jump back approximately five feet. The animals that had positioned themselves downwind of the ground crew were observed to have their nostrils flared with their noses up and mouths open. The herd was observed for 25 minutes prior to the overflight occurrence.

At 3:28 PM, four F-16 aircraft in box formation passed directly over the herd flying toward the south at an altitude of 500 feet above ground level. The SEL for the overflight was measured at 90 dBA. Major reactions were observed from 100 percent of the herd. The entire herd ran approximately 20 yards toward the west, stopped, and turned to face the ground crew. After approximately 30 seconds, a majority of the herd resumed normal behavior. Several animals began to lay down while others began to graze. The animals closest to the ground crew remained facing the ground crew until the ground crew departed.

#### **J.3.4 Horses**

Seven horses were placed in a paddock adjacent to the feedlot.

##### **J.3.4.1 Control Observations**

The horses were observed for twenty-five minutes prior to the overflight occurrences. Several of the animals moved slightly within the paddock fence line. The animals kept their heads down throughout the entire observation period, grazing the paddock grounds and feeding from a feed bin. All of the animals observed had their tails in constant motion, swinging back and forth across their hind quarters to rid themselves of insects. Several animals were observed shaking their manes at various times during the observation period. There was no interaction between the horses.

##### **J.3.4.2 Effects of Overflights**

**June 22, 1994.** At 1:32 PM, two F-16 aircraft in line abreast formation passed directly over the paddock flying in a southern direction at an altitude of 1,000 feet above ground level. The SEL for the overflight was measured at 87 dBA. No reactions were observed from 100 percent of the animals.

At 1:37 PM, a single F-16 aircraft passed directly over the paddock flying in a southern direction at an altitude of 500 feet above ground level. The SEL for the overflight was measured at 89 dBA. No reactions were observed from 100 percent of the animals.

#### J.4 CONCLUSIONS

Behavioral responses of American bison to low-altitude F-16 aircraft overflights were limited. Based on the observational and noise data generated, it is concluded that:

- Free-ranging bison juvenile and adult females with calves were not affected by F-16 aircraft overflights conducted directly overhead at altitudes as low as 300 feet above ground level. SELs ranged from 87 to 104 dBA.
- Bison bulls contained in a feedlot exhibited minor to major behavioral reactions to F-16 aircraft overflights conducted at altitudes under 1,500 feet above ground level directly overhead. The animals assumed normal behavior shortly after each overflight occurrence. The bulls were not affected by overflights conducted 1 nautical mile away from the feedlot. SELs ranged from 87 to 104 dBA.
- Yearling bison, free-ranging separately from other animals in the herd, were observed to have a major reaction to an overflight at an altitude of 500 feet above ground level directly overhead. The SEL for the overflight was 90 dBA. A majority of the animals assumed normal behavior within 30 seconds after the overflight occurrence. It was the general consensus of the ground crew and ranch manager that there was an increase in the herd's anxiety level due to their close proximity to the ground crew during the overflight occurrence. The herd's unfamiliarity with the pasture may have added to their anxiety level. The herd's major reaction to the overflight occurrence could be attributed to this heightened anxiety level. Additional observations may be necessary before any definitive conclusions can be reached concerning the impacts of military aircraft overflights of yearling bison.
- Horses contained in a paddock were not affected by F-16 aircraft overflights conducted directly overhead at altitudes as low as 500 feet above ground level. SELs ranged from 87 to 104 dBA.

Information on heart- and metabolic-rate data were not gathered at the request of the herd manager. Therefore, no conclusions can be drawn on any potential physiological effects that American bison experience in relation to low-altitude F-16 aircraft overflights. Furthermore, the observational examination was conducted after calving season and prior to mating season. No attempt was made to measure the effects of low-altitude F-16 aircraft overflights on American bison reproductive rates.

**ATTACHMENT A**

**NOISE MONITORING DATA**

DATE	NOISE MONITOR SITE NUMBER	EVENT TIME <sup>1</sup>	L <sub>max</sub> (dBA)	Peak Level (dB)	SEL (dBA)
22 June 94	05	08:42:33-08:43:40	82	98	93
22 June 94	06	08:36:43-08:37:85	95	114	104
22 June 94	05	13:33:38-13:33:59	81	98	87
22 June 94	05	13:37:16-13:37:34	83	99	89
22 June 94	06	13:27:46-13:28:00	80	98	87
23 June 94	05	10:27:15-10:27:36	88	105	95
22 June 94	06	10:21:20-10:22:00	88	106	98
23 June 94	05	14:10:54-14:11:27	87	106	96
23 June 94	05	14:11:27-14:12:26	77	92	87
23 June 94	06	14:05:00-14:05:49	94	111	101
23 June 94	06	14:10:48-14:11:45	83	99	93
24 June 94	05	09:26:47-09:27:09	100	116	104
24 June 94	06	09:20:51-09:21:33	91	108	98
24 June 94	06	09:29:56-09:30:16	74	90	82
27 June 94	05	15:27:42-15:27:56	80	97	97
27 June 94	06	15:21:33-15:21:58	83	99	90

SOURCE: CAI EIS Appendix H

NOTE:

1. Event Time expressed in Hours (24-hour clock): minutes: seconds (in hundredths)





North Carolina Department of Environment and Natural Resources  
1417 Trinity Street, Raleigh, NC 27601  
Telephone: (919) 719-2111

Dear Mr. Carter:

We have reviewed your request for information regarding the status of threatened species and the actions being taken to protect them. We are pleased to provide you with the information requested.

We currently have information regarding the status of threatened species and the actions being taken to protect them.

The information requested is being provided to you in accordance with the provisions of the Freedom of Information Act.

We appreciate your interest in the status of threatened species and the actions being taken to protect them.

If you have any questions regarding the information provided, please contact the person listed below.

The information requested is being provided to you in accordance with the provisions of the Freedom of Information Act.

We appreciate your interest in the status of threatened species and the actions being taken to protect them.

If you have any questions regarding the information provided, please contact the person listed below.

The information requested is being provided to you in accordance with the provisions of the Freedom of Information Act.

We appreciate your interest in the status of threatened species and the actions being taken to protect them.

If you have any questions regarding the information provided, please contact the person listed below.

**APPENDIX K**

**CORRESPONDENCE RECEIVED IDENTIFYING  
THREATENED AND ENDANGERED SPECIES**





# Nebraska Game and Parks Commission

2200 N. 33rd St. / P.O. Box 30370 / Lincoln, NE 68503-0370 / (402) 471-0641

July 27, 1993

Christina M. Caro  
EA Science and Engineering Associates, Inc.  
1421 Prince Street, Suite 300  
Alexandria, VA 22314

Dear Ms. Caro:

We have reviewed your request for information on endangered or threatened species and sensitive wildlife habitats that occur in western Kimball, Banner, and Scottsbluff Counties in Nebraska. Five endangered or threatened species could occur in this region.

The federally and state endangered black-footed ferret (Mustela nigripes) could occur in prairie dog towns within the area.

The state endangered swift fox (Vulpes velox) could occur in shortgrass prairie habitat in the proposed project area. One of the higher concentration areas for records of swift fox in Nebraska is in Kimball County.

The federally and state endangered peregrine falcon (Falco peregrinus) occurs as a migrant throughout Nebraska and the federally and state endangered bald eagle (Haliaeetus leucocephalus) occurs as a rare nester, migrant and winter resident in Nebraska. While in Nebraska, the bald eagle uses rivers for feeding during the winter. Trees immediately adjacent to rivers are used by bald eagles as perches for feeding or loafing.

The mountain plover (Charadrius montanus) is a state threatened species that nests in the shortgrass prairie portions of the panhandle. Specific nesting site requirements include: topographically level sites with short vegetation, such as buffalo/blue grama grass prairies, which receive heavy grazing pressure. Mountain plovers have also been found to select black-tailed prairie dog towns which meet the above specific requirements. Considerable nesting habitat has been lost in Nebraska due to the conversion of shortgrass prairie into agricultural land. Recent documentation of nesting by the mountain plover in Nebraska has been restricted to the remnant shortgrass prairie areas in Kimball County.

Sensitive wildlife habitats that occur in the western end of Kimball, Banner, and Scottsbluff Counties include the Wild Cat Hills and wetlands. The Wild Cat Hills in Scottsbluff and Banner Counties provide habitat to numerous game and nongame species including nesting bird species such as golden eagles, prairie falcons and white-throated swifts. Numerous wetlands, both freshwater and saline, are associated with the North Platte River in Scottsbluff County and Pumpkin Creek in Banner County. These wetlands provide migratory habitat and nesting habitat for numerous species of birds as well as year-round habitat for numerous game and nongame species.

If I can be of further assistance, feel free to contact me.

Sincerely,



Mary Kay Clausen  
Nongame Heritage Zoologist



Joan Finney  
Governor

DEPARTMENT OF WILDLIFE & PARKS

Theodore D. E.  
Secretary

OPERATIONS OFFICE  
Rt. 2, Box 54A  
Pratt, KS 67124 - 9599  
(316) 672-5911 / FAX (316) 672-6020

August 18, 1993

Christina M. Caro  
Scientist  
Science & Engineering Associates, Inc.  
1421 Prince Street, Suite 300  
Alexandria, VA 22314

Ref: D3.0100  
Trak: 930462

Dear Ms. Caro:

We have reviewed the DOPAA for the Colorado Airspace Initiative involving Air National Guard training flights over parts of Greeley, Hamilton, Sherman and Wallace Counties in Kansas. The project was reviewed for potential impacts on crucial wildlife habitats, current state-listed threatened and endangered species, and public recreation areas for which this agency has some administrative authority.

Our review indicates none of the named resources will be impacted. No special mitigation measures are necessary. No Department of Wildlife and Parks permits or special authorizations are needed. Although the state's threatened and endangered species lists and the Department's lands obligations periodically change, due to the project's location and design, no future clearances will be required regardless of when the project work starts.

Sincerely,

A handwritten signature in cursive script that reads "Robert D. Wood".

Robert D. Wood, Wildlife Ecologist  
Environmental Services Section

RDW:cs

xc: Reg 1, Schroeder  
Reg 3, Baugh

WYOMING  
GAME AND FISH DEPARTMENT

Mike Sullivan, Governor



Francis Petera, Director



August 27, 1993

EIS 7329  
Science and Engineering  
Associates, Inc. (SEA)  
Air National Guard Readiness  
Center/Environmental Impact  
Statement (EIS)  
Colorado Airspace Initiative  
Albany, Carbon, Goshen, Laramie  
and Platte Counties

CHRISTINA M. CARO  
SCIENTIST  
SCIENCE AND ENGINEERING  
ASSOCIATES, INC.  
1421 PRINCE STREET, SUITE 300  
ALEXANDRIA, VA 22314

Dear Ms. Caro:

The staff of the Wyoming Game and Fish Department has reviewed your request for information regarding the list of potentially impacted wildlife habitats and biologically sensitive areas.

The Wyoming Game and Fish Department feels the scope of this request is too broad to adequately respond without specific information on the proposed changes to the MOAs and MTRs and the operations that will be conducted in these areas. The area contains several habitats and sensitive species for which we have significant concerns. We suggest that SEA either provide our Department with more specific details about the proposal or purchase copies of wildlife distribution maps and database queries from our headquarters. The Wyoming Mammal and Bird Checklists would also provide SEA with a list of priority species and their general distribution within the state.

The five county area described by SEA includes habitat for several species that are protected by state statute. In some cases, observations of these wildlife have been reported although the status of these species is not well known. These include river otter, wolverine, fisher, lynx, black-footed ferret and pika. Besides the black-footed ferret, the area includes other federally endangered species including the Wyoming toad, wintering and nesting bald eagles, migrating peregrine falcons and whooping cranes. The area also includes golden eagles and possibly piping plovers and least terns. In addition, several other species occurring in the area are candidates for listing under the Endangered Species Act. These species

include the swift fox, white-faced ibis, ferruginous hawk, northern goshawk, mountain plover, long-billed curlew, black tern, loggerhead shrike, and the Preble's meadow jumping mouse.

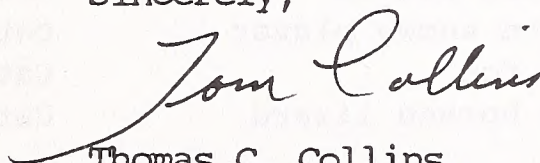
White-tailed ptarmigan have been documented in the Snowy Range. The five county area also includes sensitive areas for courtship, breeding, nesting, and wintering habitat for sage grouse and sharp-tailed grouse. Migratory birds occurring in the area include species of waterfowl, shorebirds, songbirds, and raptors along with their nesting, breeding, migration, and wintering habitats. These species may be disturbed by low-level aerial surveys. Some areas have a considerable amount of wetlands.

The addition of MOAs and MTRs, and their increased use, may impact limited juniper/ponderosa and pine/mixed grass habitats in Platte County (Guernsey) that are important to a population of turkeys in this area.

In southeastern Wyoming, wetlands and riparian zones are extremely important to a variety of wildlife species such as bald eagles, mule deer, white-tailed deer, antelope, and numerous other species. Additional impacts to the North Platte River system should be carefully evaluated and avoided. If impacts do occur, habitat mitigation (in kind) should be required as an alternative.

The area includes sensitive habitats for big game species, including elk, bighorn sheep, mule deer, white-tailed deer, and pronghorn. Areas within the project region have been identified as crucial wintering, parturition and migration areas. Increased disturbance to wildlife on these habitats during sensitive periods may result in adverse impacts to these species. We suggest SEA obtain copies of seasonal range maps for their analysis. For us to provide further comment on the proposal, SEA should provide our agency with specific information as it is developed.

Sincerely,



Thomas C. Collins  
Environmental Coordinator  
Office of Director  
Environmental Services

TC:vb  
cc: Wildlife Division  
USFWS



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
Ecological Services  
Suite D, 3530 Pan American Highway, NE  
Albuquerque, New Mexico 87107



August 27, 1993

Cons. #2-22-93-I-443

Ms. Christina M. Caro  
Science & Engineering Associates, Inc.  
1421 Prince Street, Suite 300  
Alexandria, Virginia 22314

Dear Ms. Caro:

This responds to your letter dated July 20, 1993, requesting a list of species federally listed or proposed to be listed as threatened or endangered. The proposed action involves the Colorado Airspace Initiative (Initiative). The Initiative would establish or modify Military Operations Areas (MOAs) and Military Training Routes (MTRs) to minimize impacts on the new Denver International Airport, while meeting the training requirements for the 140th FW at Buckley ANGB. Specifically, this Initiative would modify four existing MOAs and five MTRs, delete one MTR and a portion of another, and establish one new MOA and three new MTRs. Your geographic area of interest is northern Union County, New Mexico.

We have used the information in your request to narrow the list of species occurring in the project area to those that may be affected by the proposed action. The following species may be found in the project area:

black-footed ferret	Endangered
bald eagle	Endangered
American peregrine falcon	Endangered
ferruginous hawk	Category 2 candidate
white-faced ibis	Category 2 candidate
mountain plover	Category 2 candidate
western snowy plover	Category 2 candidate
swift fox	Category 2 candidate
Texas horned lizard	Category 2 candidate

Category 2 candidate species are those for which the U.S. Fish and Wildlife Service (Service) has information indicating that proposing to list is possibly appropriate, but for which substantial data on biological vulnerability or threats are not currently available to support the immediate preparation of such rules. Candidate species have no legal protection under the Endangered Species Act and are included in this document for planning purposes only. However, the Service is concerned and would appreciate receiving any status information that is available or gathered on these species.



Ms. Christina M. Caro

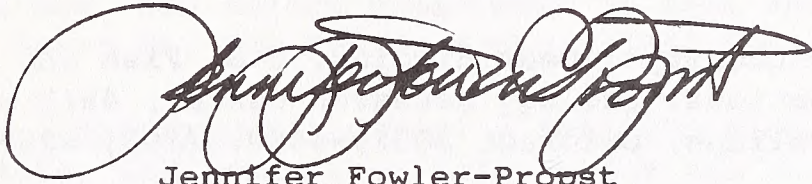
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Wetlands, riparian vegetation, and the above listed species' sensitive habitat(s) on or near the site should also be protected. If adverse impacts cannot be avoided, we would appreciate discussing your project in more detail.

We suggest you contact the New Mexico Department of Game and Fish and the New Mexico Energy, Minerals and Natural Resources Department for information concerning fish, wildlife, and plants of State concern.

If we can be of further assistance, please call Mary Orms at (505) 883-7877.

Sincerely,

A handwritten signature in black ink, appearing to read "Jennifer Fowler-Propst", written in a cursive style.

Jennifer Fowler-Propst  
State Supervisor

Enclosure

cc: (wo/enc)

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico  
Director, New Mexico Energy, Minerals and Natural Resources Department,  
Forestry and Resources Conservation Division, Santa Fe, New Mexico

Species List  
Colorado Airspace Initiative  
Union County, New Mexico  
August 27, 1993

Endangered

Black-footed ferret (Mustela nigripes) - This species is usually found in association with prairie dog towns in grassland plains and surrounding mountain basins up to 10,500 feet elevation. A survey for black-footed ferrets is required if the prairie dog town is over 80 acres for black-tailed prairie dogs and 200 acres for white-tailed and Gunnison's prairie dogs. If the prairie dog town is greater than 1,000 acres, then the area should be evaluated for possible reintroduction of black-footed ferrets.

Authority: Dean Biggins, U.S. Fish and Wildlife Service,  
National Ecology Research Center, 4512 McMurray Avenue, Fort  
Collins, Colorado 80525-3400, (303) 226-9467.

Bald eagle (Haliaeetus leucocephalus) - This species occupies New Mexico primarily as a winter resident, but also occurs as a migrant with several nesting in the state. Birds roost in large trees which may or may not be close to their feeding areas. Bald eagles are found in riparian areas adjacent to rivers, reservoirs, and ponds. Rabbits, fish and waterfowl are their primary prey items.

Authority: Sandy Williams, New Mexico Department of Game and  
Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

American peregrine falcon (Falco peregrinus anatum) - The peregrine falcon prefers areas with steep rocky cliffs in close proximity to water. Preferred habitat contains dense bird populations in conjunction with large gulfs of air such as is in canyons.

Authority: Sandy Williams, New Mexico Department of Game and  
Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Category 2 Candidates

Ferruginous hawk (Buteo regalis) - This species is found almost statewide during migration. Birds seem to key in on wide open grasslands and prairies, especially for nesting.

Authority: Sandy Williams, New Mexico Department of Game and  
Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

White-faced ibis (Plegadis chihi) - This species inhabits salt and freshwater marshes, shallow margins of muddy pools, ponds, and rivers.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Mountain plover (Charadrius montanus) - This species is primarily found in short grass prairies often associated with prairie dog towns. Nest sites are chosen in flat country with sparse and low-lying vegetation. This bird feeds exclusively on insects; primarily beetles, grasshoppers, and crickets.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Western snowy plover (Charadrius alexandrinus nivosus) - Inhabits flat sandy areas, alkali flats, and areas near water which are devoid of vegetation or have very little vegetation.

Authority: Sandy Williams, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9914.

Swift fox (Vulpes velox) - prefers open desert and plains. Usually found in short-grass prairie with loose sandy soil.

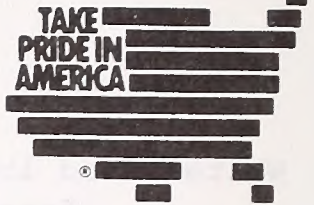
Authority: John Hubbard, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9925.

Texas horned lizard (Phrynosoma cornutum) - This species has dark stripes which radiate from the eye region on each side of its face and two rows of pointed fringe scales on each side of the body. The lizard inhabits arid and semiarid open country with sparse plant growth--bunch grass, cactus, juniper, acacia, and mesquite. The substrate may be of sand, loam, hardpan, or rock. Some loose soil is usually present in which these lizards bury themselves. They also seek shelter under shrubs, in burrows of other animals, or among rocks.

Authority: Charlie Painter, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, (505) 827-9901.



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE FISH AND WILDLIFE ENHANCEMENT

Colorado State Office  
730 Simms Street, Suite 290  
Golden, CO 80401

ES/CO: Species Lists  
Mail Stop 65412

Phone (303) 231-5280

FTS 554-5280

FAX (303) 231-5285

Ms. Christina M. Caro  
Science and Engineering Associates, Inc.  
1421 Prince Street, Suite 300  
Alexandria, Virginia 22314

AUG 31 1993



Dear Ms. Caro:

In response to your letter of July 20, 1993, the U.S. Fish and Wildlife Service is providing the federally listed and candidate species list you requested for the Environmental Impact Statement (EIS) you are writing on the Colorado Airspace Initiative for the Air National Guard Readiness Center. This list and comments should be helpful in your preparation of the environmental assessment of the possible environmental effects from the Colorado Airspace Initiative project. These comments have been prepared under the provisions of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et. seq.).

Section (7c) of the ESA requires the Federal agency proposing a major Federal action significantly affecting the quality of the human environment to conduct and submit to the Service a biological assessment to determine effects of the proposal on listed species. The biological assessment shall be completed within 180 days after the date on which initiated or a time mutually agreed upon between the agency and the Service. The assessment must be completed before physical project modification/alteration begins. If the biological assessment is not begun within 90 days, the species list provided below should be verified prior to initiation of the assessment.

The lead Federal agency should evaluate the potential impacts of the proposed project and determine if the action may affect any listed species. If a determination is "may affect" for listed species, the Federal agency must request in writing formal consultation from this office and should provide this office with a biological assessment and any other relevant information used in making impact determinations.

The Service also is interested in the protection of species which are candidates for official listing as threatened or endangered (Federal Register, Vol. 56, No. 225, November 21, 1991; Vol. 55, No. 35, February 21, 1990). While these species presently have no legal protection under the ESA, it is within the spirit of this act to consider project impacts to potentially sensitive candidate species. It is the intention of the Service to protect these species before human-related activities adversely impact

their habitat to a degree that they would need to be listed and, therefore, protected under the ESA. Additionally, we wish to make you aware of the presence of Federal candidates should any be proposed or listed prior to the time that all Federal actions related to the project are completed. If any candidate species will be unavoidably impacted, appropriate mitigation should be proposed and discussed with this office.

The federally listed species and the candidate species that could occur at or visit the project sites are listed by state and county in the following table:

Counties →	A l a m o s a	A r a p a h o e	B a c a	B e n t	C h a f f e	C h e y e n n e	C o s t i l l a	C r o w l e y	C u s t e r	D o u g l a s	E l P a s o
<b>COLORADO:</b>											
Federally Listed Species and Their Status ↓											
American peregrine falcon, <i>Falco peregrinus</i> , Endangered					X				X	X	X
Bald eagle, <i>Haliaeetus leucocephalus</i> , Endangered	X	X	X	X	X	X	X	X	X	X	X
Whooping crane, <i>Grus americana</i> , Endangered	X		X								
Least tern (interior population), <i>Sterna antillarum</i> , Endangered			X	X							
Piping plover, <i>Charadrius melodus</i> , Threatened			X	X							
Eskimo curlew, <i>Numenius borealis</i> , Endangered			X						X		
White-faced ibis, <i>Plegadis chihi</i> , Category 2	X	X	X	X	X	X					
Mountain plover, <i>Charadrius montanus</i> , Category 1	X	X	X	X		X		X		X	X
Ferruginous hawk, <i>Buteo regalis</i> , Category 2			X	X				X			
Southwestern willow flycatcher, <i>Empidonax traillii extimus</i> , Category 1							X				

Counties →	A l a m o s a	A r a p a h o e	B a c a	B e n t	C h a f f e	C h e y e n n e	C o s t i l l a	C r o w l e y	C u s t e r	D o u g l a s	E l P a s o
Colorado (Cont):  Federally Listed Species and Their Status ↓											
Northern goshawk, <i>Accipiter gentilis</i> , Category 2									X		
Black tern, <i>Chlidonias niger</i> , Category 2	X	X	X	X	X	X	X	X	X	X	X
Mexican spotted owl, <i>Strix occidentalis lucidia</i> , Threatened										X	X
Western snowy plover, <i>Charadrius alexandrinus nivosus</i> , Category 2	X			X							X
Baird's sparrow, <i>Ammodramus bairdii</i> , Category 2		X	X	X		X		X		X	X
Loggerhead shrike, <i>Lanius ludovicianus</i> Category 2		X		X					X		X
Boreal western toad, <i>Bufo boreas boreas</i> , Category 2					X						
Colorado hog-nosed skunk, <i>Conepatus mesoleucus figginsi</i> , Category 2			X	X					X		X
Black-footed ferret, <i>Mustela nigripes</i> , Endangered	X	X	X	X		X	X	X		X	X
Preble's meadow jumping mouse, <i>Zapus hudsonius preblei</i> , Category 2		X								X	X
North American wolverine, <i>Gulo gulo luscus</i> , Category 2					X				X		
North American lynx, <i>Felis lynx canadensis</i> , Category 2									X		
Swift fox, <i>Vulpes velox</i> , Category 2		X	X	X		X		X		X	X
Texas horned lizard, <i>Phrynosoma cornutum</i> , Category 2			X	X				X			

Counties →	A l a m o s a	A r a p a h o e	B a c a	B e n t	C h a f f e	C h e y e n n e	C o s t i l l a	C r o w l e y	C u s t e r	D o u g l a s	E l P a s o
Colorado (Cont): Federally Listed Species and Their Status ↓											
Fringed-tailed myotis, <i>Myotis thysanodes pahasapensis</i> , Category 2			X	X							X
Regal fritillary butterfly, <i>Speyeria idalia</i> , Category 2		X								X	X
Uncompahgre fritillary butterfly, <i>Boloria acrocneuma</i> , Endangered									X		
Pawnee montane skipper, <i>Hesperia leonardus montana</i> , Threatened										X	

Counties →	F r e m o n t	H u e r f a n o	K i t C a r s o n	L a r i m e r	L a s A n i m a s	M o r g a n	O t e r o	P a r k	P r o w e r s	P u e b l o	S a g u a c h e	T e l l e r	W e l d
Colorado (Cont): Federally Listed Species and Their Status ↓													
American peregrine falcon, <i>Falco peregrinus</i> , Endangered	X	X		X				X			X	X	
Bald eagle, <i>Haliaeetus leucocephalus</i> , Endangered	X	X	X	X	X	X	X	X	X	X	X	X	X
Whooping crane, <i>Grus americana</i> , Endangered		X		X	X	X			X	X	X		X
Least tern (interior population), <i>Sterna antillarum</i> , Endangered			X		X	X			X				X

Counties →	F r e m o n t	H u e r f a n o	K i t C a r s o n	L a r i m e r	L a s A n i m a s	M o r g a n	O t e r o	P a r k	P r o w e r s	P u e b l o	S a g u a c h e	T e l l e r	W e l d
Colorado (Cont):													
Federally Listed Species and Their Status ↓													
Piping plover, <i>Charadrius melodus</i> , Threatened			X		X	X			X				X
Eskimo curlew, <i>Numenius borealis</i> , Endangered			X	X	X	X			X				X
Mountain plover, <i>Charadrius montanus</i> , Category 1		X	X	X	X	X	X		X	X	X		X
Ferruginous hawk, <i>Buteo regalis</i> , Category 2					X	X	X		X	X			X
Southwestern willow flycatcher, <i>Empidonax trailli extimus</i> , Category 1					X								
Northern goshawk, <i>Accipiter gentilis</i> , Category 2		X		X				X			X		
Mexican spotted owl, <i>Strix occidentalis lucida</i> , Threatened	X	X								X			
Western snowy plover, <i>Charadrius alexandrinus nivosus</i> , Category 2				X			X	X	X	X			
Loggerhead shrike, <i>Lanius ludovicianus</i> , Category 2	X	X				X				X			
White-faced ibis, <i>Plegadis chihi</i> , Category 2									X	X	X	X	X
Baird's sparrow, <i>Ammodramus bairdii</i> , Category 2		X	X	X	X	X	X		X	X			X



Counties →	F r e m o n t	H u e r f a n o	K i t C a r s o n	L a r i m e r	L a s A n i m a s	M o r g a n	O t e r o	P a r k	P r o w e r s	P u e b l o	S a g u a c h e	T e l l e r	W e l d
Colorado (Cont):													
Federally Listed Species and Their Status ↓													
Black tern, <i>Chlidonias niger</i> , Category 2	X	X	X	X	X	X	X	X	X	X	X	X	X
Harlequin duck, <i>Histrionicus histrionicus</i> , Category 2								X					
Texas horned lizard, <i>Phrynosoma cornutum</i> , Category 2				X	X	X	X		X	X			
Black-footed ferret, <i>Mustela nigripes</i> , Endangered	X		X	X	X	X	X	X	X	X	X		X
Swift fox, <i>Vulpes velox</i> , Category 2	X	X	X	X	X	X	X		X	X		X	
Colorado hog-nosed skunk, <i>Conepatus mesoleucus figginsi</i> , Category 2	X				X		X	X	X	X		X	
Noth American wolverine, <i>Gulo gulo lucus</i> , Category 2		X		X			X	X					
North American lynx, <i>Felis lynx canadensis</i> , Category 2								X			X		
Preble's meadow jumping mouse, <i>Zapus hudsonius peblei</i> , Category 2				X		X							X
Fringed-tailed myotis, <i>Myotis thysanodes pahasapensis</i> , Category 2		X		X	X	X	X		X	X			X
Regal fritillary butterfly, <i>Speyeria idalia</i> , Category 2			X	X		X							X

Counties →	F r e m o n t	H u e r f a n o	K i t C a r s o n	L a r i m e r	L a s A n i m a s	M o r g a n	O t e r o	P a r k	P r o w e r s	P u e b l o	S a g u a c h e	T e l l e r	W e l d
Colorado (Cont):													
Federally Listed Species and Their Status ↓													
Pawnee montane skipper, <i>Hesperia leonardus montana</i> , Threatened								X				X	
Uncompahgre fritillary butterfly, <i>Boloria acrocneuma</i> , Endangered											X		
Stevens' tortricid moth, <i>Decodes stevensi</i> , Category 2				X									
Boreal western toad, <i>Bufo boreas boreas</i> , Category 2				X				X					

Counties →			
<b>KANSAS:</b>			
Federally Listed Species and Their Status ↓	Hamilton	Sherman	Wallace
American peregrine falcon, <i>Falco peregrinus</i> , Endangered	X	X	X
Bald eagle, <i>Haliaeetus leucocephalus</i> , Endangered	X	X	X
Whooping crane, <i>Grus americana</i> , Endangered	X	X	X
Least tern (interior population), <i>Sterna antillarum</i> , Endangered	X	X	X
Piping plover, <i>Charadrius melodus</i> , Threatened	X	X	X
Black-footed ferret, <i>Mustela nigripes</i> , Endangered	X	X	X

Counties →			
<b>Kansas (Cont):</b>			
Federally Listed Species and Their Status ↓	Hamilton	Sherman	Wallace
Mountain plover, <i>Charadrius montanus</i> , Category 1	X	X	X
Ferruginous hawk, <i>Buteo regalis</i> , Category 2	X	X	X
Western snowy plover, <i>Charadrius alexandrinus nivosus</i> , Category 2	X	X	X
Loggerhead shrike, <i>Lanius ludovicianus</i> , Category 2	X	X	X
White-faced ibis, <i>Plegadis chihi</i> , Category 2	X	X	X
Black tern, <i>Chlidonias niger</i> , Category 2	X	X	X
Baird's sparrow, <i>Ammodramus bairdii</i> , Category 2	X	X	X
Texas horned lizard, <i>Phrynosoma cornutum</i> , Category 2	X	X	X
Swift fox, <i>Vulpes velox</i> , Category 2	X	X	X
Plains spotted skunk, <i>Spilogale putorius interrupta</i> , Category 2	X	X	X

Counties →			
<b>NEBRASKA:</b>			
Federally Listed Species and Their Status ↓	Banner	Kimball	Scotts Bluff
American peregrine falcon, <i>Falco peregrinus</i> , Endangered	X	X	X
Bald eagle, <i>Haliaeetus leucocephalus</i> , Endangered	X	X	X
Whooping crane, <i>Grus americana</i> , Endangered	X	X	X

Counties →			
Nebraska (Cont):			
Federally Listed Species and Their Status ↓	Banner	Kimball	Scotts Bluff
Black-footed ferret, <i>Mustela nigripes</i> , Endangered	X	X	X
Ferruginous hawk, <i>Buteo regalis</i> , Category 2	X	X	X
Mountain plover, <i>Charadrius montanus</i> , Category 1	X	X	X
Loggerhead shrike, <i>Lanius ludovicianus</i> , Category 2	X	X	X
Swift fox, <i>Vulpes velox</i> , Category 2	X	X	X
Plains spotted skunk, <i>Spilogale putorius interrupta</i> , Category 2	X	X	X

Counties →	A l b a n y	C a r b o n	G o s h e n	L a r a m i e	P l a t t e
WYOMING:					
Federally Listed Species and Their Status ↓					
American peregrine falcon, <i>Falco peregrinus</i> , Endangered		X			
Bald eagle, <i>Haliaeetus leucocephalus</i> , Endangered		X	X		X
Whooping crane, <i>Grus americana</i> , Endangered	X	X			
Wyoming toad, <i>Bufo hemiophrys baxteri</i> , Endangered	X				

The Service is concerned about issues that will adversely affect threatened and endangered species as well as candidate species. The following comments will address some of these concerns.

The Mexican spotted owl (MSO), *Strix occidentalis lucida*, is one of three subspecies of spotted owls in North America. Effective April 15, 1993, the Mexican spotted owl was listed as threatened

under the Endangered Species Act of 1973. The Recovery Team is scheduled to identify critical habitat in November of this year. Habitat as defined in the Final Rule to List the MSO (Federal Register, March 16, 1993) is the current reference used for MSO in Colorado. Habitat consists of mountains and canyons containing dense multi-storied forests with closed canopies. In Colorado, MSO have been found in two canyon types: (1) narrow, shady, cool sandstone slickrock canyons in pinon-juniper near Mesa Verde National Park; (2) steep, dark, narrow, rocky-walled canyons with mature to old growth mixed conifer vegetation from Sedalia, Colorado, south along the front range of the Wet Mountains near Walsenburg, Colorado. Historically there are records showing MSO as far north as Boulder, Colorado. Breeding season begins in February when birds pair up. Eggs are usually laid from mid to late April. From mid to late May, eggs hatch and young are usually fledged by mid to late June. Adults continue to feed the young through late August or early September. Young disperse in October, and adults split up and winter alone. The MSO migrates elevationally and therefore remains in the area year round. The EIS should consider avoidance measures for areas containing this owl. This owl is easily preyed upon by other raptors if it is "spooked" from its roost. Should this happen, it is considered a "take" under the ESA and punishable under that act.

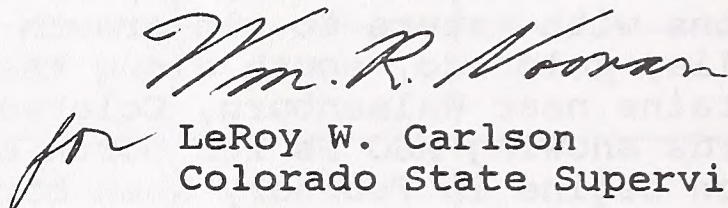
State sensitive species also need to be considered in the EIS. The lesser prairie chicken, plains sharp-tailed grouse, mountain plover, and the prairie falcon all are of concern to the State of Colorado and should be addressed. Consideration should be given to affects on elk, pronghorn antelope and bighorn sheep while at production areas, winter ranges, and winter concentration areas. Waterfowl and shorebird nesting areas and winter concentration areas need to be addressed both from the affects to these migratory birds and the safety of the pilots and planes. Affects on raptors while in nesting areas is also of concern.

Possible mitigation to be considered for these impacts are flight avoidance measures such as a no-fly zone of 1.5 nautical miles for lateral avoidance or an appropriate (species specific) vertical (AGL) avoidance around critical areas. The recommended approach to this is to obtain the extensive maps of these critical areas that the Colorado Division of Wildlife has prepared and overlay them on the maps of the flight routes. This would allow the problem areas to be identified and solutions to be found to minimize impacts to the wildlife and provide the necessary training airspace for the National Guard.

The Service recommends that you contact the Colorado Division of Wildlife to address any concerns it may have. The contact person for this area is Bruce Goforth of the Colorado Springs Office at (719) 473-2945, Extension 224. Questions concerning the individual states should be directed to the field office for that

state. For the state of Kansas, contact Dan Mulhern of the Manhattan, Kansas office at (913) 539-3474. For the state of Nebraska, contact Wally Jobman of the Grand Island, Nebraska office at (308) 382-6468. For the state of Wyoming, contact Mike Jennings of the Cheyenne, Wyoming office at (307) 772-2374. If the Service can be of further assistance, contact Clay Ronish of this office at (303) 231-5280.

Sincerely,

  
for LeRoy W. Carlson  
Colorado State Supervisor

cc: FWS/ES; SLC  
CDOW, Colorado Springs, CO (Attn. Bruce Goforth)  
FWS/ES; R6 (Attn: Dale Hoffman)  
FWS/ES; Manhattan, KS  
FWS/ES; Grand Island, NE  
FWS/ES; Cheyenne, WY  
FWS/FWAO; Golden, CO  
Reading file  
Project file

Reference:  
CLAY\SPECLIST.21



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE FISH AND WILDLIFE ENHANCEMENT

Colorado State Office  
730 Simms Street, Suite 290  
Golden, CO 80401

ES/CO: Air Force  
Mail Stop 65412

Phone (303) 231-5280

FTS 554-5280

FAX (303) 231-5285

MSgt Katherine Jones  
Air National Guard Readiness Center  
3500 Fetchet Avenue, Mail Stop 18  
Andrews Air Force Base, Maryland 20331

Dear MSgt Jones:

This is in followup to our August 18, 1993, letter to you and our August 31, 1993, letter to Ms. Christina Caro of Science and Engineering Associates, Inc. (enclosed). The U.S. Fish and Wildlife Service wishes to ensure continuous communication between our two organizations on the issue of the Colorado Airspace Initiative. The Service's role in this issue is outlined by the following regulations: the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.); the Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. 703 et. seq.); the Bald Eagle Protection Act of 1940 (BEPA), as amended (16 U.S.C. 668-668d); the National Wildlife Refuge System Administration Act of 1966 (Refuge Administration Act), as amended (16 U.S.C. 668dd-668ee); and the National Environmental Policy Act of 1969 (NEPA).

These acts clearly state the role of the lead Federal agency involved in the action. To alleviate any misunderstanding of this role, the Service is providing this letter addressing the roles of the lead Federal agency as related to these acts.

Section 7 of the ESA requires Federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat. The lead Federal agency should evaluate the potential impacts of the proposed project and determine if the action may affect any listed species. If a determination is "may adversely affect" for a listed species, the Federal agency must request in writing formal consultation under Section 7 from this office and should provide this office with a biological assessment and any other relevant information used in making impact determinations. If a "no effect" determination is made, we will review your determination and either concur or not concur. If we do not concur, formal consultation will be required.

Please be apprised of the potential application of the MBTA and the BEPA to your project. The MBTA does not require intent to be proven and does not allow for "take," except as permitted by

regulations. Section 703 of the MBTA provides: "Unless and except as permitted by regulations . . . it shall be unlawful at any time, by any means or in any manner, to . . . take, capture, kill, attempt to take, capture, kill, or possess . . . any migratory bird, any part, nest, or egg of any such bird . . ." The BEPA prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagle or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing activities.

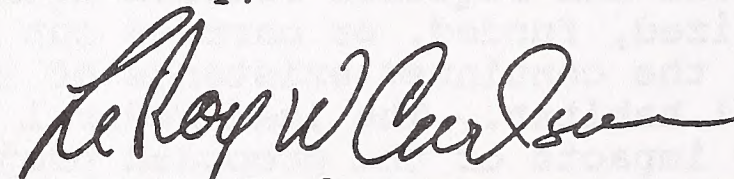
The Refuge Administration Act provides guidelines and directives for administration and management of all areas in the system, including "wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas." These areas are authorized for use as permitted by regulations provided "such uses are compatible with the major purposes for which such areas were established."

NEPA requires that all Federal agencies prepare detailed environmental impact statements for "every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment."

The Service would now like to reiterate a point made in past correspondence with you. The Service believes the Environmental Impact Statement the Air National Guard Readiness Center is preparing should include complete coverage of the cumulative impacts from all military flights within Colorado and not just those flights planned by this airspace initiative.

If the Service can be of further assistance, contact Clay Ronish of this office at (303) 231-5280.

Sincerely,



LeRoy W. Carlson  
Colorado Field Supervisor

Enclosure



# STATE OF COLORADO

## OFFICE OF THE EXECUTIVE DIRECTOR

Department of Natural Resources  
1313 Sherman Street, Room 718  
Denver, Colorado 80203  
Phone (303) 866-3311  
FAX: (303) 866-2115

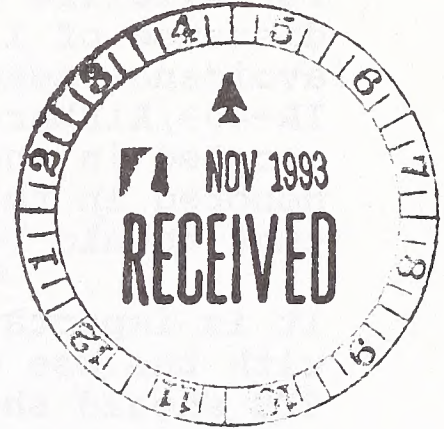


Roy Romer  
Governor  
Ken Salazar  
Executive Director  
Ron Cattany  
Deputy Director

W-472

## M E M O R A N D U M

TO: Jim Peck, Governor's Policy Office  
FROM: Steve Norris *SN*  
DATE: October 1, 1993  
SUBJECT: Colorado Airspace Initiative



The Department of Natural Resources has reviewed the final DOPAA (July 1993) for the Colorado Airspace Initiative (CAI). In addition to the general comments set forth below, two divisions within the department have identified issues related to activities proposed as part of the CAI. Their detailed comments -- from the Division of Wildlife and the Division of Parks and Outdoor Recreation -- are attached.

The department recommends that the following general issues be examined in the environmental impact statement.

- There should be a full inventory of noise-sensitive areas that may be affected by proposed operations. Sensitivity should be measured in terms of both noise levels (decibels) and suddenness (ie. how quickly and without warning the noise impact occurs).
- Sudden loud noise associated with the proposed air operations may have real impacts on wildlife and people. The National Guard Bureau (Bureau) needs to understand these impacts, take reasonable steps to avoid them and, if necessary, mitigate impacts that are unavoidable.
- In order to correctly define some of these impacts, careful measurement of the noise caused by aircraft in their various training configurations is essential. Such measurement may entail non-traditional approaches to noise impact assessment. Noise studies for the Denver International Airport went beyond the scope of previous studies. The Bureau should be willing to use similar methods for sensitive areas along the various flight corridors and training areas.

- Colorado should not, through the creation of an extensive network of MTRs and MOAs, become a training ground for national guard units from other states. With this in mind, we recommend that training routes and areas be designed that minimally meet current and projected requirements for the Colorado ANG.
- The Bureau should identify alternatives that avoid overflight of specified areas that would be subjected to unacceptable noise and related impacts. Adequate avoidance for wildlife and public recreation purposes is a lateral distance of 1.5 NM from the designated sites. This avoidance measure has been previously recommended for the IR-409/Airburst Range environmental assessment and was adopted in that EA. We expect this commitment to be honored in this EIS. The attached comments identify areas that should be considered for such protection.
- It is important to identify cumulative impacts associated with the use of other military airspace in Colorado. The EIS should show these other MTRs and MOAs, describe their use and explain what cumulative impacts may derive from the use of all such airspace.
- Designated wilderness areas warrant special attention. Sudden loud noises are clearly incompatible with the solitary, contemplative experience which wilderness is intended to provide.

The Air National Guard has a legitimate mission and needs adequate airspace to prepare for that mission. The EIS must recognize that other legitimate needs and interests also exist. We expect that the Bureau will make a serious effort to learn about these other needs and interests and take every reasonable step to accommodate them.

The Department of Natural Resources, and particularly the Division of Wildlife and the Division of Parks and Outdoor Recreation, look forward to working with the Bureau and its contractors in preparing a responsive EIS and in seeking answers to the tough questions raised in the context of the Colorado Airspace Initiative.

attachments:

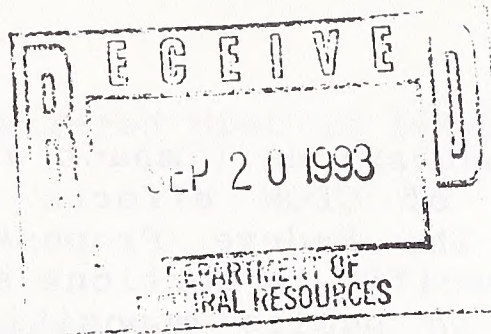
1. September 14, 1993 letter from DOW, with its attachments
2. September 30, 1993 memo from DPOR

cc: Ken Salazar, Exec. Dir. (without attachments)  
 Bruce Goforth, DOW (with DPOR attachment only)  
 Dean Winstanley, DPOR (with DOW attachment only)

STATE OF COLORADO  
Roy Romer, Governor  
DEPARTMENT OF NATURAL RESOURCES  
**DIVISION OF WILDLIFE**

AN EQUAL OPPORTUNITY EMPLOYER

Perry D. Olson, Director  
6060 Broadway  
Denver, Colorado 80216  
Telephone: (303) 297-1192



REFER TO



*For Wildlife—  
For People*

Mr. Steve Norris  
Assistant Director  
Colorado Department of Natural Resources  
1313 Sherman St., Rm. 718  
Denver, Colorado 80203

September 14, 1993

RE: Colorado Division of Wildlife Scoping Comments for the Air  
National Guard--Colorado Airspace Initiative

Dear Mr. Norris:

I am responding on behalf of the Colorado Division of Wildlife (CDOW) to your August 18th request for comments regarding the above referenced proposal.

#### HISTORICAL PERSPECTIVE

CDOW has been actively involved with military training flight issues over the past four years, beginning with our analysis of the Strategic Air Command's Mt. Dora Military Operations Area (MOA) proposal in 1989. Since that time, Governor Romer and several of Colorado's Congressional delegation have assisted CDOW in contacting key military personnel to insure that Colorado's wildlife and recreational resources are given meaningful consideration during military flight training operations.

To date, CDOW's primary interaction has been with the Colorado Air National Guard (COANG) and with the Air National Guard Readiness Center personnel at Andrews Air Force Base in Maryland. COANG administers the vast majority of military training flights in Colorado; and CDOW's objective has been to document and review all COANG flight operations for potential impact to the resources we manage.

Our most recent and in depth activity in this respect has been with the Airburst (IR-409) Proposal, and with the Redeye Proposal. The Airburst Proposal was enacted in early 1993, with concessions given to wildlife and recreational interests.

DEPARTMENT OF NATURAL RESOURCES, Kenneth Salazar, Executive Director

WILDLIFE COMMISSION, William R. Hegberg, Member • Eldon W. Cooper, Chairman • Felix Chavez, Member • Rebecca L. Frank, Member

Louis F. Swift, Member • George VanDenBerg, Member • K-25 Larry M. Wright, Member • Thomas M. Eve, Member

These concessions (impact avoidance measures) represent the first fruits of CDOW efforts to protect Colorado's wildlife resources. The Redeye Proposal, a military flight training initiative specific to portions southeast Colorado, was abandoned in 1992 due to public opposition and inadequate environmental documentation. It has since been resurrected as the Colorado Airspace Initiative (CAI).

#### COLORADO AIRSPACE INITIATIVE (Overview)

The Colorado Airspace Initiative (CAI), unlike the Redeye Proposal, is a comprehensive, statewide reworking of all COANG flight activities in Colorado. Therefore, it is important to understand that CAI is much more than the simple renaming of the Redeye Proposal as CDOW was given to understand in 1992 and in early 1993. CAI will impact natural resources throughout the state, with the exception of CDOW's N.W. Region (the Green River Complex alternative has been dropped).

The reworking of COANG flight activities through CAI will result in a significant increase in Colorado airspace dedicated to military flight training, primarily due to the expansion of MOAs. Most of the MTRs will remain, but will be reconfigured to allow as many as five training routes to access the Airburst Bombing Range at Ft. Carson, versus the one which provides access presently.

The result will be a large increase in military flight activity funneling into Ft. Carson. In addition, since much of the proposed airspace will be given MOA status, those flights accessing the MOAs (statewide) will be permitted to occupy the airspace at a reduced floor level of 300 ft. versus 1500 ft. above ground level (AGL) for MTRs. Finally, flights using the MOAs will be able to "delay" for 20 to 30 minutes while engaged in training exercises, instead of simply passing through, as with MTRs.

#### ENVIRONMENTAL IMPACTS

Impacts to the environment resulting from this proposal are anticipated to be very significant. This determination has been reached by plotting coordinants for the proposed military flight activities and by overlaying the resulting lines with CDOW wildlife species distribution maps. Analysis of the overlays indicates that numerous wildlife species will be negatively impacted, as will other resources.

Those areas or issues of greatest concern to CDOW can be grouped in three main categories: Biological, Recreational/Aesthetic, and Economic. A general listing of potential impacts by category follows:

##### Biological

##### I. Federal and State Threatened and Endangered Species

##### A. Federal

1. Bald Eagle
2. American Peregrine Falcon

## Federal and State Threatened and Endangered Species (continued)

3. Mexican Spotted Owl
4. Least Tern
5. Piping Plover
6. Mountain Plover (candidate)
7. Whooping Crane
8. Eskimo Curlew
9. Black Tern (candidate)
10. Ferruginous Hawk (candidate)
11. Northern Goshawk (candidate)
12. Baird's Sparrow (candidate)
13. Western Snowy Plover (candidate)
14. Loggerheaded Shrike (candidate)
15. White Faced Ibis (candidate)
16. Western Snowy Plover (candidate)

### B. State

1. Greater Prairie Chicken
2. Lesser Prairie Chicken
3. Plains Sharp-Tailed Grouse
4. Piping Plover
5. American Peregrine Falcon
6. Greater Sandhill Crane
7. Whooping Crane
8. Bald Eagle
9. Least Tern

## II. Raptors

### Nesting Areas

## III. Waterfowl and Shorebirds

### A. Winter Concentration Areas

### B. Nesting Areas

## IV. Sensitive Species

### A. Elk

1. Production Areas
2. Winter Range & Concentration Areas

### B. Bighorn Sheep

1. Production Areas
2. Winter Range & Winter Concentration Areas

### C. Antelope

1. Production Areas
2. Winter Concentration Areas

For all these species, especially avian species, CDOW is concerned that the noise related "startle effect" resulting from low flying, extremely loud aircraft, i.e. F-16, will cause problems with one or more of the following occurring:

1. interruption of mating
2. nest abandonment or abandonment of young
3. spontaneous abortion

## Anticipated impacts to wildlife (continued)

4. loss of young or injury of adults during escape response
5. interruption of feeding with loss of prey, or lost feeding opportunity
6. disposition to poor body condition and to secondary disease pathogens due to stress
7. unnecessary expenditures of energy (due to flight response) during critical times of year, i.e. winter
8. death due to impact with aircraft
9. abandonment of chosen habitat in favor of those areas less impacted but less prime

In a situation where threatened or endangered species are involved, any of these impacts may undermine recovery efforts and result in a "taking" under Section 9 of the Endangered Species Act.

Where endangered species are not involved, impacts to populations as a whole are less threatening. However, the sensitive species listed have great economic and aesthetic value and should be protected when possible to maintain optimal populations and recreational uses.

CDOW's approach to avoiding these impacts has been to request that COANG adopt specific flight avoidance measures where aircraft/wildlife interactions will occur. In most cases we have requested that the F-16 and other aircraft avoid noise sensitive areas by 1.5NM (nautical miles-approximately two statute miles). This particular distance provides a reduction in noise to levels that comes reasonably close to rural ambient levels, thus reducing or eliminating the startle effect(see appendices). The 1.5NM lateral avoidance can easily be accommodated on MTRs which are typically 3 to 20 miles wide, and on MOAs, though the Air National Guard is reluctant to place flight restrictions in MOAs.

Vertical avoidance measures are usually ineffective since altitudes (10,000 to 15,000 ft.) necessary to significantly diminish the noise factor cannot be accommodated on MTRs or even MOAs.

CDOW has worked successfully with COANG on the Airburst Range (IR-409) environmental assessment in identifying noise sensitive wildlife and recreation areas. The 1.5NM lateral avoidance measure was used throughout the route, without compromising flight training capability. CDOW feels this is a good example of how agencies with dissimilar missions can work together successfully and without undue impact to one another administratively or to mission goals.

## Recreational/Aesthetic

CDOW's primary concern from the recreational/aesthetic perspective is the impact of low flying aircraft to recreationists using State Wildlife Areas. These areas are rich in habitat and wildlife values, and attract large numbers of people for hunting, fishing and watching wildlife.

Low flying aircraft creating a startle response in people and in wildlife destroys the experience of recreationists. If this were to happen on a continual basis, visitation may diminish or stop. State Wildlife Areas (SWAs) which will be impacted by CAI are as follows: Pueblo, Huerfano, Apishipa, San Luis Lakes, Two Buttes, Blanca, Russell Lakes, Mishak Lakes, Brush Hollow, Beaver Creek, Mueller State Park/Dome Rock, Karval Lakes, and Elevenmile.

#### Economic

Direct impacts to wildlife populations resulting in reduced hunting and/or viewing opportunity is but one potential result from heavy low level aircraft use. Loss of revenue is another potential result. Our constituents may chose to avoid areas deemed undesirable due to heavy aircraft use. And, the ultimate effect may be fewer license buyers and lost CDOW income (CDOW is a self funded agency) since the need to have a positive experience while hunting or fishing, etc. may no longer be readily available. Also, income to local economies may suffer due to a diminished dollar turnover effect. At present wildlife recreation (hunting and fishing alone) brings approximately 2 billion dollars to Colorado's economy commiserate with the ski industry.

#### Other

CDOW personnel fly inventory counts for various wildlife species throughout Colorado. With the increase in sorties proposed, and with greatly increased MOA designations, the safety of our personnel using slow flying aircraft will be compromised. Most of our flights occur at approximately 500 ft. MOA designation will allow flights approaching supersonic speeds to be flown at 300 ft. AGL versus 1,500 ft. AGL. This presents a safety issue for other civilian aircraft as well.

Bird/Aircraft Collisions - The vast majority of bird/aircraft collisions experienced by the Air Force have occurred from surface to 500 ft. elevation (see appendices). Reducing the flight floor over much of Colorado's airspace through MOA designation or expansion will aggravate the bird strike problem.

Air Pollution - CDOW is concerned that aircraft emissions where concentrated flight activity is proposed may contribute to acidic aquatic conditions with impacts to amphibians, fish and reptiles.

Monitoring/Enforcement - CDOW needs assurance that any agreed upon avoidance measures will be implemented and enforced. To date, eight months following adoption of the Airburst Range environmental assessment, COANG and Air National Guard have not entered the agreed upon flight avoidance measures into the Flight Operations Program Manuals used by airspace managers and others.

## IMPACTS BY REGION/FLIGHT ROUTE

To more specifically identify anticipated aircraft/wildlife conflict areas, a listing of anticipated impacts by flight routes is provided:

### N.E. Region

IR-416-- Sorties to increase from 30 to 46. Originates in N.E. Colorado, proceeds to Wyoming, and reenters Colorado in the Cougar MOA, near Raymer. This route may impact Prairie falcons, Golden eagles, Ferruginous hawks, Greater prairie chickens, Mountain plover and antelope.

The single area of greatest concern along this route is Pawnee Buttes. These geologically and habitat rich formations represent a major raptor concentration area, as well as the reintroduction site for the Greater prairie chicken. Pawnee Buttes should be avoided by 1.5 NM. Moving south and east, the Pinneo area should also be avoided in deference to the Greater prairie chicken. Flights crossing the South Platte River should attain the maximum altitude allowed on the MTR ( approx. 2,500 AGL ) one mile prior to and one mile after river crossings. This to avoid bird strikes or disturbance to waterfowl, Bald eagles, shore birds, White pelicans and recreationists.

XIR-426-- The same avoidance measures recommended for IR 416 should apply here as well.

### S.E. Region

IR-415--Sorties to increase from 40 to 96. This route originates east of Denver and accesses Airburst Range at Ft. Carson. This route will impact Karval SWA which should be avoided by 1.5NM. It will also cross the Arkansas River with potential impacts to waterfowl, Bald eagles, shore birds, migrating sandhill cranes, and recreationists. Flights crossing the Arkansas River should be at an altitude of 2,500 ft. AGL beginning 1 mile prior and 1 mile after crossings. A peregrine falcon nest near the flight route convergence point ( G ) northeast of Walsenburg should be avoided by 1.5NM.

XVR-1427-- Sortie utilization 346. This route originates north of the Cheyenne MOA and impacts Lesser prairie chickens in the Holly area. It proceeds to the Two Buttes and Pinon Canyon MOAs and then passes into the La Veta and Airburst MOAs, ending at the Airburst Range. Impacts to various raptor species, Bighorn sheep and waterfowl will occur on this route. Coordination with Ft. Carson DECAM is recommended for flight avoidance measures on Pinon Canyon. Apishapa SWA should be avoided by 1.5NM. Also, seasonal avoidance measures should be observed for several bighorn lambing sites. Golden eagle nest sites should be avoided by 1.5NM. Lesser prairie chicken leks should be avoided seasonally by 1.5NM.



IR-414--Sortie utilization 16 to 32.

XIR-424 -- the reverse of IR-414--Sortie utilization 266. These routes have potential for impacts to waterfowl in the Ordway vicinity (Lake Henry and Lake Meridith), as well as in crossing the Arkansas River. The Arkansas River should be crossed at 2,500 ft. AGL beginning 1 NM before and 1 NM after crossings.

#### SE/SW Region

IR-413--Sortie utilization 100 Sorties to 254. This route originates in the Palmer Lake area near a Peregrine falcon aerie which should be avoided by 1.5NM. The route also has potential for impacts to several Peregrine falcon aeries further south along the Rampart Range, now subject of a May Effect. A nesting Bald eagle along Four Mile Creek should be avoided by 1.5Nm. Wintering elk populations may be impacted along this route SW of Woodland Park and in the 39 Mile, Black Mtn. and Waugh Mtn. areas.

A seasonal avoidance may be appropriate here. Eleven Mile State Recreation area should be avoided by 1.5NM in deference to waterfowl and recreationists. Peregrine falcons observed in Eleven Mile canyon, but not yet known to nest there, must be kept in mind for potential avoidance. Bighorn sheep wintering and lambing areas will be impacted in the Wellsville - Howard area which should be avoided seasonally. The Arkansas River should be crossed in this area at 2,500 ft. AGL, one NM prior and after the river crossing, to avoid impacts to bighorn sheep, Bald eagles, and recreationists. Potential impacts to the Sangre de Cristo and Greenhorn Wilderness Areas should be considered; and, a minimum altitude level of 2500 ft. AGL should be observed in each case. Wintering Bald Eagles in the San Luis Valley may be impacted and should be avoided by 1.5NM. Migrating Whooping cranes and Sandhill cranes may need seasonal avoidance protection.

IR-409--Sortie utilization ? This route moves through the Pinon Canyon and La Veta MOAs into the Airburst MOAs with potential impacts to Bighorn sheep, elk, a nesting Bald eagle, nesting Mountain plover, numerous raptor nests(including Peregrine falcon, Mexican spotted owls, Pueblo SWA, numerous bird species along the Arkansas River(Bald eagles, Osprey, Great blue herons, waterfowl), and recreationists. This route encompasses the convergence point of 5 MTRs NW of Walsenburg and begins a major use corridor(expanded from 5-15 miles) through the Greenhorn Wilderness Area, through Pueblo State Park, and surrounding Ft. Carson. Overall use of this airspace will increase by up to 300%, and with flights as low as 300 ft. AGL. Aircraft may exercise in this area for 20 to 30 minutes at a time.

The Arkansas River should be crossed at a minimum elevation of 2,500 ft. AGL, one NM mile prior to and after crossing. Pueblo SWA should be avoided by 1.5NM. All Peregrine falcon aeries, Golden and Bald eagle nests should be avoided by 1.5NM. Bighorn sheep should be avoided on a seasonal basis by 1.5NM, as should elk concentration areas.

## MOAs

Most of the MOA proposals will result in an increase in sorties, i.e. Cheyenne 1,324 to 2019; Two Buttes 418 to 661; and Airburst 895 to 2531. CDOW is very concerned about the creation and reconfiguration of MOAs. Unlike the MTRs, these areas will allow concentrated flight activity (20 to 30 minutes per sortie), and will have a flight floor of 300 ft. AGL. The potential impacts to wildlife and recreationists, given these changes, and an increase in total sorties of approximately 100 %, are enormous. For instance, the current configuration of the Airburst MOA will now provide for a 300% increase in use of the Airburst Range and surrounding airspace.

This is being proposed regardless of a May Effect declaration by the USFWS for Peregrine falcon (late 1992) for the Airburst Range where peregrines have been observed foraging. Three active peregrine nests have been documented near by. Is access to Airburst Range being planned from the West? If so, CDOW recommends against this access since Peregrine falcons will be impacted, as will Beaver Creek SWA.

Many of these MOAs have been connected to result in huge flight impact areas, which along with expanded MTRs, blanket the majority of airspace in SE Colorado. CDOW questions the need for this considering that COANG and other military training flight activity has been successfully conducted in this area over the past 20 years without such blanketing. Does the downsizing of air reserve units justify CAI as proposed? Also, CDOW is concerned that no assessment of cumulative impacts has been done to take into consideration other military flight paths not shown in this proposal.

## CONCLUSION

CDOW feels the CAI initiative, as proposed, will result in unmitigated airspace use by COANG where such use has not been necessary in the past. This will occur due to enlargement and reconfiguration of MOAs to connect, thus creating a blanketing of airspace over already environmentally saturated areas such as Ft. Carson.

The Airburst Range at Ft. Carson drives much of this initiative with five MTRs accessing the range, versus one in the past. As these routes move toward Ft. Carson, they converge in airspace which quickly becomes MOAs, where flight activity is concentrated, and where avoidance measures are discouraged or denied. Use through this corridor and of the Airburst Range will increase approximately 300%.

Such airspace use will result in significant impacts to wildlife and to recreationists. Indeed, it totally ignores and frustrates the current USFWS imposed MAY EFFECT, part of which requires that an already initiated Peregrine falcon study be

conducted to determine the extent of F-16 impacts.

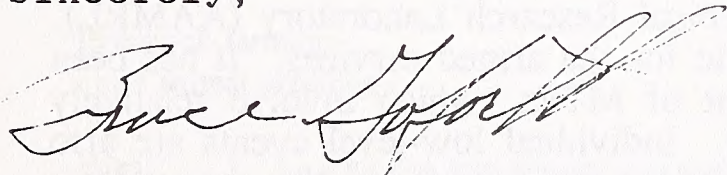
CDOW feels such conflicts can be avoided by abandoning MTRs such as IR-413, and by withdrawing certain airspace designated for MOA status. In taking such action, COANG will allow itself greater latitude to accommodate avoidance measures meant to reduce negative impacts to Colorado's wildlife, to recreationists and to the public in general. These interests are substantial and should be weighed with the realization that COANG's mission, while important, should not supersede all others in Colorado, individually or collectively.

CDOW has proposed workable avoidance measures which will allow COANG to accomplish its mission without significant impacts to wildlife and recreationists. If these measures are adopted, both entities will benefit.

CDOW would like to join COANG in further exploring opportunities to reconfigure flight operations with this goal in mind. We hope we will be given this opportunity.

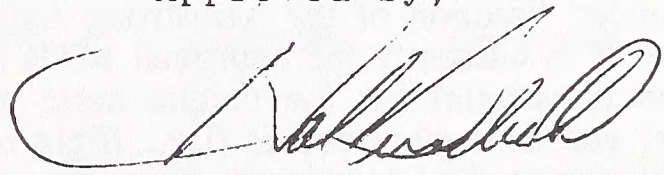
If I can be of further assistance in analyzing the CAI proposal, or in developing recommendations for decreasing potential impacts, please let me know. CDOW appreciates the opportunity to provide these comments.

Sincerely,



Bruce Goforth  
Sr. Wildlife Biologist

Approved by,



Ronald P. Desilet  
Regional Manager

Table 3.8-1  
Loudness Sensitivity

<u>Actual Increase in Sound Level (db)</u>	<u>Perceived Increase in Loudness (%)</u>
1	7
3	23
5	41
10	100

Source: Impact Characterization of Noise including Implications of Identifying and Achieving Levels of Cumulative Noise Exposure. EPA Report NTID 73.4, 1973.

The  $L_{dn}$  is the preferred noise metric of the Department of Housing and Urban Development (HUD), the Department of Transportation (DOT), the Department of Defense (DOD), Federal Aviation Administration (FAA), EPA, and the Veteran's Administration. The Army uses calculated  $L_{dn}$  values for its Installation Compatible Use Zone (ICUZ) program. From the analysis of noise-generating activities, noise contours can be plotted to define zones I, II, and III, which correspond to  $L_{dn}$  values below 65 dbA, between 65 dbA and 75 dbA, and above 75 dbA, respectively. These ICUZ noise zones match up with noise zones A/B, C-1/C-2 and D-1/D-2/D-3; respectively, as defined and structured by the Federal Interagency Committee on Urban Noise (FICUN) in *Guidelines for Considering Noise in Land Use Planning and Control* (FICUN, 1980). Table 3.8-2 presents the recommended land uses for the ICUZ program and FICUN recommended noise zones. In general, an  $L_{dn}$  of 65 dbA or lower is compatible with most land uses, including residential.

An additional noise metric, the  $L_{dnmr}$ , has been developed specifically for MTRs by the Air Force under direction of the Armstrong Aerospace Medical Research Laboratory (AAMRL). This metric is currently the approved MTR noise metric for the armed services. It has been designed to account for the unique noise environment of MTRs, which involve relatively irregular and infrequent events (i.e., flight operations). Individual low-level events are also different from typical community noise sources because of the rapid onset rate that can create a "startle" effect. The  $L_{dnmr}$  is the "onset rate-adjusted monthly day-night average, A-weighted sound level." It is similar to the  $L_{dn}$  in that it is an averaged metric with a 10-db penalty for events occurring between 2200 and 0700 hours. However, it is an average for an entire month, utilizing the highest monthly sortie activity, and includes an additional 0- to 5-db penalty to compensate for the "startle" effect of a low-altitude overflight.

Where there is no onset penalty and the number and kind of noise events are the same on an average day, use of the  $L_{dnmr}$  metric will result in the same values as those predicted using the  $L_{dn}$  metric. Both  $L_{dn}$  and  $L_{dnmr}$  are averaged noise metrics that are responsive to infrequent, high noise level events. For example, a rural environment with a background noise level of  $L_{dn}$  35 or less would be raised to  $L_{dn}$  60 by a single daily low-level flight directly overhead lasting less than a minute.

Table 3.8-2

Recommended Land Uses for  $L_{dn}$ -Based Noise Zones<sup>1</sup>

	----- Noise Zones -----		
	Zone I [or A/B] ( $L_{dn} < 65$ )	Zone II [or C-1/C-2] ( $L_{dn} 65-75$ )	Zone III [or D-1/D-2/D-3] ( $L_{dn} > 75$ )
Residential (all uses)	Acceptable	Generally unacceptable <sup>2</sup>	Unacceptable
Manufacturing	Acceptable	Acceptable	Acceptable <sup>3</sup>
Transportation, communication, and utilities	Acceptable	Acceptable	Acceptable
Trade	Acceptable	Acceptable	Acceptable <sup>3</sup>
Public services	Acceptable	Generally unacceptable <sup>2</sup>	Unacceptable
Cultural, recreational, and entertainment	Acceptable	Generally unacceptable <sup>2</sup>	Unacceptable
Agricultural	Acceptable	Acceptable	Acceptable
Livestock farming and animal breeding	Acceptable	Acceptable	Unacceptable

- Notes:
1.  $L_{dn}$  is the dbA level averaged over a 24-hour period.
  2. Use is generally discouraged; however, if allowed, sound attenuation techniques should be required.
  3. For an  $L_{dn}$  level above 75 db, sound attenuation techniques should be required.

Source: Federal Interagency Committee on Urban Noise, 1980.

Table 3.8-5

Maximum Single-Event Noise Levels as a  
Function of Slant Distance (db)

Slant Distance (feet)	Aircraft Type			
	A-7 <sup>1</sup>	F-4 <sup>2</sup>	F-16 <sup>3</sup>	F-111 <sup>4</sup>
315	109.2	118.5	106.7	107.1
400	106.7	116.1	104.3	104.6
1,000	96.1	106.2	94.2	94.4
2,000	87.4	98.1	85.7	86.0
4,000	77.9	88.9	76.0	77.0
6,300	70.7	81.9	68.5	70.4
10,000	62.3	74.1	60.1	63.2
20,000	46.4	60.1	46.5	50.8

- Notes:
1. Assumes airspeed of 450 knots, power setting of 95 percent rpm.
  2. Assumes airspeed of 550 knots, power setting of 98 percent rpm.
  3. Assumes airspeed of 500 knots, power setting of 85 percent rpm.
  4. Assumes airspeed of 350 knots, power setting of 90 percent rpm.

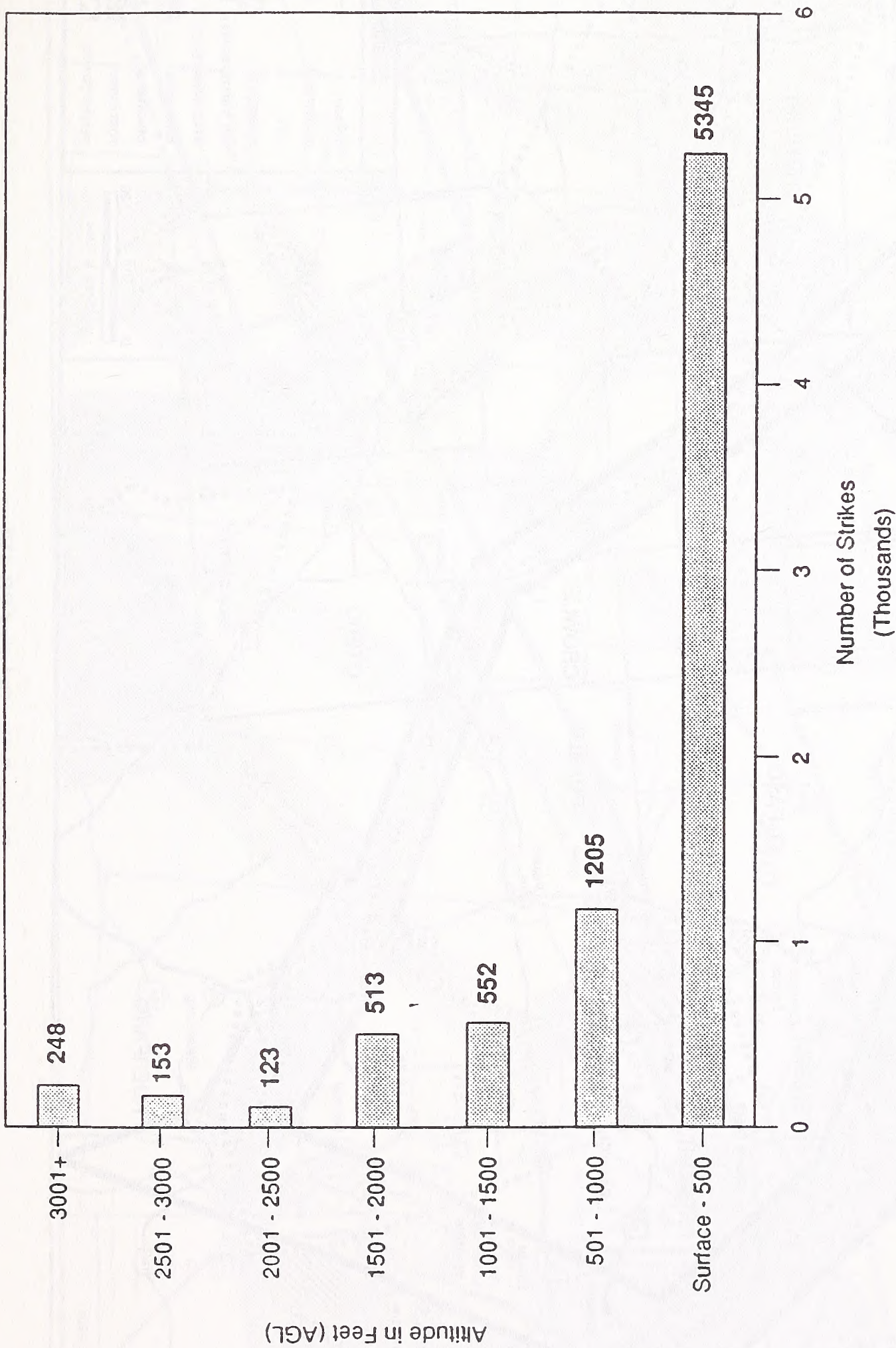
Source: Omega 10r computer program, USAF 1988b.

## IR-409

The majority of aircrews accessing the range enter IR-409 at alternate entry Point G near Cedarwood. Consequently, the route is infrequently used from its beginning at Point A near Lamar to Point G (personal communication, Krikorian 1989). The distance from Point G to the route's termination at the Airburst Range (Point I) is approximately 44 miles (38 NM). Current use of the route, from Point G to Point I, is approximately 3,000 sorties per year (total use of the range minus 222 Army helicopter sorties).

### 3.9.1 Population

The Airburst Range is situated in the southcentral portion of the Fort Carson Military Reservation in northwestern Pueblo County. The area is essentially uninhabited except for scattered ranches and the town of Penrose, located about 5 miles to the west of the range. The population of Penrose is approximately 4,000 people. Somewhat more distant are the towns of



Source: HQ USAF/LEEVN, 1989.

Figure 3.11-1

1987 - 89 AIR FORCE BIRD STRIKES WORLDWIDE BY ALTITUDE

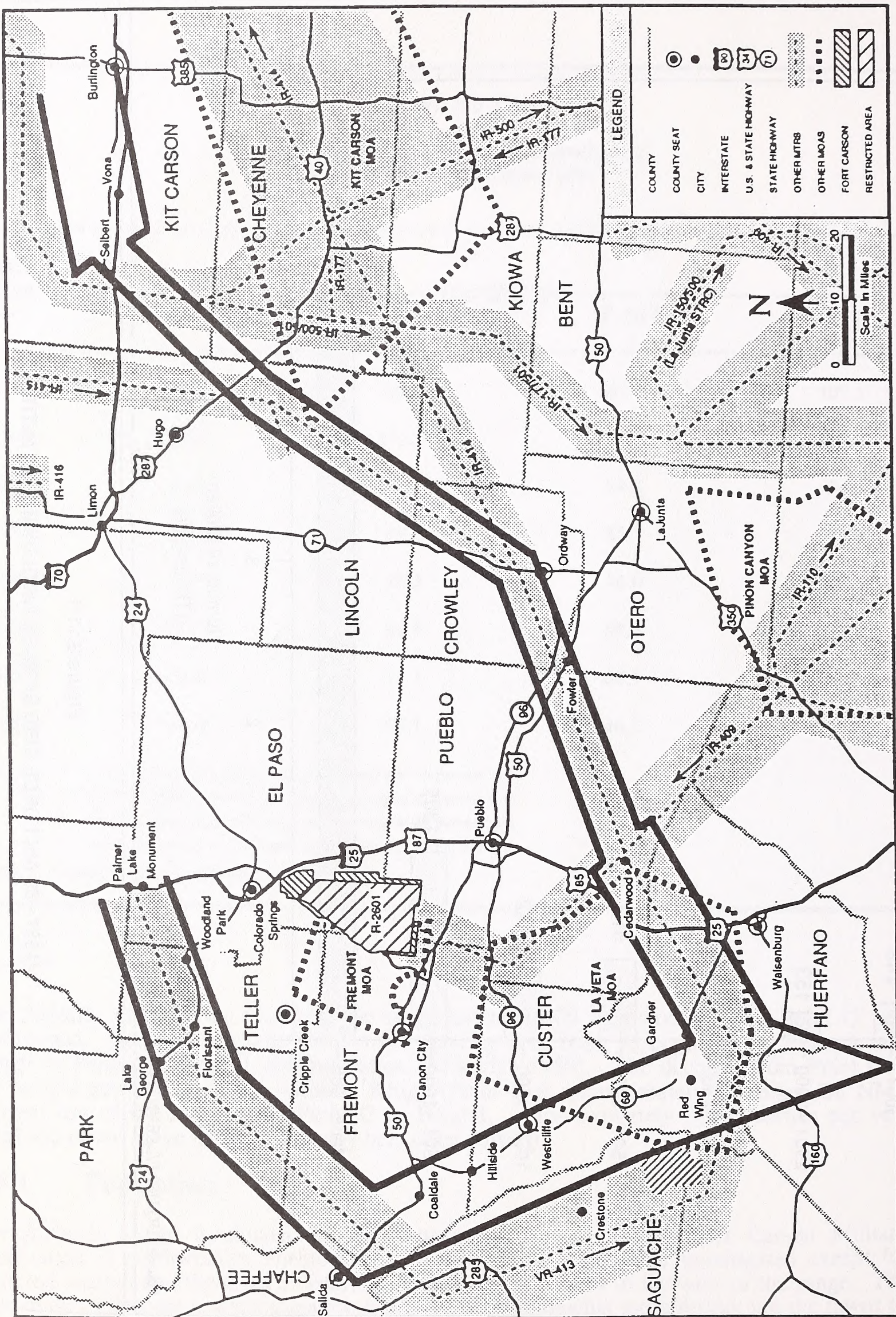


Figure 2-10. Existing VR-412





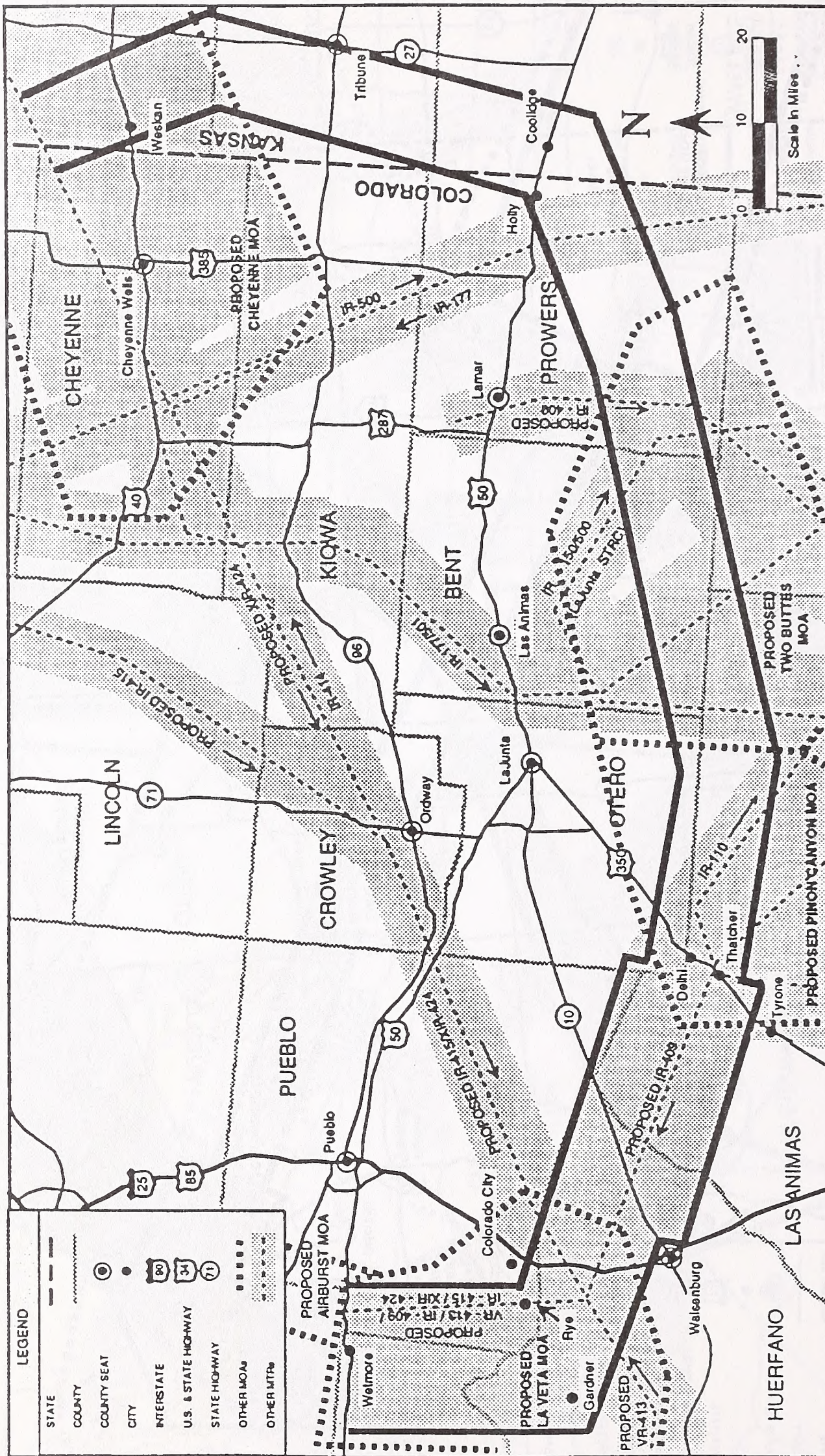


Figure 3-13. Proposed XVR-1427

## MEMORANDUM

COLORADO STATE PARKS

Laurie A. Mathews, Director

TO: Steve Norris

FROM: Dean Winstanley *DWW*

SUBJECT: Colorado Airspace Initiative

DATE: September 30, 1993

This is in response to your memorandum of August 18, 1993 asking for input on the affect the Colorado Airspace Initiative (CAI) would have on Colorado State Parks. After reviewing the Air National Guard's Description of Proposed Action and Alternatives (DOPAA), we are very concerned with the proposed changes to Military Training Route VR 413. Specifically, the DOPAA would re-route VR 413 directly over San Luis Lakes State Park, Eleven Mile State Park and Mueller State Park and significantly increase the number of annual training flights (sorties). If adopted, the proposed changes would negatively impact recreation at these parks as well as potentially disturb the wildlife in the park.

### Description of the State Parks Within the Proposed VR 413

**San Luis Lakes State Park.** Opened in May 1993, this 3,000-acre collection of natural lakes and wetlands is the newest of Colorado's 41 state parks. It is located about 5 miles west of the entrance to Great Sand Dunes National Monument on Sixmile Road in Alamosa County. Visitors to the park take part in hiking, picnicking, fishing, water sports, wildlife viewing and camping at 51 sites; limited hunting opportunities are available as well. Along with spectacular views of the Great Sand Dunes and the lofty Sangre de Cristo Range, San Luis Lakes is, perhaps, characterized most by the abundant wildlife, especially migratory waterfowl and birds.

**Mueller State Park.** This beautiful, 12,103 acre mountain park continues to grow in popularity with recreationists; last year's visitation climbed to 351,000, more than twice that of the previous year. A 90-mile network of backcountry trails provides visitors the opportunity to explore the rolling timber and grassland and to observe some of Mueller's abundant wildlife. Elk, big horn sheep, black bear and eagles, among other species, make this pristine area their home. In addition to trail use, Mueller is popular for camping (90 sites), picnicking and fishing. The park is located four miles south of the town of Divide in Teller County.

**Eleven Mile State Park.** Characterized by short grasses and rocky outcroppings around an enormously popular fishing reservoir, Eleven Mile State Park hosts almost half a million visitors annually. Most visitors come for the water sports, but camping at 265 sites and opportunities to view the area's abundant wildlife are available. Eleven Mile is located 10 miles southwest of Lake George in Park County.

### Description of Proposed Changes to VR 413

Key details of the proposed changes to VR 413, as well as other pertinent facts about these military training flights are listed below.

- \* The proposed Military Training Route VR 413 would pass directly over San Luis Lakes, Mueller and Eleven Mile state parks.
- \* Sorties would increase from 100 to 254 per year.
- \* Flyovers would include Saturdays.
- \* Many of the training runs consist of four F-16s flying in formation at one time.
- \* Airspeed of these aircraft is estimated at 480 knots.
- \* The proposal would continue low altitude training runs as low as 300 feet.
- \* The Air National Guard's F-16, F-18, F-15, and F-111 jets are all capable of flying as low as 100 feet.
- \* VR 413 is used for visual navigation training at low altitudes. This can encourage pilots to test their skills at the lowest possible altitude.
- \* At the scoping meeting in Moffat, Colorado on August 4, 1993, San Luis Valley residents testified that "maverick" sorties have gone much lower than 300 feet and have strayed from the currently assigned airspace.

### Impact of CAI Training Route VR 413

Under the proposed Military Training Route VR 413, as explained in the DOPAA, a number of potential impacts to San Luis Lakes, Mueller and Eleven Mile state parks have been identified as concerns by our division.

**Negative Impact on Quality of Recreation Experience.** The Colorado State Parks mission includes providing "...quality outdoor recreation experiences for our visitors while effectively managing the natural resources under our authority." The division is concerned that our ability to provide quality recreation will be compromised by the proposed military flights over these parks. Coloradans and out of state visitors enjoy state parks for the recreational opportunities, the chance to observe nature and for the peace and quiet. The prospect of Saturday morning campers being awakened at 7 am by the frightening roar of F-16 jets in low-flying formation leads us to predict that the pleasant, peaceful experience of many park visitors will be impacted.

**Negative Economic Impact on the Parks.** Revenue from entrance fees, camping fees, group picnic fees and other sources provide the funding for the majority of Colorado State Parks' annual operating budget; we rely heavily on this type of park-generated revenue to keep our parks open. Low-level sorties by supersonic military jets on a regular basis could potentially impact the visitation (and revenues) at San Luis Lakes, Mueller and Eleven Mile state parks. People would simply choose another place to recreate such as the Great Sand Dunes National Monument, about 8 mile from San Luis Lakes State Park.

**Noise Impact on Park Visitors and Staff.** There is no question that the proposed flights over San Luis Lakes, Mueller and Eleven Mile state parks will generate a significant level of noise. Although the division does not know what the exact estimated decibel level will be for these flyovers, it will without question disturb the experience of the park visitors. This noise will also

impact the park staff. Eleven Mile State Park, which lies within or on the edge of the currently used VR-413 route, has documented problems in the past with jets flying directly over the reservoir at levels much lower than 300 feet. Complaints have been submitted by the park manager on a number of occasions over the past few years.

Although State Parks is not in a position to predict exactly how the wildlife will react to substantially increased decibel levels, we expect that there will be at least some negative impact. The Colorado Division of Wildlife will no doubt comment on this.

**Negative Visual Impact.** Many State Parks visitors, especially those at a wildlife refuge such as San Luis Lakes and Mueller, are looking for a very quiet, natural setting. The sight of low-flying F-16 fighter jets approaching in formation will undoubtedly upset many of these visitors. Such an occurrence is simply not consistent with the desired experience many of our park visitors are seeking.

**Disturbance to the Park Wildlife.** Perhaps the most significant recreational pursuit at San Luis Lakes and Mueller state parks is the opportunity to view the many mammals and bird species that make these areas a year round or part time home. At San Luis Lakes, interpretive ranger-led nature walks and other park programs provide visitors an opportunity to view and learn about the waterfowl, songbirds and other species, some of which are rare or threatened. Ranger-led interpretive walks at Mueller are at least as significant, enabling visitors to view bugling elk, big horn sheep and other wildlife.

As stated above, State Parks is not in a position to predict precisely what type of impact the proposed changes to VR 413 will have on the wildlife at these parks. Our concern, however, is that the close proximity of the 254 annual fighter jet sorties will disturb the wildlife. The Division of Wildlife is, obviously, the most qualified to provide an analysis of any potential impact to the wildlife resources.

#### Impact on Colorado Natural Areas

The Colorado Natural Areas program (CNAP), administered by State Parks, is charged under Colorado law with identifying and protecting certain natural areas of the state which contain diverse ecosystems, ecological communities and other natural features or phenomena which are indigenous to Colorado. In addition to providing opportunities for observing and studying areas of Colorado that remain in their natural/original condition, designated and registered Natural Areas also serve as areas of "natural beauty, inspiration, and diversity which meet aesthetic needs and which enrich the meaning and enjoyment of human life."<sup>1</sup> In other words, many Natural Areas serve recreational needs of the public. There are currently 78 such sites in the state, two of which lie within the proposed VR 413. These two sites include Dome Rock and Saddle Mountain.

Although Saddle Mountain received its Natural Area designation due to its pristine plant communities, Dome Rock serves as a critical lambing ground for big horn sheep. In addition to the importance of Dome Rock as a wildlife area, it draws large numbers of recreationists to its secluded site within Mueller State Park. Impacts of F-16 flyovers on the wildlife and recreation experience at Dome Rock area are of concern to Colorado State Parks.

---

<sup>1</sup> Stated in 33-33-101 et. seq., Colorado Revised Statutes.

Conclusions Regarding CAI Training Route VR 413

Due to a potential impact on the quality of recreation, increases in noise levels, an unpleasant visual impact, potential economic impacts to the division and possible impacts on the wildlife resource, Colorado State Parks opposes the proposed re-routing of Military Training Route VR 413 over San Luis Lakes, Mueller and Eleven Mile state parks.

cc: Ken Salazar  
Laurie Mathews  
Kent Wiley  
John Brandstatter  
John Koshak  
Gregg Nootbaar  
Dave Spencer

3-11-94

STATE OF COLORADO  
Roy Romer, Governor  
DEPARTMENT OF NATURAL RESOURCES  
**DIVISION OF WILDLIFE**

AN EQUAL OPPORTUNITY EMPLOYER

Southeast Regional Office  
2126 N. Weber Street  
Colorado Springs, Colorado 80907  
Telephone: (719) 473-2945



For Wildlife-  
For People

**FAX TRANSMITTAL SHEET**

TO: BRIAN HOPPY

FROM: BRUCE GOFORTH

NOTES: PLEASE NOTE THE T or F DESIGNATION  
I PLACED ON EACH SPECIE, AND THE ADDITION  
OF THE MEXICAN SPOTTED OWL.

*Bruce Goforth*

IF YOU HAVE ANY QUESTIONS REGARDING THIS TRANSMISSION  
Please Contact

GREATER PRAIRIE, SANDHILL, PERRINE AND

AT

SANDHILL CRANE WERE DOWN LISTED FROM ENHANCED  
TO THREATENED ON THE STATE LIST.

Our FAX Number is (719) 473-4062



Science &  
Engineering  
Associates, Inc.

1111 Pine Street  
Suite 300  
Alexandria, Virginia 22304  
(703) 549-8884  
FAX: (703) 549-6145



March 11, 1994

Facsimile Transmission

Mr. Bruce Goforth  
Sr. Wildlife Biologist  
Colorado Department of Natural Resources  
Division of Wildlife  
6060 Broadway  
Denver, Colorado 80216

**REFERENCE:** State of Colorado Threatened and Endangered Species

Dear Mr. Goforth:

As we spoke of earlier today, a list of the State of Colorado Threatened and Endangered (T & E) species was included in your letter to Mr. Steve Norris, Assistant Director - Colorado Department of Natural Resources, dated September 14, 1993. The species were as follows:

- Greater Prairie Chicken - T-
- Lesser Prairie Chicken - T-
- Plains Sharp-Tailed Grouse - E-
- Piping Plover - T-
- American Peregrine Falcon - T-
- Greater Sandhill Crane - T-
- Whooping Crane - E
- Bald Eagle - T-
- Least Tern - E-
- Mexican Spotted Owl - T-

Please indicate which of the above species are threatened, and which are endangered.

Also, you stated that four species have been removed from the State of Colorado T & E species list within the past month. Further information concerning these four species (i.e., names of the species, dates delisted, etc.) would be greatly appreciated.

Please fax the information to me at your earliest convenience. My fax number is (703) 549-6145. If you have any questions regarding these requests, please contact me at (703) 549-8884. Thank you for your time and cooperation.

Sincerely,

Brian K. Hoppy  
Scientist

cc: Douglas Murtland



STATE OF COLORADO  
Roy Romer, Governor  
DEPARTMENT OF NATURAL RESOURCES  
**DIVISION OF WILDLIFE**

AN EQUAL OPPORTUNITY EMPLOYER

Southeast Regional Office  
2126 N. Weber Street  
Colorado Springs, Colorado 80907  
Telephone: (719) 473-2945



For Wildlife  
For People

FAX TRANSMITTAL SHEET

TO: BRIAN HOPPY, SEA

FROM: CHUCK LOEFFLER

NOTES: Please give me a call if you have any questions.

IF YOU HAVE ANY QUESTIONS REGARDING THIS TRANSMISSION  
Please Contact

Chuck

AT

719-473-2945, ext. 203

Our FAX Number is (719) 473-4062

X = KNOWN RESIDENT and/or BREEDING POPULATIONS.  
✓ = IMPORTANT MIGRATION OR WINTERING AREAS.

ATTACHMENT A

Colorado Threatened and Endangered Species										
Countries	Greater Prairie Chicken	Lesser Prairie Chicken	Plains Sharp-Tailed Grouse	Piping Plover	American Peregrine Falcon	Greater Sandhill Crane	Whooping Crane	Bald Eagle	Least Tern	Mexican Spotted Owl
- Alamosa						✓	✓	✓		
- Arapahoe										
- Baca		X		X				✓	X	
- Bent					X					
- Chaffee										
- Cheyenne						✓	✓	✓		
- Costilla							✓	✓		
- Crowley										
- Custer			X		X					XX
- Douglas										
- Elbert										
- El Paso					X			X		XX
- Fremont					X					
- Huerfano				X				✓	X	
- Kiowa		X								
- Kit Carson										
- Larimer					X					
- Las Animas					X					
- Lincoln										
- Morgan										
- Otero					X					
- Park										
- Prowers		X								
- Pueblo								✓		X
- Sagauche					X			X		
- Teller										
- Washington	X							✓		
- Weld								X		

STATE OF KANSAS



Joan Finney  
Governor

DEPARTMENT OF WILDLIFE & PARKS

Theodore D. Ensley  
Secretary

OPERATIONS OFFICE  
512 SE 25th Ave.  
Pratt, KS 67124-8174  
(316) 672-5911 / FAX (316) 672-6020

April 25, 1994

Mr. Brian K. Hoppy  
Environmental Scientist  
Science & Engineering Associates, Inc.  
1421 Prince Street, Suite 300  
Alexandria VA 22314

Ref: D5.0100  
Air National Guard  
Training  
Trak: 930462

Dear Mr. Hoppy:

This will respond to your April 21 correspondence requesting a reevaluation of the Colorado Airspace Initiative adding Kearny and Wichita counties to those named in the 1993 inquiry. My comments of August 18, 1993 are basically applicable to Kearny and Wichita counties. I did fail to point out in my previous response, however, since the training flights may go over the Arkansas River, pilots should be aware of the potential for encountering flocks of waterfowl during spring and fall migration periods. Also, both golden and bald eagles are known to winter along the river where they utilize large trees as roost or feeding sites. Eagles would normally occur most frequently from November through March.

Thank you for providing the opportunity to comment further.

Sincerely,

Robert D. Wood, Chief  
Environmental Services Section

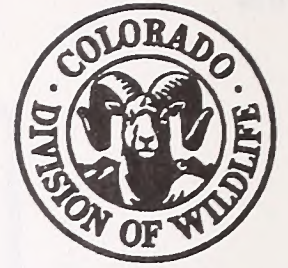
RDW:ss

STATE OF COLORADO  
Roy Romer, Governor  
DEPARTMENT OF NATURAL RESOURCES  
**DIVISION OF WILDLIFE**

AN EQUAL OPPORTUNITY EMPLOYER

Perry D. Olson, Director

Southeast Regional Office:  
2126 N Weber Street  
Colorado Springs, CO 80907  
(719)473-2945



*For Wildlife-  
For People*

June 17, 1994

Mr. Brian K. Hoppy  
Science & Engineering Assoc., Inc  
7918 Jones Branch Drive, Suite 500  
McLean, VA 22102

SUBJ: CAI EIS Wildlife Data Request

Dear Mr. Hoppy:

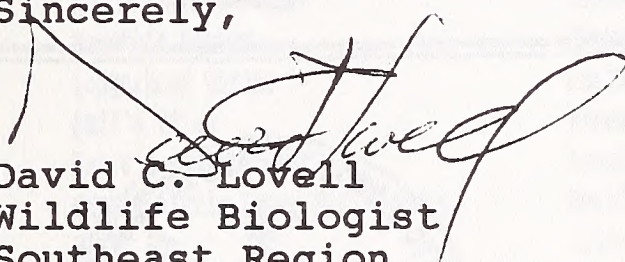
Enclosed please find a Microcomputer Database Request Form which must be signed and returned prior to processing your request. The species and data layers in which you have expressed interest include Peregrine Falcon, Bald Eagle, Least Tern, Piping Plover, Lesser Prairie Chicken, Osprey, White Pelican, Bighorn Sheep, Elk, Mexican Free-Tailed Bat, Golden Eagle, CAI MTR's, CAI MOA's, R2601, Airburst Range, SAC MTR's, and NMANG's Colorado MTR. I will provide these plots to you as discussed on mylar acetate at a scale of 1:500,000 for use as overlays with Commercial Navigation Charts. Our charge to SEA for these services will cover materials only, as agreed, and SEA will not be charged for time spent producing these materials.

All materials are being provided to SEA for the express use in the Colorado Air National Guard's Colorado Airspace Initiative (CAI) Environmental Impact Statement (EIS) assessment. These data are not to be used on any other project or provided to or resold to any other SEA client or on any other project without first obtaining the express written permission of the Colorado Division of Wildlife. Additionally, a disclaimer will be provided with the plots and with which you should be aware of prior to the use of this data.

Any of the raptor nesting information, especially that for peregrine falcon and bald eagle, should be considered proprietary, and should be used for analysis only. This information should not appear in the EIS in any manner that might provide readers the necessary information to locate an actual nest site. Care should be taken when presenting distribution information regarding other State or Federal Threatened or Endangered species as well.

If you have any questions or require additional information please feel free to call me at (719)473-2945 x227.

Sincerely,



David C. Lovell  
Wildlife Biologist  
Southeast Region

cc: B. Goforth  
file

GOVERNOR  
Bruce King

STATE GAME COMMISSION  
JAMES H. (JAMIE) KOCH, CHAIRMAN  
SANTA FE



STATE OF NEW MEXICO  
DEPARTMENT OF GAME & FISH

Village Building  
P.O. Box 25112  
Santa Fe, N.M. 87504

THOMAS P. ARVAS, O.D., VICE-CHAIRMAN  
ALBUQUERQUE

BOB JONES  
CROW FLATS

J.W. "JOHNNY" JONES  
ALBUQUERQUE

BRUCE WILSON  
MESILLA PARK

DAVID M. SALMAN  
LA CUEVA

ANDREA MAES CHAVEZ  
NAVAJO DAM

DIRECTOR AND SECRETARY  
TO THE COMMISSION  
Bill Montoya

DATE: 7/18/94

TO: Brian K. Hoppy  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



FROM: Jim Basley, CONSERVATION SERVICES DIVISION

THIS TRANSMISSION CONSISTS OF 2 PAGES, INCLUDING COVER SHEET.

COMMENTS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Status List of T&E, Proposed & Candidate Species:

DEC 1993

in Union County

INVERT NAME.....	SCIENTIFIC NAME.....	FEDERAL END.	FED.... THREAT.	FED.. PROP.	FED... CARD.	STATE END.	STATE.. THREAT.
Arkansas River Shiner	<i>Notropis girardi</i>	-	-	-	X	X	-
Suckermouth Minnow	<i>Phenacobius airzbilis</i>	-	-	-	-	-	X
Texas Horned Lizard	<i>Phrynosoma cornutum</i>	-	-	-	X	-	-
Arid Land Ribbon Snake	<i>Thamnophis proximus diaboifcus</i>	-	-	-	-	-	X
White-faced Ibis	<i>Plegadis chihi</i>	-	-	-	X	-	-
Bald Eagle	<i>Haliaeetus leucocephalus</i>	X	-	-	-	-	X
Northern Goshawk	<i>Accipiter gentilis</i>	-	-	-	X	-	-
Ferruginous Hawk	<i>Buteo regalis</i>	-	-	-	X	-	-
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	X	-	-	-	X	-
Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	-	X	-	X	-	-
Mountain Plover	<i>Charadrius montanus</i>	-	-	-	X	-	-
Loggerhead Shrike	<i>Lanius ludovicianus</i>	-	-	-	X	-	-
Bell's Vireo	<i>Vireo bellii</i>	-	-	-	-	-	X
Baird's Sparrow	<i>Ammodramus bairdii</i>	-	-	-	X	-	X
Occult Little Brown Bat; <i>Myotis</i>	<i>Myotis lucifagus occultus</i>	-	-	-	X	-	-
Swift Fox	<i>Vulpes velox velox</i>	-	-	-	X	-	-
Circular Pea-cian	<i>Musculium pertusum</i>	-	-	-	-	-	X
Wide Pea-cian	<i>Musculium transversum</i>	-	-	-	-	-	X

STATE OF COLORADO  
Roy Romer, Governor  
DEPARTMENT OF NATURAL RESOURCES  
**DIVISION OF WILDLIFE**

AN EQUAL OPPORTUNITY EMPLOYER



*For Wildlife-  
For People*

Perry D. Olson, Director

Southeast Regional Office:  
2126 N Weber Street  
Colorado Springs, CO 80907  
(719)473-2945



July 18, 1994

Mr. Brian Hoppy  
Science & Engineering Associates, Inc.  
7918 Jones Branch Drive, Suite 500  
McLean, VA 22102

Dear Mr. Hoppy:

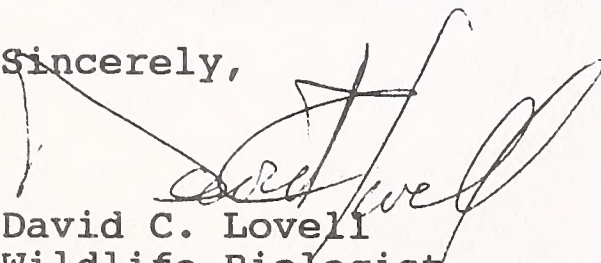
Enclosed please find the first batch of GIS plots to be used in the Colorado Airspace Initiative Environmental Impact Statement. As requested, the plots were produced at a map scale of 1:500,000 so that they might be used in conjunction with the commercial navigation charts.

The enclosed materials include plots of the proposed CAI military airspace, Air Combat Command and New Mexico National Guard airspace, as well as distribution maps for least tern, piping plover, lesser prairie chicken, peregrine falcon, bald eagle, white pelican, osprey, and Mexican free-tailed bat.

I am currently working to provide distribution maps for bighorn sheep and golden eagle, as well as plots of important State Wildlife Areas. I will also provide you with preliminary plots of the telemetry results from this first years Fort Carson peregrine falcon study. I should have these processed within the next week.

If you have any questions regarding these materials please feel free to call. I will include the bill for materials with the final shipment.

Sincerely,

  
David C. Lovell  
Wildlife Biologist  
Southeast Region



# WYOMING GAME AND FISH DEPARTMENT

Mike Sullivan, Governor



Francis E. Peters, Governor



## FACSIMILE TRANSMITTAL COVER

from

Fax Number (307) 777-4610

Number of Pages Including Cover Sheet: 8

TO:

Brian Hoppy

Science & Engineering Associates

FAX #:

(703) 761-4105

FROM:

WYOMING GAME AND FISH DEPARTMENT, 5400 BISHOP BLVD, CHEYENNE, WY 82006

TELEPHONE:

(307) 777-4509 (Tom Collins)

NOTES:

Colorado Airspace Initiative EIS

Please call (307) 777-4541 immediately if complications develop

I have included:

- 1) USFWS T&E spp list for WY - those I have starred should be included in your T&E/Candidate spp list as additions.
- 2) We have no state-listed T&E species; we have WGFED priority species 1, 2 & 3, but these have no legal or statutory basis (list included).
- 3) Federal Register notice on Swift fox.

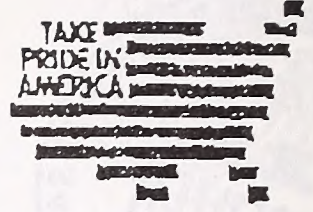
FAX TRANSMITTAL

# of pages = 3

Paul Day

Steve Brocman

Department of the Interior



FISH AND WILDLIFE SERVICE

Ecological Services

4000 Morrie Avenue

Cheyenne, WY 82001

IN REPLY REFER TO

ES-61411

March 22, 1994

Listed below are the threatened and endangered species in Wyoming, as defined by the Endangered Species Act of 1973, as amended (ESA). Candidate species of animals and plants follow.

SPECIES	STATUS	EXPECTED OCCURENCE
Black-footed ferret ( <u>Mustela nigripes</u> )	Endangered	Potential resident in prairie dog ( <u>Cynomys</u> sp.) colonies.
Bald eagle ( <u>Haliaeetus leucocephalus</u> )	Endangered	Nesting. Winter resident. Migrant.
Peregrine falcon ( <u>Falco peregrinus</u> )	Endangered	Nesting. Migrant.
Whooping crane ( <u>Grus americana</u> )	Endangered	Resident. Migrant.
Kendall Warm Springs dace ( <u>Rhinichthys osculus thermalis</u> )	Endangered	Resident.
Wyoming toad ( <u>Bufo hemiophrys baxteri</u> )	Endangered	Resident of Laramie River Valley.
Gray wolf ( <u>Canis lupus</u> )	Endangered	Potential resident.
Grizzly bear ( <u>Ursus arctos horribilis</u> )	Threatened	Resident.
* Ute ladies-tresses ( <u>Spiranthes diluvialis</u> )	Threatened	Floodplains in southern Goshen County

*new discovery*

Proposals leading to water depletions (consumption) in the Colorado River System must evaluate impacts to the following downstream species:

Colorado squawfish ( <u>Psychocheilus lucius</u> )	Endangered	Downstream resident of Green River System.
Humpback chub ( <u>Gila cypha</u> )	Endangered	"
Bonytail Chub ( <u>Gila elegans</u> )	Endangered	"
Razorback sucker ( <u>Xytrachan texanus</u> )	Endangered	"

Proposals leading to water depletions (consumption) in the Platte River System must evaluate impacts to the following downstream species:

Piping plover ( <u>Charadrius melodus</u> )	Threatened	Downstream resident of Platte River System.
Least tern ( <u>Sterna antillarum</u> )	Endangered	"
Whooping crane ( <u>Grus americana</u> )	Endangered	"
Pallid sturgeon ( <u>Scaphirhynchus albus</u> )	Endangered	"

Candidate species that occur in Wyoming are identified below. Many Federal agencies have policies to protect candidate species from further population declines. The U.S. Fish & Wildlife Service requests that any information on the status of these species be forwarded to the letterhead address.

<u>Candidate Species</u>	<u>Category</u>	<u>Scientific Name</u>	<u>Expected Occurrence</u>
<u>Mammals</u>			
Preble's shrew	2	<u>Sorex preblei</u>	Yellowstone NP
Spotted bat	2	<u>Euderma maculatum</u>	Bighorn County
Allen's 13-lined ground squirrel	2	<u>Spermophilus tridecemlineatus alleni</u>	W. slope BH mts. & upper Green R.
Preble's meadow jumping mouse	2	<u>Zapus hudsonicus preblei</u>	E. of Laramie mts.
Pygmy rabbit	2	<u>Brachylaeus idahoensis</u>	Sagebrush in SW Wyo.
* Fringed-tailed myotis	2	<u>Myotis thysanodes pahasapensis</u>	E. Wyo., Black Hills → observed in project area
Swift fox	2	<u>Vulpes velox</u>	SE Wyo. grasslands
* Plains (Eastern) spotted skunk	2	<u>Spilogale putorius interrupta</u>	E. of Bighorn and Laramie Mts. known to occur in project area
North Amer. wolverine	2	<u>Gulo gulo luscus</u>	mountains statewide
North Amer. lynx	2	<u>Felis lynx canadensis</u>	mountains statewide
<u>Birds</u>			
Trumpeter swan	2	<u>Cygnus buccinator</u>	NW Wyoming
White-faced ibis	2	<u>Plegadis chihi</u>	wetlands statewide
Harlequin duck	2	<u>Histrionicus histrionicus</u>	rivers in NW Wyoming
Ferruginous hawk	2	<u>Buteo regalis</u>	grasslands statewide
Northern Goshawk	2	<u>Accipiter gentilis</u>	forests statewide
Columbian sharp-tailed grouse	2	<u>Tympanuchus phasianellus columbianus</u>	Baggs area, Little Snake R.
Mountain plover	1	<u>Charadrius montanus</u>	grasslands statewide
Long-billed curlew	3C	<u>Numenius americanus</u>	grasslands/wetlands
Black tern	2	<u>Chlidonias niger</u>	wetlands statewide
* Loggerhead shrike	2	<u>Lanius ludovicianus</u>	woodlands/shrublands occurs in project area

Amphibians

Western boreal toad	2	<u>Bufo boreas boreas</u>	MB mts, western mts
Spotted frog	2	<u>Rana pretiosa</u>	NW WY; YNP

Reptiles

Black Hills redbelly snake	2	<u>Storeria occipitomaculata</u> <u>nahasapae</u>	NE WY; Black Hills
-------------------------------	---	--	--------------------

Fish

Colorado River cutthroat	2	<u>Salmo clarki pleuriticus</u>	Green and Little Snake River drainages
Bonneville cutthroat trout	2	<u>Salmo clarki utah</u>	Bear R.
Flannelmouth sucker	2	<u>Catostomus latipinnis</u>	Green & Little Snake Rivers & tribs.
Sturgeon chub	2	<u>Hypobopsis gelida</u>	Powder & BI R.
Plains topminnow	2	<u>Fundulus sciadicus</u>	N. & S. Platte drgs & Niobrara River
Roundtail chub	2	<u>Gila robusta</u>	Green & Little Snake R. drgs.
Leatherside chub	2	<u>Gila copei</u>	Bear, upper Snake, and Green River drainages

Invertebrates

Narrow-foot hygrotus diving beetle	2	<u>Hygrotus diversipes</u>	Natrona County, near Midwest
Jackson Lake Springsnail (= Elk Island snail)	2	<u>Pyrgulopsis (Fonelicella)</u> <u>robusta</u>	Jackson Lake
Jackson Lake Snail	2	<u>Helisoma (Carinifex)</u> <u>jacksonense</u>	Jackson Lake
Cave Physa (= Wyoming cave snail)	2	<u>Physella (Physa) spelunca</u>	Kane Cave, BI County

Plants

(see attached list)

<sup>2b</sup> 1 - Federal TLD listing appears appropriate and is anticipated. 2 - Current data insufficient to support listing. 2C - More widespread or abundant than previously believed, or no immediate threat identified.

TABLE 1. PRIORITY SPECIES IN NEED OF SPECIAL MANAGEMENT IN WYOMING

*Starred appear in project area (confirmed breeding, nesting)*

## PRIORITY I SPECIES

- ♣ Common loon
- ♣ American white pelican
- ♣ Black-crowned night-heron
- ♣ Snowy egret
- ♣ White-faced ibis
- ♣ Caspian tern
- ♣ Forster's tern
- ♣ Trumpeter swan

## PRIORITY II SPECIES

- ♣ Clark's grebe-*observed*
- ♣ Western grebe
- ♣ American bittern
- ♣ Merlin
- ♣ Upland sandpiper
- ♣ Black tern
- ♣ Yellow-billed cuckoo-*observed*
- ♣ Burrowing owl
- ♣ Dwarf shrew
- ♣ Pygmy shrew
- ♣ Cliff chipmunk
- ♣ Meadow jumping mouse

## PRIORITY III SPECIES

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>♣ Great blue heron</li> <li>♣ Ferruginous hawk</li> <li>♣ Long-billed curlew</li> <li>♣ Lewis' woodpecker</li> <li>Black-backed woodpecker</li> <li>Ash-throated flycatcher</li> <li>Scrub jay-<i>observed</i></li> <li>Plain titmouse-<i>observed</i></li> <li>Bushtit-<i>observed</i></li> <li>Gray vireo</li> <li>Scott's oriole</li> <li>♣ Eastern mole</li> <li>Spotted bat</li> <li>Yuma myotis</li> <li>California myotis</li> <li>Brazilian free-tailed bat-<i>observed</i></li> <li>Keen's myotis-<i>observed</i></li> <li>Fringed myotis-<i>observed</i></li> <li>Red Bat</li> <li>Hoary bat-<i>observed</i></li> <li>Townsend's big-eared bat-<i>observed</i></li> </ul> | <ul style="list-style-type: none"> <li>Pallid bat-<i>observed</i></li> <li>Canyon mouse</li> <li>Pinon mouse</li> <li>Preble's shrew</li> <li>♣ Merriam's shrew</li> <li>♣ Spotted ground squirrel</li> <li>♣ Abert's squirrel</li> <li>♣ Plains pocket mouse</li> <li>♣ Silky pocket mouse</li> <li>Red Desert great basin pocket mouse</li> <li>♣ Hispid pocket mouse</li> <li>♣ Plains harvest mouse</li> <li>♣ White-footed mouse</li> <li>♣ Ringtail</li> <li>Least weasel</li> <li>Wolverine-<i>observed</i></li> <li>Fisher-<i>observed</i></li> <li>♣ River otter</li> <li>Lynx-<i>observed</i></li> </ul> |
|--|--|

*This list currently being revised & updated; approval by end of year expected; these are species we consider sensitive but they have no legal status relative to a State TFE. State "Protected Animals" are black-footed ferret, fisher, lynx, otter, pika & wolverine (by statute). Fisher, lynx & wolverine have been observed in project area, but residency not documented. Otter & pika occur in project area; ferret historically occurred in project area.*

WGFD PRIORITY 1 SPECIES: SPECIES THAT NEED IMMEDIATE ATTENTION AND ACTIVE MANAGEMENT TO INSURE THAT EXTIRPATION OR A SIGNIFICANT DECLINE IN THE BREEDING POPULATION IN WYOMING DOES NOT OCCUR.

WGFD PRIORITY 2 SPECIES: SPECIES IN NEED OF ADDITIONAL STUDY TO DETERMINE WHETHER INTENSIVE MANAGEMENT IS WARRANTED OR WHETHER LOW LEVEL MANAGEMENT SUCH AS MONITORING POPULATION TRENDS AND ENCOURAGING RESOURCE MANAGEMENT PLANNING TO ACCOMODATE THE SPECIES' NEEDS WOULD SUFFICE.

WGFD PRIORITY 3 SPECIES: KNOWLEDGE OF THESE SPECIES IS SO LIMITED THAT THEY CANNOT BE EVALUATED. SPECIES NEEDS SHOULD BE ACCOMODATED IN RESOURCE MANAGEMENT PLANNING BUT INTENSIVE MANAGEMENT PROGRAMS TO MAINTAIN OR ENHANCE POPULATIONS DO NOT APPEAR WARRANTED AT PRESENT. SPECIES WHOSE POPULATIONS AND HABITAT TRENDS SHOULD BE MONITORED TO DETERMINE IF LOW LEVELS OF MANAGEMENT CONTINUE TO BE ADEQUATE.

## DEPARTMENT OF THE INTERIOR

## Fish and Wildlife Service

## 50 CFR Part 17

## Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition to List the Swift Fox as Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 90-day petition finding.

**SUMMARY:** The U.S. Fish and Wildlife Service (Service) announces a 90-day finding for a petition to add the swift fox (*Vulpes velox*) to the List of Threatened and Endangered Wildlife and Plants. While the petition did not present substantial information indicating that the requested action may be warranted throughout the species range, the Service has found that substantial information exists to support a decision that listing of the swift fox may be warranted throughout its entire range. The Service is continuing a status review of the species and requests any additional information regarding this finding.

**DATES:** The finding announced in this notice was made on May 23, 1994. Comments and materials related to this petition finding may be submitted to the Field Supervisor (see ADDRESSES below) until further notice.

**ADDRESSES:** Information, comments, or questions concerning the swift fox petition may be submitted to the Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, 420 South Garfield Avenue, Suite 400, Pierre, South Dakota 57501-5408. The petition, finding, and comments are available for public inspection, by appointment, during normal business hours at the above address.

**FOR FURTHER INFORMATION CONTACT:**

Elizabeth McPhillips, Acting Supervisor, at the above address, telephone (605) 224-8693.

**SUPPLEMENTARY INFORMATION:****Background**

Section 4(b)(3)(A) of the Endangered Species Act (Act) of 1973, as amended in 1982 (16 U.S.C. 1531 *et seq.*), requires that the U.S. Fish and Wildlife Service (Service) make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information to indicate that the petitioned action may be warranted. To the maximum extent practical, this finding is to be made within 90 days of

the receipt of the petition, and the finding is to be published promptly in the Federal Register. If the finding is positive, the Service also is required to promptly commence a status review of the species.

A petition dated February 22, 1992 from Mr. Jon C. Sharps was received by the Service on March 3, 1992. The petition requested the Service to list the swift fox (*Vulpes velox*) as an endangered species in the northern portion of its range, if not the entire range. A status review for the species was first initiated for the swift fox by a notice of review published on December 30, 1982 (47 FR 58454).

The petition and its referenced documentation states that the swift fox once occurred in abundant numbers throughout the species' historical range. The species was known from the Canadian Prairie Province south through Montana, eastern Wyoming, and North and South Dakota to the Texas Panhandle. The petitioner asserts that the swift fox has declined and is considered rare in the northern portion of its range. The petitioner indicates that the swift fox is extremely vulnerable to human activities such as trapping, hunting, automobiles, agricultural conversion of habitat, and prey reduction from rodent control programs. The petitioner requests that, at a minimum, the swift fox be listed as an endangered species in Montana, North Dakota, South Dakota, and Nebraska. Justification for such action, as cited by the petitioner includes the present status of the species and its habitat in the petitioned area, geographic and climatic positioning of the species, the strong link to the prairie dog ecosystem, the large distance from the kit-swift fox hybrid zone, and the potential for these populations to contain the subspecies, *Vulpes velox hebes* or northern swift fox.

The Service has reviewed information regarding the status of the swift fox throughout its range. Historically, the swift fox was considered abundant throughout the Great Plains and the prairie provinces of Canada (Hall and Kelton 1959; Egoscue 1979; Zumbaugh and Choates 1985; U.S. Fish and Wildlife Service 1990; FaunaWest 1991). Beginning in the late 1800's to early 1900's, the swift fox declined in numbers, and soon the northern population collapsed and the southern population became quite rare (Cary 1911; Warren 1942; Egoscue 1979; Bee et al. 1981; FaunWest 1991).

In the mid-1950's the swift fox staged a limited comeback in portions of its historical range (Long 1965; Kilgore 1969; McDaniel 1976; Sharps 1977;

Hines 1980; FaunaWest 1991). However, this reappearance was limited in nature and in recent years many of these populations have again declined. Several factors are provided as reasons for the decline of the species throughout much of its historical range. These factors include: (1) Loss of native prairie habitat through conversion for agricultural production and mineral extraction, (2) fragmentation of the remaining habitat, creating a less suitable cropland-grassland habitat mosaic, (3) degradation of habitat due to colonial rodent control activities, (4) predation and interspecific competition, and (5) the species' vulnerability to human activities, such as predator control, trapping, shooting, and collisions with automobiles (Hillman and Sharps 1978; Hines 1980; Ambruster 1983; Uresk and Sharps 1986; Jones et al. 1987; Sharps 1989; U.S. Fish and Wildlife Service 1990; FaunaWest 1991; Carbyn et al. 1992).

Currently, swift fox exist in highly disjunct populations in a greatly reduced portion of the species' historical range (Hines 1980; Jones et al. 1987; U.S. Fish and Wildlife Service 1990; FaunaWest 1991). Presently, North Dakota, Montana, and Oklahoma do not contain known populations of swift fox. South Dakota and Nebraska only contain one to five remnant populations in a fraction of the States' historical range. Kansas, Texas, and Wyoming maintain localized populations with limited distributions. Colorado and New Mexico appear to contain localized populations distributed throughout reduced portions of the States' historical range.

In 1970, the Service listed the northern subspecies (*Vulpes velox hebes*) as endangered (35 FR 8485). This designation was removed in the United States due to controversy over taxonomy; however, the designation for Canada as endangered remains in place (45 FR 49844).

Canada classified the swift fox as extirpated in 1970 (Carbyn et al. 1992). Since 1983, the Canadian Wildlife Service has been involved in a reintroduction experiment in the hope of recovering the swift fox. This 12-year program has resulted in an estimated wild fox population of 150 foxes within two release areas (Carbyn et al. 1992). However, the viability of this population is in question due to the low numbers of established animals, high predation rates, continued habitat loss or modification within the release areas, and the unpredictability of climatic or other stochastic events such as disease (Carbyn et al. 1992).

The Service notes that the majority of information reviewed supported many of the petitioner's contentions concerning the decline of and threats to the swift fox within the northern portion of its historical range. This information also indicated that many of the petitioner's contentions appear valid throughout the remainder of the species' range.

The petitioner provided substantial information that listing of the swift fox may be warranted in the northern portion of its range but did not provide substantial information on the species' status in the southern portion of its range. The Service found that additional information existed to indicate that listing of the swift fox throughout its range may be warranted.

Therefore, after reviewing the petition, accompanying documentation, references cited, and the best scientific and commercial data available, the Service finds that the requested action may be warranted throughout the swift fox's historical range. Through issuance of this notice of the 90-day finding, the Service is continuing a status review of the swift fox and solicits additional information on the species. The Service will prepare a 12-month finding to determine if the petitioned action is warranted as required by section 4(b)(3)(B) of the Endangered Species Act.

#### References Cited.

A complete list of all references cited herein, as well as others, is available upon request from the Service's, Pierre Field Office (see ADDRESSES above).

#### Author

This notice was prepared by Daniel Eklund (see ADDRESSES above).

#### Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544).

#### List of Subjects in 50 CFR Part 17

Endangered and threatened species. Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Dated: May 23, 1994.

Mollie H. Beattie,

Director, Fish and Wildlife Service.

(FR Doc. 94-13263 Filed 5-31-94; 0:45 am)

BILLING CODE 4310-55-M

#### 50 CFR Part 17

Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition to Delist the Lahontan Cutthroat Trout (*Oncorhynchus clarki henshawi*) Within the Humboldt River Drainage Basin in Nevada

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 90-day petition finding.

**SUMMARY:** The U.S. Fish and Wildlife Service (Service) announces a 90-day finding on a petition to delist the Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) within the Humboldt River drainage basin of Nevada. The Service finds that the petition and a subsequent supporting letter pursuant to section 4 of the Endangered Species Act did not present substantial information indicating that the requested action may be warranted.

**DATES:** The finding announced in this document was made on May 24, 1994.

**ADDRESSES:** Data, information, comments, or questions concerning this petition should be submitted to the Reno Field Office, U.S. Fish and Wildlife Service, 4000 Kiehl Lane, Building C-125, Reno, Nevada 89502. The petition finding, supporting data, and comments are available for public inspection, by appointment, during normal business hours at the above address.

**FOR FURTHER INFORMATION CONTACT:** David L. Harlow, Field Supervisor, at the above address (telephone 702/784-5227).

#### SUPPLEMENTARY INFORMATION:

##### Background

Section 4(b)(3)(A) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.), requires that the Service make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information to demonstrate that the petitioned action may be warranted. This finding is to be based on all information available to the Service at the time the finding is made. To the maximum extent practicable, this finding is to be made within 90 days of the date the petition was received, and the finding is to be published promptly in the Federal Register.

On April 12, 1993, the Service received a petition dated April 8, 1993, to delist the threatened Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) within the Humboldt River drainage basin of Nevada. The petition

was received from Mr. Gene Gustin, Chairman of the Elko County Federal Land Use Planning Commission, Elko, Nevada. The petition clearly identified itself as a petition, and contained the name, signature, and address of the petitioner. A supporting letter was received from Mr. Lee Chapman, Chairman of the Elko County Board of Commissioners on April 21, 1993, also petitioning the Service to delist the Lahontan cutthroat trout within the Humboldt River drainage basin. The Service's policy on letters received subsequent to an original petition is to consider the information presented, even if one or more of these letters identifies itself as a petition. In that way, the Service evaluates the petitioned action in the most timely manner as the first letter accepted as a petition sets the statutory deadlines.

The petition, supporting letter, and other documentation were reviewed to determine if substantial information was provided to indicate that the requested action may be warranted. The petition and the supporting letter contained several assertions to support the petitioner's contention that the Humboldt River basin Lahontan Cutthroat Trout was no longer in need of protection provided by the Act.

As evidence that this species should be removed from the threatened species list, the petitioner referenced the existence of management plans from the Nevada Department of Wildlife (Nevada Dept. of Wildlife 1990, Coffin 1982), the U.S. Bureau of Land Management (1992, 1993), and the U.S. Forest Service, and a letter written by the Forest Service in 1986 that suggested that these management plans and the draft Recovery Plan contained enough data and information to meet the objectives for delisting this species. The Service acknowledges the existence of these plans; however, full implementation of these plans has not occurred. Furthermore, the Lahontan cutthroat trout populations and habitat quality in the Humboldt River basin continue to decline (French 1993).

A species may be delisted if it has recovered to the point that the Act's protection is no longer needed (50 CFR 424.11(d)(2)). Before delisting may occur, the Service must determine that the species does not meet the definition of endangered or threatened due to one or more of the five factors described in section 4(a)(1) of the Act. A threatened species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Neither the petition nor the supporting letter provided substantial information that



GOVERNOR  
Bruce King



STATE OF NEW MEXICO  
DEPARTMENT OF GAME & FISH

Villagra Building  
P.O. Box 25112  
Santa Fe, N.M. 87504

STATE GAME COMMISSION  
JAMES H. (JAMIE) KOCH, CHAIRMAN  
SANTA FE

THOMAS P. ARVAS, O.D., VICE-CHAIRMAN  
ALBUQUERQUE

BOB JONES  
CROW FLATS

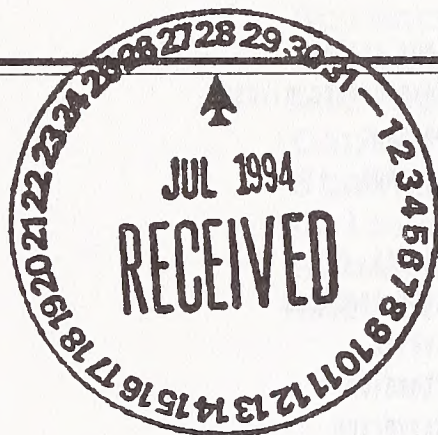
J.W. "JOHNNY" JONES  
ALBUQUERQUE

BRUCE WILSON  
MESILLA PARK

DAVID M. SALMAN  
LA CUEVA

ANDREA MAES CHAVEZ  
NAVAJO DAM

DIRECTOR AND SECRETARY  
TO THE COMMISSION  
Bill Montoya



July 20, 1994

Mr. Brian K. Hoppy, Environmental Scientist  
Science & Engineering Associates, Inc.  
7918 Jones Branch Drive, Suite 500  
McLean, Virginia 22102

The New Mexico Department of Game and Fish has received your description of the Colorado Airspace Initiative and its associated Military Training Route that may enter this state in northern Union County. Enclosed is a list of threatened, endangered, candidate or proposed species that may occur there.

Regarding your question about possible effects on sensitive species, low-level flights may have disturbance effects on species inhabiting the riparian corridor of the Cimarron River. If you have any questions, please call Bob Wilson at (505) 827-7827.

Sincerely,

Bill Montoya  
Director

BM/BW/bes  
Enc.

cc: Jennifer Fowler-Propst (Ecological Svcs. Supervisor, USFWS)  
Joanna Lackey (Northeast Area Operations Chief, NMGF)  
Dick McCleskey (Assistant Director, NMGF)  
Andrew Sandoval (Conservation Services Division Chief, NMGF)  
Jim Bailey (Conservation Services Asst. Div. Chief, NMGF)

# in Union County

INVERT NAME.....	SCIENTIFIC NAME.....	FEDERAL END.	FED.... THREAT.	FED.. PROP.	FED... CAND.	STATE END.	STATE.. THREAT.
Arkansas River Shiner	<i>Notropis girardi</i>	-	-	-	X	X	-
Suckermouth Minnow	<i>Phenacobius mirabilis</i>	-	-	-	-	-	X
Texas Horned Lizard	<i>Phrynosoma cornutum</i>	-	-	-	X	-	-
Arid Land Ribbon Snake	<i>Thamnophis proximus diabolicus</i>	-	-	-	-	-	X
White-faced Ibis	<i>Plegadis chihi</i>	-	-	-	X	-	-
Bald Eagle	<i>Haliaeetus leucocephalus</i>	X	-	-	-	-	X
Northern Goshawk	<i>Accipiter gentilis</i>	-	-	-	X	-	-
Ferruginous Hawk	<i>Buteo regalis</i>	-	-	-	X	-	-
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	X	-	-	-	X	-
Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	-	X	-	X	-	-
Mountain Plover	<i>Charadrius montanus</i>	-	-	-	X	-	-
Loggerhead Shrike	<i>Lanius ludovicianus</i>	-	-	-	X	-	-
Bell's Vireo	<i>Vireo bellii</i>	-	-	-	-	-	X
Baird's Sparrow	<i>Ammodramus bairdii</i>	-	-	-	X	-	X
Occult Little Brown Bat; Myotis	<i>Myotis lucifugus occultus</i>	-	-	-	X	-	-
Swift Fox	<i>Vulpes velox velox</i>	-	-	-	X	-	-
Circular Pea-clam	<i>Musculium partumeium</i>	-	-	-	-	-	X
Wide Pea-clam	<i>Musculium transversum</i>	-	-	-	-	-	X

WYOMING  
GAME AND FISH DEPARTMENT

Mike Sullivan, Governor



Francis Petera, Director



August 12, 1994

EIS 7329  
Science and Engineering  
Associates, Inc. (SEA)  
Air National Guard Readiness  
Center/Environmental Impact  
Statement (EIS)  
Colorado Airspace Initiative  
Albany, Carbon, Goshen,  
Laramie and Platte Counties

BRIAN K. HOPPY  
ENVIRONMENTAL SCIENTIST  
SCIENCE & ENGINEERING ASSOCIATES, INC.  
7918 JONES BRANCH DRIVE, SUITE 500  
MCLEAN, VA 22102

Dear Mr. Hoppy:

Per your request of July 26, 1994, we have reviewed the Colorado Airspace Initiative in relation to threatened and endangered species that may occur under the proposed airspace. As I indicated to you previously, there are several species that may occur under the airspace that are not included in the list you provided. Those species are:

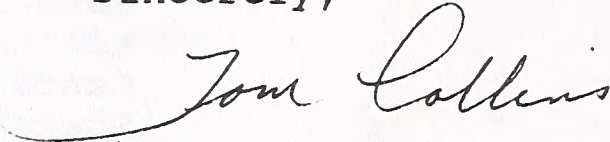
Ute ladies-tresses (*Spiranthes diluvialis*) - Threatened  
Fringe-tailed myotis (*Myotis thysanodes pahasapensis*) - C2  
Plains (Eastern) spotted skunk (*Spilogale putorius interrupta*) -C2  
Loggerhead shrike (*Lanius ludovicianus*) - C2

Regarding state-listed T&E species, the State of Wyoming has no statutory program for listing species. This department maintains a listing of priority species in need of special management (list provided previously) but this listing has no legal or statutory basis. State "Protected Animals" are identified by statute and include that black-footed ferret, fisher, lynx, otter, pika and wolverine, all of which have been observed, currently occur or historically occurred within your project area.

Mr. Brian Hoppy  
August 12, 1994  
Page 2 - EIS 7329

If we can be of further assistance, please advise us.

Sincerely,



Thomas C. Collins  
Environmental Coordinator  
Office of Director  
Environmental Services

TC:as  
cc: Wildlife Division  
USFWS

STATE OF COLORADO  
Roy Romer, Governor  
DEPARTMENT OF NATURAL RESOURCES  
**DIVISION OF WILDLIFE**

AN EQUAL OPPORTUNITY EMPLOYER

Perry D. Olson, Director

Southeast Regional Office:  
2126 N Weber Street  
Colorado Springs, CO 80907  
(719)473-2945



*For Wildlife-  
For People*

August 3, 1994



Mr. Brian Hoppy  
Science & Engineering Assoc., Inc.  
7918 Jones Branch Drive  
Suite 500  
McLean, VA 22102

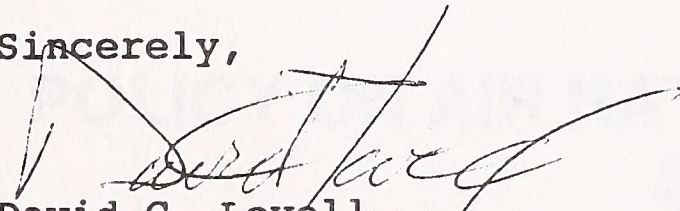
Dear Brian:

Enclosed are the remaining plots you requested for the Colorado Airspace Initiative EIS. Included are SE Region plots for golden eagle and bighorn sheep, and important recreational/wildlife sensitive properties, and NE Region plots for greater prairie chickens, bighorn sheep, and bald eagle. I have also enclosed photocopies of the preliminary results from the Fort Carson peregrine falcon study. Final results will be forthcoming sometime towards the end of September.

Also enclosed is an invoice in the amount of \$90.50. As discussed, this reflects costs for materials and computer time only and does not include charges for the processing costs. One additional 24 x 36 inch plot of State Wildlife Properties in the Northeast Region will be forthcoming as soon as I obtain the digital data from my counterpart in Fort Collins. As you probably will notice, however, the bill already reflects the cost of that plot. Please make your check payable to the Colorado Division of Wildlife and return it to me at the address indicated on the invoice.

If you have questions regarding any of the materials or the billing process please feel free to call me at (719)473-2945 x227. Thank you in advance for your attention to this matter.

Sincerely,

  
David C. Lovell  
Wildlife Biologist  
Southeast Region

DEPARTMENT OF NATURAL RESOURCES, James S. Lochhead, Executive Director

WILDLIFE COMMISSION, William R. Hegberg, Member • Eldon W. Cooper, Member • Felix Chavez, Member • Rebecca L. Frank, Member  
Louis F. Swift, Secretary • George VanDenBerg, Chairman • Arnold K-67 Member • Thomas M. Eve, Vice Chairman.



APPENDIX L

POLICY ON AIR NATIONAL GUARD OVERFLIGHTS OF DESIGNATED WILDERNESS AND WILD AND SCENIC RIVERS

INTRODUCTION

The Air National Guard (ANG) is a reserve component of the United States Air Force. It consists of active-duty pilots and crew members who are trained and equipped to perform a wide range of missions, including air defense, transport, and medical evacuation. The ANG is an integral part of the Air Force's readiness and flexibility, and its operations are essential to the national defense. This policy is designed to ensure that ANG operations are conducted in a manner that is consistent with the values and objectives of the National Wilderness System and the Wild and Scenic Rivers Act.

SCOPE AND PURPOSE

This policy applies to all ANG aircraft and personnel operating in the United States.

The purpose of this policy is to establish a framework for ANG operations that respects the values and objectives of the National Wilderness System and the Wild and Scenic Rivers Act. This includes minimizing noise, avoiding sensitive areas, and ensuring that operations are conducted in a manner that is consistent with the values and objectives of these laws.

This policy is intended to be used in conjunction with the National Wilderness System and the Wild and Scenic Rivers Act, and it is subject to change as these laws and regulations evolve.

This policy is effective as of the date of its adoption.

**APPENDIX L**

**POLICY ON AIR NATIONAL GUARD OVERFLIGHTS OF DESIGNATED WILDERNESS AND WILD AND SCENIC RIVERS**





## APPENDIX L

### POLICY ON AIR NATIONAL GUARD OVERFLIGHTS OF DESIGNATED WILDERNESS AND WILD AND SCENIC RIVERS

#### INTRODUCTION

The Air National Guard (ANG) recognizes the intent of Congress in establishing Wilderness and the Wild and Scenic River Systems, and the benefits of recreation and other activities to be derived from these areas. As defined in the law, wilderness is an area where the Earth and its community of life are untrammelled by people and where people are visitors. Despite this general operating framework, the Congress has authorized many activities (e.g., recreation, commercial outfitting, guide services, and livestock grazing). Many other activities are also permitted, including: administrative structures and installations, development of privately owned minerals, fire control, and insect and disease control. In some cases, the use of airstrips and motorboats are also authorized. Commercial and military aircraft overflights of Wilderness and Wild and Scenic Rivers are not excluded under the legislation. The ANG has the potential to impact these areas; therefore, this policy is put forth with the recognition of the importance of these national assets.

#### POLICY STATEMENT

The following assumptions and facts affect the ANG position on overflights:

- There is an increasing awareness and interest on the part of the public regarding management of wilderness. This is evidenced by a recent General Accounting Office (GAO) report on wilderness preservation, a Memorandum of Understanding (MOU) between the Department of Defense (DOD) and the U.S. Forest Service, the Nevada Wilderness Act, and the National Park Overflights Act.
- The Wilderness System constitutes about 91 million acres, 34.2 million of which is located in 42 of the contiguous states, and accounts for one (1) out of every six (6) acres of U.S. Forest Service land.
- Additional land will be added to both the Wilderness System and Wild and Scenic Rivers System.
- Legal action has been taken against the ANG at the Boundary Waters Canoe Area Wilderness regarding overflights.
- Wilderness and Wild and Scenic Rivers were designated for several uses, not just recreational. The establishment of these areas will allow natural processes to operate freely within wilderness.
- Overflights, both commercial and military, were taking place prior to designation of Wilderness and Wild and Scenic Rivers.
- The ANG is concerned about its overflight activity on these areas and the potential impact on visitors.
- The only Federal Aviation Administration (FAA) policy on overflight activity of these areas is a 2,000 feet above ground level (AGL) flight advisory.

- The ANG requires various types of airspace in which to safely conduct its operations and therefore prefers to use lightly populated areas such as those that may contain wilderness. Many of the existing ANG Military Operations Areas (MOAs) and Military Training Routes (MTRs) are located over existing Wilderness and Wild and Scenic River corridors.

Given this framework, it is ANG policy:

- To comply with all FAA regulations and applicable Federal legislation.
- To not plan any ANG ground activity on designated Wilderness or Wild and Scenic River areas, to include air drops and troop activity.
- Newly proposed airspace and modification of existing airspace will be planned to avoid these areas unless mission constraints dictate otherwise.
- The Operational and Resources Study (OARS) shall identify the rationale and provide justification for Wilderness and Wild and Scenic River overflights.
- Wilderness will be overflown at 2,000 feet AGL, or higher, whenever possible, to comply with the intent of the FAA advisory on overflights.
- There will not be any type of ANG structure, either temporary or permanent, within these areas (e.g., radar sites or communication sites).
- The units will coordinate with the appropriate manager of a Wilderness or Wild and Scenic River in terms of solving specific problems associated with ANG use of that airspace. This may include defining prohibited areas, altitude above terrain reservations, and areas of partial or seasonal closure.
- Newly proposed overflight activity will go through the appropriate Environmental Impact Analysis Process (EIAP) to identify environmental impacts and to insure the proper coordination with interested agencies.

## **CONCLUSION**

The ANG can be viewed as a visitor, in the air, to these areas. The impact, although of concern to wilderness users because of its potential to impact their solitude, is of short duration, infrequent, and often not visible. Various environmental assessments completed for airspace have indicated that impacts on wildlife and air quality are minimal. These impacts will become even less of a factor as the ANG continues to convert its forces to quieter and cleaner aircraft. The ANG mission requires the use of low-altitude airspace in remote areas to avoid more densely populated areas and to operate in a safe manner. In light of the vastness and distribution of the Wilderness and Wild and Scenic Rivers System, it is inevitable that overflights be conducted. ANG overflights will not preclude other uses for these areas, and, in most cases, will provide less of an impact on the system than on ground recreational use. Natural processes can continue to operate freely, as they have in the past.

Regardless, it will be ANG policy to plan its airspace to avoid these areas as much as possible. Where it is not possible, this criteria will be used. The ANG will continue to recognize its role in preserving our nation's pristine areas and do what it can to enhance them.

---

Signed by Major General Philip G. Killey  
Director, Air National Guard  
August 9, 1990

APPENDIX M  
LATIN TERMINING NAMES FOR  
COMMON SPECIES







## APPENDIX M

### LATIN SCIENTIFIC NAMES FOR COMMON SPECIES

(COMMON BIRD AND MAMMAL SPECIES WITHIN THE REGIONS OF INFLUENCE  
FOR THE COLORADO AIRSPACE INITIATIVE)

Common name	Scientific name
<b>BIRDS</b>	
Pied-billed grebe	<i>Podilymbus podiceps</i>
Great blue heron	<i>Ardea herodias</i>
Canada goose	<i>Branta canadensis</i>
Green-winged teal	<i>Anas rubripes</i>
Mallard	<i>Anas platyrhynchos</i>
Northern pintail	<i>Anas acuta</i>
Northern shoveler	<i>Anas clypeata</i>
Gadwall	<i>Anas strepera</i>
American wigeon	<i>Anas americana</i>
Northern harrier	<i>Circus cyaneus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Ferruginous hawk	<i>Buteo regalis</i>
Golden eagle	<i>Aquila chrysaetos</i>
American kestrel	<i>Falco sparverius</i>
Prairie falcon	<i>Falco mexicanus</i>
Ring-necked pheasant	<i>Phasianus colchicus</i>
Blue grouse	<i>Dendragapus obscurus</i>
White-tailed ptarmigan	<i>Lagopus leucurus</i>
Wild turkey	<i>Meleagris gallopavo</i>
Northern bobwhite	<i>Colinus virginianus</i>
Scaled quail	<i>Callipepla squamata</i>
Virginia rail	<i>Rallus limicola</i>
American coot	<i>Fulica americana</i>
Killdeer	<i>Charadrius vociferus</i>
Common snipe	<i>Gallinago gallinago</i>
Ring-billed gull	<i>Larus delawarensis</i>
California gull	<i>Larus californicus</i>
Herring gull	<i>Larus argentatus</i>
Rock dove	<i>Columba livia</i>
Mourning dove	<i>Zenaida macroura</i>
Greater roadrunner	<i>Geococcyx californianus</i>
Common barn-owl	<i>Tyto alba</i>
Western screech-owl	<i>Otus kennicottii</i>
Great horned owl	<i>Bubo virginianus</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Lewis' woodpecker	<i>Melanerpes formicivorus</i>

Common name	Scientific name
<b>BIRDS (Continued)</b>	
Downy woodpecker	<i>Picoides pubescens</i>
Hairy woodpecker	<i>Picoides villosus</i>
Northern flicker	<i>Colaptes auratus</i>
Horned lark	<i>Eremophila alpestris</i>
Gray jay	<i>Perisoreus canadensis</i>
Stellar's jay	<i>Cyanocitta stelleri</i>
Blue jay	<i>Cyanocitta cristata</i>
Scrub jay	<i>Aphelocoma coerulescens</i>
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>
Black-billed magpie	<i>Pica pica</i>
American crow	<i>Corvus brachyrhynchos</i>
Black-capped chickadee	<i>Parus atricapillus</i>
Mountain chickadee	<i>Parus gambeli</i>
Plain titmouse	<i>Parus inornatus</i>
Pygmy nuthatch	<i>Sitta pygmaea</i>
Brown creeper	<i>Certhia americana</i>
American dipper	<i>Cinclus mexicanus</i>
Golden-crowned kinglet	<i>Regulus satrapa</i>
Mountain bluebird	<i>Sialia currucoides</i>
Townsend's solitaire	<i>Myadestes townsendi</i>
American robin	<i>Turdus migratorius</i>
European starling	<i>Sturnus vulgaris</i>
Rufous-sided towhee	<i>Pipilo erythrophthalmus</i>
Brown Towhee	<i>Pipilo fuscus</i>
Song sparrow	<i>Melospiza melodia</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Western meadowlark	<i>Sturnella neglecta</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Rosy finch	<i>Leucosticte aretoa</i>
Pine grosbeak	<i>Pinicola enucleator</i>
Cassin's finch	<i>Carpodacus cassinii</i>
House finch	<i>Carpodacus mexicanus</i>
Red crossbill	<i>Loxia curvirostra</i>
Pine siskin	<i>Carduelis pinus</i>
American goldfinch	<i>Carduelis tristis</i>
Evening grosbeak	<i>Coccothraustes vespertinus</i>
House sparrow	<i>Passer domesticus</i>

SOURCE: Kingery 1987



## Common name

## Scientific name

**MAMMALS**

Masked shrew	<i>Sorex cinereus</i>
Wandering shrew	<i>Sorex vagrans</i>
Dwarf shrew	<i>Sorex nanus</i>
Water shrew	<i>Sorex palustris</i>
Merriam's shrew	<i>Sorex merriami</i>
Desert shrew	<i>Notiosorex crawfordi</i>
Eastern mole	<i>Scalopus aquaticus</i>
Long-eared myotis	<i>Myotis evotis</i>
Western pipistrelle	<i>Pipistrellus hasperus</i>
Big brown bat	<i>Eptesicus fuscus</i>
Hoary bat	<i>Lasiurus cinereus</i>
Pika	<i>Ochotona princeps</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Nuttall's cottontail	<i>Sylvilagus nuttallii</i>
Desert cottontail	<i>Sylvilagus audobonii</i>
Showshoe hare	<i>Lepus americanus</i>
White-tailed jackrabbit	<i>Lepus townsendii</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Least chipmunk	<i>Eutamias minimus</i>
Colorado chipmunk	<i>Eutamias quadrivittatus</i>
Yellow-bellied marmot	<i>Marmota flaviventris</i>
Thirteen-lined ground squirrel	<i>Spermophilus tridecemlineatus</i>
Spotted ground squirrel	<i>Spermophilus spilosoma</i>
Rock squirrel	<i>Spermophilus variegatus</i>
Golden-mantled squirrel	<i>Spermophilus lateralis</i>
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>
Abert's squirrel	<i>Sciurus aberti</i>
Fox squirrel	<i>Sciurus niger</i>
Chickaree	<i>Tamiasciurus hudsonicus</i>
Valley pocket gopher	<i>Thomomys bottae</i>
Northern pocket gopher	<i>Thomomys talpoides</i>
Plain pocket gopher	<i>Geomys bursarius</i>
Olive-backed pocket mouse	<i>Perognathus fasciatus</i>
Plains pocket mouse	<i>Perognathus flavescens</i>
Silky pocket mouse	<i>Perognathus flavus</i>
Beaver	<i>Castor canadensis</i>
Western harvest mouse	<i>Reithrodontomys megalotis</i>
Deer mouse	<i>Peromyscus maniculatus</i>
White-footed mouse	<i>Peromyscus leucopus</i>
Pinon mouse	<i>Peromyscus truei</i>
Northern grasshopper mouse	<i>Onychomys leucogaster</i>
Eastern woodrat	<i>Neotoma floridana</i>
White-throated wood rat	<i>Neotoma albigula</i>

Common name	Scientific name
<b>MAMMALS (Continued)</b>	
Mexican woodrat	<i>Neotoma mexicana</i>
Bushy-tailed woodrat	<i>Neotoma cinerea</i>
Gapper's red-backed vole	<i>Clethrionomys gapperi</i>
Meadow vole	<i>Microtus pennsylvanicus</i>
Muskrat	<i>Ondatra zibethicus</i>
Porcupine	<i>Erethizon dorsatum</i>
Coyote	<i>Canis latrans</i>
Red fox	<i>Vulpes vulpes</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Raccoon	<i>Procyon lotor</i>
Marten	<i>Martes americana</i>
Black bear	<i>Ursus americanus</i>
Long-tailed weasel	<i>Mustela frenata</i>
Badger	<i>Taxidea taxus</i>
Spotted skunk	<i>Spilogale putorius</i>
Stripped skunk	<i>Mephitis mephitis</i>
Bobcat	<i>Lynx rufus</i>
American elk	<i>Cervus elaphus</i>
Mule deer	<i>Odocoileus heminus</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Pronghorn antelope	<i>Antilocapra americana</i>
Bighorn sheep	<i>Ovis canadensis</i>

SOURCE: Bissell 1978

AS A RESULT OF THE SCOPING PROCESS AND THE  
ISSUES IDENTIFIED BY THE NATIONAL GUARD BUREAU  
HAS IDENTIFIED A PROPOSED ALTERNATIVE THE  
PREFERRED ALTERNATIVE IS AN EVOLUTION OF THE  
ORIGINAL PROPOSED ACTION NOW IDENTIFIED AS

THE ORIGINAL PROPOSAL

APPENDIX N

The purpose of this appendix is to provide a  
summary of the information that was used to  
develop the cumulative sortie compilation. The  
information was obtained from various sources  
including the Colorado Airspace Initiative  
Database, the National Guard Bureau, and  
other sources. The information was compiled  
into a single document for use in the  
cumulative sortie compilation.

APPENDIX N

**APPENDIX N**

**COLORADO AIRSPACE INITIATIVE CUMULATIVE  
SORTIE COMPILATION**

APPENDIX N

The purpose of this appendix is to provide a  
summary of the information that was used to  
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cumulative sortie compilation.

**AS A RESULT OF THE SCOPING PROCESS AND ISSUES IDENTIFIED, THE NATIONAL GUARD BUREAU HAS IDENTIFIED A PREFERRED ALTERNATIVE. THE PREFERRED ALTERNATIVE IS AN EVOLUTION OF THE ORIGINAL PROPOSED ACTION, NOW IDENTIFIED AS THE ORIGINAL PROPOSAL.**

## APPENDIX N

### COLORADO AIRSPACE INITIATIVE CUMULATIVE SORTIE COMPILATION

This appendix presents information on cumulative sortie totals for each of the airspace components associated with the Colorado Airspace Initiative. These sorties are a result of the proposed training scenarios required for the U.S. Air Force (USAF) units in the affected airspace. Cumulative sortie totals include those sorties resulting where airspace boundaries of the Colorado Airspace Initiative overlap with each other and with other existing military airspace.

#### **N.1 ORIGINAL PROPOSAL ALTERNATIVE TRAINING SCENARIOS**

##### **N.1.1 Normal Weapon Delivery Training Scenarios**

USAF units using the airspace areas of the Colorado Airspace Initiative under the Original Proposal Alternative, primarily the 140 WG, would conduct the weapons delivery training described in paragraphs N.1.1.1 through N.1.1.8.

###### **N.1.1.1 Weapons Delivery Scenario 1**

This scenario would consist of a 75-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes from Buckley ANGB to the Cheyenne MOA at medium altitude (15,000 to 25,000 feet MSL). The flight would delay for 10 minutes in the MOA to practice LOWAT with two 140 WG assigned F-16 aircraft practicing air-to-air tactics in the Cheyenne MOA (refer to paragraph N.1.1.1 Air-to-Air Scenario 1). After the LOWAT training, the weapons delivery flight would depart Cheyenne MOA at medium altitude for a 15 minute flight en route to Airburst Range to complete a weapons delivery mission. The flight would delay for 20 minutes at the range using the Airburst MOA and the R-2601 restricted area that includes the Airburst Range. The aircraft would then complete a 15-minute return flight at medium altitude to Buckley ANGB.

###### **N.1.1.2 Weapons Delivery Scenario 2**

This scenario would consist of an 80-minute flight with four F-16 aircraft. The aircraft would fly 20 minutes from Buckley ANGB to the La Veta MOA at medium altitude. The flight would delay for 15 minutes in La Veta MOA practicing LOWAT with two 140 WG assigned F-16 aircraft practicing air-to-air training (refer to paragraph N.1.1.2 Air-to-Air Scenario 2). After the LOWAT training, the weapons delivery flight would depart La Veta MOA for a low altitude entry into Airburst Range to complete a weapons delivery mission. The flight would delay for 30 minutes at the range using the Airburst MOA and R-2601. The flight would then complete a 15-minute return flight at medium altitude to Buckley ANGB.

###### **N.1.1.3 Weapons Delivery Scenario 3**

This scenario would consist of a 75-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes from Buckley ANGB to the Cheyenne MOA at medium altitude. The flight would delay 10 minutes in the Cheyenne MOA to practice simulated weapons delivery tactics. Upon completion of this training, the weapons delivery flight would depart the Cheyenne MOA at medium altitude to an entry point on XIR-424 MTR

for 15 minutes of low altitude navigation training en route to Airburst Range to complete a weapons delivery mission. The flight would delay for 20 minutes at the range using the Airburst MOA and R-2601. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.1.1.4 Weapons Delivery Scenario 4**

This scenario would consist of an 80-minute flight with four F-16 aircraft. The aircraft would fly 13 minutes from Buckley ANGB to the starting point of the VR-413 military training route at medium altitude. The flight would delay for 22 minutes at low altitude along VR-413 MTR for low altitude navigation training en route to Airburst Range to complete a weapons delivery mission. The flight would delay for 30 minutes at the range using Airburst MOA and R-2601. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.1.1.5 Weapons Delivery Scenario 5**

This scenario would consist of an 85-minute flight with four F-16 aircraft. The aircraft would fly 20 minutes from Buckley ANGB to the starting point of XIR-424 MTR. The flight would delay 20 minutes along XIR-424 for low altitude navigation training en route to Airburst Range to complete a weapons delivery mission. The flight would delay 30 minutes at the range using Airburst MOA and R-2601. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.1.1.6 Weapons Delivery Scenario 6**

This scenario would consist of an 80-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the starting point of IR-415. The flight would delay 20 minutes at low altitude along IR-415 for low altitude navigation training en route to Airburst Range to complete a weapons delivery mission. The flight would delay 30 minutes at the range using the Airburst MOA and R-2601. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.1.1.7 Weapons Delivery Scenario 7**

This scenario would consist of a 65-minute flight with four F-16 aircraft. The aircraft would fly 20 minutes at medium altitude from Buckley ANGB to Airburst Range to complete a weapons delivery mission. The flight would delay 30 minutes at the range using Airburst MOA and R-2601. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.1.1.8 Weapons Delivery Scenario 8**

This scenario would consist of a 90-minute flight with four F-16 aircraft. The aircraft would fly 20 minutes at medium altitude from Buckley ANGB to the starting point of IR-409. The flight would delay 25 minutes at low altitude along IR-409 for low altitude navigation training en route to Airburst Range to complete a weapons delivery mission. The flight would delay another 30 minutes at the range using the Airburst MOA and R-2601. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

## **N.1.2 Normal Surface Attack Tactics Training Scenarios**

### **N.1.2.1 Surface Attack Tactics Scenario 1**

This scenario would consist of a 70-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the Cheyenne MOA. The flight would delay 40 minutes in the Cheyenne MOA to practice simulated Maverick missile weapons delivery tactics. After completing the simulated weapons deliveries, the flight would complete a 15-minute return at medium altitude to Buckley ANGB.

### **N.1.2.2 Surface Attack Tactics Scenario 2**

This scenario would consist of a 75-minute flight with four F-16 aircraft. The aircraft would fly 13 minutes at medium altitude from Buckley ANGB to the starting point of VR-413. The flight would delay 17 minutes at low altitude along VR-413 for low altitude navigation training en route to the La Veta MOA. The flight would delay 30 minutes in La Veta MOA to practice simulated Maverick missile weapons delivery tactics. After completing the simulated weapons deliveries, the flight would complete a 15-minute return at medium altitude to Buckley ANGB.

### **N.1.2.3 Surface Attack Tactics Scenario 3**

This scenario would consist of a 65-minute flight with four F-16 aircraft. The aircraft would fly 10 minutes at medium altitude from Buckley ANGB to the starting point of IR-415. The flight would delay 10 minutes at low altitude along IR-415 to point D then along IR-414 between points A and C. The flight would delay, again, 20 minutes in the Cheyenne MOA to practice simulated Maverick missile weapons delivery tactics. After completing the simulated weapons deliveries, the flight would complete a 20-minute return at medium altitude to Buckley ANGB.

### **N.1.2.4 Surface Attack Tactics Scenario 4**

This scenario would consist of an 85-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the starting point of IR-416. The flight would delay 25 minutes at low altitude along IR-416 then enter the Cougar MOA. The flight would delay 25 minutes in the Cougar MOA to practice simulated Maverick missile weapons delivery tactics. After completing the simulated weapons deliveries, the flight would complete a 15-minute return at medium altitude to Buckley ANGB.

### **N.1.2.5 Surface Attack Tactics Scenario 5**

This scenario would consist of an 80-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the starting point of XIR-426. The flight would delay 25 minutes at low altitude along XIR-426 then enter the Cougar MOA. The flight would delay 25 minutes in the Cougar MOA to practice simulated Maverick missile weapons delivery tactics. After completing the simulated weapons deliveries, the flight would complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.1.2.6 Surface Attack Tactics Scenario 6**

This scenario would consist of an 80-minute flight with two F-16 aircraft. The aircraft would fly 20 minutes at medium altitude from Buckley ANGB to the Pinon Canyon MOA. The flight would delay 30 minutes in the Pinon Canyon MOA to practice close air support for an Army unit. After completing the simulated weapons deliveries, the flight would complete a 20-minute return at medium altitude to Buckley ANGB.

#### **N.1.3 Normal Air-to-Air Training Scenarios**

##### **N.1.3.1 Air-to-Air Training Scenario 1**

This scenario would consist of a 70-minute flight with two F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the Cheyenne MOA. The flight would delay 40 minutes in the Cheyenne MOA for LOWAT and intercept training with flights traversing the Cheyenne MOA on a Weapons Delivery Scenario 1 mission. After the weapons delivery flight departs the area, the air-to-air flight would continue training in low and medium altitude intercepts and single-ship basic fighter maneuver training. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

##### **N.1.3.2 Air-to-Air Training Scenario 2**

This scenario would consist of a 70-minute flight with two F-16 aircraft. The aircraft would fly 20 minutes from Buckley ANGB at medium altitude to the La Veta MOA. The flight would delay 30 minutes in La Veta MOA for LOWAT and intercept tactics training to practice offensive attacks on flights traversing La Veta MOA on a Weapons Delivery Scenario 2 mission. After the weapons delivery flight departs the area, the air-to-air flight would continue to train in low and medium altitude intercepts and basic fighter maneuver single-ship tactics. The flight would then complete a 20-minute return at medium altitude to Buckley ANGB.

##### **N.1.3.3 Air-to-Air Training Scenario 3**

This scenario would consist of a 60-minute flight with four F-16 aircraft. The aircraft would fly from Buckley ANGB to the Cheyenne MOA at medium altitude for 15 minutes. The flight would delay 30 minutes in the Cheyenne MOA to practice air combat tactics or air combat maneuvers against either a flight of two, or two single aircraft acting independently. The air-to-air flight would continue to train in medium altitude intercepts and basic fighter maneuvers. The flight would then complete a medium altitude, 15-minute return to Buckley ANGB.

##### **N.1.3.4 Air-to-Air Training Scenario 4**

This scenario would consist of a 70-minute flight with four F-16 aircraft. The aircraft would fly from Buckley ANGB to the Two Buttes MOA at medium altitude for 23 minutes. The flight would delay 30 minutes in the Two Buttes MOA to practice air combat tactics or air combat maneuvers against either a flight of two, or two single aircraft acting independently. Tactics on this mission would include AMRAAM air-to-air missile employment. The air-to-air flight would continue to train in medium altitude intercepts and basic fighter maneuvers. The flight would then complete a medium altitude, 23-minute return to Buckley ANGB.



#### **N.1.3.5 Air-to-Air Training Scenario 5**

This scenario would consist of a 60-minute flight with two F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the Cheyenne MOA. The flight would delay 30 minutes in the Cheyenne MOA to practice medium altitude intercepts and basic fighter maneuvers. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.1.3.6 Air-to-Air Training Scenario 6**

This scenario would consist of a 70-minute flight with two F-16 aircraft and two F-18 aircraft flying Air-to-Air Scenario 4. The aircraft would fly 23 minutes at medium altitude from Buckley ANGB to the Two Buttes MOA. The flight would delay 20 minutes in the Two Buttes MOA to practice air combat tactics or air combat maneuvers against either a flight of two, or two single aircraft acting independently. Tactics on this mission include AMRAAM air-to-air missile employment. The air-to-air flight continues to train in medium altitude intercepts and basic fighter maneuvers. The flight would then complete a 23-minute return at medium altitude to Buckley ANGB.

#### **N.1.3.7 Air-to-Air Training Scenario 7**

This scenario would consist of a 65-minute flight with two F-16 aircraft and two F-15 aircraft flying Air-to-Air Scenario 3. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the Cheyenne MOA. The flight would delay 35 minutes in the Cheyenne MOA to practice air combat tactics or air combat maneuvers against either a flight of two, or two single aircraft acting independently. Tactics on this mission include AMRAAM air-to-air missile employment. The air-to-air flight would continue to train in medium altitude intercepts and basic fighter maneuvers. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.1.3.8 Air-to-Air Training Scenario 8**

This scenario would consist of a 70-minute flight with two F-16 aircraft and two F-15 aircraft flying Air-to-Air Scenario 4. The aircraft would fly 23 minutes at medium altitude from Buckley ANGB to the Two Buttes MOA. The flight would delay 20 minutes in the Two Buttes MOA to practice air combat tactics or air combat maneuvers against either a flight of two, or two single aircraft acting independently. Tactics on this mission include AMRAAM air-to-air missile employment and basic fighter maneuvers. The air-to-air flight would continue to train in medium altitude intercepts and basic fighter maneuvers. The flight would then complete a 23-minute return at medium altitude to Buckley ANGB.

#### **N.1.3.9 Air-to-Air Training Scenario 9**

This scenario would be a weather alternate to the above sorties without adversaries and would consist of a 60-minute flight with two F-16 aircraft. The aircraft would fly 30 minutes at medium altitude from Buckley ANGB to the Cougar MOA. The flight would delay for 30 minutes in the Cougar MOA to practice medium altitude intercepts and basic fighter maneuvers. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

## **N.1.4 Special Unit Training Scenarios**

### **N.1.4.1 Special Training Scenario 1**

This scenario would consist of eight F-16 aircraft--four on an air-to-air mission and the other four on a weapon delivery mission. The air-to-air portion of this scenario would consist of a 90-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the Cheyenne MOA. The flight would delay 15 minutes in the Cheyenne MOA to practice air-to-air refueling with a KC-135 or KC-10 aircraft. The flights would join to allow the air-to-air flight to escort the weapons delivery flight to their assigned target within the Airburst Range. After the refueling and rejoin are completed, the weapons delivery and air-to-air flights would depart the Cheyenne MOA at low altitude using XVR-1427 for a 30-minute flight en route to Airburst Range to complete a weapons delivery mission. The flights would delay up to seven minutes in the Two Buttes High/Low MOA, where two to four non-F-16 adversary aircraft attempt to find and attack the weapons delivery flight. After delaying in the Two Buttes Low MOA, the flight would continue along XVR-1427 through Pinon Canyon MOA to the La Veta MOA and into the Airburst Range. The flights would delay up to five minutes in the La Veta MOA, where two to four non-F-16 adversary aircraft would attempt to find and attack the weapons delivery flight. The escorting F-16 aircraft would attempt to keep the adversary aircraft from successfully attacking the weapons delivery flight. The air-to-air F-16 flight would possibly delay in Two Buttes High/Low and/or La Veta MOAs longer than the weapons delivery flight. The air-to-air flight would not proceed onto the Airburst Range. The weapons delivery flight would plan a single attack with a possible re-attack at the target complex, then delay up to seven minutes on the range. After completing the weapons delivery at Airburst Range, the flight would return to Buckley ANGB. The air-to-air flight would depart from La Veta MOA for an 18-minute, medium altitude return to Buckley ANGB. The adversaries would consist of two to four F-15 or F-18 aircraft remaining in Two Buttes or La Veta MOAs following a normal air-to-air adversary profile from Buckley ANGB to the area.

### **N.1.4.2 Special Training Scenario 2**

This scenario would be a weather alternate to Special Training Scenario 1. This scenario would combine air-to-air and weapons delivery missions and consist of a 70-minute flight with eight F-16 aircraft as escorts. The air-to-air portion of this scenario would consist of a 70-minute flight with four F-16 aircraft as escorts. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the start point of VR-413. Both flights would practice low altitude navigation along VR-413 during a 30-minute flight en route to Airburst Range to complete a weapons delivery mission. The flights would delay up to 15 minutes in the La Veta MOA where two to four non-F-16 adversary aircraft would attempt to find and attack the weapons delivery flight. The escorting F-16 aircraft would attempt to keep the adversary aircraft from attacking the weapons delivery flight. The air-to-air F-16 flight would possibly delay in the La Veta MOA longer than the weapons delivery flight. The air-to-air flight would not proceed onto the Airburst Range. The weapons delivery flight would plan a single attack with a possible re-attack at the target complex for a delay at the range of up to seven minutes. After completing a weapons delivery at Airburst Range, the flight would complete a 15-minute return at medium altitude to Buckley ANGB. The air-to-air flight would depart from La Veta MOA for a 20-minute medium altitude flight to Buckley ANGB. The adversaries for this mission would consist two to four F-15 or F-18 aircraft remaining within the La Veta MOA and following a normal air-to-air adversary profile from Buckley ANGB to the area and return.

## **N.2        PREFERRED ALTERNATIVE TRAINING SCENARIOS**

### **N.2.1        Normal Weapon Delivery Training Scenarios**

USAF units using the airspace areas of the Colorado Airspace Initiative under the Preferred Alternative, primarily the 140 WG, would conduct the weapons delivery training described in paragraphs N.2.1.1 through N.2.1.8.

#### **N.2.1.1        Weapons Delivery Scenario 1**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.1.1.

#### **N.2.1.2        Weapons Delivery Scenario 2**

This scenario would consist of an 80-minute flight with four F-16 aircraft. The aircraft would fly 20 minutes from Buckley ANGB to the La Veta MOA at medium altitude. The flight would delay for 15 minutes in La Veta MOA practicing low altitude intercept training. After the intercept training, the flight would depart La Veta MOA for a low altitude entry through La Veta Low and Airburst MOAs into Airburst Range to complete a weapons delivery mission. The flight would delay for 30 minutes at the range using the Airburst MOA and R-2601. The flight would then complete a 15-minute return flight at medium altitude to Buckley ANGB.

#### **N.2.1.3        Weapons Delivery Scenario 3**

This scenario would consist of an 75-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes from Buckley ANGB to the Cheyenne MOA at medium altitude. The flight would delay 10 minutes in the Cheyenne MOA to practice simulated weapons delivery tactics. Upon completion of this training, the weapons delivery flight would depart the Cheyenne MOA at low altitude to an entry point on XIR-424 MTR for 15 minutes of low altitude navigation training en route to Airburst Range to complete a weapons delivery mission. The flight would delay for 20 minutes at the range using the Airburst MOA and R-2601. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.2.1.4        Weapons Delivery Scenario 4**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.1.4.

#### **N.2.1.5        Weapons Delivery Scenario 5**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.1.5.

#### **N.2.1.6        Weapons Delivery Scenario 6**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.1.6.

### **N.2.1.7 Weapons Delivery Scenario 7**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.1.7.

### **N.2.1.8 Weapons Delivery Scenario 8**

This scenario would consist of a 90-minute flight with four F-16 aircraft. The aircraft would fly 20 minutes at medium altitude from Buckley ANGB to an entry point of IR-409. The flight would delay 25 minutes at low altitude along IR-409 for low altitude navigation training en route to Airburst Range to complete a weapons delivery mission. The flight would delay another 30 minutes at the range using the Airburst MOA and R-2601. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

### **N.2.1.9 Weapons Delivery Scenario 9**

This scenario would consist of a 120-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to Cheyenne MOA and delay 40 minutes for refueling. The flight would begin at medium altitude at the starting point of IR-409 and delay 20 minutes at low altitude along IR-409 for low altitude navigation training en route to Airburst Range to complete a weapons delivery mission. The flight would delay another 30 minutes at the range using the Airburst MOA and R-2601. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

## **N.2.2 Normal Surface Attack Tactics Training Scenarios**

### **N.2.2.1 Surface Attack Tactics Scenario 1**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.2.1.

### **N.2.2.2 Surface Attack Tactics Scenario 2**

This scenario would not be used as part of the Preferred Alternative.

### **N.2.2.3 Surface Attack Tactics Scenario 3**

This scenario would consist of a 65-minute flight with four F-16 aircraft. The aircraft would fly 10 minutes at medium altitude from Buckley ANGB to the starting point of IR-414. The flight would delay 10 minutes at low altitude along IR-414 between points A and C. The flight would delay, again, 20 minutes in the Cheyenne MOA to practice simulated Maverick missile weapons delivery tactics. After completing the simulated weapons deliveries, the flight would complete a 20-minute return at medium altitude to Buckley ANGB.

#### **N.2.2.4 Surface Attack Tactics Scenario 4**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.2.4.

#### **N.2.2.5 Surface Attack Tactics Scenario 5**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.2.5.

#### **N.2.2.6 Surface Attack Tactics Scenario 6**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.2.6.

### **N.2.3 Normal Air-to-Air Training Scenarios**

#### **N.2.3.1 Air-to-Air Training Scenario 1**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.3.1.

#### **N.2.3.2 Air-to-Air Training Scenario 2**

This scenario would consist of a 70-minute flight with two F-16 aircraft. The aircraft would fly 20 minutes from Buckley ANGB at medium altitude to the La Veta MOA. The flight would delay 30 minutes in La Veta MOA for intercept tactics training and basic fighter maneuver tactics. The flight would then complete a 20-minute return at medium altitude to Buckley ANGB.

#### **N.2.3.3 Air-to-Air Training Scenario 3**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.3.3.

#### **N.2.3.4 Air-to-Air Training Scenario 4**

This scenario would consist of a 70-minute flight with four F-16 aircraft. The aircraft would fly from Buckley ANGB to the Two Buttes High MOA at medium altitude for 23 minutes. The flight would delay 30 minutes in the Two Buttes High MOA to practice air combat tactics or air combat maneuvers against either a flight of two, or two single aircraft acting independently. Tactics on this mission would include AMRAAM air-to-air missile employment. The air-to-air flight would continue to train in medium to high altitude intercepts and basic fighter maneuvers. The flight would then complete a medium altitude, 23-minute return to Buckley ANGB.

#### **N.2.3.5 Air-to-Air Training Scenario 5**

This scenario would be the same as that described for the Original Proposal Alternative in Section N.1.3.5.

#### **N.2.3.6 Air-to-Air Training Scenario 6**

This scenario would consist of a 70-minute flight with two to four F-16 aircraft and two to four dissimilar adversary aircraft. The aircraft would fly 23 minutes at medium altitude from Buckley ANGB to the Two Buttes MOA. The flight would delay 20 minutes in the Two Buttes MOA to practice air combat tactics or air combat maneuvers against either a flight of two, or two single aircraft acting independently. Tactics on this mission include AMRAAM air-to-air missile employment. The air-to-air flight continues to train in medium to high altitude intercepts and basic fighter maneuvers. The flight would then complete a 23-minute return at medium altitude to Buckley ANGB.

#### **N.2.3.7 Air-to-Air Training Scenario 7**

This scenario would consist of a 65-minute flight with two to four F-16 aircraft and two to four dissimilar adversary aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the Cheyenne MOA. The flight would delay 35 minutes in the Cheyenne MOA to practice air combat tactics or air combat maneuvers against either a flight of two, or two single aircraft acting independently. The air-to-air flight would continue to train in medium altitude intercepts and basic fighter maneuvers. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

#### **N.2.3.8 Air-to-Air Training Scenario 8**

This scenario would not be used as part of the Preferred Alternative.

#### **N.2.3.9 Air-to-Air Training Scenario 9**

This scenario would consist of a 60-minute flight with two to four F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the Cougar MOA. The flight would delay for 30 minutes in the Cougar MOA for LOWAT, medium to high altitude intercepts, and basic fighter maneuvers. The flight would then complete a 15-minute return at medium altitude to Buckley ANGB.

### **N.2.4 Special Unit Training Scenarios**

#### **N.2.4.1 Special Training Scenario 1**

This scenario would consist of eight F-16 aircraft--four on an air-to-air mission and the other four on a weapon delivery mission. The air-to-air portion of this scenario would consist of a 90-minute flight with four F-16 aircraft. The aircraft would fly 15 minutes at medium altitude from Buckley ANGB to the Cheyenne MOA. The flight would delay 15 minutes in the Cheyenne MOA to practice air-to-air refueling with a KC-135 or KC-10 aircraft. The flights would join to allow the air-to-air flight to escort the weapons delivery flight to their assigned target within the Airburst Range. After the

refueling and rejoin are completed, the weapons delivery and air-to-air flights would depart the Cheyenne MOA at low altitude using XVR-1427 for a 30-minute flight en route to Airburst Range to complete a weapons delivery mission. The flights would delay up to seven minutes in the Two Buttes High/Low MOA, where two to four non-F-16 adversary aircraft attempt to find and attack the weapons delivery flight. After delaying in the Two Buttes Low MOA, the flight would continue along XVR-1427 through Pinon Canyon MOA and into the Airburst Range. The air-to-air flight would not proceed onto the Airburst Range. The weapons delivery flight would plan a single attack with a possible re-attack at the target complex, then delay up to seven minutes on the range. After completing the weapons delivery at Airburst Range, the flight would return to Buckley ANGB. The air-to-air flight would depart from Two Buttes High/Low MOA for an 23-minute, medium altitude return to Buckley ANGB. The adversaries would consist of two to four F-15 or F-18 aircraft remaining in Two Buttes High/Low MOA following a normal air-to-air adversary profile from Buckley ANGB to the area.

#### **N.2.4.2 Special Training Scenario 2**

This scenario would not be used as part of the Preferred Alternative.

## **N.3            CALCULATING CUMULATIVE SORTIE TOTALS**

### **N.3.1        Overview**

Airspace utilization is quantified by determining the total number of sorties obligated to each airspace. The number of sorties allocated to each airspace is determined by unit training requirements placed on the units by USAF and the number of flights (sorties) needed to meet these training requirements. Cumulative impacts are determined by adding together sorties from coincidental airspace (i.e., airspace overlapping the same geographic area). Considerable effort has been put into developing the sortie profile for each airspace component that can provide information to determine cumulative sortie totals.

Table N-1 summarizes the number of sorties that will be flown in each airspace component under the alternatives of the Colorado Airspace Initiative and the other existing airspace within the region of influence for the Colorado Airspace Initiative. The sortie totals for Table N-1 do not represent the cumulative sortie totals. An aircraft typically uses several MOAs and/or MTRs on a single training flight. For example, under the Original Proposal, a sortie flown following Weapons Delivery Scenario 3, as described in Section N.2.1.3, would utilize Cheyenne MOA, XIR-424 MTR, and Airburst MOA during the same training flight. This one sortie would be counted in each of the sortie totals for Cheyenne MOA, XIR-424 MTR, and Airburst MOA. Therefore, the totals shown in Table N-1 for each airspace component cannot be simply added together to produce a total sorties count for the overall Original Proposal (or the Preferred Alternative), as this would over-count the sortie totals. To avoid double-counting, training flights that utilize overlapping airspace components during the same sortie have been accounted for in the cumulative totals. Tables N-2 and N-3 provide the number of sorties that are shared by MOAs and MTRs for the Original Proposal and Preferred Alternative, respectively.

Sections N.3.3.1 through N.3.3.14 provide a means to determine cumulative sorties that will be flown through each airspace component associated with the Colorado Airspace Initiative. Included in these totals are coincidental military airspace separate from the Colorado Airspace Initiative. The number of cumulative sorties have been determined at selected geographic reference points within each airspace evaluated for the Colorado Airspace Initiative. These reference points coincide with geographical areas where the various airspace components overlap. The locations of these reference points are detailed on a series of maps (figures) for each airspace component for each of the three Colorado Airspace Initiative alternatives. Tables N-4 through N-17 provide the cumulative number of sorties associated with these reference points.

### **N.3.2        How to Use the Cumulative Sortie Reference Point Figures and Tables**

The reference points shown on Figures N-4 and N-34 coincide with the geographical areas where the airspace boundaries of the Colorado Airspace Initiative that overlap with each other, and with other existing military airspace. A reference point of interest may be selected, and to determine the sorties at that location, the user can refer to the appropriate corresponding airspace table to read the number. The cumulative totals have been adjusted to account for training flights that utilize several airspace components during the same sortie. This method provides an accurate cumulative total, and avoids double-counting the sorties in individual airspace components.



**Table N-1. Summary of the Sorties Associated with the Proposed Alternatives and Other Existing Airspace**

AIRSPACE	NUMBER OF SORTIES <sup>1</sup>		
	NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Cheyenne MOA (Kit Carson)	1,324	2,019	1,804
Pinon Canyon MOA	41	44	62
La Veta Low MOA La Veta High MOA	445 695	1,100	320 634
Airburst MOA (Fremont)	2,536	2,531	2,461
Two Buttes Low MOA Two Buttes High MOA	0 0	418 661	475 854
IR-409 (whole route) IR-409 Segments F to I	176 1,641	114 1,062	53 845
VR-413	100	254	176
VR-412	10	0	0
IR-414	16	32	62
XIR-424	0	266	211
IR-415	40	92	88
IR-416	30	46	62
XIR-426	0	46	62
XVR-1427 (whole route) XVR-1427 Segments F to I	0 0	346 250	343 185
<b>OTHER EXISTING MILITARY AIRSPACE WITHIN THE ROI FOR THE CAI</b>			
US Army Helicopter sorties (in Pinon Canyon MOA)	280	280	280
Cougar MOA	252	252	277
IR-107	982	982	982
IR-110	23	23	23
IR-150	397	397	397
IR-177	459	459	459
IR-500	2	2	2
IR-501	78	78	78
VR-108	386	386	386

**Note:**

1. Types of aircraft flown include fighter aircraft such as F-16, F-14, F-15, and F-18, bomber aircraft such as B-1 and B-52, and airlift aircraft such as C-130 and KC-135, and other like DOD aircraft. See Appendix E for detailed information.

**Table N-2. Shared Sorties under the Original Proposal**

MOAs	MTRs	SHARED SORTIES
Cheyenne	IR-414	32
	XIR-424	210
	XVR-1427 A-F	346
Two Buttes Low	XVR-1427 A-F	346
Pinon Canyon	IR-409	4
Airburst	IR-409 F+	1043
	VR-413	188
	IR-415	64
	XIR-424	266
	XVR-1427 F+	250
La Veta Low	VR-413	114
	XVR-1427 F+	250
Cougar	IR-416	42
	XIR-426	42

**Table N-3. Shared Sorties under the Preferred Alternative**

MOAs	MTRs	SHARED SORTIES
Cheyenne	IR-414	56
	XIR-424	112
	XVR-1427 A-F	370
Two Buttes Low	XVR-1427 A-F	370
Airburst	IR-409 F+	1,095
	VR-413	160
	IR-415	80
	XIR-424	192
	XVR-1427 F+	226
Cougar	IR-416	56
	XIR-426	56

### **N.3.3 Airspace Components**

#### **N.3.3.1 Cheyenne (Kit Carson) MOA**

Figures N-1 and N-2 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing Kit Carson MOA, and the Original Proposal and Preferred Alternative Cheyenne MOA, respectively. Table N-4 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

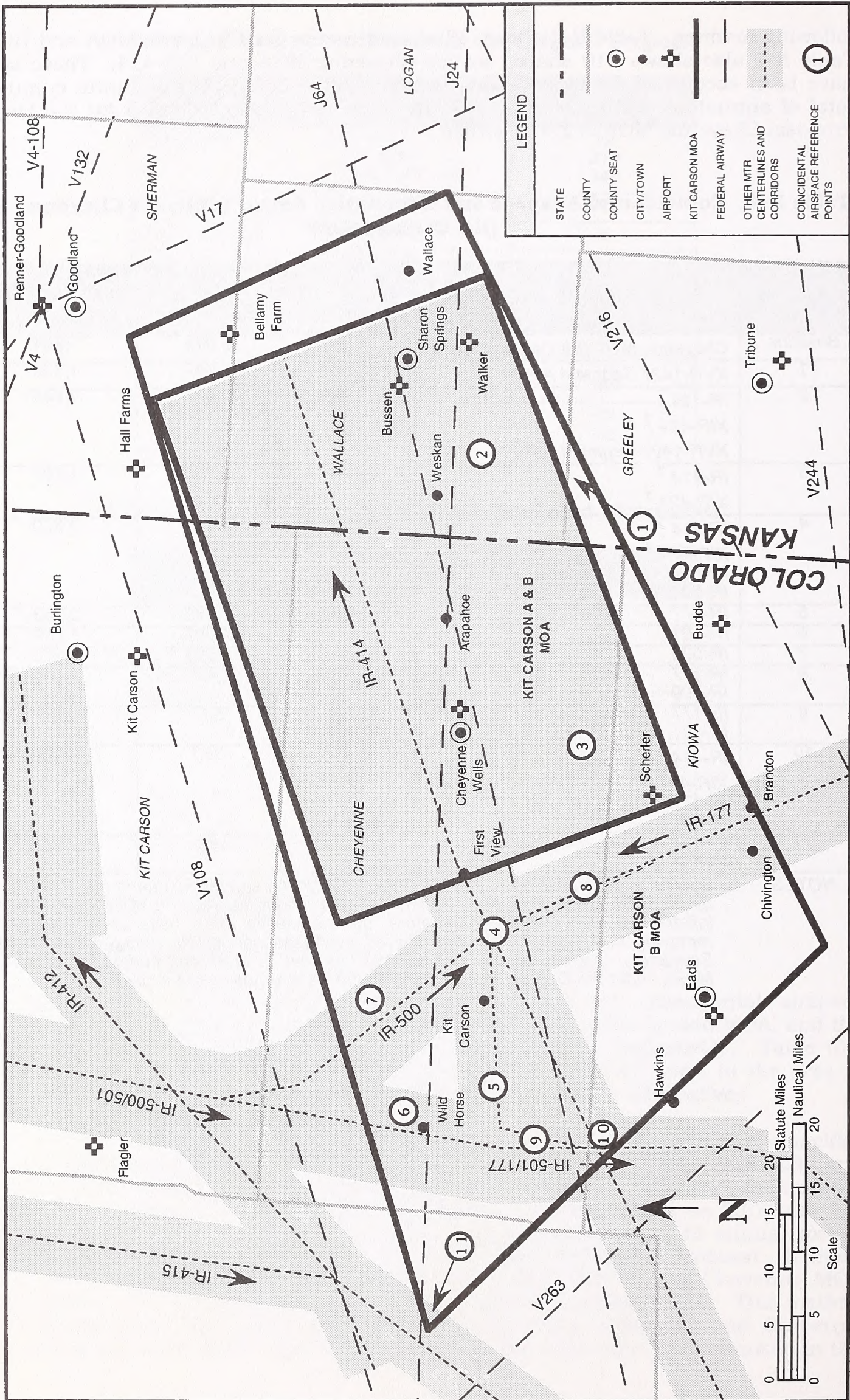
For example, Reference Point 3, as shown on Figures N-1 and N-2, coincides with the geographical area where the airspace boundaries of IR-414, XIR-424, and Cheyenne MOA overlap. Under the Original Proposal column in Table N-4, the number of cumulative sorties flown in the area of Reference Point 3 is shown as 2,075 sorties. However, Table N-1 shows 2,019 annual sorties for Cheyenne MOA, 32 annual sorties for IR-414, and 266 annual sorties for XIR-424 under the Original Proposal. If these sorties are totaled, the annual number of sorties within this area of Cheyenne MOA would equal 2,317, providing an inaccurate and inflated cumulative total. This method would double-count the training flights that utilize IR-414, XIR-424, and Cheyenne MOA during the same sortie. Therefore, the cumulative totals have been adjusted in the

following manner. Table N-2 shows 32 shared sorties for Cheyenne MOA and IR-414. Table N-2 also shows 210 shared sorties Cheyenne MOA and XIR-424. These sorties have been accounted for by adjusting the cumulative total. The accurate cumulative total of annual sorties occurring within the area of Reference Point 3 for the Original Proposal Cheyenne MOA is 2,075 sorties.

**Table N-4. Coincidental Airspace and Cumulative Sortie Totals for Cheyenne MOA (Kit Carson MOA)**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	Cheyenne MOA (Kit Carson MOA) <sup>1</sup>	1,324	2,019	1,804
1	XVR-1427 Segment A/B <sup>1</sup>	1,324	2,019	1,835
2	IR-414 <sup>1</sup> XIR-424 <sup>1</sup> XVR-1427 Segment A/B <sup>1</sup>	1,340	2,075	1,940
3	IR-414 <sup>1</sup> XIR-424 <sup>1</sup>	1,340	2,075	1,909
4	IR-414 <sup>1</sup> XIR-424 <sup>1</sup> IR-177 IR-500	1,801	2,536	2,370
5	IR-177	1,783	2,478	2,263
6	IR-501	1,402	2,097	1,882
7	IR-500	1,326	2,021	1,806
8	IR-177 IR-500	1,785	2,480	2,265
9	IR-177 IR-501	1,861	537	537
10	IR-414 <sup>1</sup> XIR-424 <sup>1</sup> IR-177 IR-501	1,877	835	810
11	IR-412 IR-415	1,374	92	88

NOTES: 1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.



**Figure N-1. Coincidental Airspace Reference Points for Kit Carson A/B MOA--Existing Conditions**

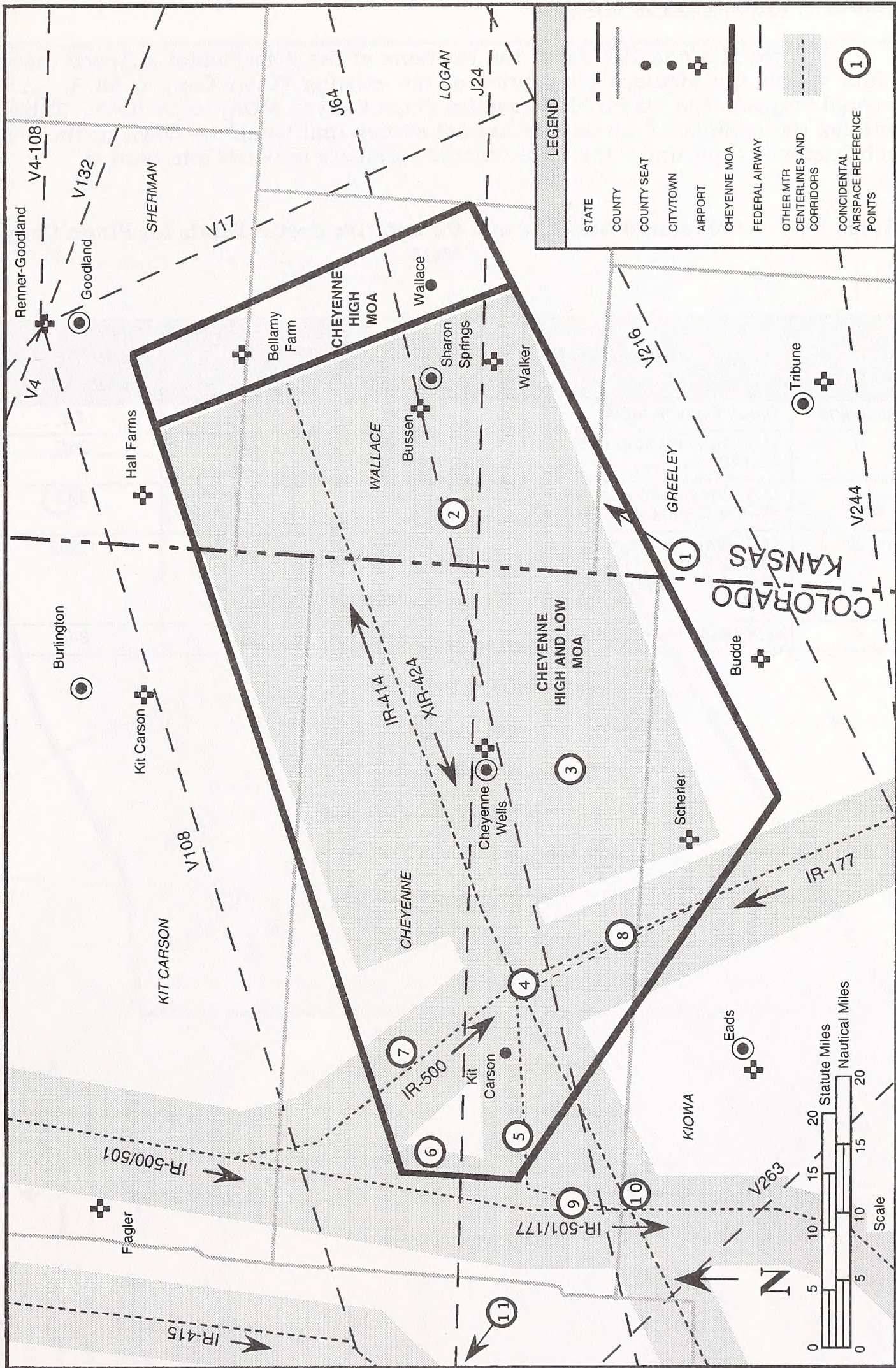


Figure N-2. Coincidental Airspace Reference Points for Cheyenne High and Low MOA--Original Proposal and Preferred Alternative

**N.3.3.2 Pinon Canyon MOA**

Figures N-3 and N-4 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing Pinon Canyon MOA, and the Original Proposal and Preferred Alternative Pinon Canyon MOA, respectively. Table N-5 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-5. Coincidental Airspace and Cumulative Sortie Totals for Pinon Canyon MOA**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	Pinon Canyon MOA	41	44	62
1	U.S. Army Helicopter sorties IR-110	344	347	365
2	U.S. Army Helicopter sorties IR-409 Segment E/F	497	434	395
3	U.S. Army Helicopter sorties IR-409 Segment F/G XVR-1427 Segment F/G IR-110	1,985	1,655	1,395
4	U.S. Army Helicopter sorties	321	324	342

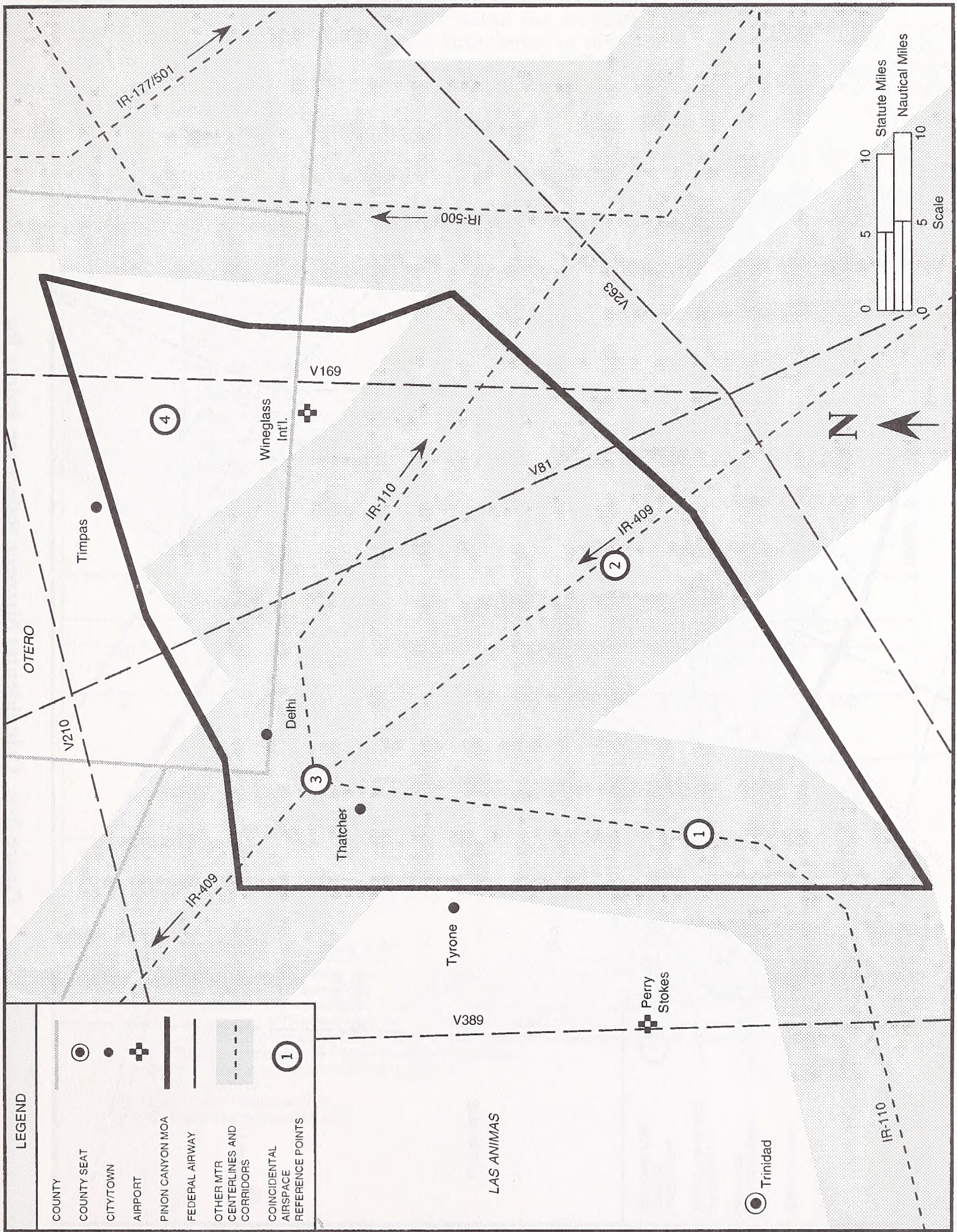


Figure N-3. Coincidental Airspace Reference Points for Pinon Canyon MOA--Existing Conditions

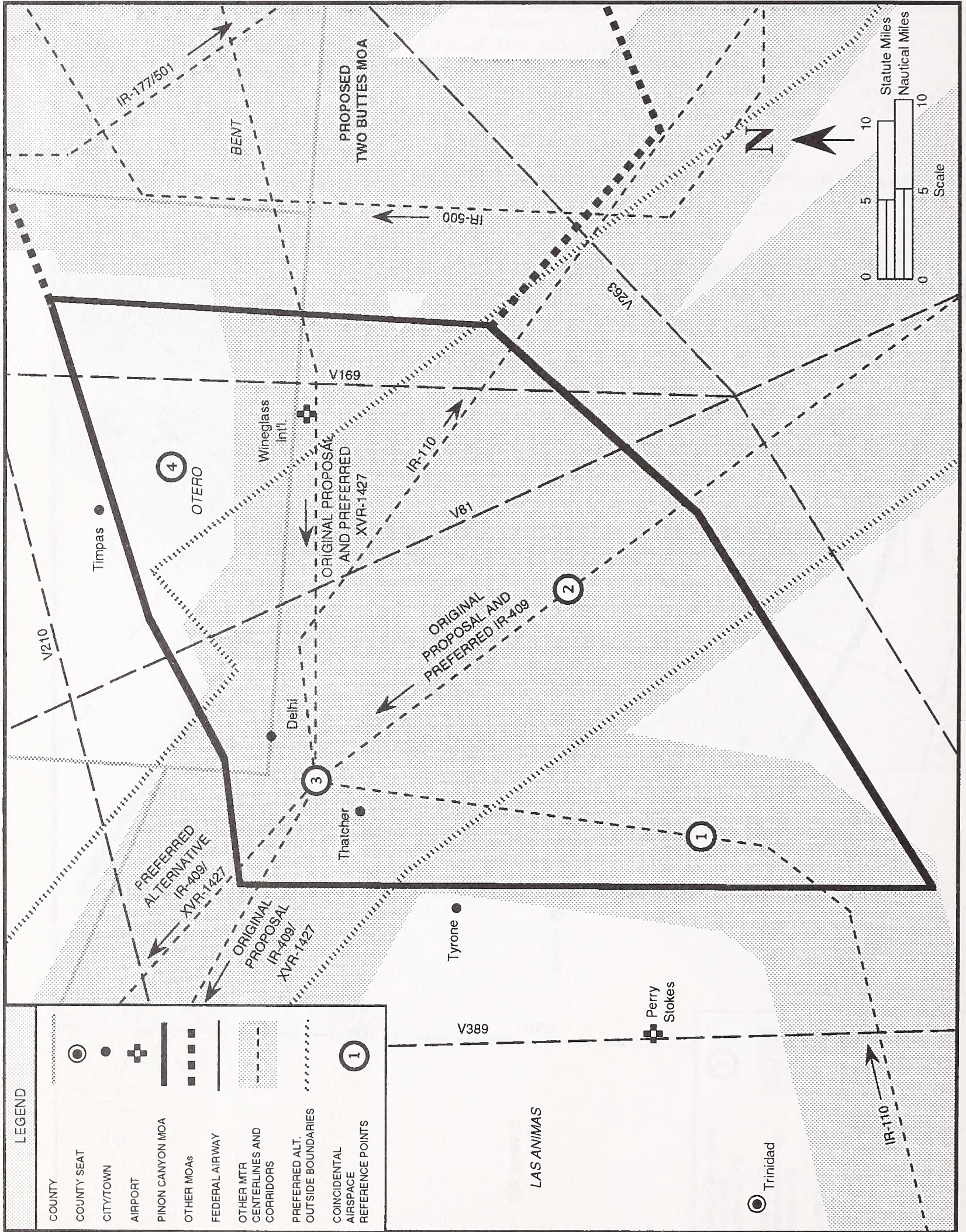


Figure N-4. Coincidental Airspace Reference Points for Pinon Canyon MOA--Original Proposal and Preferred Alternative



### N.3.3.3 La Veta MOA

Figures N-5, N-6, and N-7 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing, Original Proposal, and Preferred Alternative La Veta MOA, respectively. Table N-6 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-6. Coincidental Airspace and Cumulative Sortie Totals for La Veta MOA**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	La Veta Low MOA <sup>1</sup>	445	429	320
	La Veta High MOA <sup>1</sup>	695	671	634
1	IR-409 Segment H/I IR-415 <sup>2</sup> VR-413 <sup>1, 2</sup> XIR-424 <sup>2</sup> XVR-1427 Segment G/H <sup>1, 2</sup>	2,957	3,120	2,835
2	IR-409 Segment F/G <sup>3</sup> IR-415 <sup>5</sup> VR-412 <sup>4</sup> VR-413 <sup>3</sup> XIR-424 <sup>5</sup> XVR-1427 Segment G/H <sup>1, 6</sup>	3,067	1,458	2,556
3	VR-412 <sup>4</sup> VR-413	1,250	1,240	1,130
4	VR-412 <sup>4</sup>	1,150	1,100	954
5	IR-409 Segment F/G <sup>5</sup> XVR-1427 Segment F/G <sup>1, 5</sup>	1,140	2,622	954
6	IR-409 Segment F/G <sup>5</sup> IR-415 <sup>5</sup> VR-412 <sup>4</sup> VR-413 <sup>4</sup> XIR-424 <sup>5</sup> XVR-1427 Segment G/H <sup>1, 5</sup>	1,250	2,980	1,130
7	IR-409 Segment G/H <sup>5</sup> IR-415 <sup>5</sup> VR-413 <sup>1, 5</sup> XIR-424 <sup>5</sup> XVR-1427 Segment G/H <sup>1, 5</sup>	1,140	3,120	954

NOTES: 1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.

- 2. Original Proposal and Preferred Alternative only.
- 3. No-Action and Preferred Alternative only.
- 4. No-Action only.
- 5. Original Proposal only.
- 6. Preferred Alternative only.

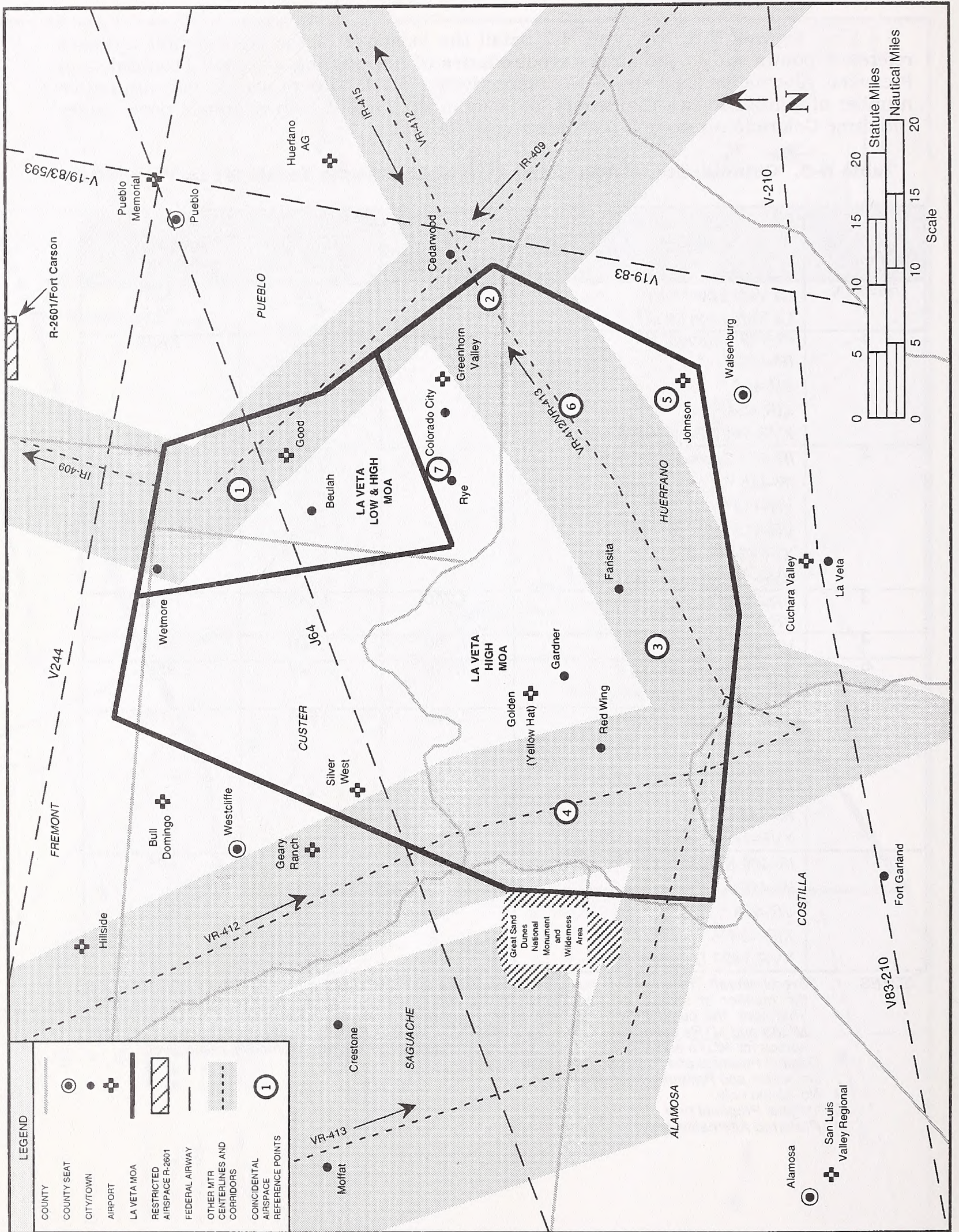


Figure N-5. Coincidental Airspace Reference Points for La Veta Low and High MOA--Existing Conditions

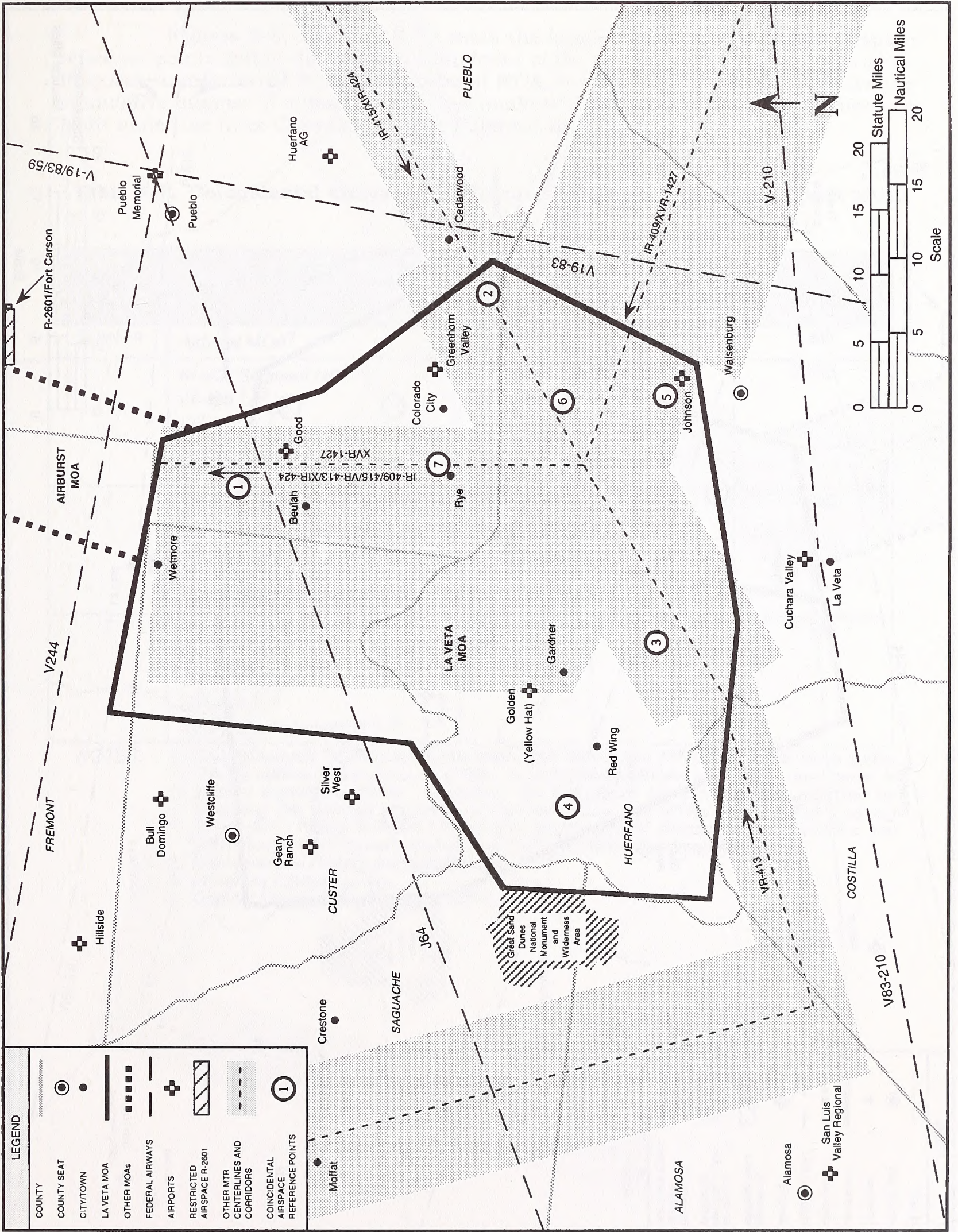


Figure N-6. Coincidental Airspace Reference Points for La Veta MOA--Original Proposal

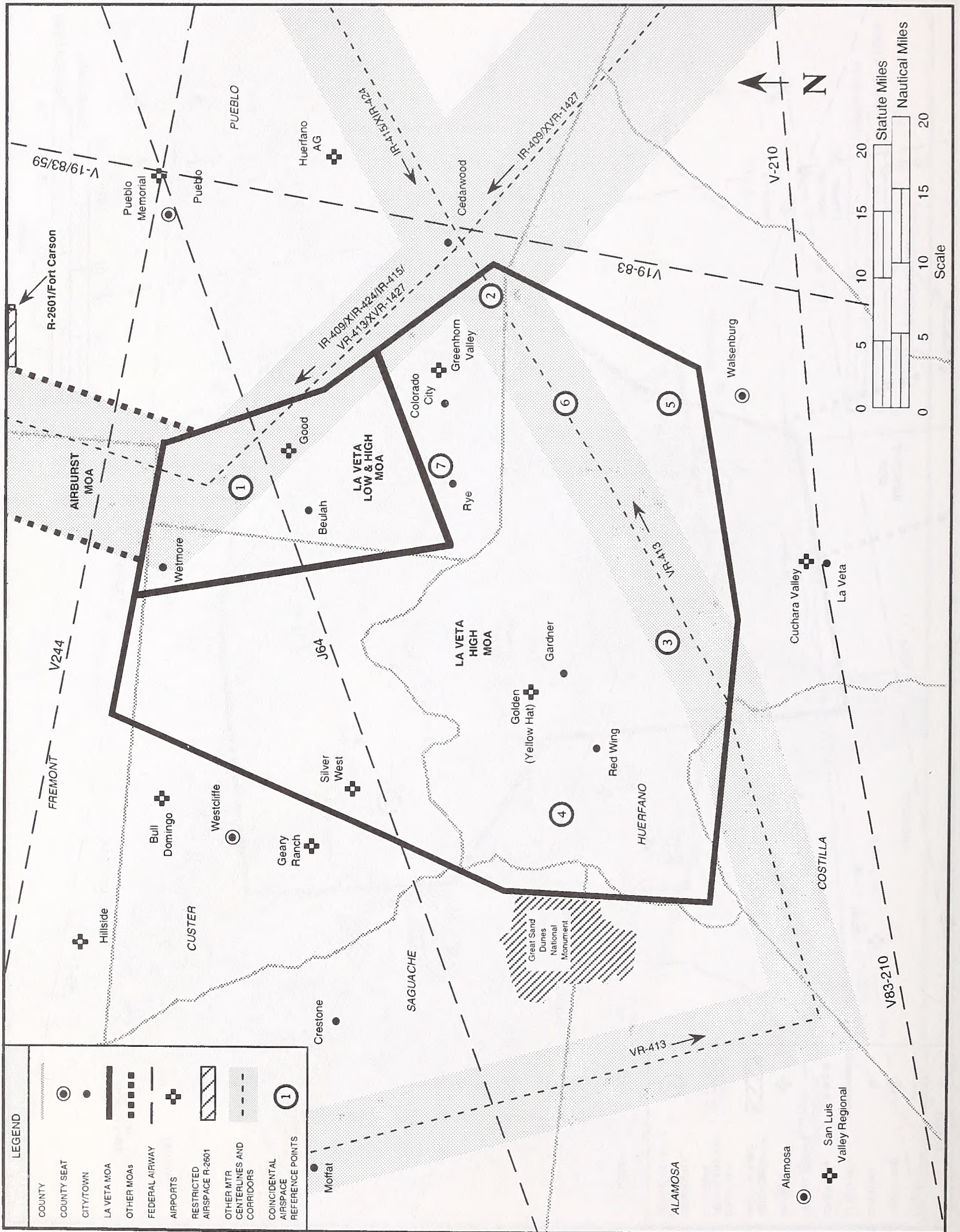


Figure N-7. Coincidental Airspace Reference Points for La Veta MOA--Preferred Alternative

### N.3.3.4 Airburst (Fremont) MOA

Figures N-8, N-9, and N-10 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing (Fremont MOA), Original Proposal, and Preferred Alternative Airburst MOA, respectively. Table N-7 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-7. Coincidental Airspace and Cumulative Sortie Totals for Airburst MOA**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	Airburst MOA <sup>1</sup>	2,536	2,531	2,461
1	IR-409 Segment H/I 1, 2 IR-415 1, 3 VR-413 1, 3 XIR-424 1, 3 XVR-1427 Segment H/I 1, 3	4,353	2,531	2,995
2	IR-409 Segment H/I 1 IR-415 1, 4 VR-413 1, 4 XIR-424 1, 4 XVR-1427 Segment H/I 1, 4	1,817	3,104	2,995
3	IR-409 Segment H/I 1, 2 IR-415 1, 3 VR-413 1, 3 XIR-424 1, 3 XVR-1427 Segment H/I 1, 3	1,817	2,531	2,995

- NOTES:
1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
  2. No-Action and Preferred Alternative only.
  3. Preferred Alternative only.
  4. Original Proposal and Preferred Alternative only.

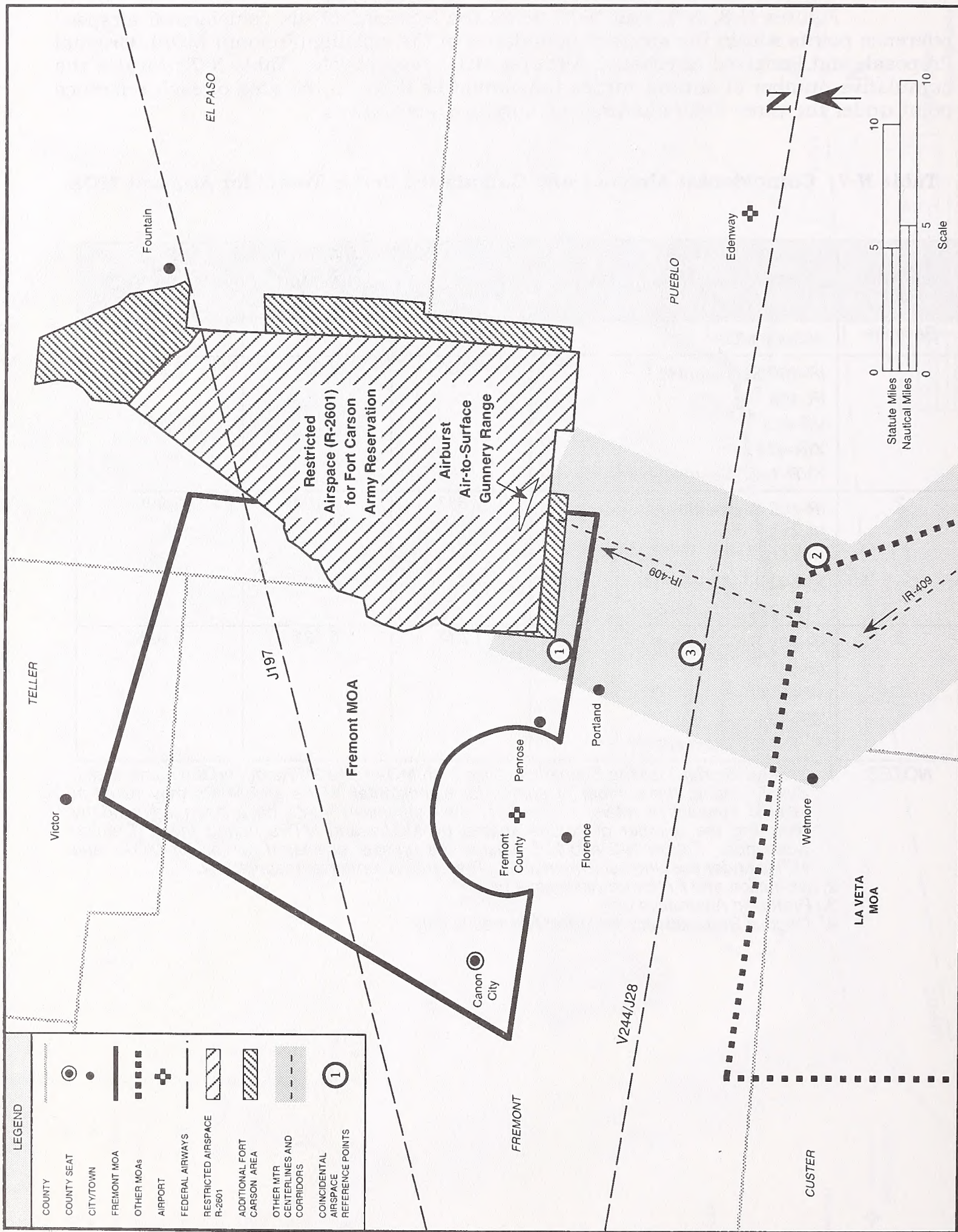


Figure N-8. Coincidental Airspace Reference Points for Fremont MOA--Existing Conditions

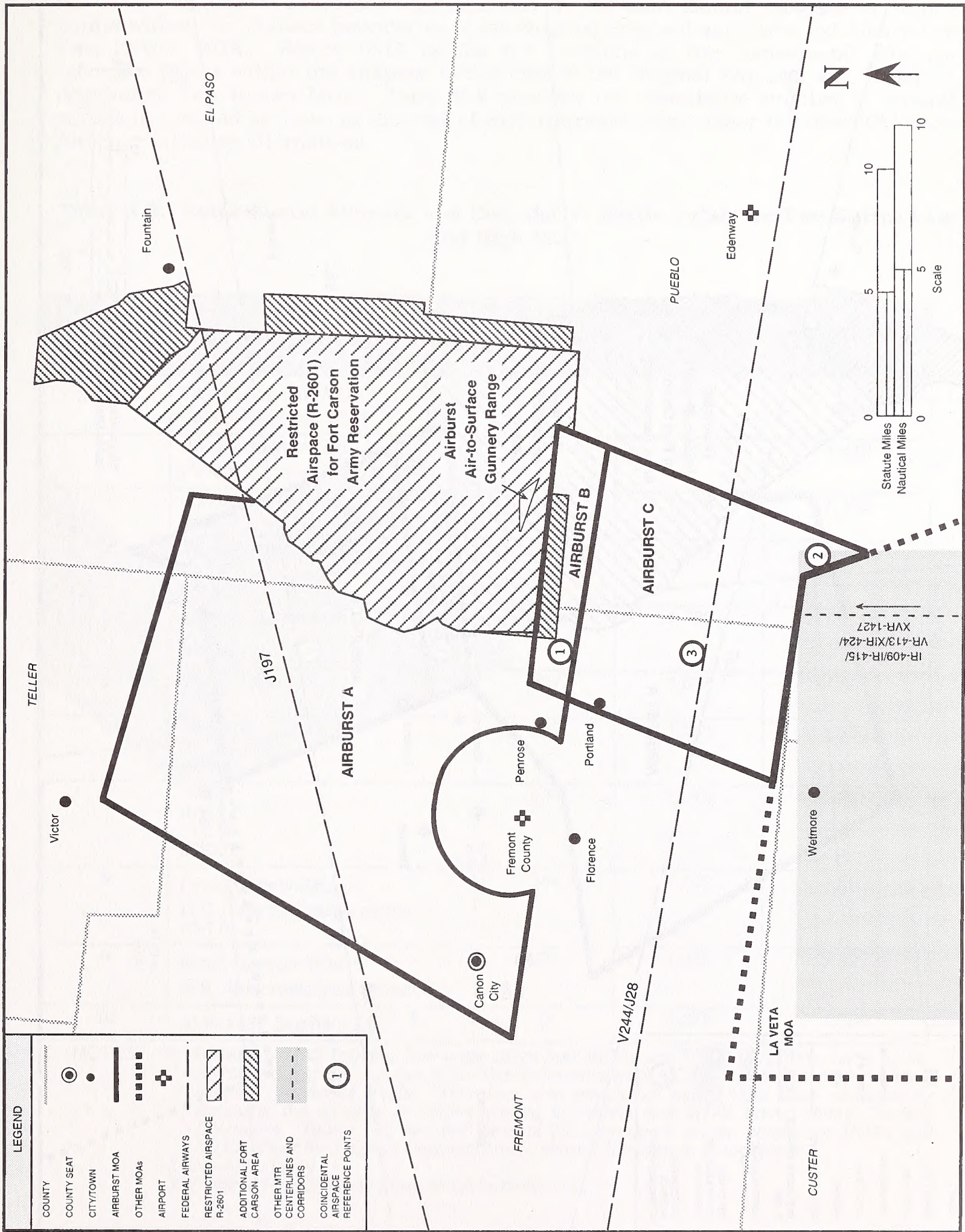
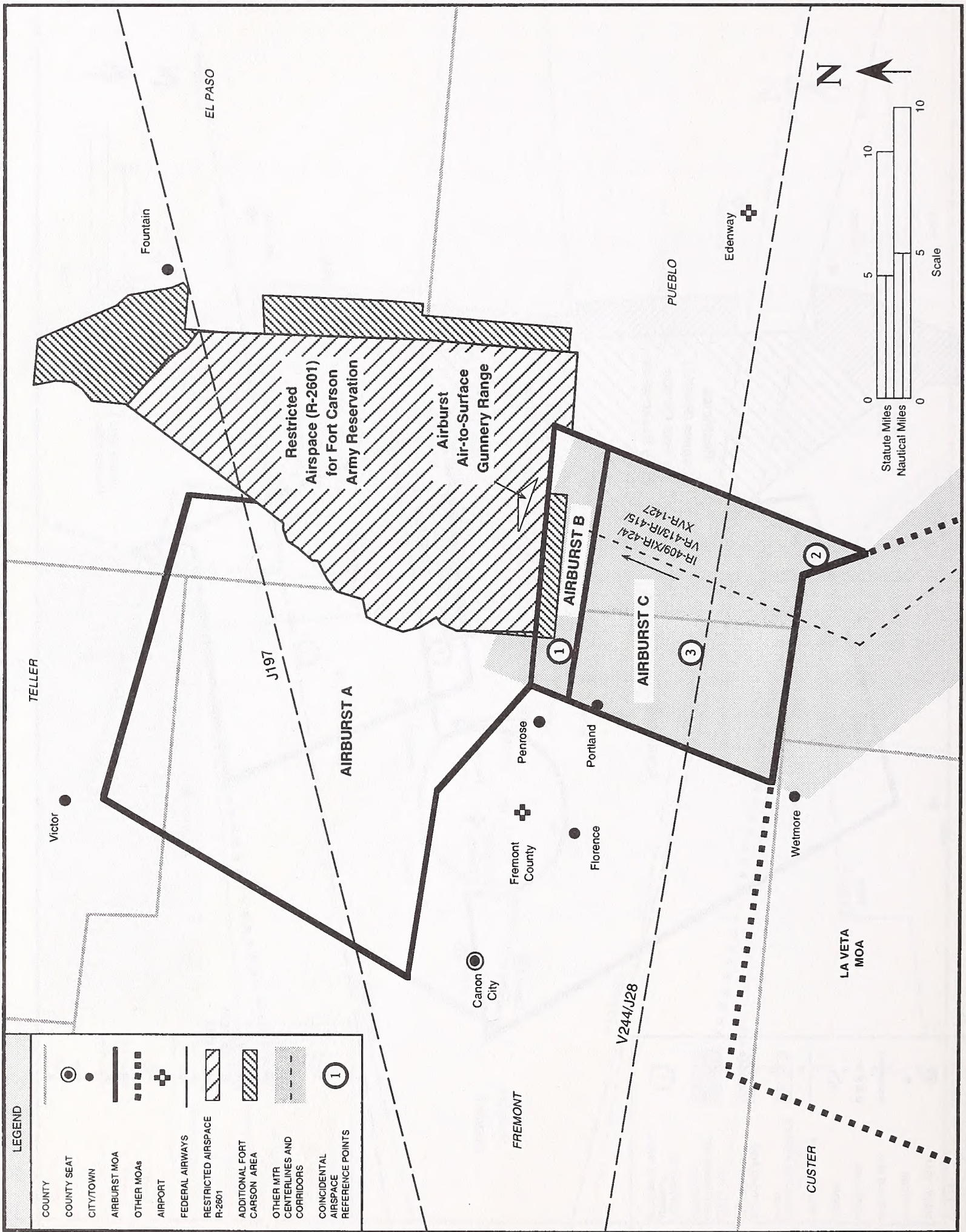


Figure N-9. Coincidental Airspace Reference Points for Airburst A, B, and C MOA--Original Proposal



**Figure N-10. Coincidental Airspace Reference Points for Airburst A, B, and C MOA--Preferred Alternative**



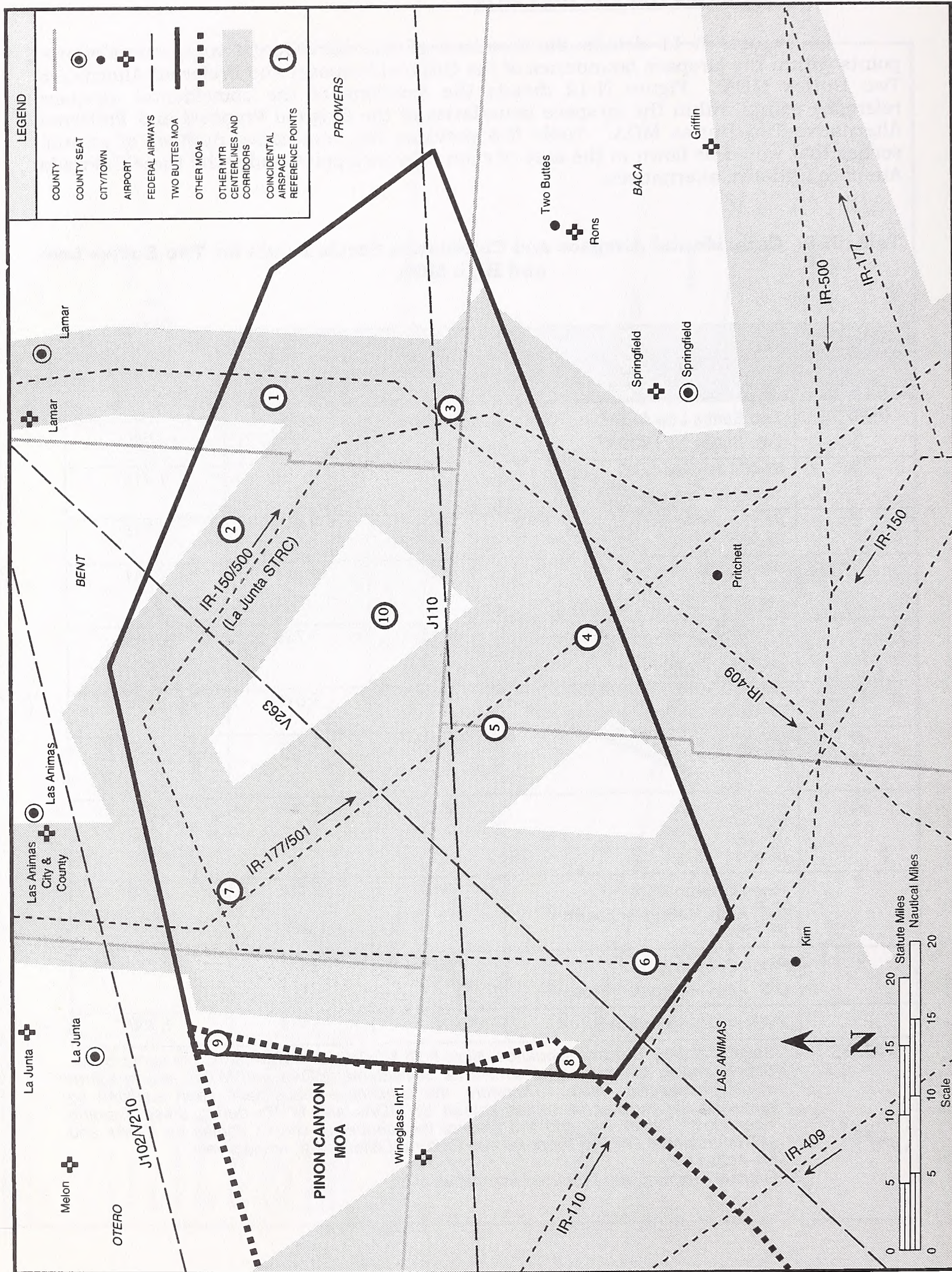
### N.3.3.5 Two Buttes Low and High MOA

Figures N-11 details the locations of the coincidental airspace reference points within the airspace boundaries of the Original Proposal and Preferred Alternative Two Buttes MOA. Figure N-12 details the locations of the coincidental airspace reference points within the airspace boundaries of the Original Proposal and Preferred Alternative Two Buttes MOA. Table N-8 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

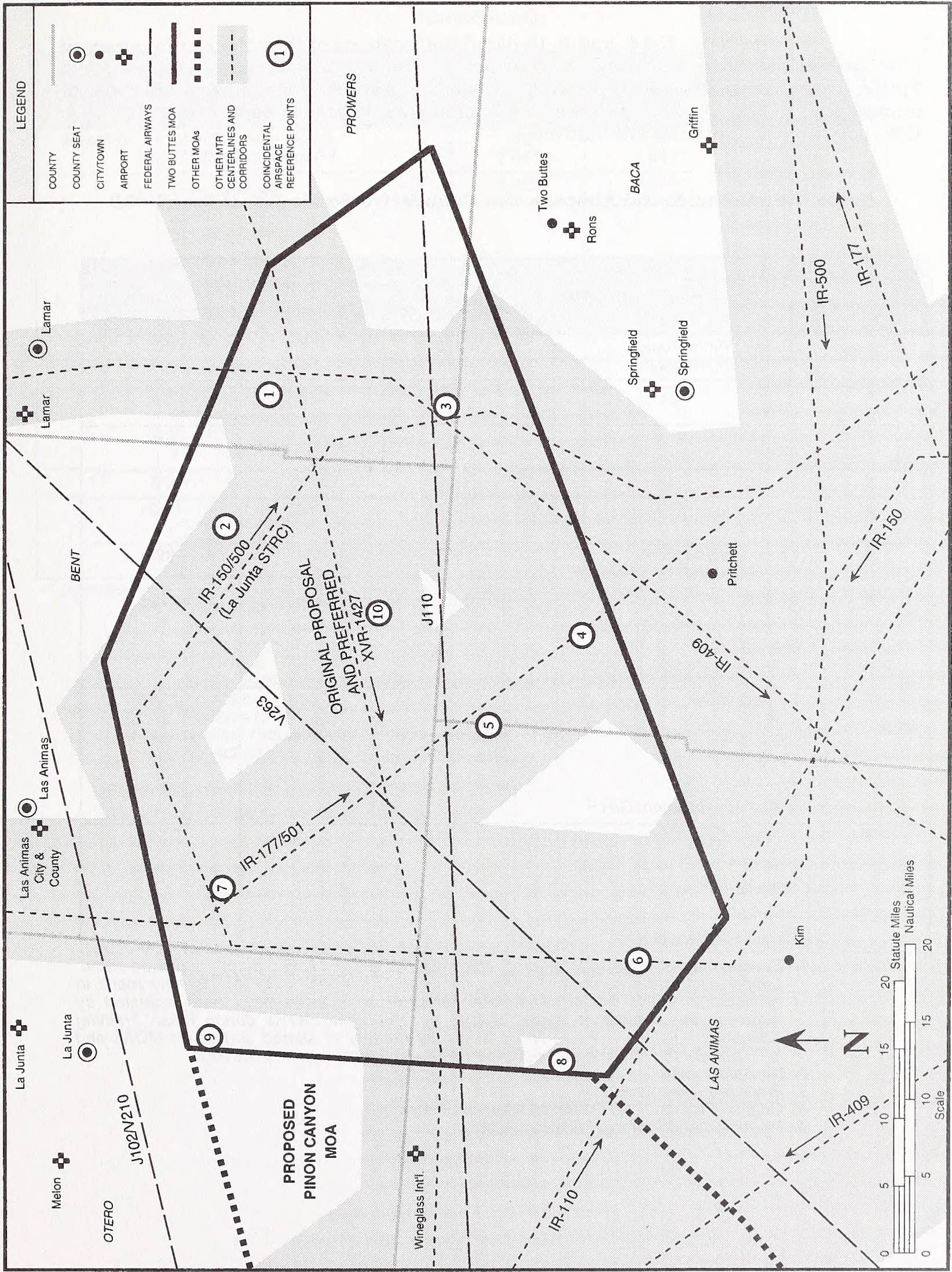
**Table N-8. Coincidental Airspace and Cumulative Sortie Totals for Two Buttes Low and High MOA**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	Two Buttes Low MOA <sup>1</sup>	0	418	475
	Two Buttes High MOA <sup>1</sup>	0	661	854
1	IR-409 Segment B/C XVR-1427 Segment D/E <sup>1, 3</sup>	176	1,193	1,413
2	IR-150 IR-500	399	1,478	1,728
3	IR-409 Segment C/D IR-150 IR-500	575	1,592	1,781
4	IR-409 Segment C/D IR-177 IR-501	713	1,730	1,919
5	IR-177 IR-501	537	1,616	1,866
6	IR-110 IR-150 IR-500	422	1,501	1,751
7	IR-150 IR-177 IR-500 IR-501	936	2,015	2,265
8	Pinon Canyon MOA <sup>2</sup> U.S. Army Helicopter sorties <sup>2</sup> IR-110	344	1,102	1,352
9	Pinon Canyon MOA <sup>2</sup> U.S. Army Helicopter sorties <sup>2</sup>	321	1,079	1,329
10	XVR-1427 Segment D/E <sup>1, 3</sup>	0	1,079	1,360

- NOTES:
1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
  2. No-Action only.
  3. Original Proposal and Preferred Alternative only.



**Figure N-11. Coincidental Airspace Reference Points for Two Buttes MOA--Existing Conditions**



**Figure N-12. Coincidental Airspace Reference Points for Two Buttes MOA--Original Proposal and Preferred Alternative**

**N.3.3.6 IR-409**

Figures N-13, N-14, and N-15 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing, Original Proposal, and Preferred Alternative IR-409, respectively. Table N-9 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-9. Coincidental Airspace and Cumulative Sortie Totals for IR-409**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	IR-409 Whole Route IR-409 Segments F-I	176 1,641	114 1,062	53 845
1	IR-150 IR-500	575	513	452
2	IR-177 IR-501	713	651	590
3	IR-110	199	137	76
4	IR-107 VR-108	1,544	1,482	1,421
5	Pinon Canyon MOA U.S. Army Helicopter sorties	497	434	395
6	IR-415 VR-412 <sup>2</sup> XIR-424 <sup>4</sup> XVR-1427 Segment F/G <sup>3</sup>	1,867	358	1,725
7	La Veta MOA IR-415 VR-412 <sup>2</sup> VR-413 <sup>2</sup> XIR-424 XVR-1427 Segment G/H <sup>3</sup>	3,107	1,458	2,855
8	La Veta MOA <sup>1</sup> IR-415 <sup>4</sup> VR-413 <sup>1, 4</sup> XIR-424 <sup>4</sup> XVR-1427 Segment H/I <sup>1, 4</sup>	2,957	3,120	2,855

- NOTES: 1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
2. No-Action only.
3. Preferred Alternative only.
4. Original Proposal and Preferred Alternative only.
5. No-Action and Preferred Alternative only.

**Table N-9. Coincidental Airspace and Cumulative Sortie Totals for IR-409  
(Continued)**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	IR-409 Whole Route IR-409 Segments F-I	176 1,641	114 1,062	53 845
9	Airburst MOA <sup>1</sup> IR-415 <sup>1, 3</sup> VR-413 <sup>1, 3</sup> XIR-424 <sup>1, 3</sup> XVR-1427 Segment H/I <sup>1, 3</sup>	4,353	2,531	2,995
10	Two Buttes MOA <sup>1</sup> XVR-1427 Segment C/D <sup>1</sup>	176	1,193	1,413
11	Two Buttes MOA	176	1,193	1,382
12	Pinon Canyon MOA U.S. Army Helicopter sorties IR-110 XVR-1427 Segment F/G	2,161	2,115	1,791
13	XVR-1427 Segment C/D	176	460	396
14	IR-150 IR-177 IR-500 IR-501	1,112	1,050	989

- NOTES: 1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
2. No-Action only.
3. Preferred Alternative only.
4. Original Proposal and Preferred Alternative only.
5. No-Action and Preferred Alternative only.

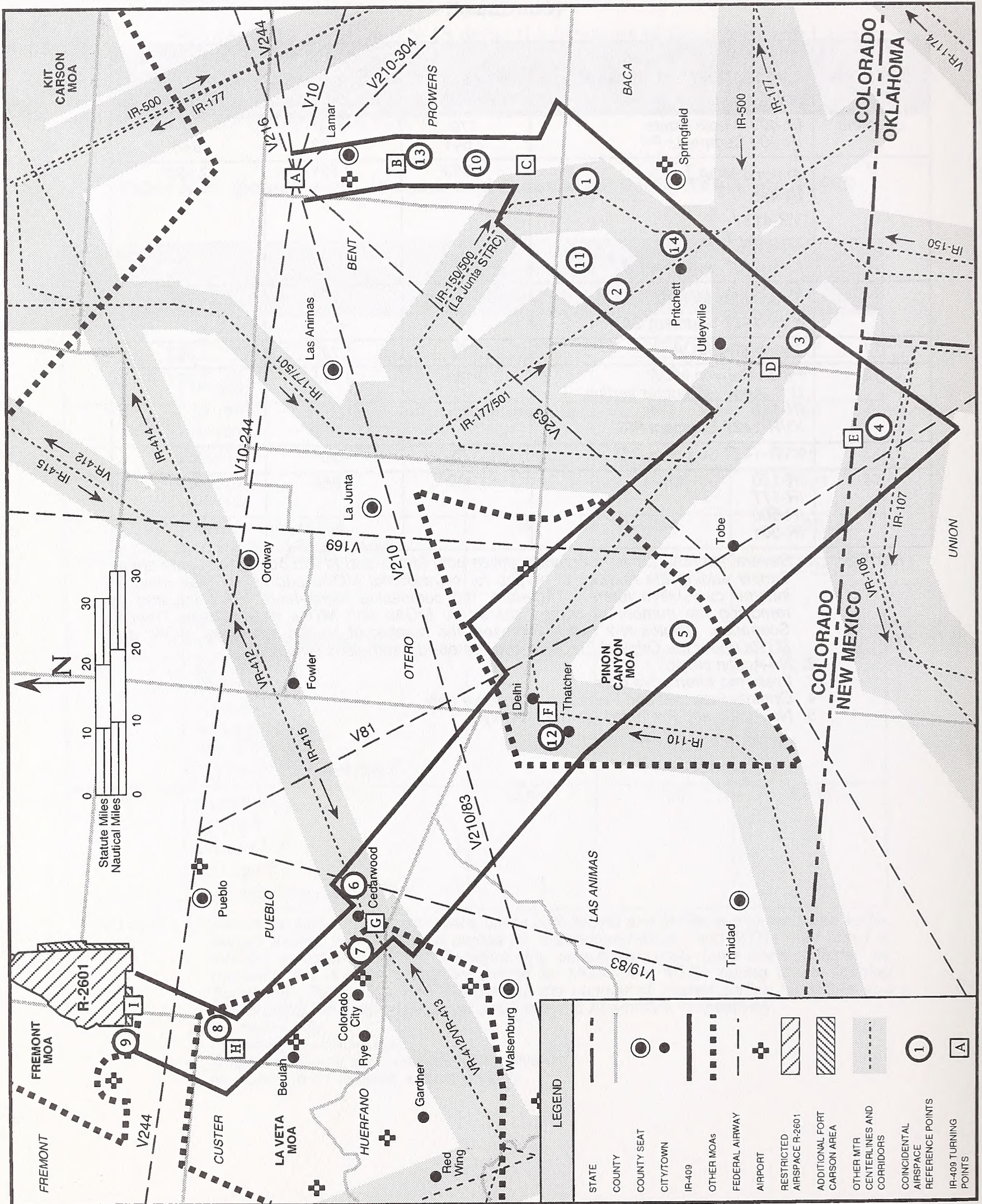


Figure N-13. Coincidental Airspace Reference Points for IR-409--Existing Conditions

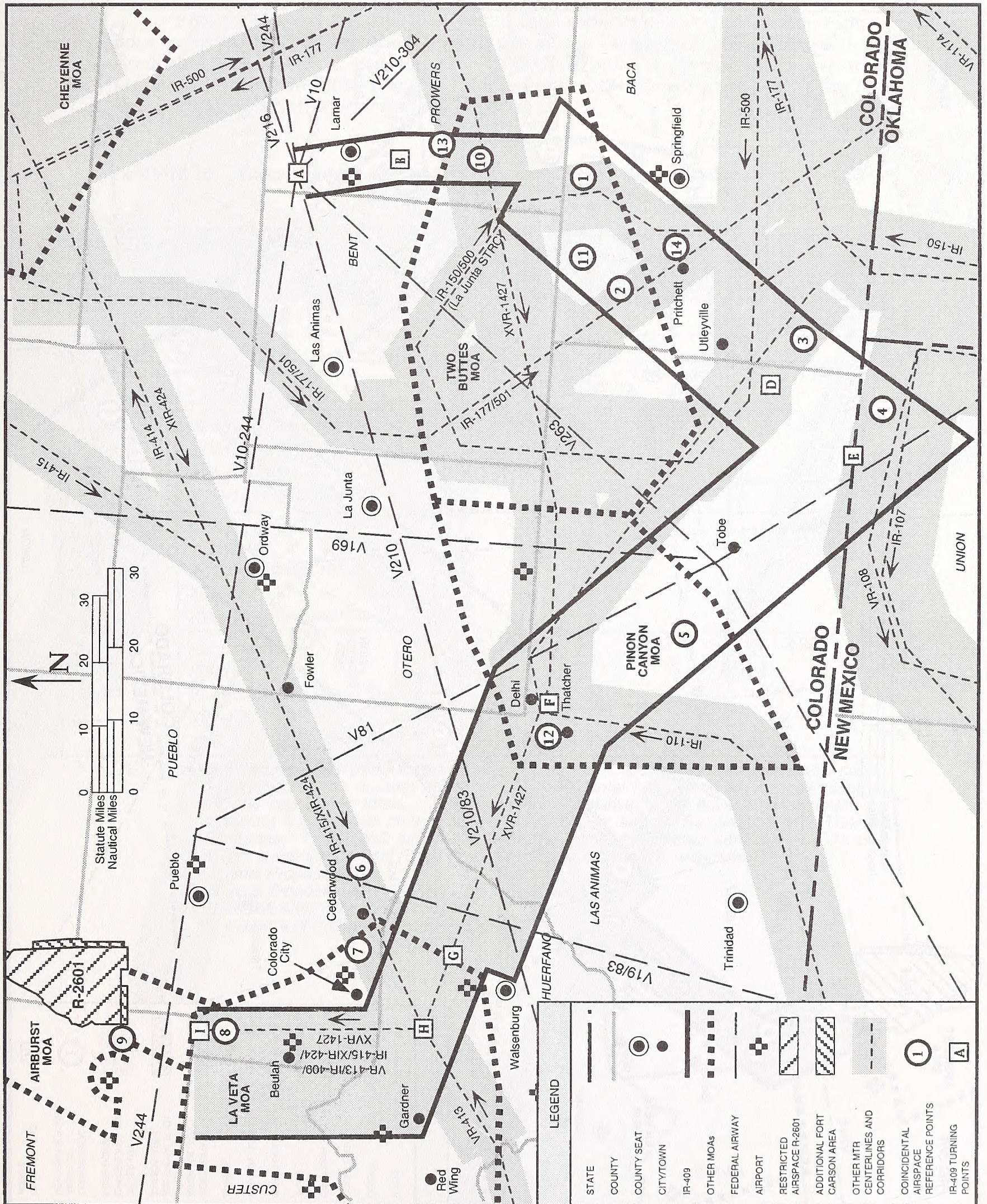


Figure N-14. Coincidental Airspace Reference Points for IR-409--Original Proposal

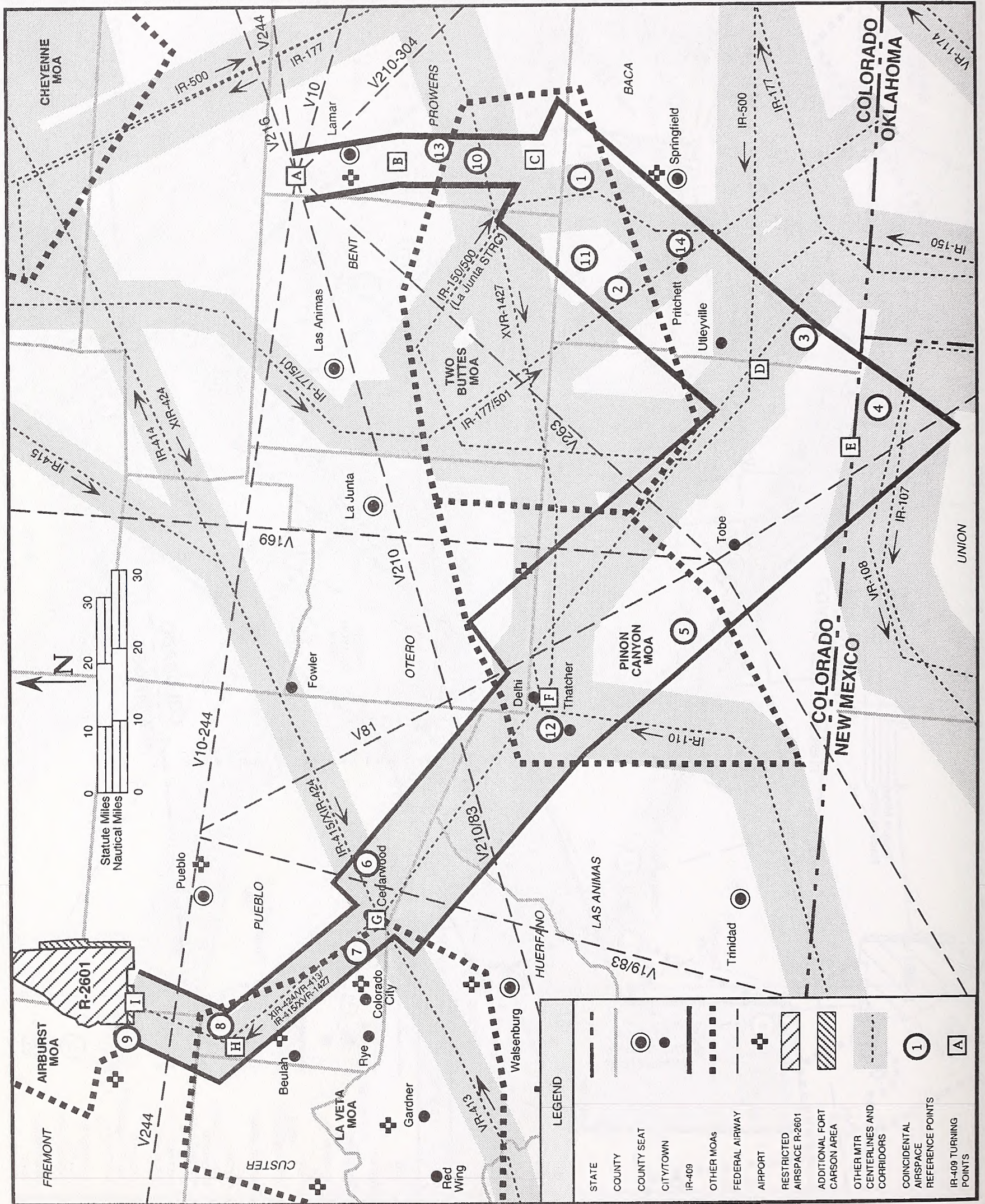


Figure N-15. Coincidental Airspace Reference Points for IR-409--Preferred Alternative



**N.3.3.7 VR-413**

Figures N-16, N-17, and N-18 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing, Original Proposal, and Preferred Alternative VR-413, respectively. Table N-10 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-10. Coincidental Airspace and Cumulative Sortie Totals for VR-413**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	VR-413 MTR <sup>1</sup>	100	254	176
1	VR-412	110	254	176
2	VR-412 La Veta MOA <sup>1</sup>	1,250	1,240	1,130
3	IR-409 Segment H/I <sup>5</sup> IR-415 <sup>4</sup> XIR-424 <sup>1, 4</sup> XVR-1427 Segment G/H <sup>1, 4</sup>	1,817	0	1,901
4	La Veta MOA <sup>1</sup> IR-415 <sup>3</sup> IR 409 Segment H/I XIR-424 <sup>3</sup> XVR-1427 Segment G/H <sup>1, 3</sup>	2,957	3,120	2,855
5	Airburst MOA <sup>1, 3</sup> IR-415 <sup>1, 4</sup> IR-409 Segment H/I <sup>1, 5</sup> XIR-424 <sup>1, 4</sup> XVR-1427 Segment H/I <sup>1, 4</sup>	1,817	2,531	2,995

- NOTES:
1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
  2. Original Proposal only.
  3. Original Proposal and Preferred Alternative only.
  4. Preferred Alternative only.
  5. No Action and Preferred Alternative only.

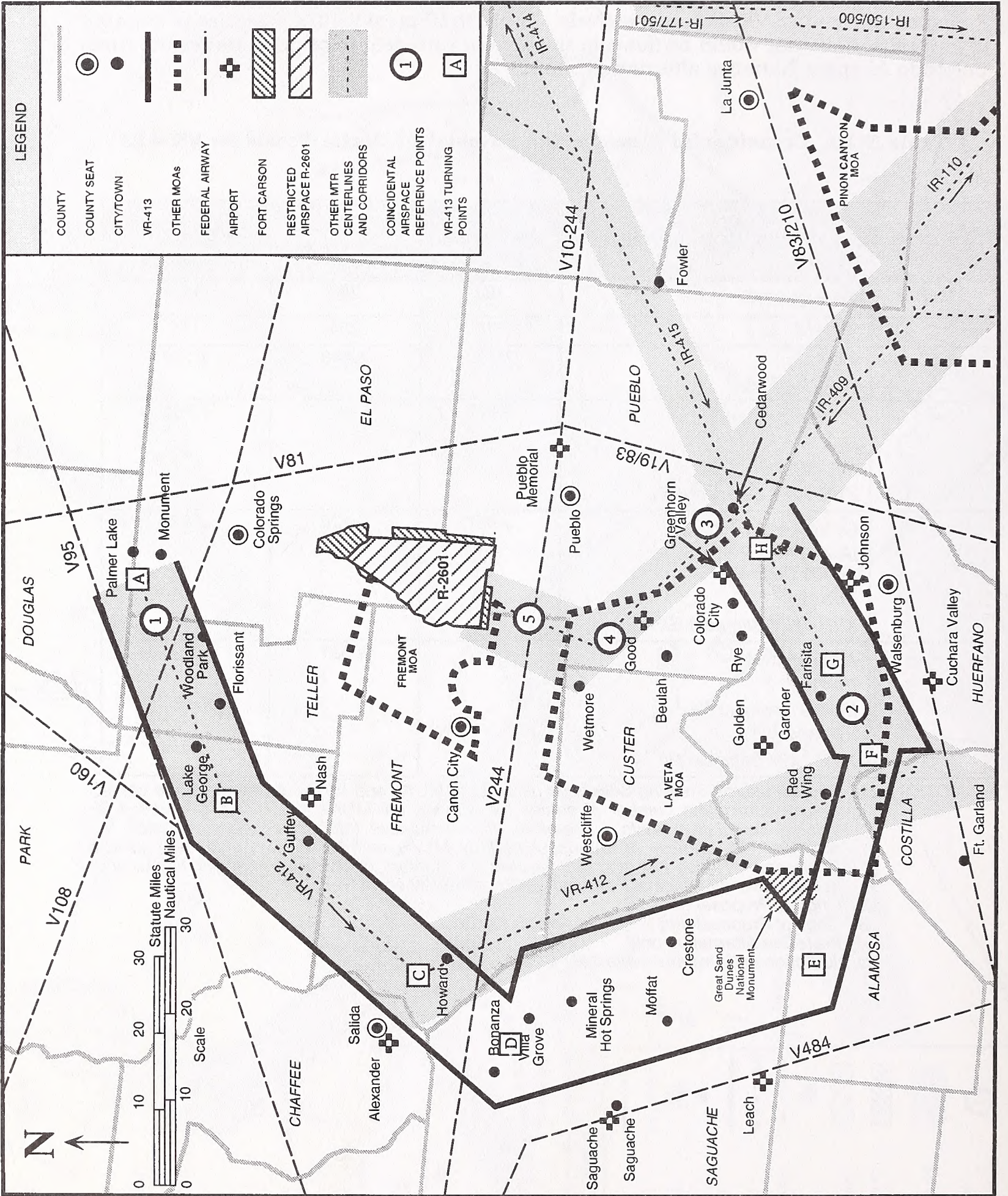


Figure N-16. Coincidental Airspace Reference Points for VR-413--Existing Conditions

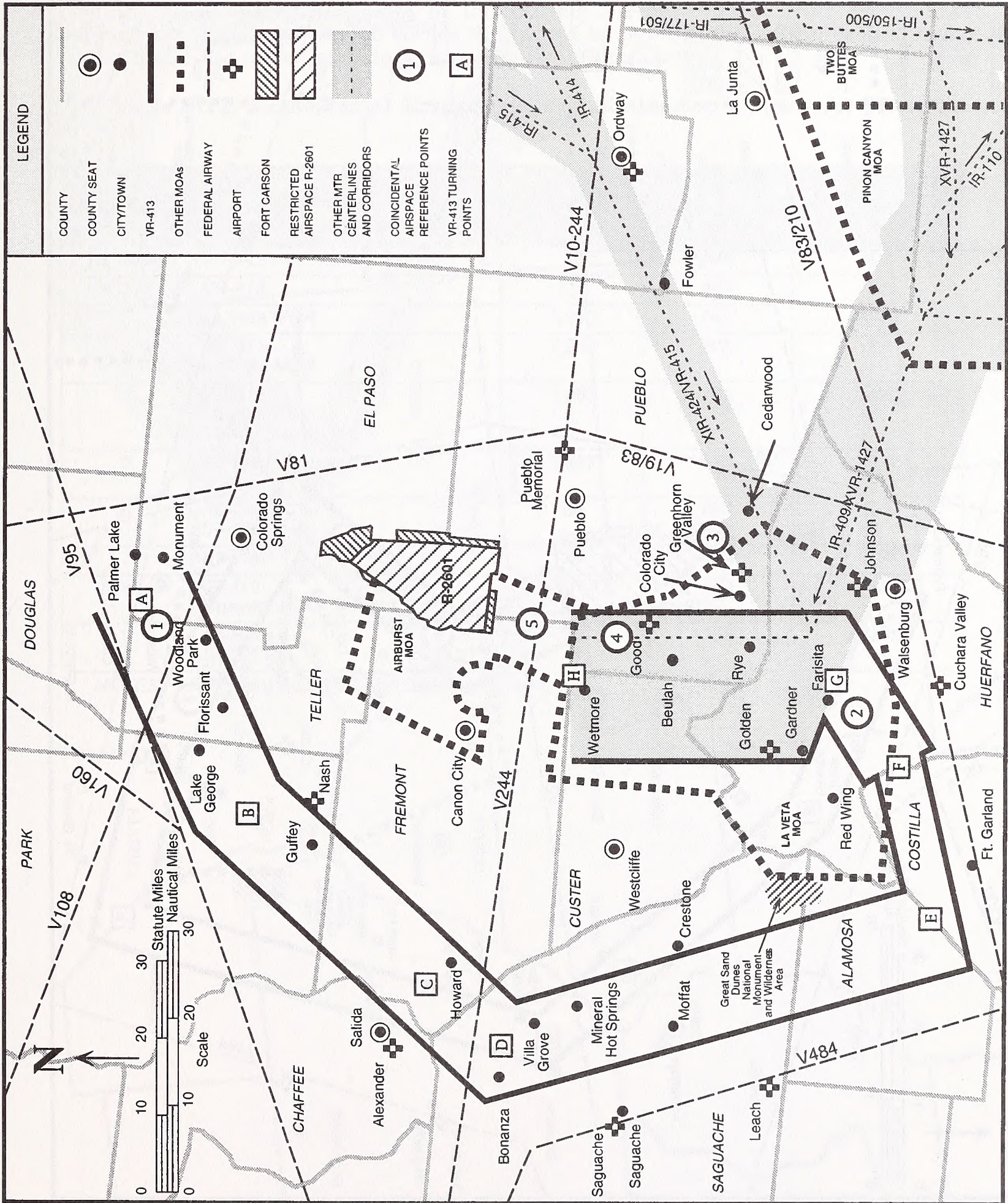


Figure N-17. Coincidental Airspace Reference Points for VR-413--Original Proposal

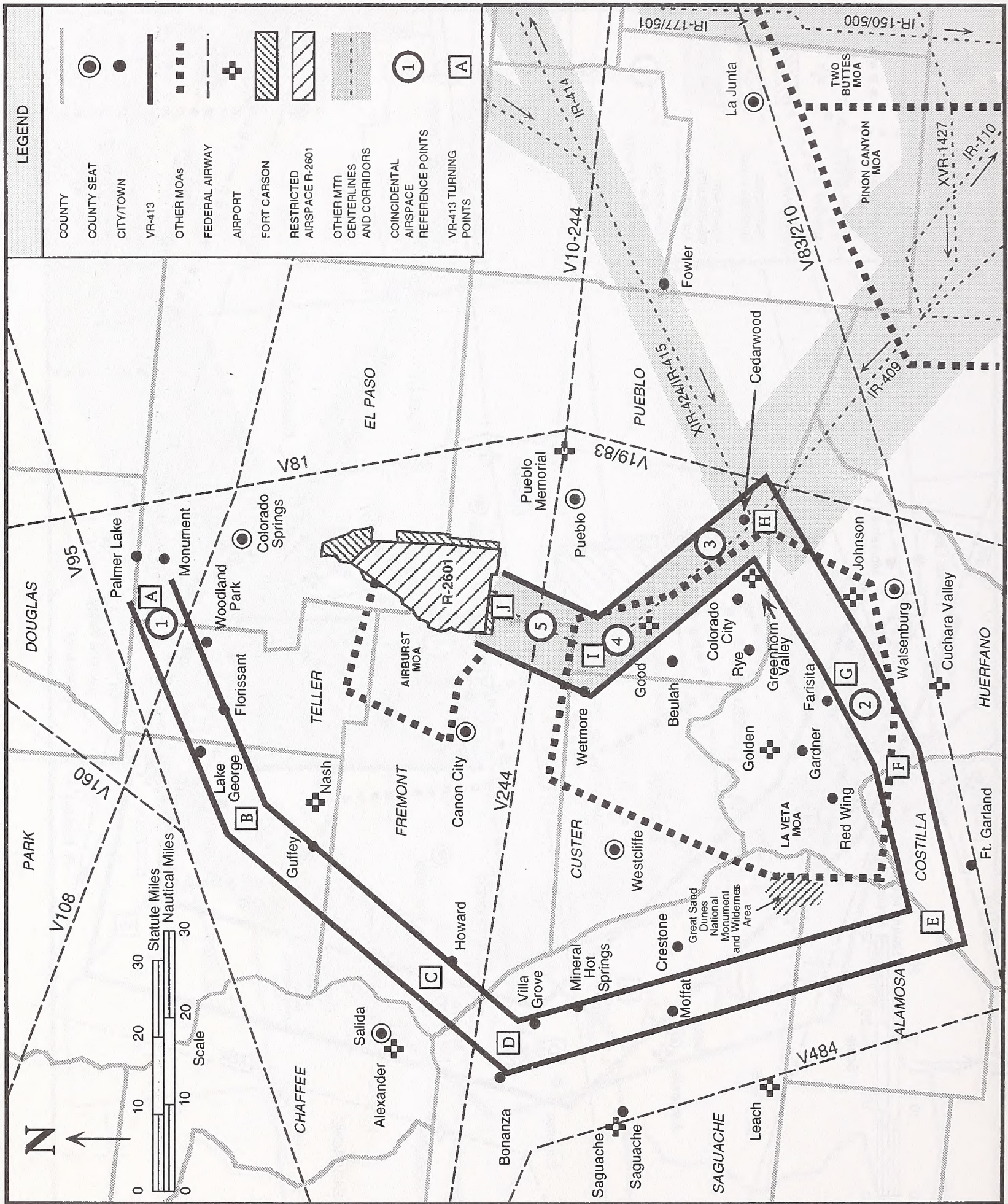


Figure N-18. Coincidental Airspace Reference Points for VR-413--Preferred Alternative

**N.3.3.8 VR-412**

Figures N-19 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing VR-412. Table N-11 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-11. Coincidental Airspace and Cumulative Sortie Totals for VR-412**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	VR-412	10	N/A	N/A
1	VR-413	110	N/A	N/A
2	La Veta MOA	1,150	N/A	N/A
3	VR-413 La Veta MOA	1,250	N/A	N/A
4	VR-413 La Veta MOA IR-409 Segment G/H	3,067	N/A	N/A
5	IR-409 Segment G/H IR-415	1,867	N/A	N/A
6	IR-414 IR-415	66	N/A	N/A
7	IR-415	50	N/A	N/A
8	IR-415 Cheyenne (Kit Carson) MOA	1,374	N/A	N/A
9	IR-500 IR-501	90	N/A	N/A

NOTES: N/A = Not Applicable (no sorties proposed)

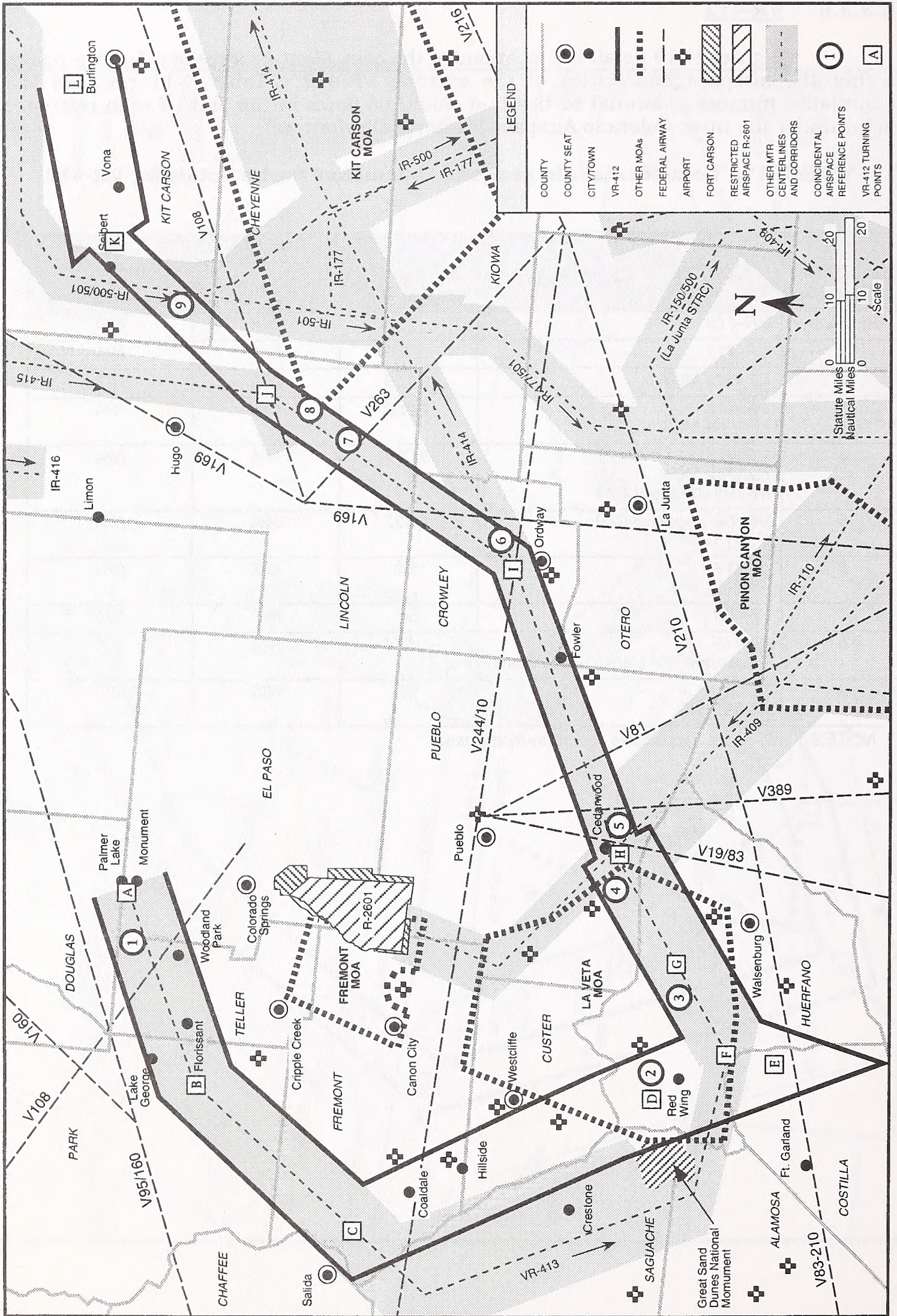


Figure N-19. Coincidental Airspace Reference Points for VR-412--Existing Conditions

**N.3.3.9 IR-414**

Figures N-20 and N-21 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing IR-414, and the Original Proposal and Preferred Alternative IR-414, respectively. Table N-12 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-12. Coincidental Airspace and Cumulative Sortie Totals for IR-414**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	IR-414 MTR <sup>1</sup>	16	32	62
1	XIR-424 <sup>1, 2</sup> Cheyenne MOA <sup>1</sup> XVR-1427 Segment A/B <sup>1</sup>	1,340	2,075	1,940
2	XIR-424 <sup>1, 2</sup> Cheyenne MOA <sup>1</sup>	1,340	2,075	1,909
3	XIR-424 <sup>1, 2</sup> Cheyenne MOA <sup>1</sup> IR-177 IR-500	1,801	2,536	2,370
4	XIR-424 <sup>1, 2</sup> Cheyenne MOA <sup>1</sup> IR-177 IR-501	1,877	2,612	2,446
5	IR-415 VR-412 <sup>3</sup> XIR-424 <sup>2</sup>	66	390	361

- NOTES:
1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
  2. Original Proposal and Preferred Alternative only.
  3. No-Action only.

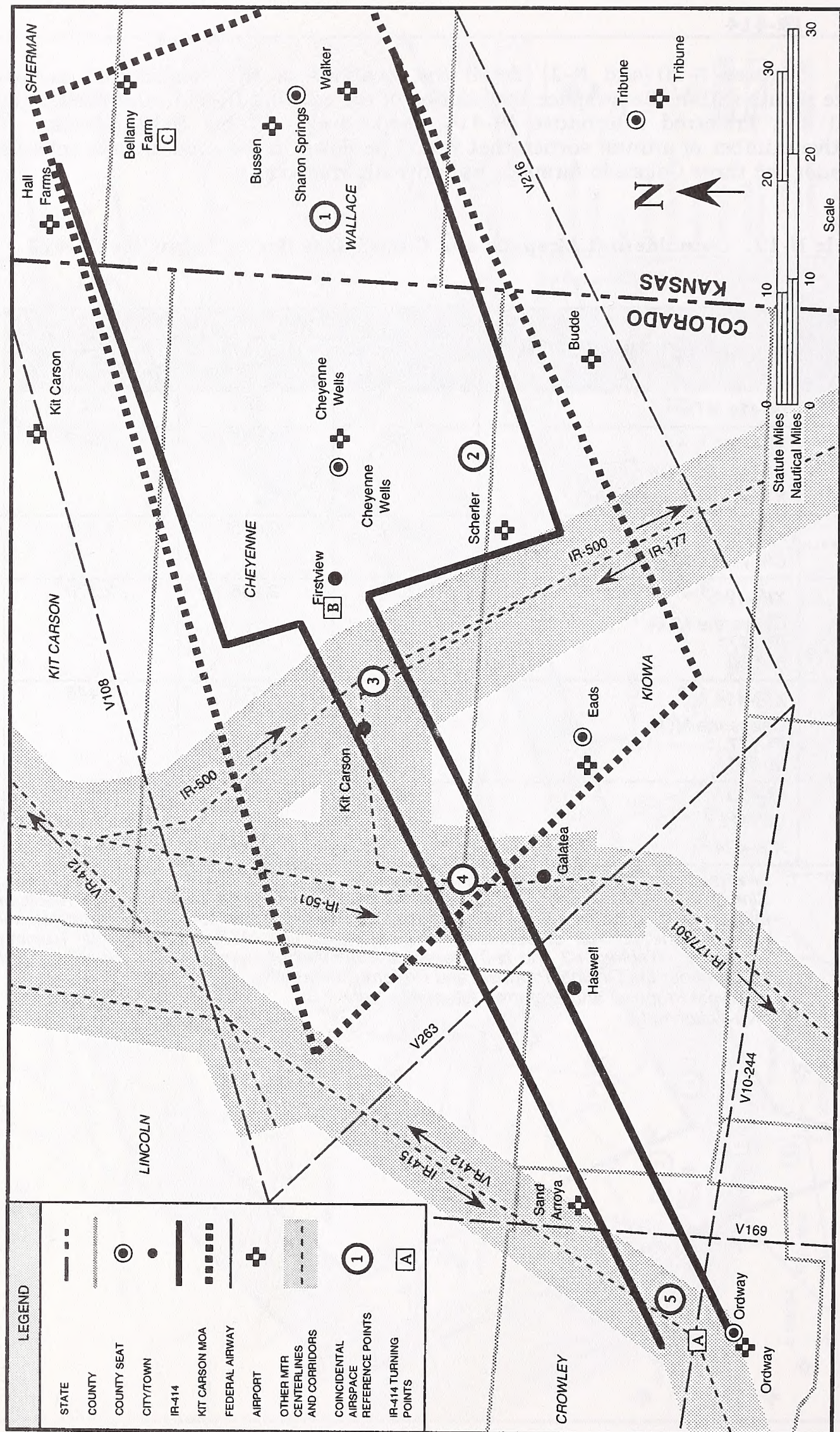


Figure N-20. Coincidental Airspace Reference Points for IR-414--Existing Conditions



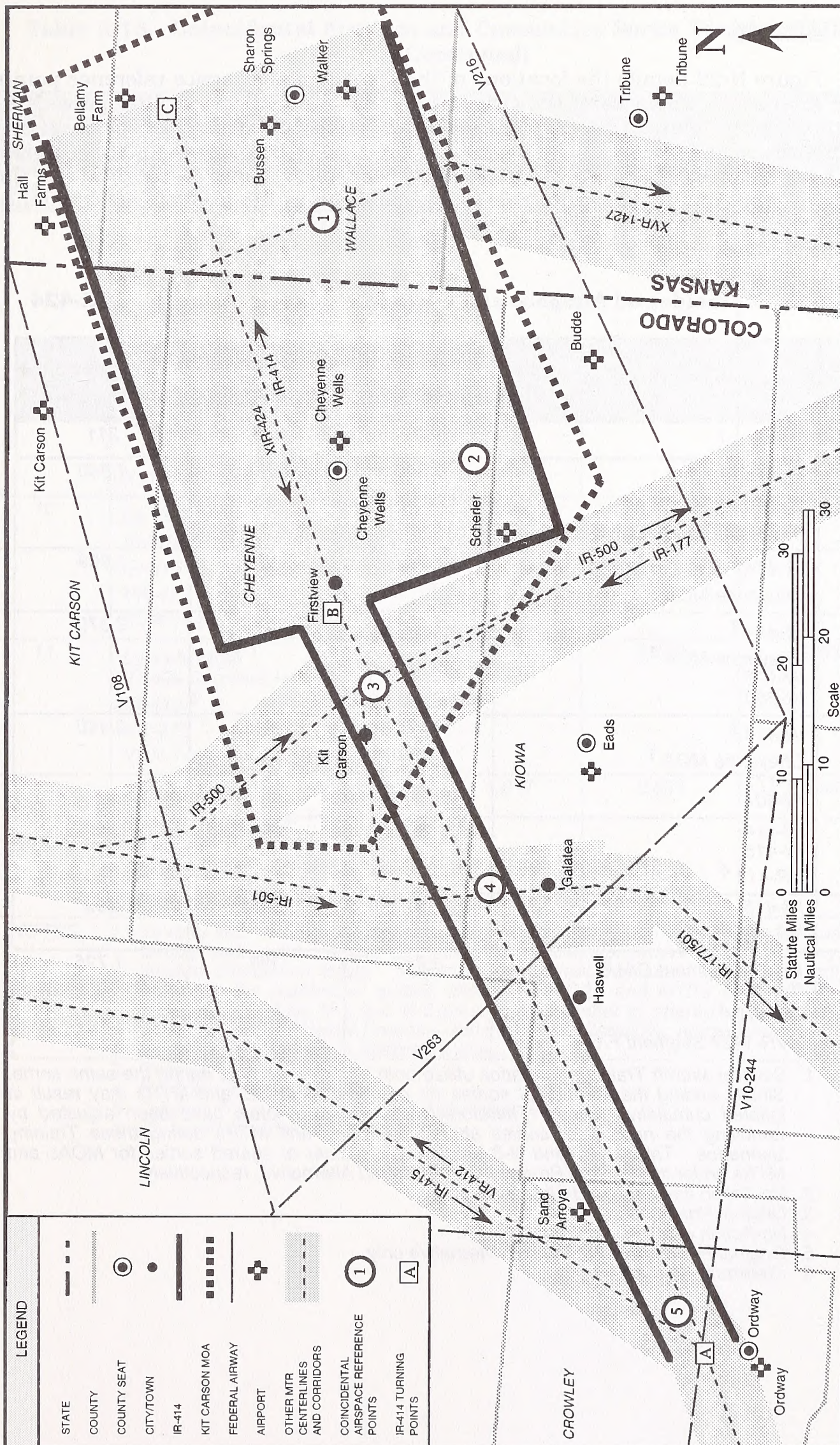


Figure N-21. Coincidental Airspace Reference Points for IR-414--Original Proposal and Preferred Alternative

**N.3.3.10 XIR-424**

Figure N-22 details the locations of the coincidental airspace reference points within the airspace boundaries of the Original Proposal and Preferred Alternative XIR-424 under existing conditions. Figures N-23 and N-24 detail the locations of the coincidental airspace reference points within the airspace boundaries of the Original Proposal and Preferred Alternative XIR-424, respectively. Table N-13 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-13. Coincidental Airspace and Cumulative Sortie Totals for XIR-424**

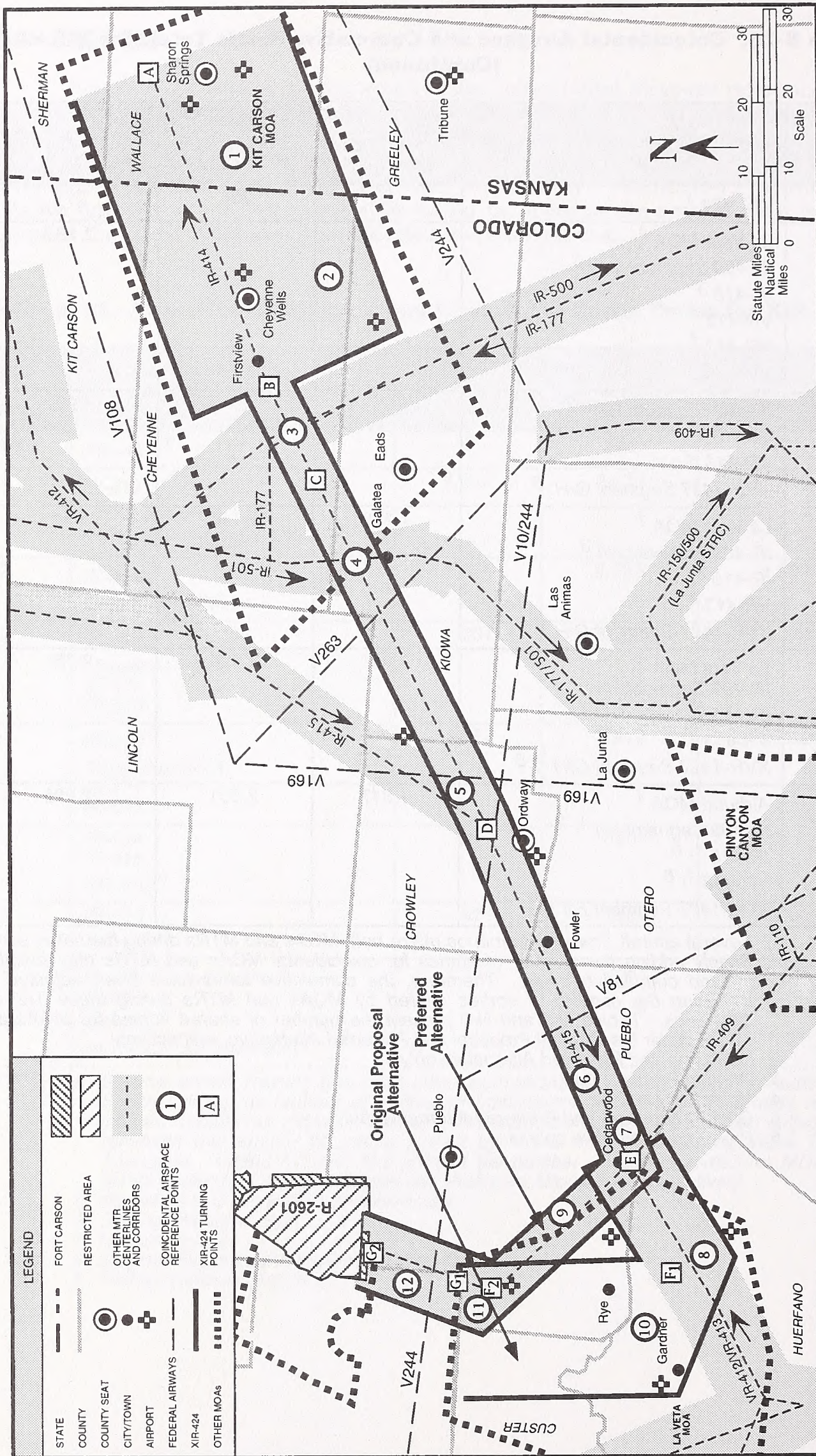
Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	XIR-424 <sup>1</sup>	0	266	211
1	IR-414 <sup>1</sup> Cheyenne MOA <sup>1</sup> XVR-1427 Segment AVB <sup>1</sup>	1,340	2,075	1,940
2	IR-414 <sup>1</sup> Cheyenne MOA <sup>1</sup>	1,340	2,075	1,909
3	IR-414 <sup>1</sup> Cheyenne MOA <sup>1</sup> IR-177 IR-500	1,801	2,536	2,370
4	IR-414 <sup>1</sup> Cheyenne MOA <sup>1</sup> IR-177 IR-501	1,877	2,612	2,446
5	IR-414 IR-415 VR-412 <sup>4</sup>	66	390	361
6	IR-415 VR-412 <sup>4</sup>	50	358	299
7	IR-409 Segment G/H <sup>2</sup> IR-415 VR-412 <sup>4</sup> XVR-1427 Segment F/G <sup>6</sup>	1,867	358	1,725

- NOTES:
1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
  2. No-Action and Preferred Alternative only.
  3. Original Proposal only.
  4. No-Action only.
  5. Original Proposal and Preferred Alternative only.
  6. Preferred Alternative only.

**Table N-13. Coincidental Airspace and Cumulative Sortie Totals for XIR-424  
(Continued)**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	XIR-424 <sup>1</sup>	0	266	211
8	La Veta MOA <sup>1</sup> IR-409 Segment G/H <sup>3</sup> IR-415 <sup>3</sup> VR-412 <sup>4</sup> VR-413 <sup>1</sup> XVR-1427 Segment G/H <sup>1, 3</sup>	1,250	3,120	1,130
9	IR-409 Segment G/H <sup>2</sup> IR-415 <sup>6</sup> VR-413 <sup>6</sup> XVR-1427 Segment G/H <sup>6</sup>	1,817	0	1,901
10	La Veta MOA <sup>1</sup> IR-409 Segment H/I <sup>3</sup> IR-415 <sup>3</sup> VR-413 <sup>1, 3</sup> XVR-1427 Segment G/H <sup>1, 3</sup>	1,140	3,120	954
11	La Veta MOA <sup>1</sup> IR-409 Segment H/I IR-415 <sup>5</sup> VR-413 <sup>1</sup> XVR-1427 Segment G/H <sup>1, 5</sup>	2,957	3,120	2,855
12	Airburst MOA <sup>1</sup> IR-409 Segment H/I <sup>1, 2</sup> IR-415 <sup>1, 6</sup> VR-413 <sup>1, 6</sup> XVR-1427 Segment H/I <sup>1, 6</sup>	1,817	2,531	2,995

- NOTES: 1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
2. No-Action and Preferred Alternative only.
3. Original Proposal only.
4. No-Action only.
5. Original Proposal and Preferred Alternative only.
6. Preferred Alternative only.



Notes: F1 and G1 - Proposed Action Alternative  
 F2 and G2 - Preferred Alternative

**Figure N-22. Coincidental Airspace Reference Points for XIR-424--Existing Conditions**

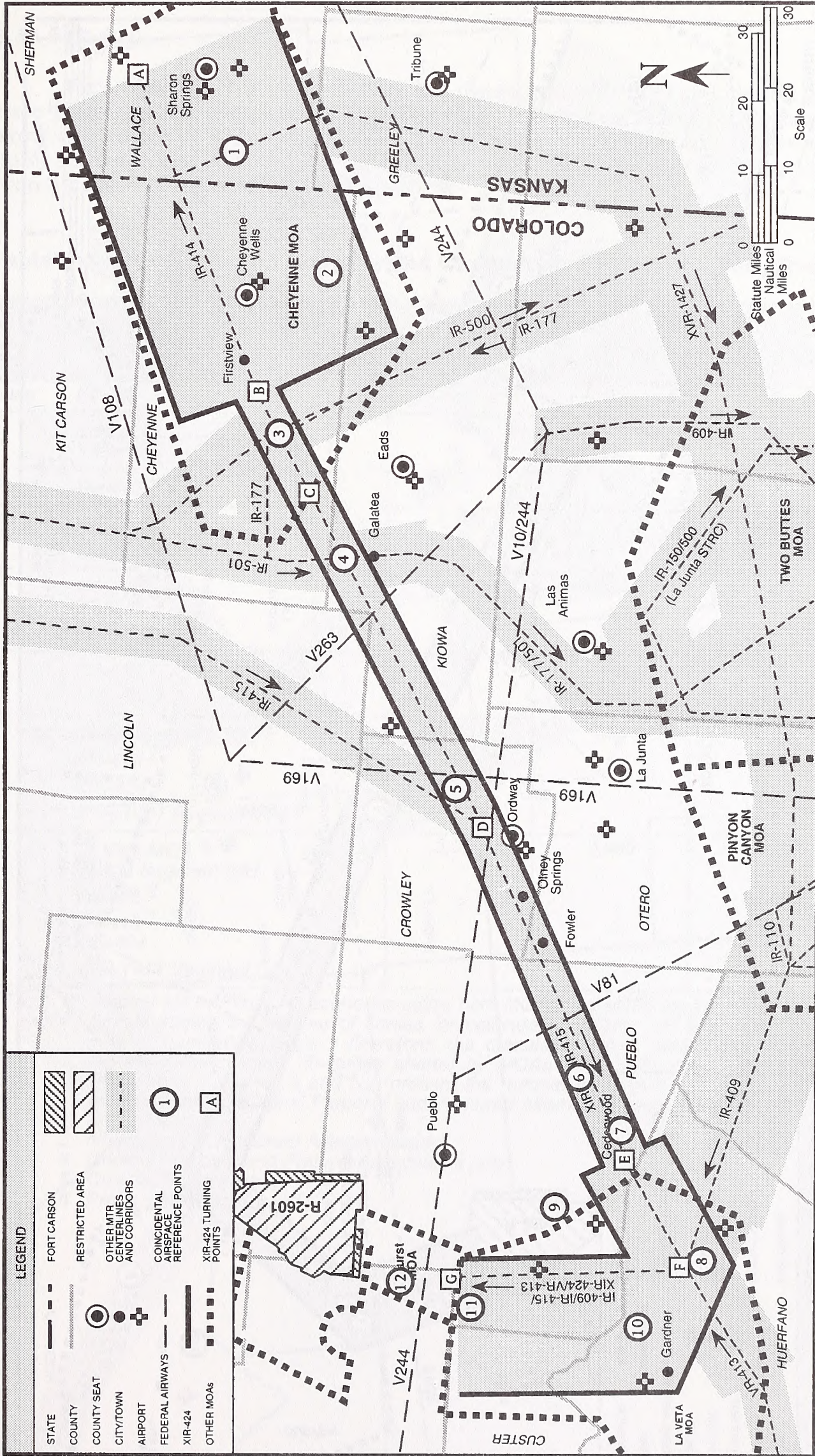


Figure N-23. Coincidental Airspace Reference Points for XIR-424--Original Proposal

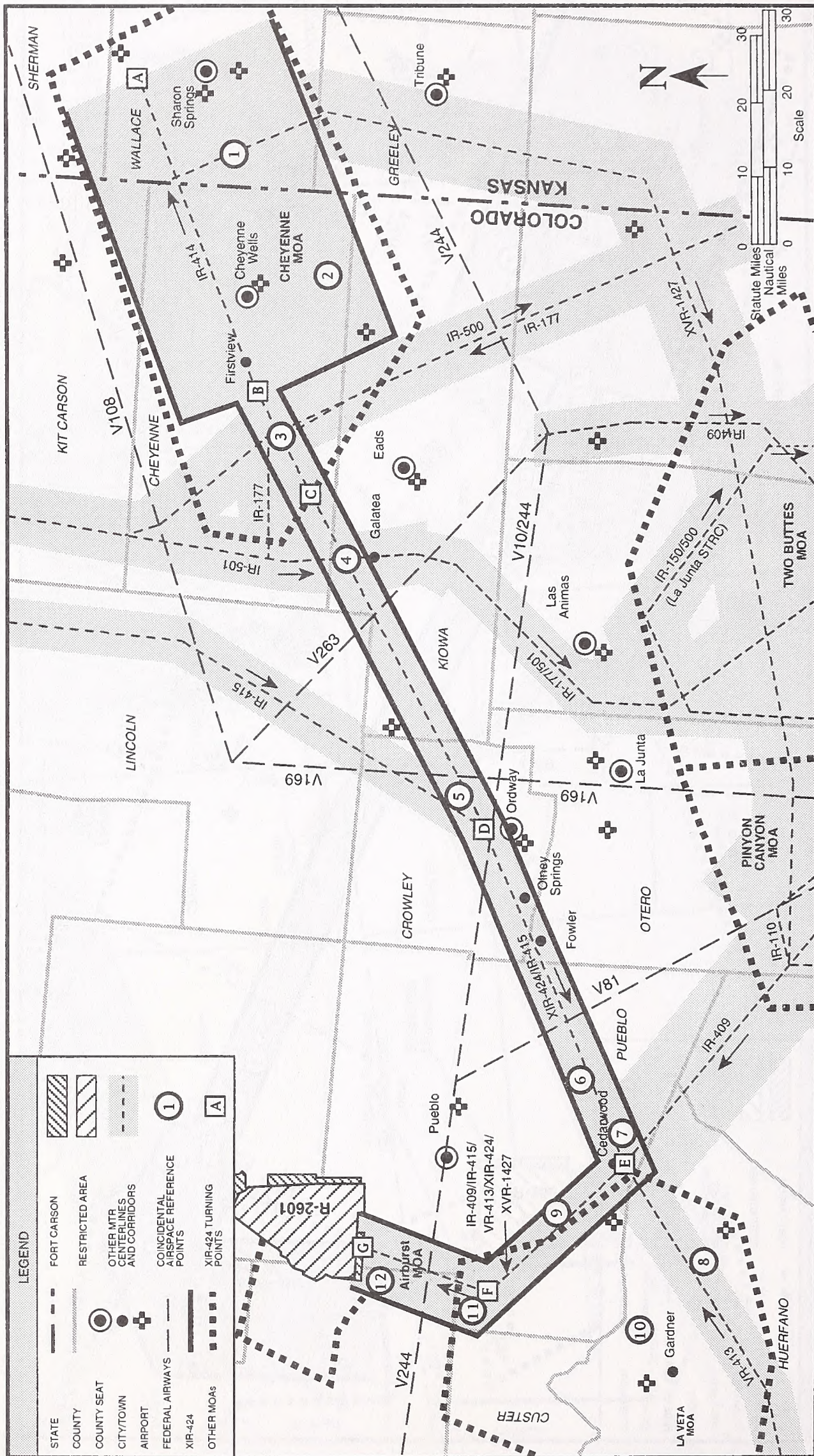


Figure N-24. Coincidental Airspace Reference Points for XIR-424--Preferred Alternative

**N.3.3.11 IR-415**

Figures N-25, N-26, and N-27 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing, Original Proposal, and Preferred Alternative IR-415, respectively. Table N-14 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-14. Coincidental Airspace and Cumulative Sortie Totals for IR-415**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	IR-415	40	92	88
1	IR-416 <sup>2</sup> XIR-426	70	138	150
2	VR-412 <sup>2</sup>	50	92	88
3	VR-412 <sup>2</sup> Cheyenne MOA <sup>2</sup>	1,374	92	88
4	VR-412 <sup>2</sup> IR-414 XIR-424 <sup>4</sup>	66	390	361
5	VR-412 <sup>2</sup> XIR-424 <sup>4</sup>	50	358	299
6	IR-409 Segment F/G <sup>3</sup> VR-412 <sup>2</sup> XIR-424 <sup>4</sup> XVR-1427 Segment F/G <sup>6</sup>	1,867	358	1,725
7	La Veta MOA <sup>1</sup> IR-409 Segment G/H VR-412 <sup>2</sup> VR-413 <sup>1, 3</sup> XIR-424 XVR-1427 Segment G/H <sup>1, 4</sup>	3,067	2,980	2,556

- NOTES:
1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
  2. No-Action only.
  3. No-Action and Preferred Alternative only.
  4. Original Proposal and Preferred Alternative only.
  5. Original Proposal only.
  6. Preferred Alternative only.

**Table N-14. Coincidental Airspace and Cumulative Sortie Totals for IR-415  
(Continued)**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	IR-415	40	92	88
8	La Veta MOA <sup>1</sup> IR-409 Segment H/I <sup>5</sup> VR-412 <sup>2</sup> VR-413 <sup>1</sup> XIR-424 <sup>5</sup> XVR-1427 Segment H/I <sup>1, 5</sup>	1,250	3,120	1,130
9	La Veta MOA <sup>1</sup> IR-409 Segment H/I <sup>1, 5</sup> VR-413 <sup>1, 4</sup> XIR-424 <sup>5</sup> XVR-1427 Segment H/I <sup>1, 5</sup>	1,140	3,120	954
10	IR-409 Segment H/I <sup>3</sup> VR-413 <sup>6</sup> XIR-424 <sup>6</sup> XVR-1427 Segment H/I <sup>6</sup>	1,817	0	1,901
11	Airburst MOA <sup>1, 4</sup> IR-409 Segment H/I <sup>1, 3</sup> VR-413 <sup>1, 3</sup> XIR-424 <sup>1, 3</sup> XVR-1427 Segment H/I <sup>1, 3</sup>	1,817	2,531	2,995

- NOTES: 1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
2. No-Action only.
3. No-Action and Preferred Alternative only.
4. Original Proposal and Preferred Alternative only.
5. Original Proposal only.
6. Preferred Alternative only.



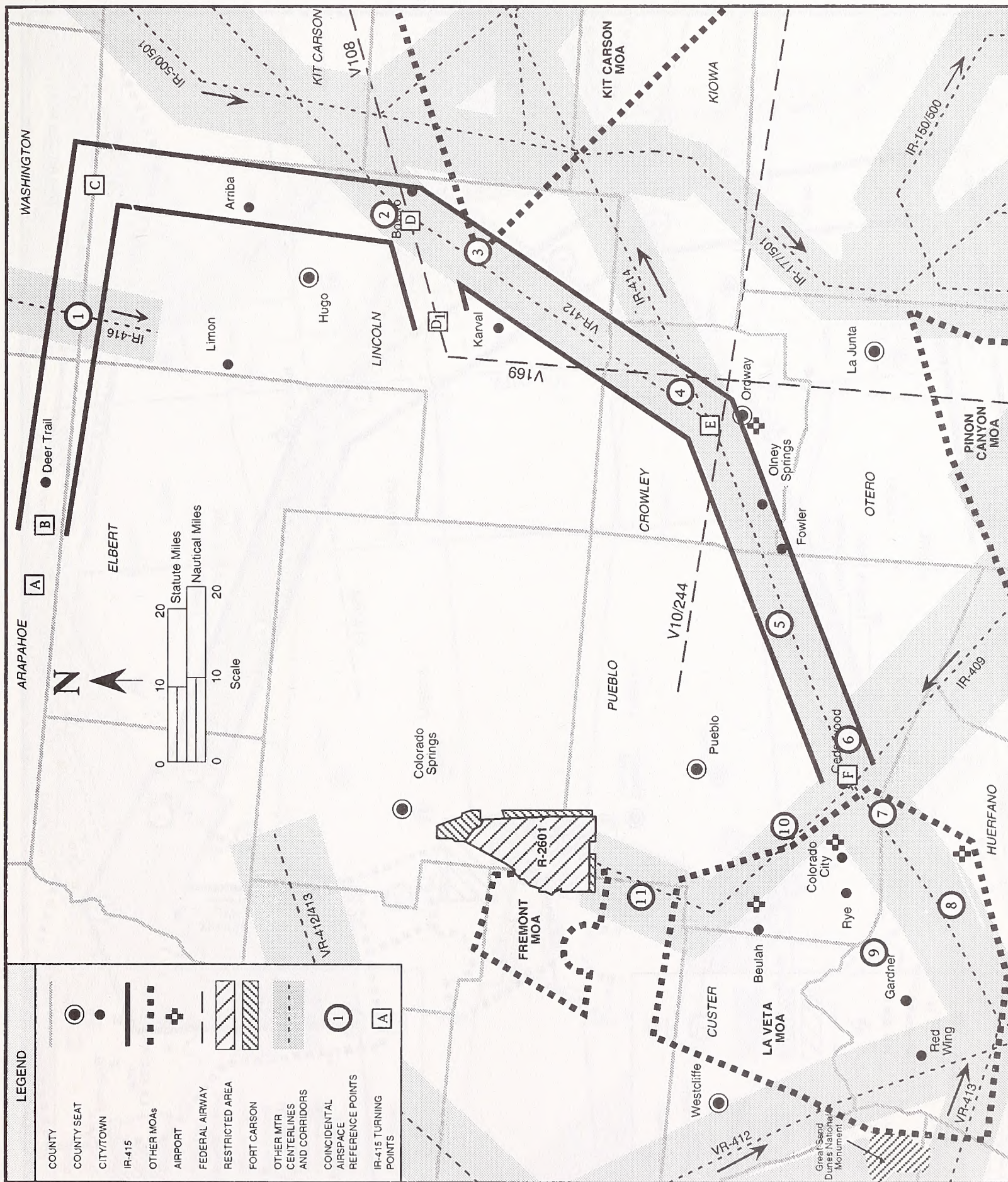


Figure N-25. Coincidental Airspace Reference Points for IR-415--Existing Conditions

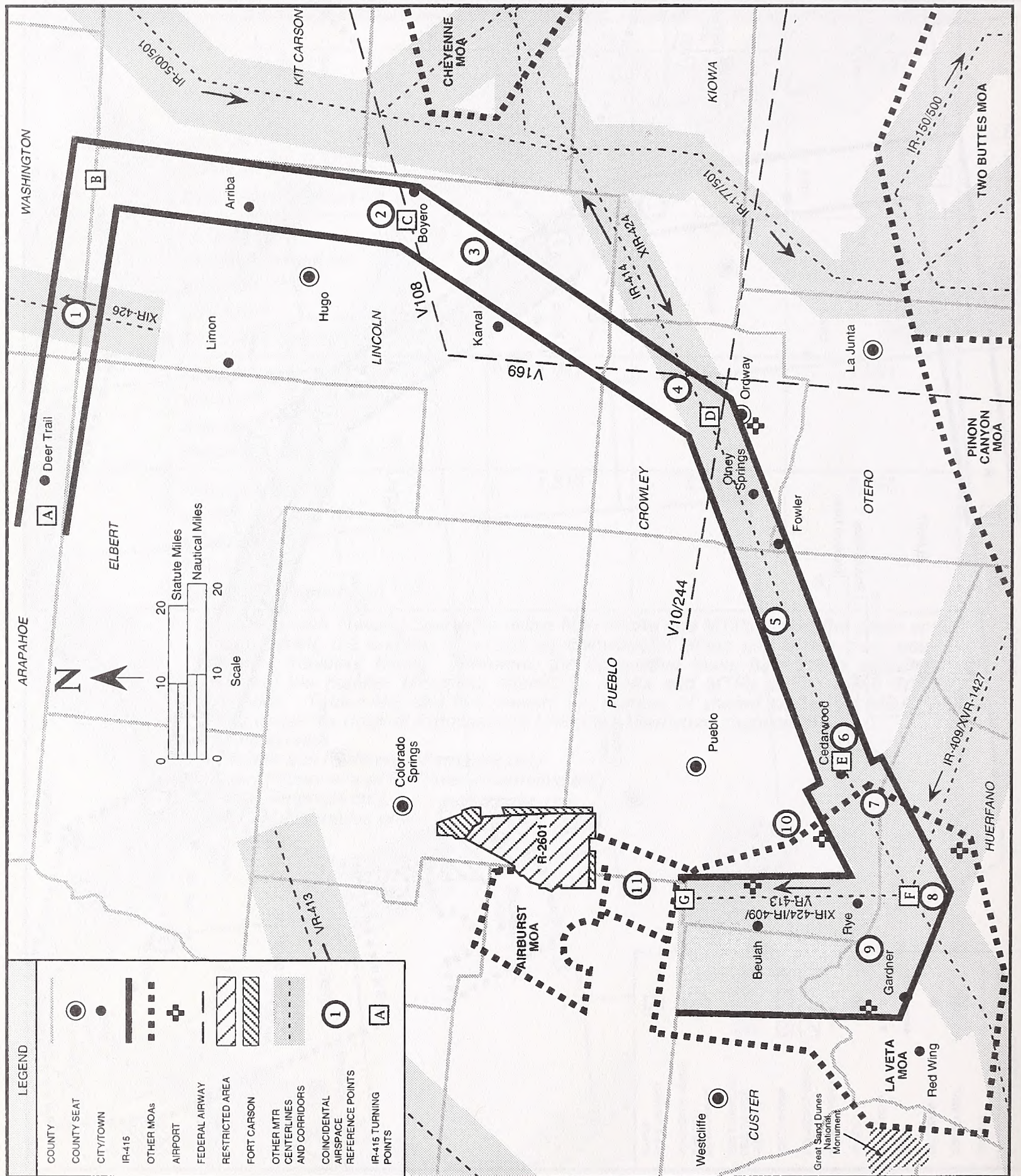


Figure N-26. Coincidental Airspace Reference Points for IR-415--Original Proposal

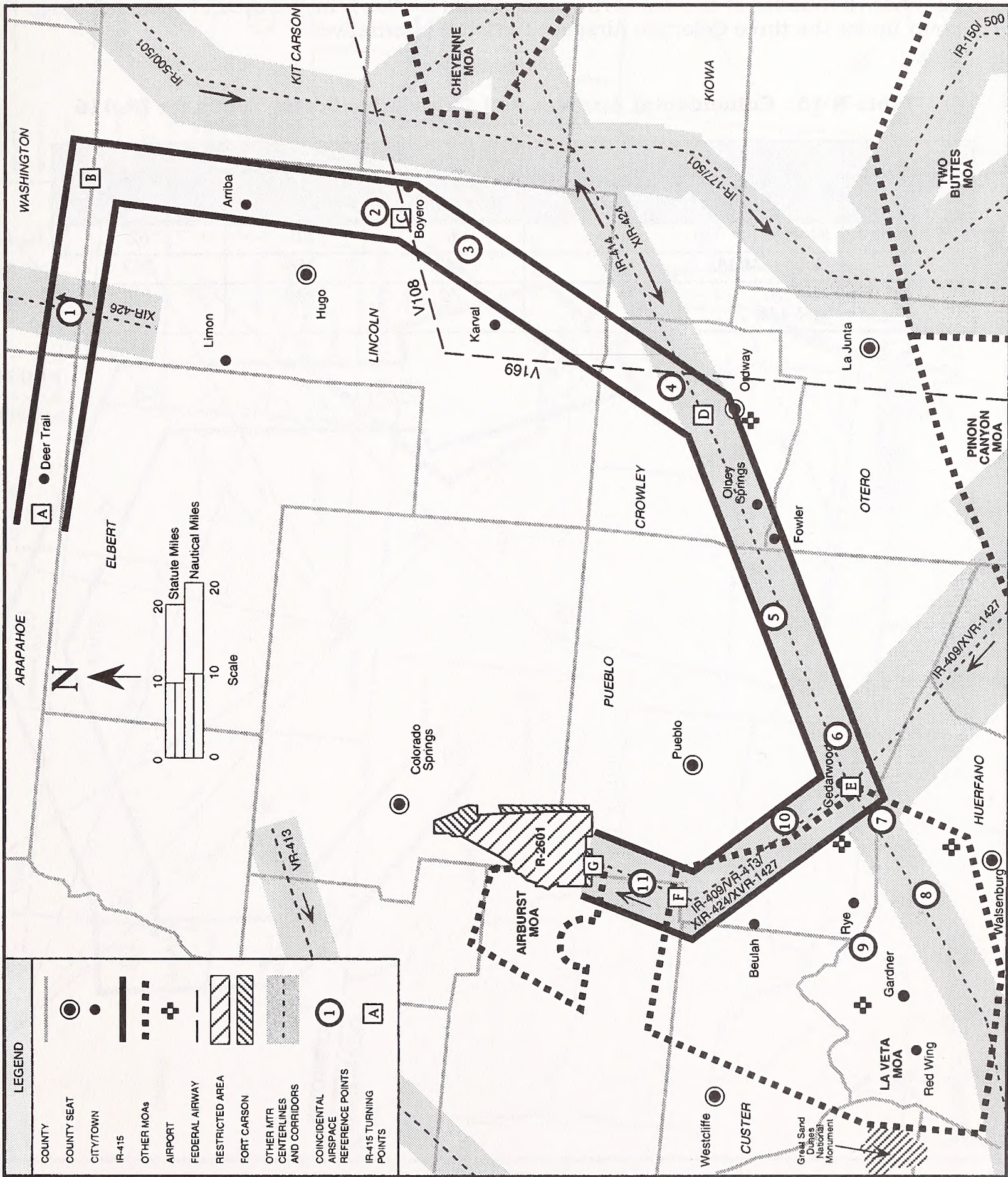


Figure N-27. Coincidental Airspace Reference Points for IR-415--Preferred Alternative

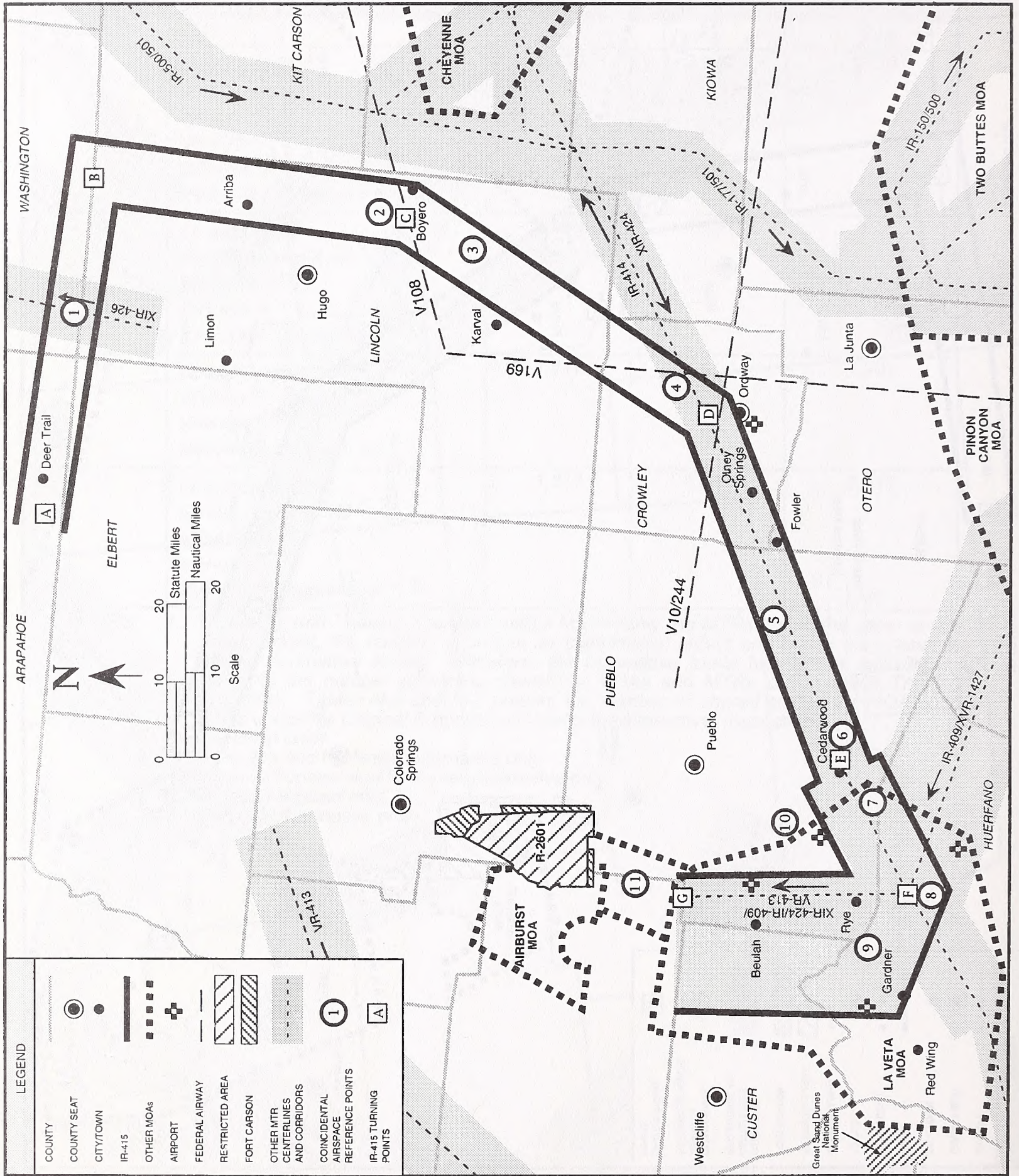


Figure N-26. Coincidental Airspace Reference Points for IR-415--Original Proposal

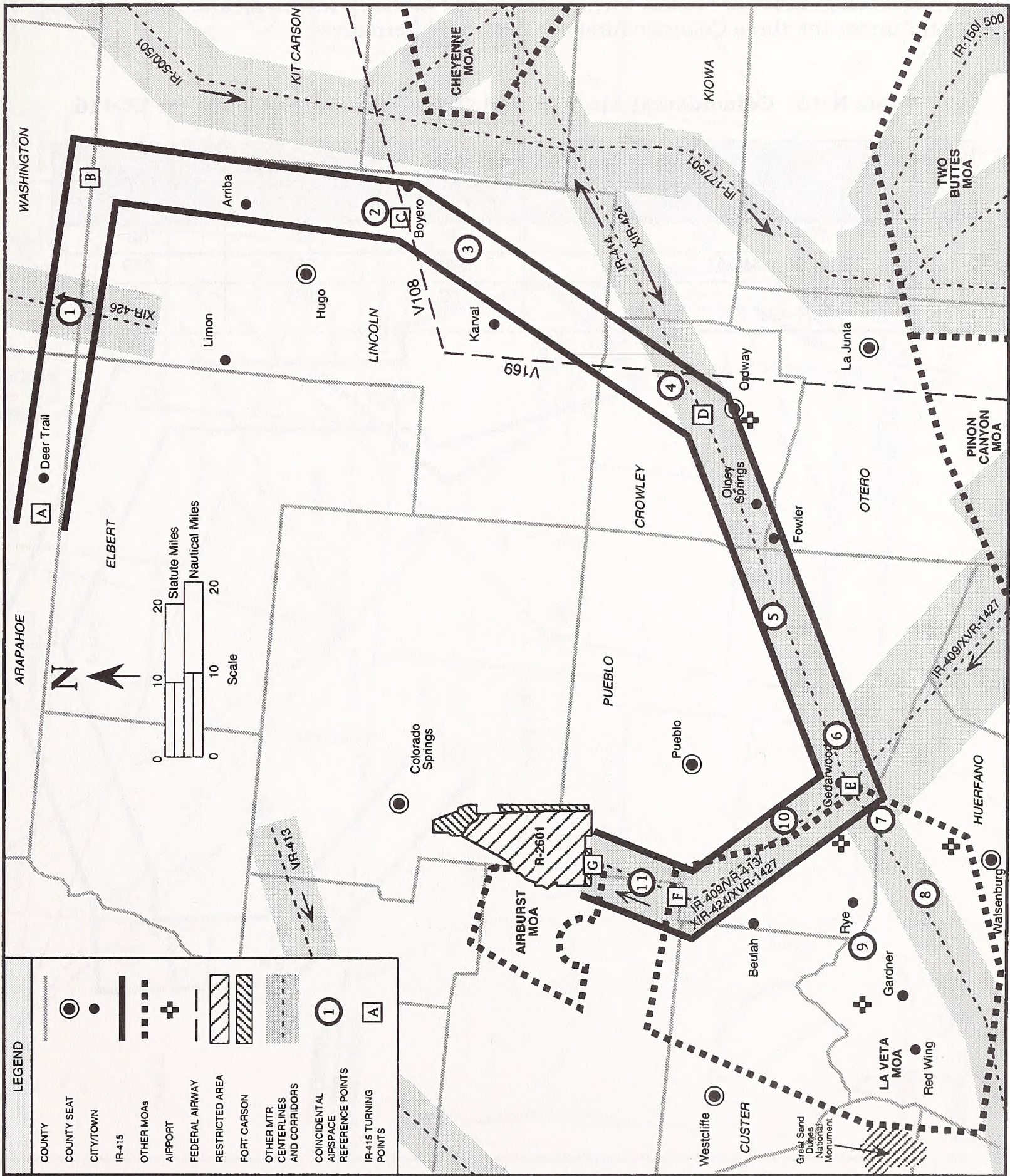


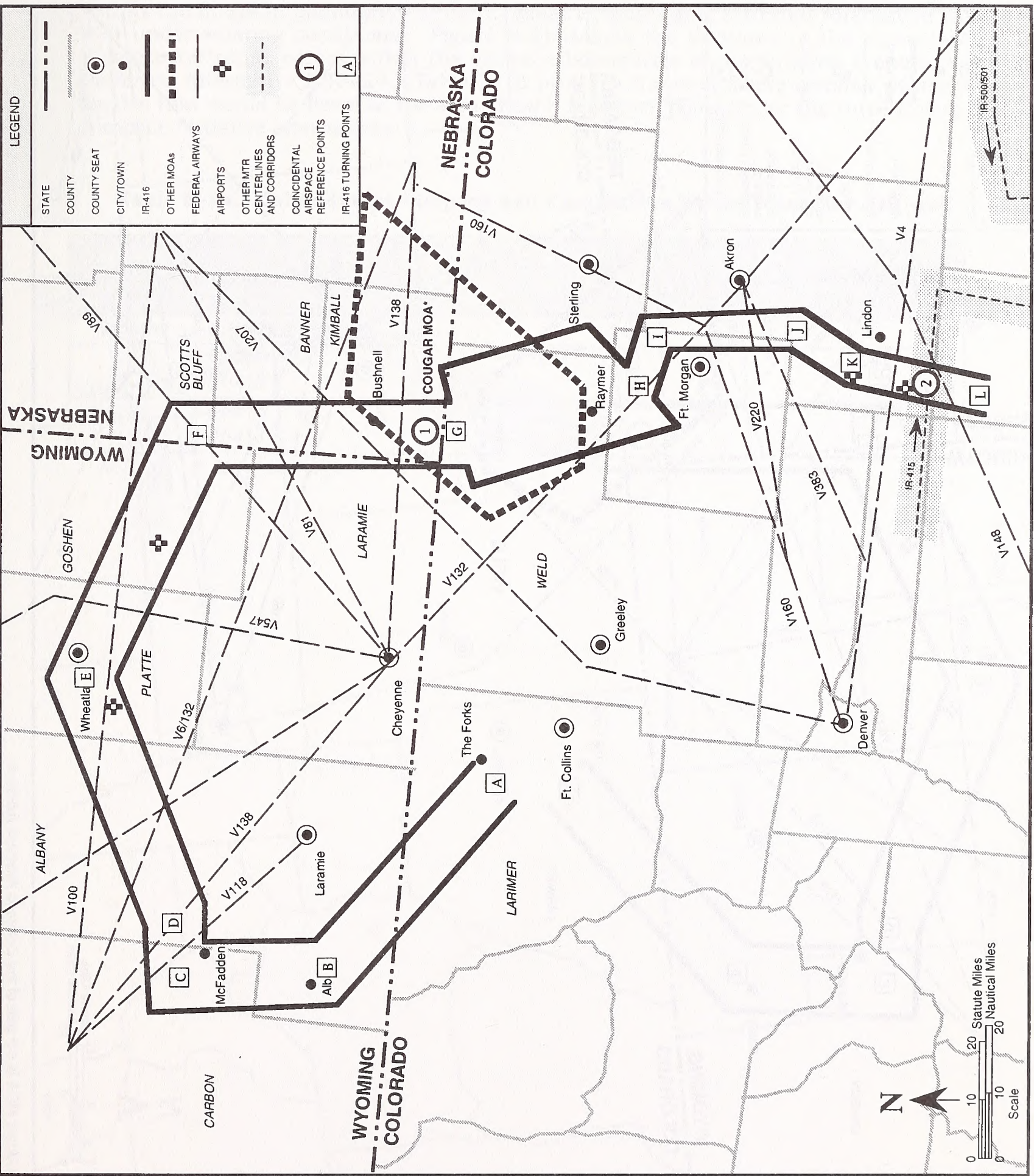
Figure N-27. Coincidental Airspace Reference Points for IR-415--Preferred Alternative

**N.3.3.12 IR-416**

Figure N-28 and N-29 detail the locations of the coincidental airspace reference points within the airspace boundaries of the existing IR-416, and the Original Proposal and Preferred Alternative IR-416, respectively. Table N-15 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

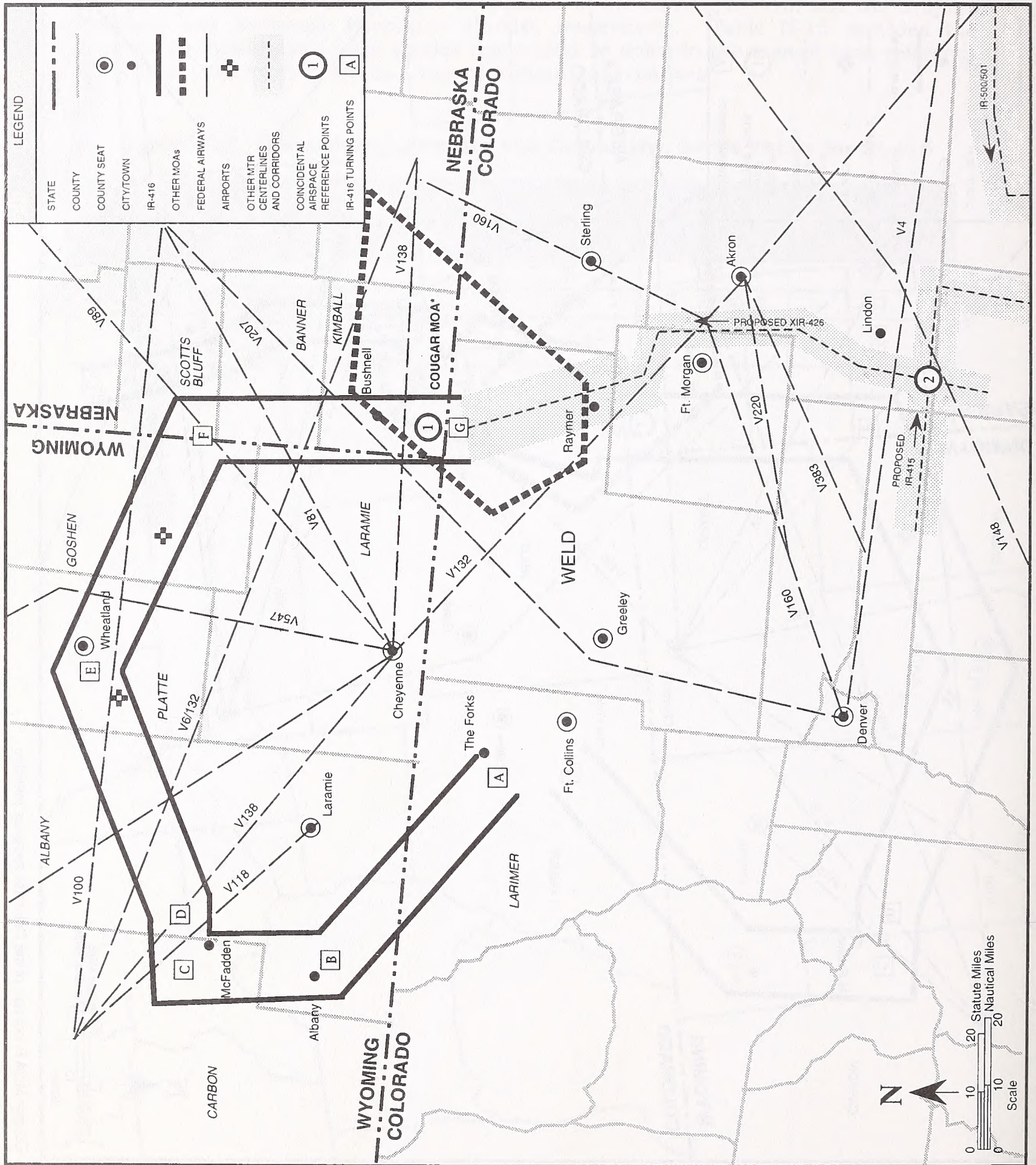
**Table N-15. Coincidental Airspace and Cumulative Sortie Totals for IR-416**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	IR-416	30	46	62
1	Cougar MOA	282	256	283
2	IR-415 XIR-426	70	138	150



\* Cougar MOA is not part of the Colorado Airspace Initiative

**Figure N-28. Coincidental Airspace Reference Points for IR-416--Existing Conditions**



\*Cougar MOA is not part of the Colorado Airspace Initiative

Figure N-29. Coincidental Airspace Reference Points for IR-416--Original Proposal and Preferred Alternative



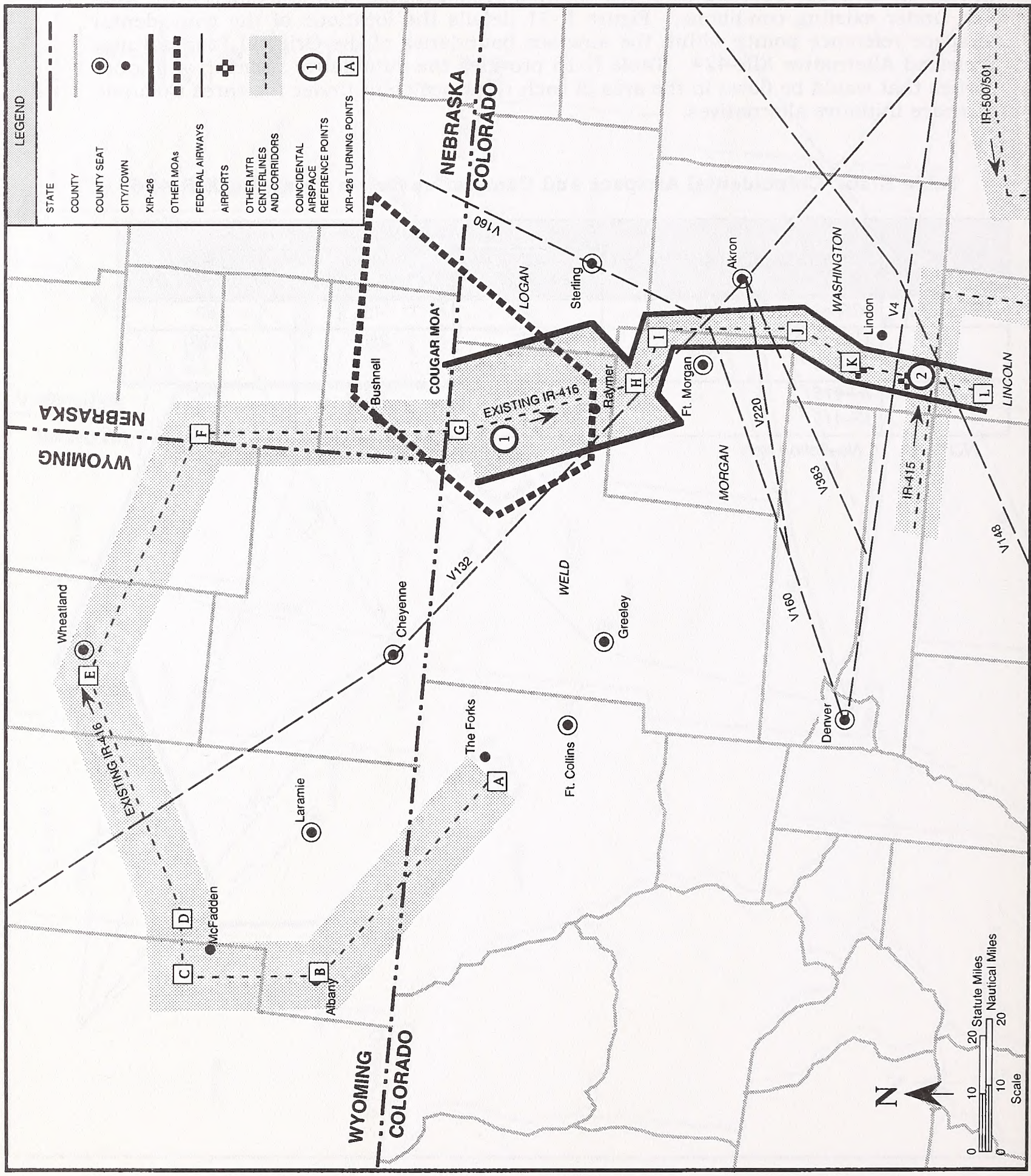
**N.3.3.13 XIR-426**

Figure N-30 details the locations of the coincidental airspace reference points within the airspace boundaries of the Original Proposal and Preferred Alternative XIR-426 under existing conditions. Figure N-31 details the locations of the coincidental airspace reference points within the airspace boundaries of the Original Proposal and Preferred Alternative XIR-424. Table N-16 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-16. Coincidental Airspace and Cumulative Sortie Totals for XIR-426**

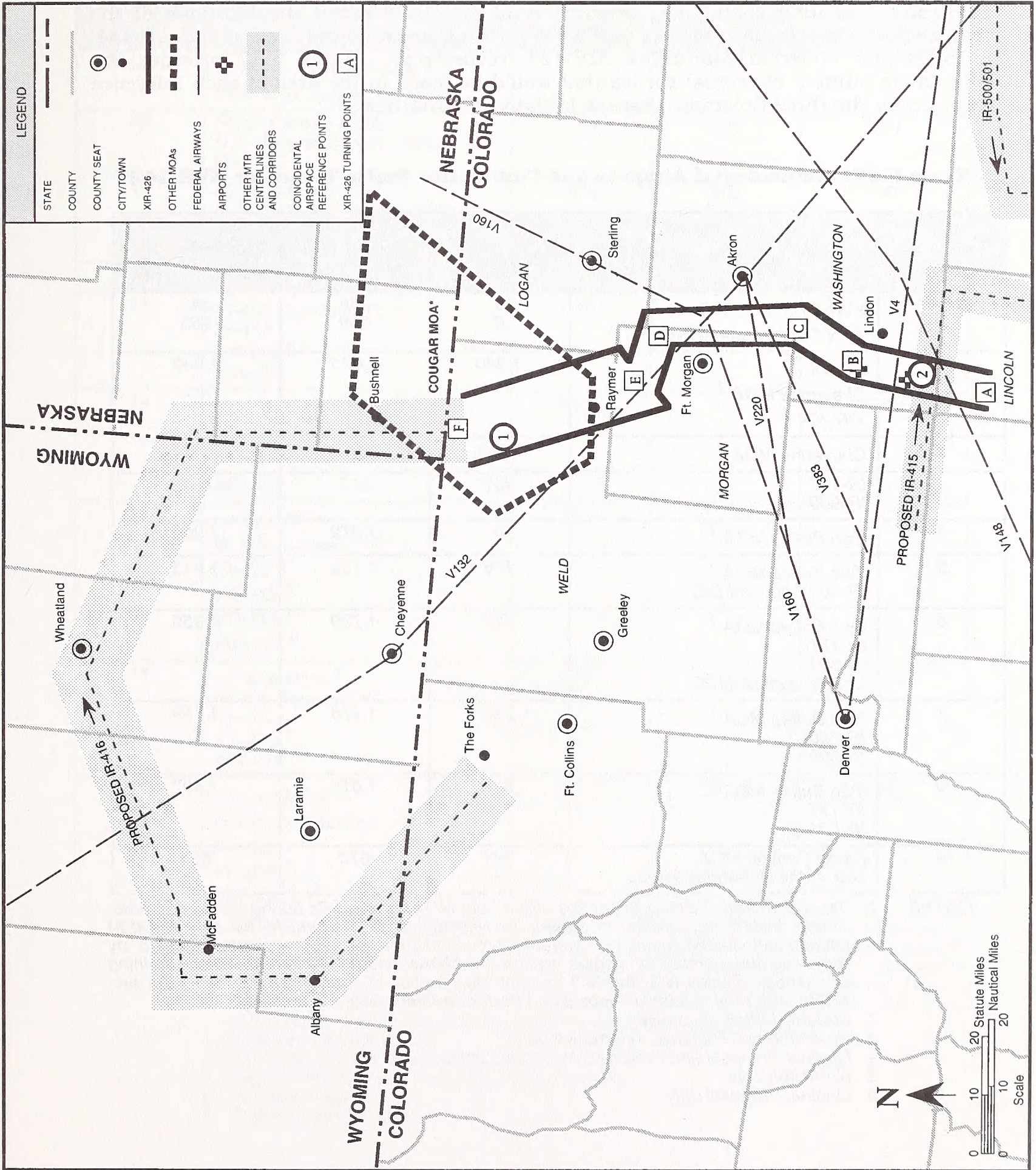
Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	XIR-426	0	46	62
1	Cougar MOA IR-416 <sup>1</sup>	282	256	283
2	IR-415 IR-416 <sup>1</sup>	70	138	150

NOTES: 1. No-Action only.



\*Cougar MOA is not part of the Colorado Airspace Initiative

**Figure N-30. Coincidental Airspace Reference Points for XIR-426--Existing Conditions**



\*Cougar MOA is not part of the Colorado Airspace Initiative

Figure N-31. Coincidental Airspace Reference Points for XIR-426--Original Proposal and Preferred Alternative

**N.3.3.14 XVR-1427**

Figure N-32 details the locations of the coincidental airspace reference points within the airspace boundaries of the Original Proposal and Preferred Alternative XVR-1427 under existing conditions. Figures N-33 and N-34 detail the locations of the coincidental airspace reference points within the airspace boundaries of the Original Proposal and Preferred Alternative XIR-424, respectively. Table N-17 provides the cumulative number of annual sorties that would be flown in the area of each reference point under the three Colorado Airspace Initiative alternatives.

**Table N-17. Coincidental Airspace and Cumulative Sortie Totals for XVR-1427**

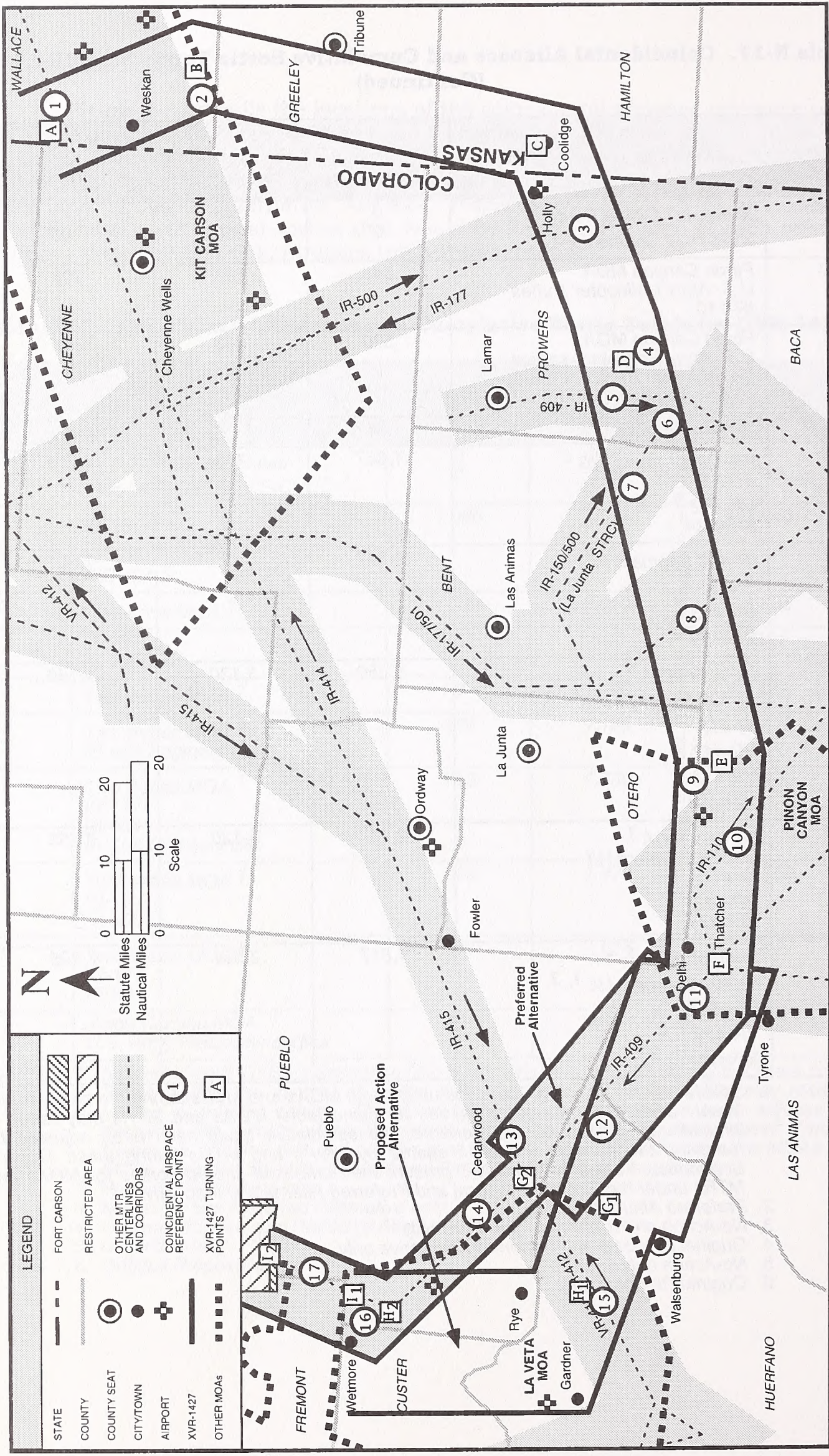
Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	XVR-1427 Whole Route <sup>1</sup>	0	346	343
	XVR-1427 Segment F-G <sup>1</sup>	0	250	185
1	IR-414 <sup>1</sup> Cheyenne MOA <sup>1</sup> XIR-424 <sup>1</sup>	1,340	2,075	1,940
2	Cheyenne MOA <sup>1</sup>	1,324	2,019	1,835
3	IR-177 IR-500	461	807	804
4	Two Buttes MOA <sup>1</sup>	0	1,079	1,360
5	Two Buttes MOA <sup>1</sup> IR-409 Segment B/C	176	1,193	1,413
6	Two Buttes MOA <sup>1</sup> IR-177 IR-501 IR-409 Segment B/C	713	1,730	1,950
7	Two Buttes MOA <sup>1</sup> IR-150 IR-500	399	1,478	1,759
8	Two Buttes MOA <sup>1</sup> IR-177 IR-501	537	1,616	1,897
9	Pinon Canyon MOA U.S. Army Helicopter sorties	321	670	685

- NOTES:
1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
  2. Preferred Alternative only.
  3. No-Action and Preferred Alternative only.
  4. Original Proposal and Preferred Alternative only.
  5. No-Action only.
  6. Original Proposal only.

**Table N-17. Coincidental Airspace and Cumulative Sortie Totals for XVR-1427  
(Continued)**

Reference Point	COINCIDENTAL AIRSPACE	CUMULATIVE SORTIE TOTALS		
		NO-ACTION (EXISTING)	ORIGINAL PROPOSAL	PREFERRED ALTERNATIVE
Baseline	XVR-1427 Whole Route <sup>1</sup> XVR-1427 Segment F-G <sup>1</sup>	0 0	346 250	343 185
10	Pinon Canyon MOA U.S. Army Helicopter sorties IR-110	344	693	708
11	Pinon Canyon MOA U.S. Army Helicopter sorties IR-110 IR-409 Segment E/F	520	803	761
12	IR-409 Segment F/G	1,817	1,772	1,426
13	IR-409 Segment F/G <sup>3</sup> IR-415 VR-412 <sup>5</sup> XIR-424	1,867	358	1,725
14	IR-409 Segment F/G <sup>3</sup> IR-415 <sup>2</sup> VR-413 <sup>2</sup> XIR-424 <sup>2</sup>	1,817	0	1,901
15	La Veta MOA <sup>1</sup> IR-409 Segment H/I <sup>6</sup> IR-415 <sup>6</sup> VR-412 <sup>5</sup> VR-413 <sup>1</sup> XIR-424 <sup>6</sup>	1,250	3,120	1,130
16	La Veta MOA <sup>1</sup> IR-409 Segment H/I IR-415 VR-413 <sup>1</sup> XIR-424	2,957	3,120	2,855
17	Airburst MOA <sup>1, 4</sup> IR-409 Segment H/I <sup>1, 3</sup> IR-415 <sup>1, 2</sup> VR-413 <sup>1, 2</sup> XIR-424 <sup>1, 2</sup>	1,817	2,531	2,995

- NOTES:
1. Several aircraft Training Scenarios utilize both MOAs and MTRs during the same sortie. Simply adding the number of sorties for coincidental MOAs and MTRs may result in inflated cumulative totals. Therefore, the cumulative totals have been adjusted by removing the number of sorties shared by MOAs and MTRs during these Training Scenarios. Tables N-2 and N-3 present the number of shared sorties for MOAs and MTRs under the Original Proposal and Preferred Alternative, respectively.
  2. Preferred Alternative only.
  3. No-Action and Preferred Alternative only.
  4. Original Proposal and Preferred Alternative only.
  5. No-Action only.
  6. Original Proposal only.



Notes: G1, H1, and I1 - Proposed Action Alternative  
 G2, H2, and I2 - Preferred Alternative

Figure N-32. Coincidental Airspace Reference Points for XVR-1427--Existing Conditions

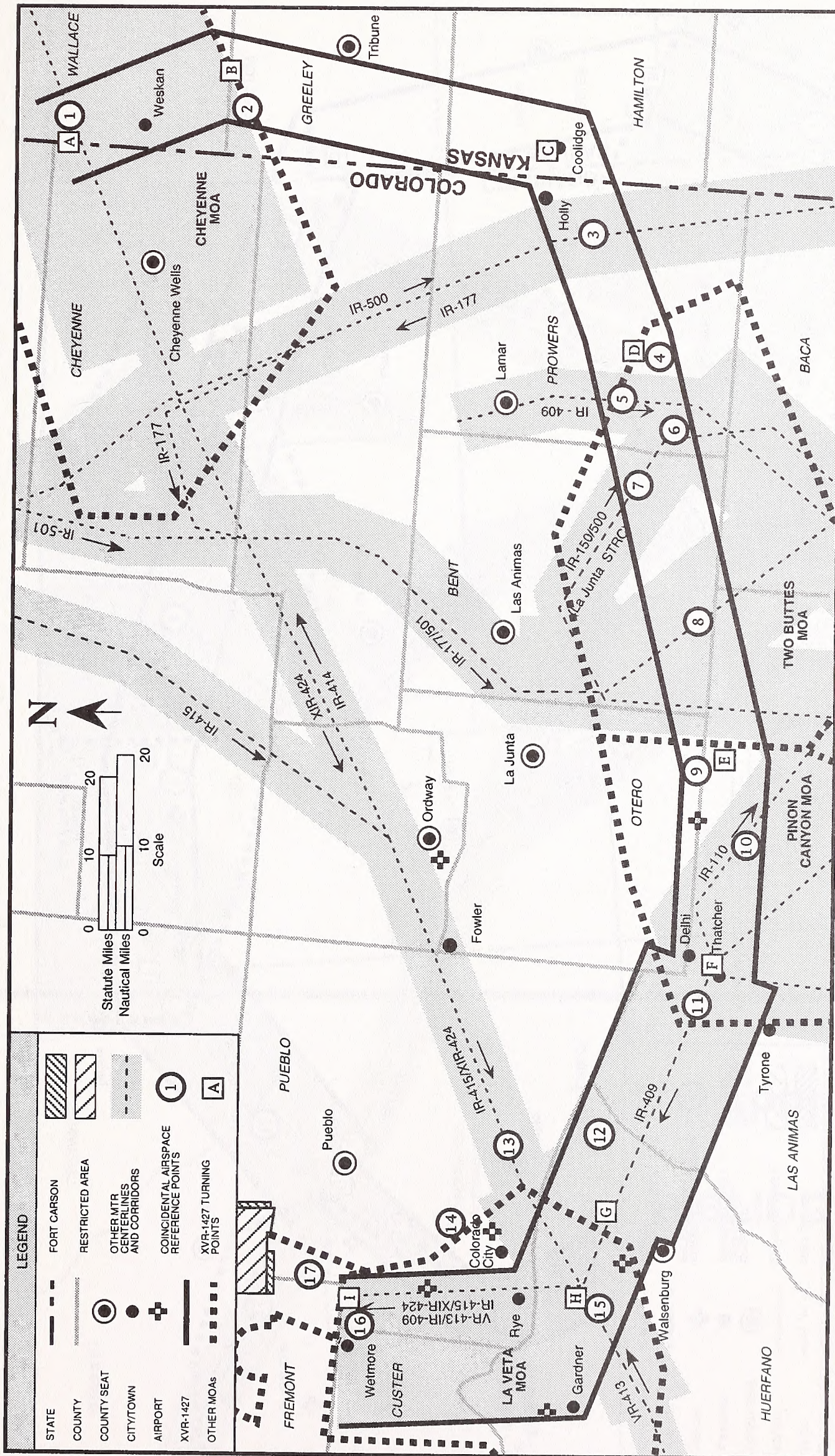


Figure N-33. Coincidental Airspace Reference Points for XVR-1427--Original Proposal

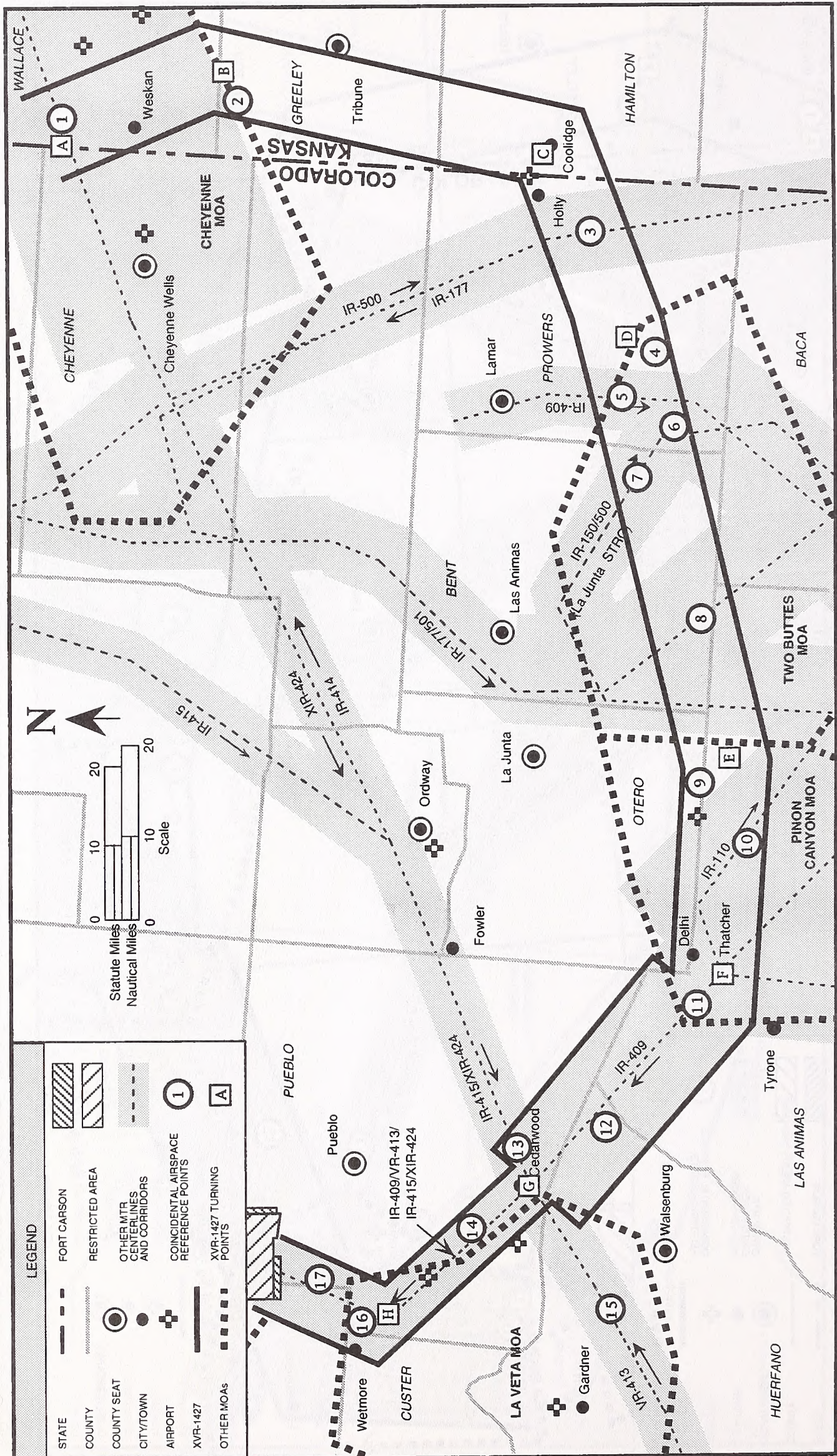


Figure N-34. Coincidental Airspace Reference Points for XVR-1427--Preferred Alternative







## APPENDIX O

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MEMORANDUM FOR THE DIRECTOR  
ATTENTION: MGR 015 0200  
FROM: [Illegible]  
SUBJECT: [Illegible]

SIDE: [Illegible]

1. [Illegible]
2. [Illegible]
3. [Illegible]
4. [Illegible]

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## APPENDIX P

# BIRD AVOIDANCE MODEL EVALUATIONS







DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE SAFETY AGENCY

20 Feb 96

MEMORANDUM FOR ANG/CEVP

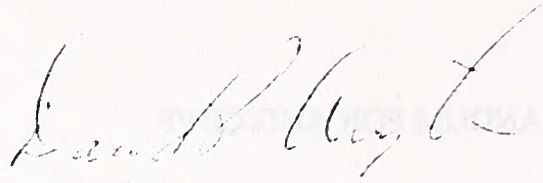
ATTENTION: Mr. Dick Masse

FROM: USAF BASH TEAM  
HQ AFSA/SEFW  
9700 AVE G SE, BLD 24499  
KIRTLAND AFB, NM 87117-5671

SUBJ: Low-level Route Evaluations and BAM Graphs

1. Attached are the BAM graphs (Attachment 1) and low-level route evaluations that you requested. USAF BASH Team recommendations state these evaluations are good for three years and should be reevaluated at that time. Funding for a new Bird Avoidance Model (BAM) is expected in 1997. This model will automate this labor intensive process and should make the PC-based BAM available to the field.
2. The purpose of these evaluations is to minimize the risk of a damaging bird strike. This is accomplished by making recommendations to pilots and route planners based on the severity of the bird strike hazard at a particular time of day, month and segment of a low-level route. Attachment 2 provides available birdstrike history for routes and/or MOA's evaluated.
3. Different bird species may be active at any hour of the day or night during any month of the year. We cannot eliminate the bird strike hazard, but we can significantly reduce it by flying at times and locations where birds are less concentrated.
4. For BAM graphs, routes are plotted indicating relative risk during dawn ( $\pm$  one hour of sunrise), mid-day (one hour after sunrise to one hour before sunset), dusk ( $\pm$  one hour of sunset) and night (one hour after sunset to one hour before sunrise). Units using the BAM have reported a significant reduction in bird strikes. Note: The BAM graph should only be used as a decision tool. The BAM doesn't identify particular segments where the greatest hazard is present and gives no additional information on identified hazards.
5. The scale on the y-axis depicts the actual number of bird strikes expected over 1,000,000 nautical miles of the route for an aircraft with a frontal surface area of 100 square feet. Make note of the magnitude of these numbers when comparing different graphs (i.e. a route with an upper value of 200 on the y-axis is twice as hazardous as one with 100).
6. The BAM is based on population and distribution of North American waterfowl (geese, ducks and swans) and some species of raptors (birds of prey) which comprise approximately 60% of all damaging birdstrikes. Raptor and waterfowl migration and concentration data may change from year to year, therefore updated graphs should be requested every three years or upon modification of route coordinates.

7. Questions may be addressed to Maj Peter Windler, HQ AFSA/SEFW (BASH Team) at DSN 246-5674, commercial (505) 846-5674.



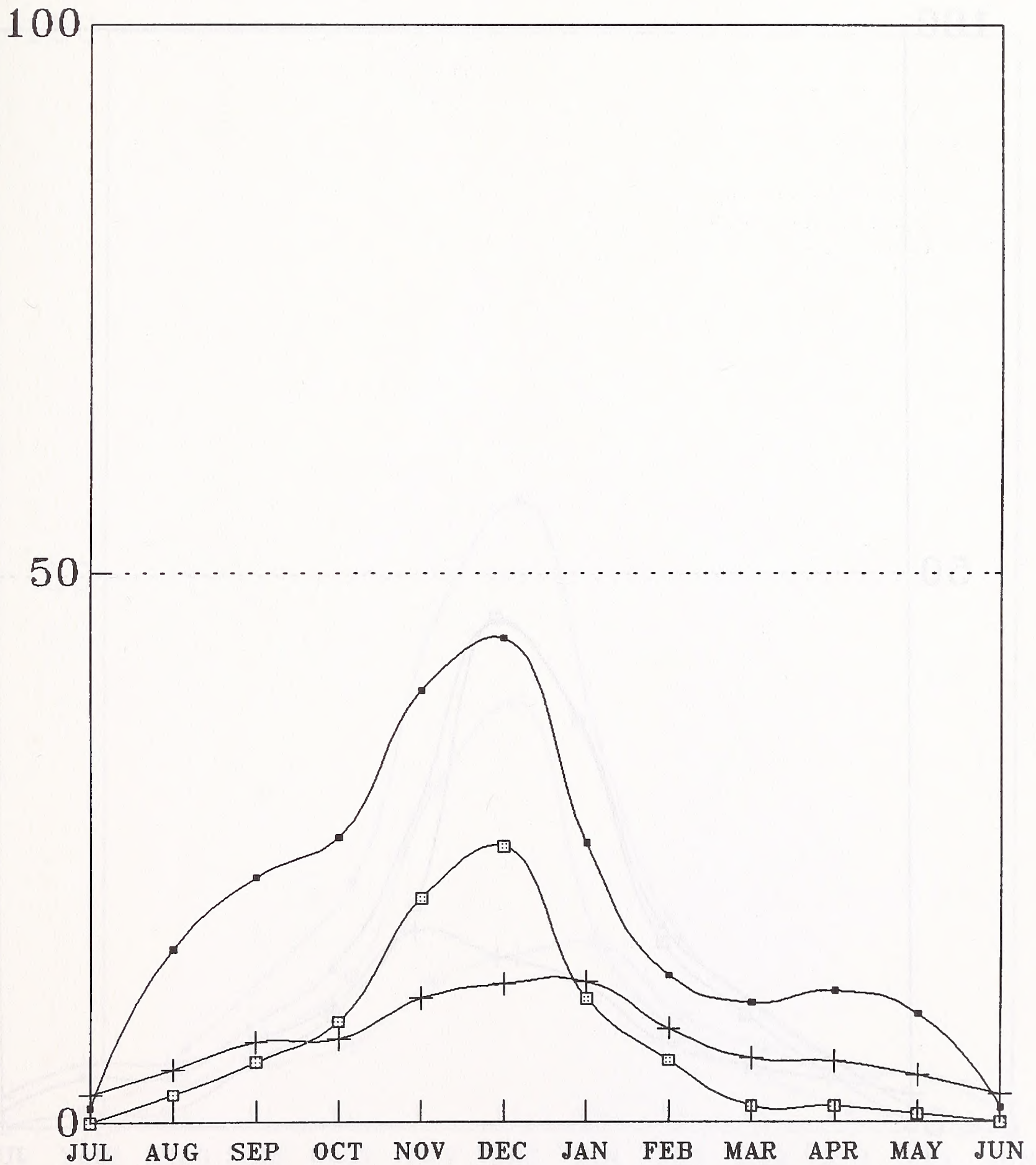
**DAVID P. ARRINGTON, MAJ, USAF**  
**Chief, USAF BASH Team**

**4 Attachments**

- 1. BAM Graphs**
- 2. Birdstrike Historical data**
- 3. Low-level Route Evaluations**
- 4. Questionnaire**

# IR-409

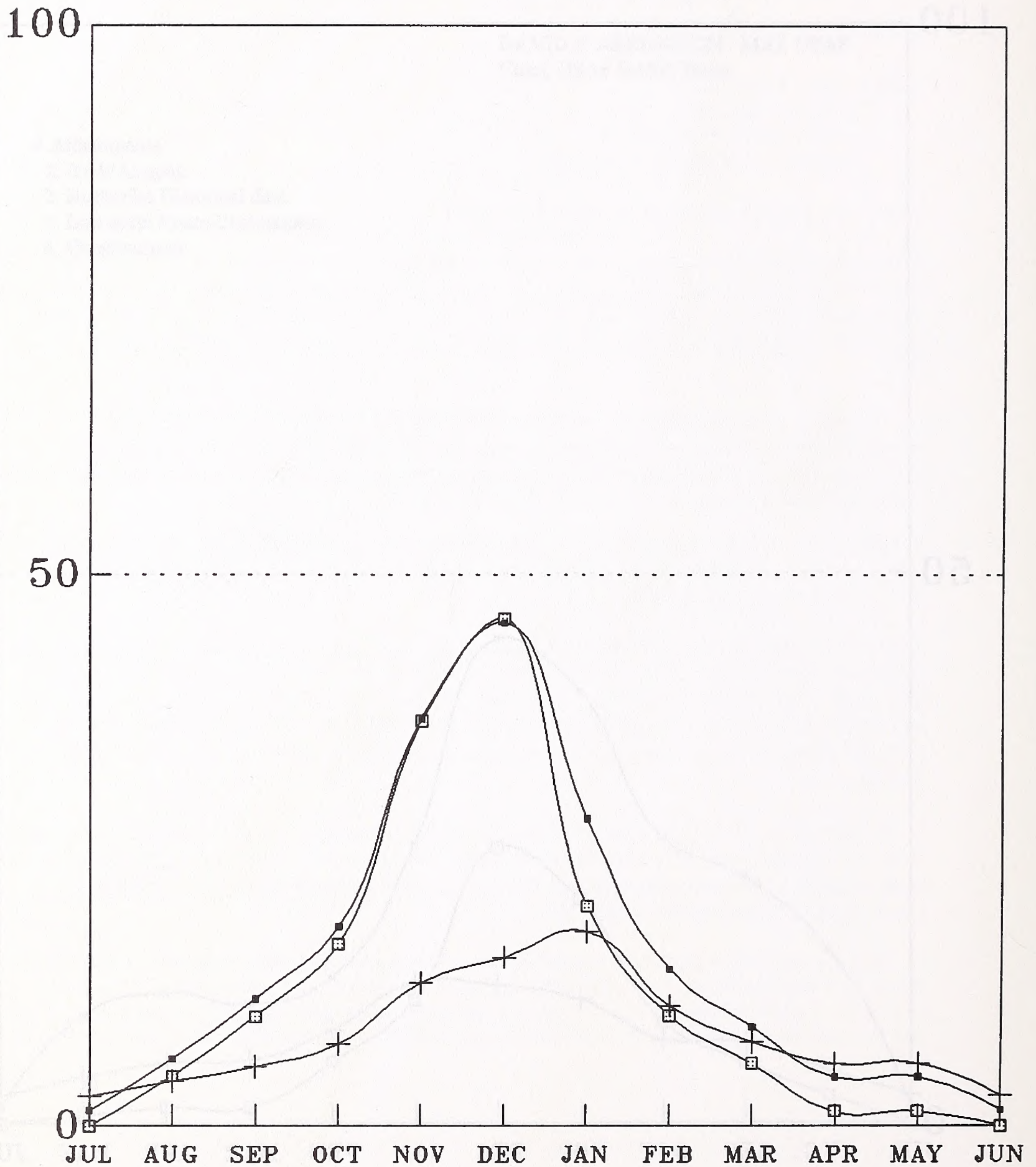
## Entire Route



—■— DAWN/DUSK + MID-DAY —□— NIGHT

# IR-414

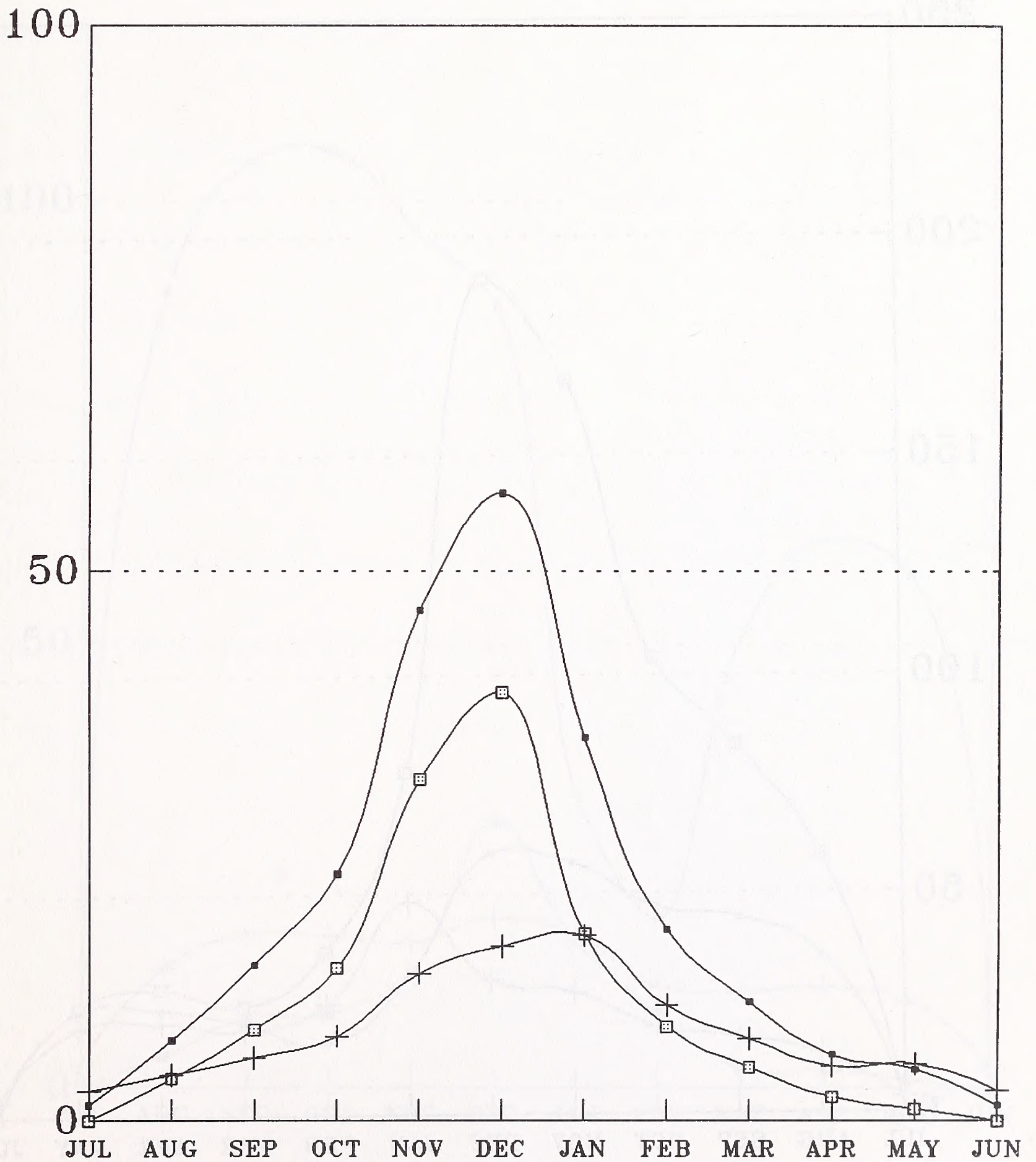
## Entire Route



■ DAWN/DUSK + MID-DAY □ NIGHT

# IR-415

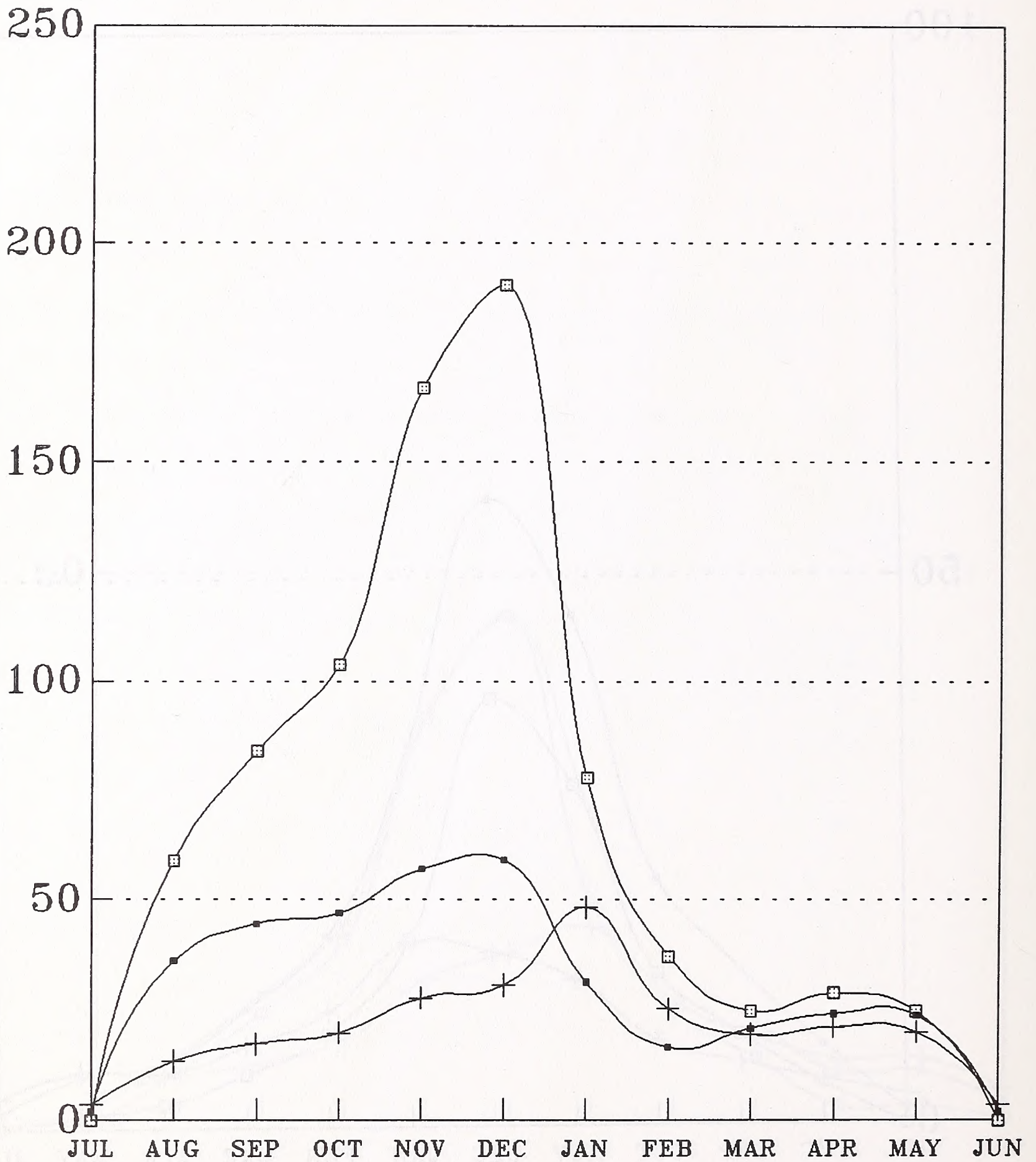
## Entire Route



■ DAWN/DUSK + MID-DAY □ NIGHT

# IR-416

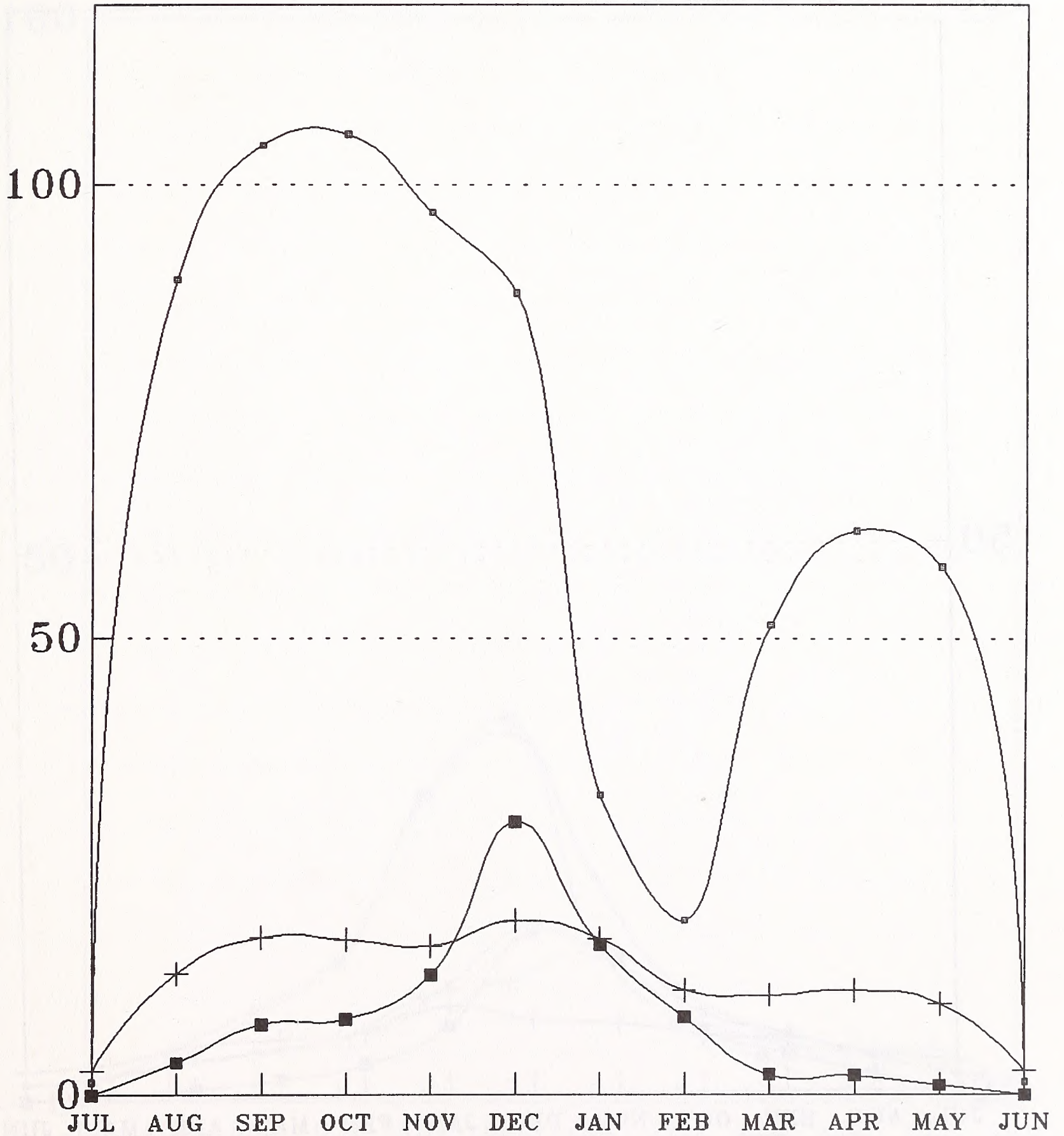
## Entire Route



—■— DAWN/DUSK + MID-DAY ◻— NIGHT

# TWO BUTTES MOA

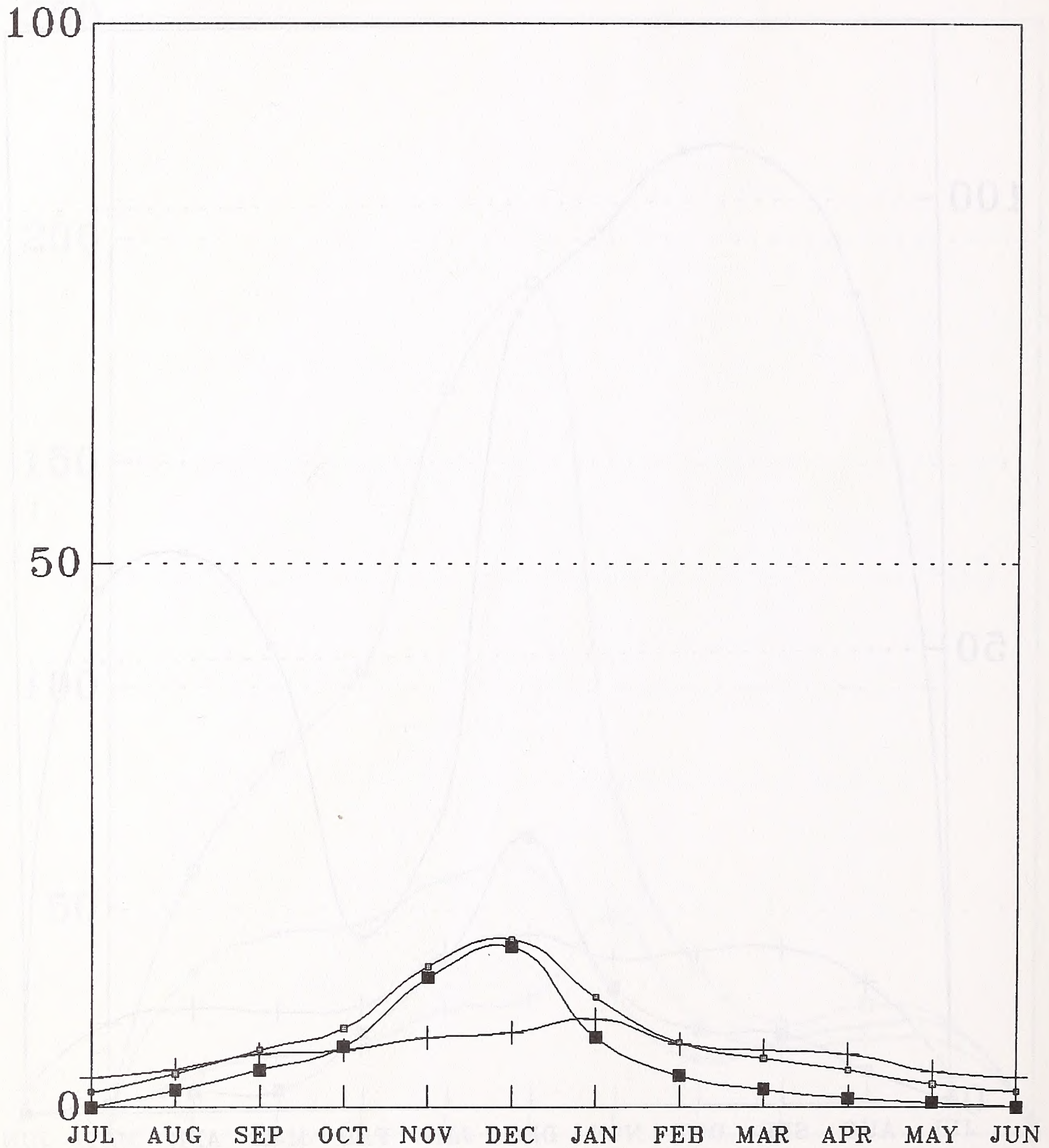
Entire Route



□ DAWN/DUSK + MID-DAY ■ NIGHT

# AIR BURST MOA

## Entire Route

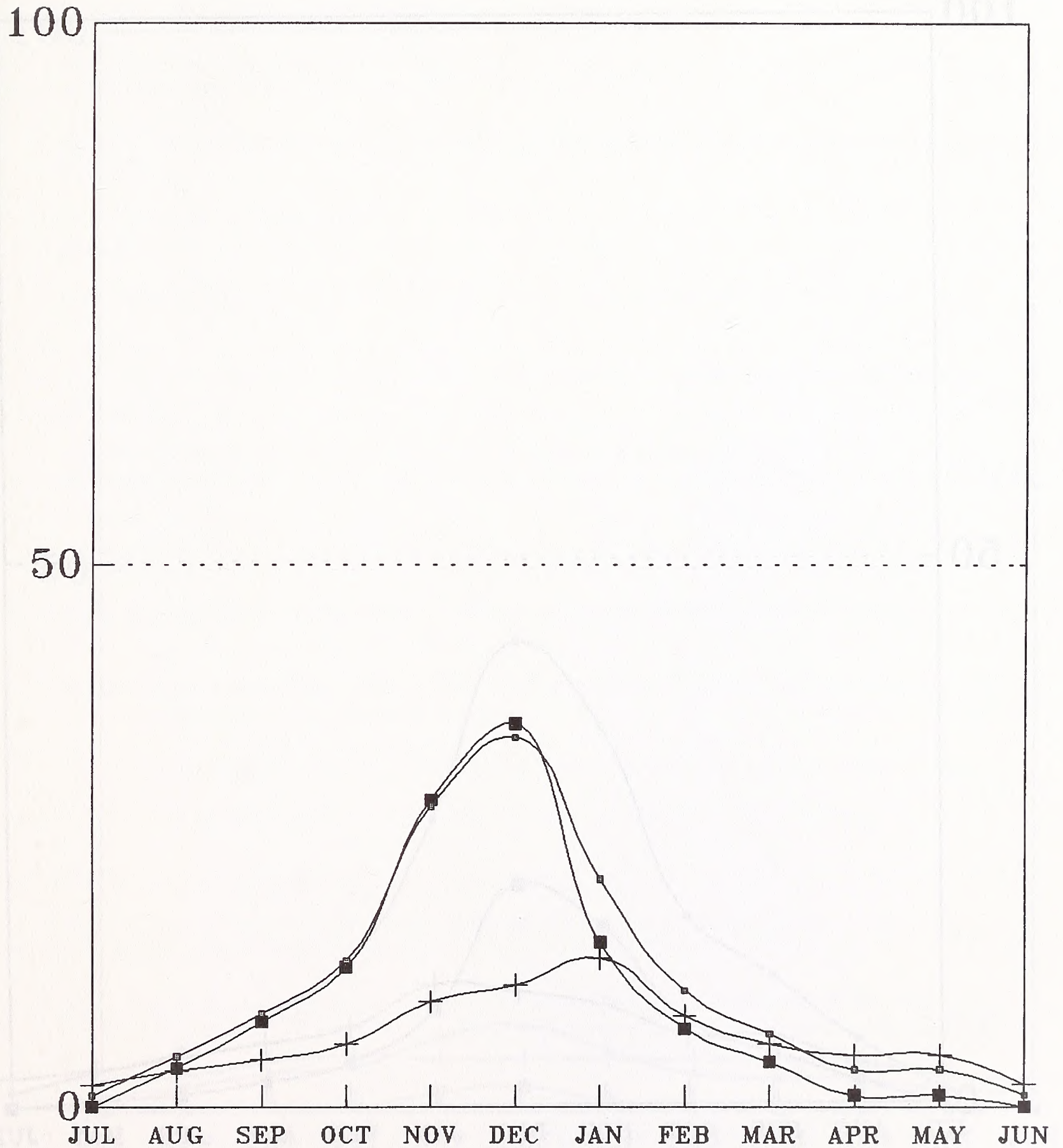


—□— DAWN/DUSK + MID-DAY —■— NIGHT



# KIT CARSON MOA

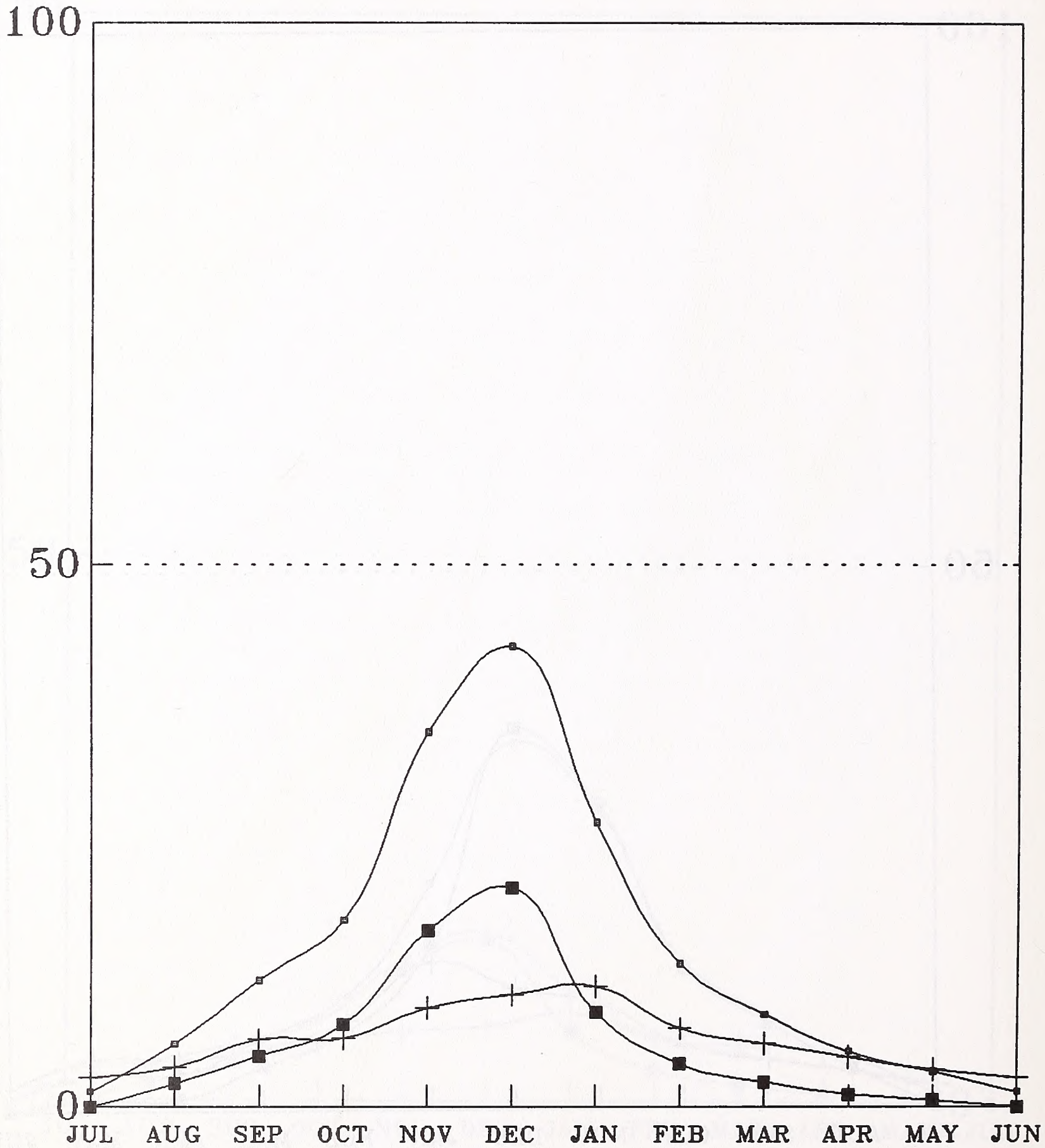
AREAS A/B  
Entire Route



□ DAWN/DUSK + MID-DAY ■ NIGHT

# PINON CANYON

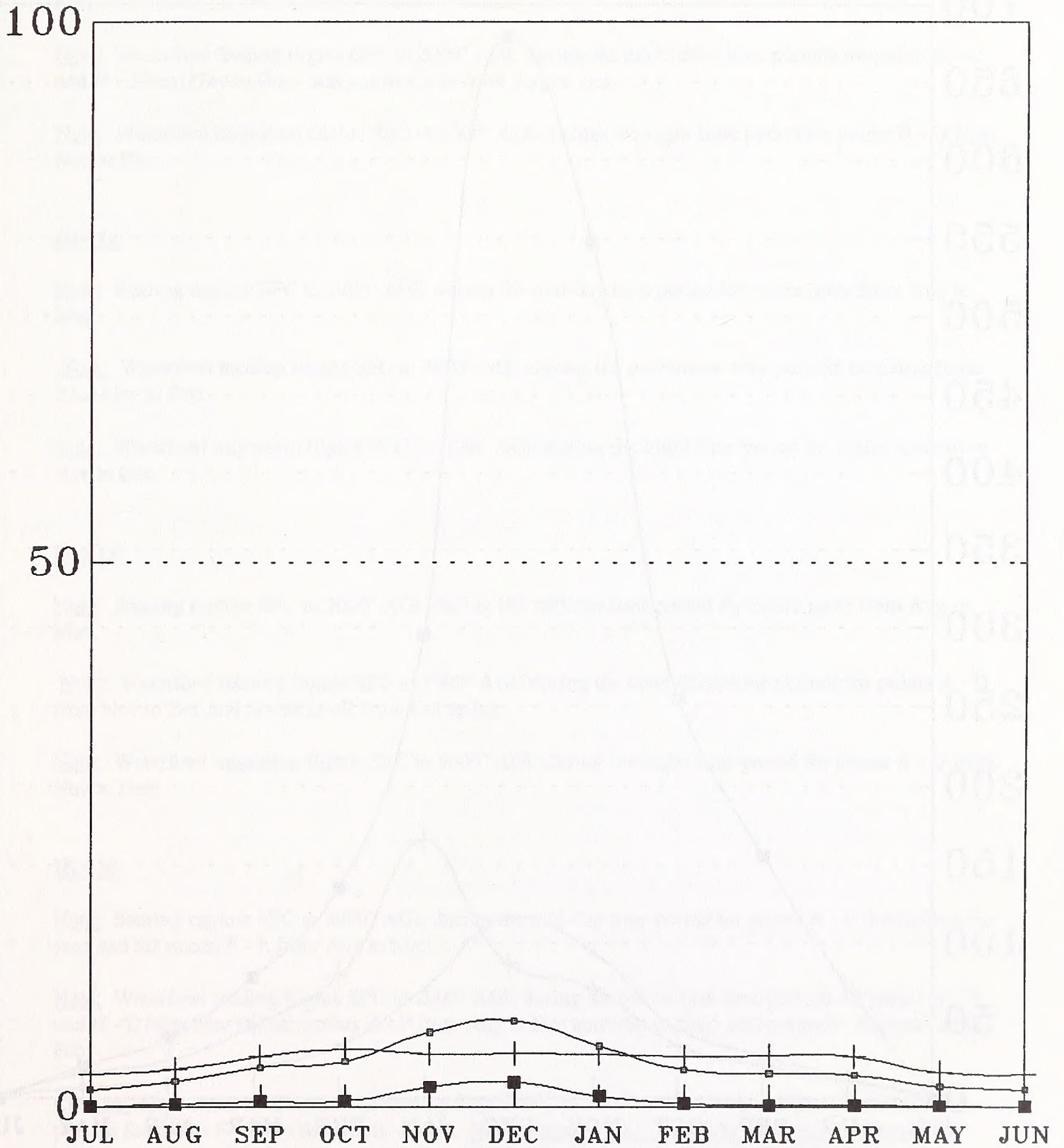
## Entire Route



—□— DAWN/DUSK + MID-DAY —■— NIGHT

# LAVETA MOA

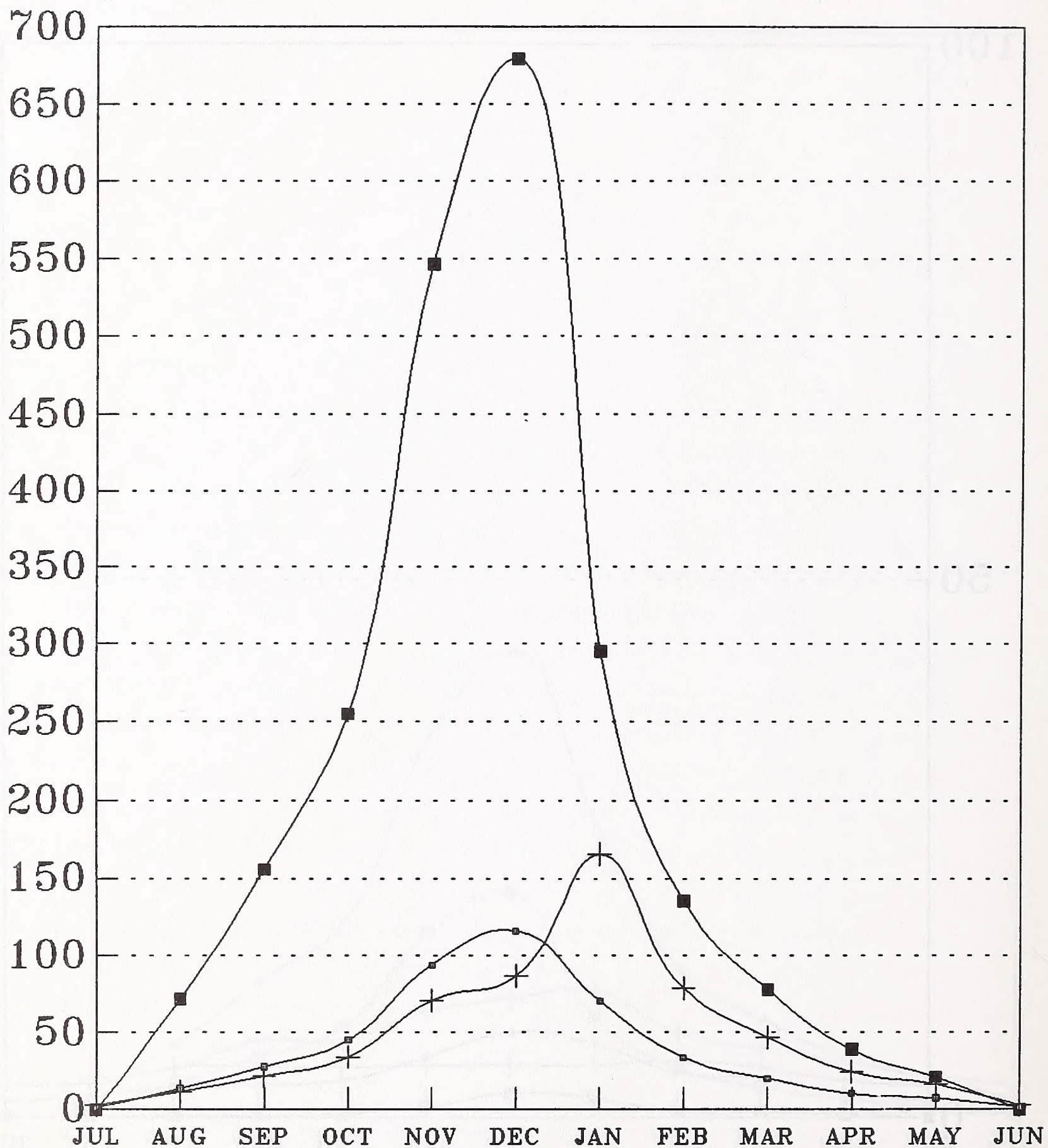
HIGH/LOW  
Entire Route



□ DAWN/DUSK + MID-DAY ■ NIGHT

# COUGAR MOA

## Entire Route



—□— DAWN/DUSK + MID-DAY —■— NIGHT

## LOW-LEVEL ROUTE EVALUATIONS

Attachment 3

### IR-409

Note: Soaring raptors SFC to 2000' AGL during the mid-day time period for entire route from Aug to May.

Note: Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for points B - C and D - I from Nov to Dec; and points C - D from Aug to Dec.

Note: Waterfowl migration flights SFC to 5000' AGL during the night time period for points B - D from Nov to Dec.

### IR-414

Note: Soaring raptors SFC to 2000' AGL during the mid-day time period for entire route from Aug to May.

Note: Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for entire route from Nov to Dec.

Note: Waterfowl migration flights SFC to 5000' AGL during the night time period for entire route from Nov to Dec.

### IR-415

Note: Soaring raptors SFC to 2000' AGL during the mid-day time period for entire route from Aug to May.

Note: Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for points A - D from Nov to Dec and points D - E from Oct to Jan.

Note: Waterfowl migration flights SFC to 5000' AGL during the night time period for points A - D from Nov to Dec.

### IR-416

Note: Soaring raptors SFC to 2000' AGL during the mid-day time period for points A - F throughout the year and for points F - L from Aug to May.

Note: Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for points A - B and H - L from Nov to Dec; points B - F from Aug to Dec and Mar to May; and points F - H from Oct to Feb.

Caution: High number of waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for points F - H for the month of Dec. Recommendation: Avoid flying these segments (use alternate entry/exit points) during the dawn/dusk time periods for the month of Dec.

IR-416 (cont)

Note: Waterfowl feeding flights SFC to 2000' AGL during the mid-day time period for points E - F from Mar to May and points F - H from Oct to Dec and Feb to Mar.

Caution: High numbers of waterfowl feeding flights SFC to 2000' AGL during the mid-day time period for points F - H for the month of Jan. **Recommendation: Avoid flying these segments (use alternate entry/exit points) during the mid-day time period for the month of Jan.**

Note: Waterfowl migratory flights SFC to 5000' AGL during the night time period for points B - D from Aug to Nov; points D - E from Aug to Dec and Apr to May; points E - F for the month of Dec and from Mar to May; points F - H for the month of Aug and from Mar to Apr; and points H - L from Nov to Dec.

Caution: High number of waterfowl migratory flights SFC to 5000' AGL during the night time period for points E - F from Aug to Nov and points F - H from Sep to Feb. **Recommendation: Avoid flying these segments (use alternate entry/exit points) during the night time period from Aug to Feb.**

**TWO BUTTES MOA**

Note: Soaring raptors SFC to 2000' AGL during the mid-day time period for:

West of 103° longitude - from Sep to Apr.  
East of 103° longitude - from Aug to May.

Note: Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for:

West of 103° longitude - from Nov to Dec.  
Between 103° W and Highway 287 - from Nov to Jan.  
East of Highway 287 - from Jan to Feb.

Caution: High number of waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for:

East of Hwy 287 - from Aug to Dec and Mar to May.

**Recommendation: Avoid flying in this area below 1000' AGL during the dawn/dusk time periods from Aug to Dec and Mar to May.**

Note: Waterfowl movement flights SFC to 2000' AGL during the mid-day time period for:

East of Hwy 287 - from Aug to Dec and Mar to May.

Note: Waterfowl migratory flights SFC to 5000' AGL during the night time period for:

East of 103° W - from Nov to Dec.

### **AIRBURST MOA**

Evaluation based on minimum altitudes of 1500' AGL for area A and 300' AGL for areas B/C.

Note: Soaring raptors SFC to 2000' AGL during the mid-day time period for all areas Aug to May.

Note: Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for areas B and C from Nov to Dec.

### **KIT CARSON MOA**

Area B has no significant hazards based on a minimum altitude of 9000' MSL.

Area A has the following hazards:

Note: Soaring raptors SFC to 2000' AGL during the mid-day time period for area A from Aug to May.

Note: Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for area A from Nov to Dec.

Note: Waterfowl migration flights SFC to 5000' AGL during the dawn/dusk time periods for area A from Nov to Dec.

### **PINON CANYON**

Note: Soaring raptors SFC to 2000' AGL during the mid-day time period for entire area from Aug to May.

Note: Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for entire area from Nov to Dec.

### **LAVETA MOA**

Note: Soaring raptors SFC to 2000' AGL during the mid-day time period for entire area from Aug to May.

Note: Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for LOW area from Nov to Dec.

## **COUGAR MOA**

**Note:** Soaring raptors SFC to 2000' AGL during the mid-day time period for entire area from Aug to May.

**Note:** Waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for entire area from Oct to Nov and Jan to Feb.

**Caution:** High number of waterfowl feeding flights SFC to 2000' AGL during the dawn/dusk time periods for entire area for the month of Dec. **Recommendation: Avoid flying this area below 1000' AGL during the dawn/dusk time periods for the month of Dec.**

**Note:** Waterfowl feeding flights SFC to 2000' AGL during the mid-day time period for entire area from Oct to Dec and Feb to Mar.

**Caution:** High number of waterfowl feeding flights SFC to 2000' AGL during the mid-day time period for entire area for the month of Jan. **Recommendation: Avoid flying this area during the mid-day time period for the month of Jan.**

**Note:** Waterfowl migratory flights SFC to 5000' AGL during the night time period for entire area for the month of Aug and from Mar to Apr.

**Caution:** High number of waterfowl migratory flights SFC to 5000' AGL during the night time period for entire area from Sep to Feb. **Recommendation: Avoid flying this area during the night time period from Sep to Feb.**



# IR-409 BIRD STRIKE DATA (1985 - 1995)

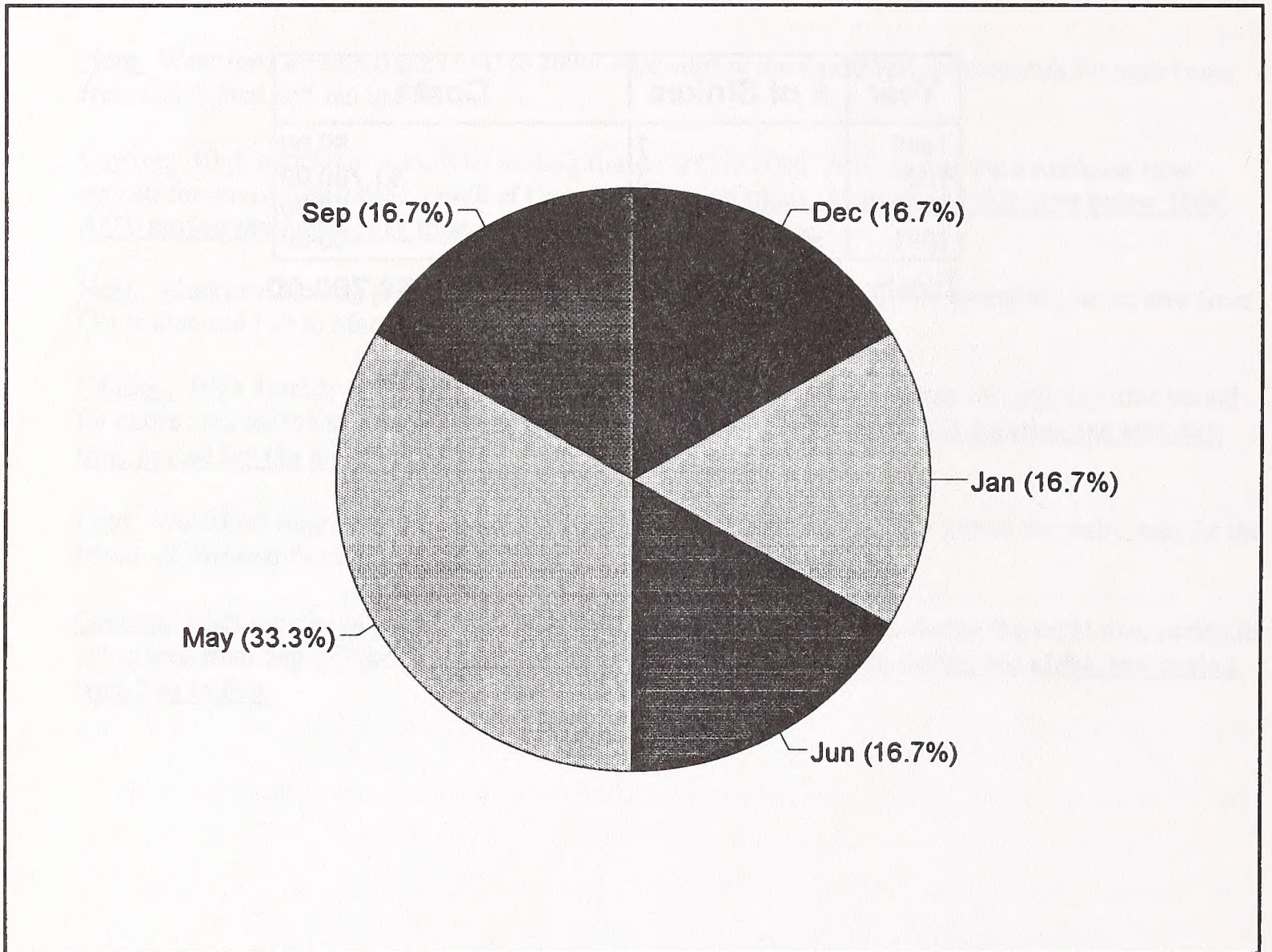
Report Date : Wednesday, February 21, 1996

Year	# of Strikes	Cost
1986	1	\$0.00
1987	3	\$1,700.00
1989	1	\$0.00
1991	1	\$0.00
<b>Totals:</b>	<b>6</b>	<b>\$1,700.00</b>

Page Number : 1

# IR-409 BIRD STRIKE DATA (1985 - 1995)

## Bird Strikes by Month:

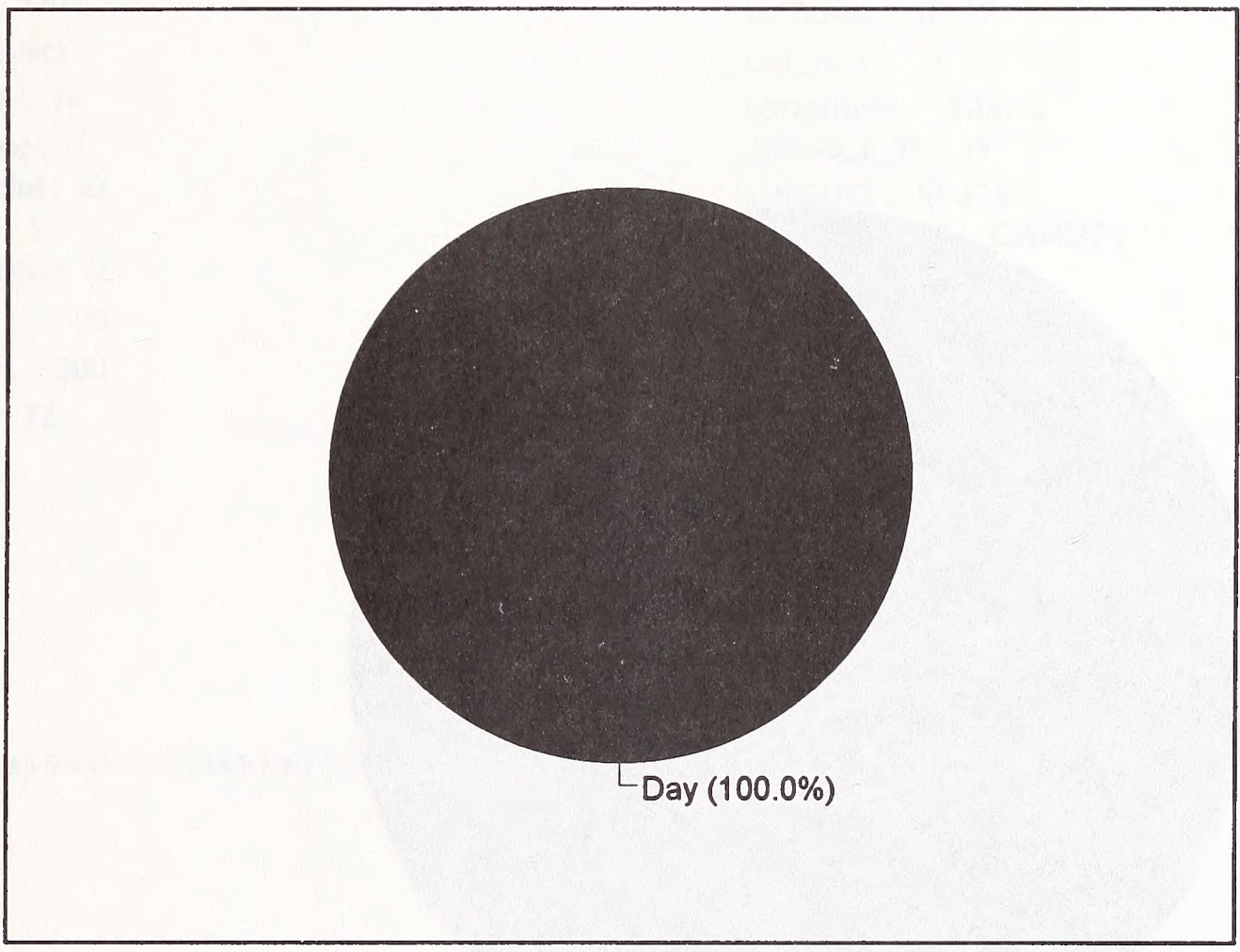


Total Number of Strikes: 6

Page Number : 2

**IR-409 BIRD STRIKE DATA (1985 - 1995)**

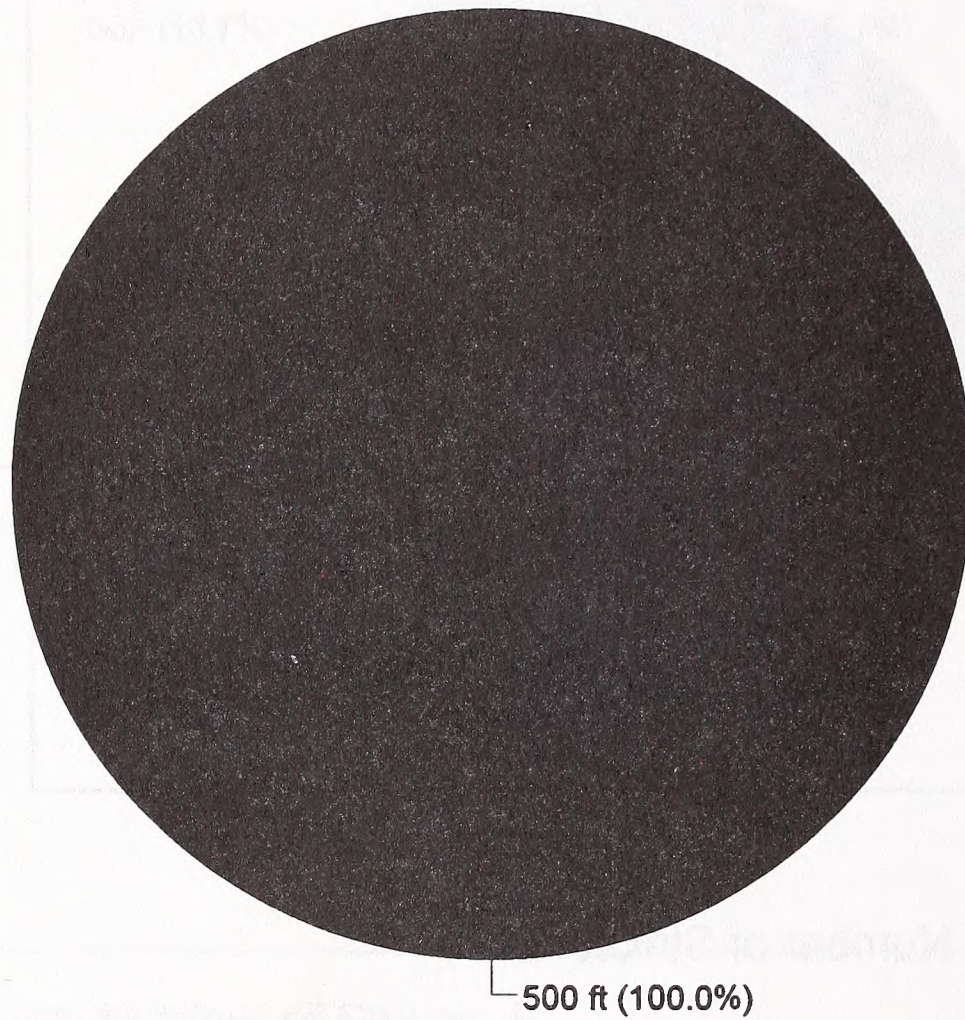
**Bird Strikes by Time Period:**



**Total Number of Strikes: 6**

**Page Number : 3**

**Bird Strikes by Altitude AGL:**



The altitude used as a label is the maximum altitude for strikes in that zone. Zones are in 500 ft. intervals, so a zone labeled 1500 ft. includes strikes from 1001 - 1500 ft.

**Total Number of Strikes: 6**

IR-415 BIRD STRIKE DATA (1985 - 1995)

IR-415 BIRD STRIKE DATA (1985 - 1995)

Base Name : BUCKLEY ANGB, CO	Date of Strike : 11/21/86
ICAO : KBKF	Time : 1000
REP ICAO : KBKF	Latitude : 39.17
MAJCOM : ANG	LAT_N_S : N
Aircraft Type : A	Longitude : 103.15
Aircraft Series : 7	LONG_E_W : W
Aircraft Model : D	LLROUTE : IR-415
Light Code : 1	Impact Point : CANOPY
Phase of Flight : LL	Cost : \$0.00
Speed KIAS : 420	Class : S
Altitude AGL : 500	Number of Birds : S
Flight Path : ZZ	Bird Species :
Remarks :	Bird Weight : 0.00
	Call # :

\*\*\*\*\*

APPENDIX D

RESULTS OF THREATENED AND ENDANGERED SPECIES CONSULTATIONS

IR-416 BIRD STRIKE DATA (1985 - 1995)

Base Name : BUCKLEY ANGB, CO  
ICAO : KBKF  
REP ICAO : KBKF  
MAJCOM : ANG  
Aircraft Type : A  
Aircraft Series : 7  
Aircraft Model : D  
Light Code : 1  
Phase of Flight : LL  
Speed KIAS : 350  
Altitude AGL : 4000  
Flight Path : CC  
Remarks :

Date of Strike : 5/7/87  
Time : 1000  
Latitude : 40.47  
LAT\_N\_S : N  
Longitude : 105.20  
LONG\_E\_W : W  
LLROUTE : IR-416  
Impact Point : WINDSCRN  
Cost : \$0.00  
Class : S  
Number of Birds : S  
Bird Species : RED-TAILED HAWK  
Bird Weight : 40.00  
Call # :

%%



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Washington, D.C. 20250  
P.O. Box 25080  
Denver, Colorado 80225

1987-1988  
1989-1990  
1991-1992

1993-1994

Mr. Harry A. Knicker, Jr.  
Chief, Environmental Planning Bureau  
Department of the Air Force  
ATTN: DSWP  
2200 Webster Avenue  
Aurora, CO, 80012-3317

1995-1996

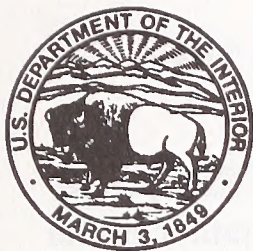
As a result of the review of the BLM-Department of the Air Force (DOW) Memorandum of Understanding (MOU) dated April 1, 1987, and the Department of the Air Force's (DAF) Memorandum of Understanding (MOU) dated April 1, 1987, the DOW and DAF have agreed to a new MOU. The new MOU will be signed by the DOW and DAF in the near future. The new MOU will be signed by the DOW and DAF in the near future. The new MOU will be signed by the DOW and DAF in the near future.

**APPENDIX Q**

**RESULTS OF THREATENED AND ENDANGERED SPECIES CONSULTATIONS**







# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
Colorado Field Office  
P.O. Box 25486  
Denver Federal Center  
Denver, Colorado 80225-0207

ES/CO: ANG  
ES/GJ-6-CO-97-F-009  
Mail Stop 65412

July 1, 1997

Mr. Harry A. Knudsen, Jr.  
Chief, Environmental Planning Branch  
Department of the Air Force  
ANG/CEVP  
3500 Fetchet Avenue  
Andrews AFB, MD 20762-5157

Dear Mr. Knudsen :

In accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation Regulations (50 CFR 402), this is the U.S. Fish and Wildlife Service's (Service) final biological opinion for impacts to federally listed endangered and threatened species in Colorado, Wyoming, Kansas, Nebraska, and New Mexico from the Colorado Air National Guard's (ANG) action, the Colorado Airspace Initiative. This opinion is provided to you as the lead Federal Agency regarding section 7 consultation on this project. The Service has incorporated reasonable and prudent alternatives that should be included as conditions of future ANG airspace operations.

Your attached letter dated April 4, 1997, transmitted the ANG's biological assessment (BA) for the Colorado Airspace Initiative, the ANG's aircraft training operations, within the states of Colorado, Kansas, Nebraska, Wyoming, and New Mexico.

The Service analyzed the impacts of the project including effects on federally listed endangered and threatened species in Colorado, Wyoming, Kansas, Nebraska, and New Mexico resulting from the proposed air operations. The BA also addressed potential impacts to 25 species that were identified as either threatened, endangered, proposed or candidates for listing. However, this opinion only considered the following endangered species: the endangered American peregrine falcon (falcon) (*Falco peregrinus anatum*), which nests in areas impacted by several of the MOA's and MTR's; the threatened Mexican spotted owl (*Strix occidentalis lucida*); and the threatened bald eagle (*Haliaeetus leucocephalus*).

For ANG's aircraft training operations, I concur with the ANG's determination that the air operations "may adversely effect" the falcon. Although not addressed in the BA, but rather in the Draft Environmental Impact Statement (DEIS) and various meetings, I also concur that the ANG's training operations will have "no adverse affects" on the owl or the eagle.

Additionally, after conferring with the Service's Wyoming field office, I also concur with a "no adverse affect" for the falcon in Wyoming.

Because a "no adverse affect" was reached for the owl and the eagle, **this opinion will only address the falcon.**

## **BIOLOGICAL OPINION**

This biological opinion is based upon information regarding cumulative affects, conditions forming the environmental baseline, the species' current ecological statuses, and the importance of the nesting population in Colorado to the survival and recovery of this species per the recovery plan. The data used in the preparation of this opinion constitutes the best scientific and commercial information currently available.

The Service's biological opinion is that the direct and indirect effects of the current ANG aircraft training operations are not likely to jeopardize the continued existence of the falcon. No critical habitat has been designated for the falcon, therefore, none will be effected.

## **PROJECT DESCRIPTION**

The following project description was provided by ANG in the biological assessment of the ANG's aircraft training operation issued on April 4, 1997 (ANG 1997).

The ANG addressed several alternatives in the DEIS for the Colorado Airspace Initiative. From the DEIS, a preferred alternative was chosen and this alternative is what is covered in this biological opinion. The preferred alternative of the Colorado Airspace Initiative responds to the need to accomplish the ANG's required training by creating a network of existing and new airspace of the various required characteristics that will work together to provide the training specifications needed by the users. This network of airspace components, with several Military Operational Areas (MOA's) and interconnected Military Training Routes (MTR's), is spread out over a wide area and provides an opportunity for the avoidance of bad weather and disperses the impacts. The MOA's provide the airspace needed for combat training, as well as access to the Airburst Range. The MTR's give pilots experience flying both mountainous terrain and at low altitude, and connect the MOA's with each other and with the Airburst Range.

The 140th Wing and the other Department of Defense users required airspace for pilots to attain and maintain proficiency standards established by the United States Air Force to support the National Command Authority. This basic requirement includes airspace for low, medium, and high altitude air-to-air training and airspace for air-to-surface gunnery training.

## MITIGATION MEASURES PROPOSED BY ANG

ANG currently makes detailed instructions available to pilots that are adjusted periodically through the Flight Information Publication (FLIP). Another source of mitigations related to the airspace that is provided to military pilots is the Bird Avoidance Modeling results from the USAF Headquarters Safety Agency.

Additionally, ANG has proposed mitigations to further reduce the likelihood of any affects. These mitigation measures consist of the following: 1) Maintain a minimum 3,000 foot lateral and overhead distance from the two known nest sites within the existing Fremont/proposed Airburst A MOA's from March 15 through July 15; 2) Pilot education briefings especially targeted to visiting pilots that would use the air space. This training would identify the correct operating altitudes that need to be observed to avoid noise sensitive areas. This training would ensure that pilots are aware and sensitive to the importance of observing these operating requirements.

## STATUS OF THE SPECIES

### American peregrine falcon

The life history, decline, and reasons for the decline of the peregrine falcon are well documented in the literature and therefore, a very limited discussion is provided below.

The American peregrine falcon was listed as endangered throughout its range, excluding Alaska, on June 2, 1970. Peregrine falcons are widely distributed though a broad range of habitat types. However, they nest predominantly on ledges of sheer cliffs, and crags usually close to water with riparian vegetation, which provides a readily available source of avian prey. Peregrine falcons generally return to nest sites in late February or early March and continue courtship through mid to late April. They forage almost exclusively on small birds which they capture in mid-air. They require a large foraging area and frequently forge up to 15 miles from the nest. The decline of peregrine falcons has been attributed to the effects of organochlorine pesticides on reproduction and poaching for falconry.

Between 1964 and 1974 there were only 6 to 11 known occupied nesting territories in Colorado (U.S. Fish and Wildlife Service , 1984). However, due to an intensive reintroduction program, the number of falcons in Colorado has been steadily increasing. Additional information about the ecology and status of the falcon can be found in the American Peregrine Falcon Rocky Mountain/Southwest Population Recovery Plan (U.S. Fish and Wildlife Service, 1984).

There are five known falcon nest sites that will be directly overflown under this proposed action. Two of these nests are found within the proposed Airburst A MOA, however, only one of these nests will be impacted. The other four nests will not be approached to within 3,000 feet in all directions and therefore will not be impacted.

## **ENVIRONMENTAL BASELINE**

The environmental baseline includes the past and present impacts of all Federal, State, and private actions and other human activities in the action area; the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal section 7 consultation; and the impacts of State or private actions contemporaneous with the consultation process.

In formulating this biological opinion, the Service considered adverse and beneficial effects of future Federal, State and private activities that are reasonably foreseeable to occur within the project area, along with the direct and indirect effects of ANG's proposed Federal action for the project and impacts from actions that are part of the environmental baseline (50 CFR 402.02 and 402.14 (g) (3)).

The ecological status of the federally listed species as described in the species' accounts in this opinion were considered along with ANG's biological assessment and conditions forming the cumulative effects and environmental baseline. This broad and comprehensive information base was used, first to determine whether the proposed Federal action is likely to adversely affect the federally listed falcon and secondly, to determine whether adverse affects of the proposed Federal action would likely jeopardize the continued existence of the falcon.

Within the action area, there are five nest sites that will be potentially overflowed. Additionally, seven more nest sites are in proximity to the airspace. Of these twelve nest sites, currently only seven are actively being used, three sites within the airspace and four in proximity to the action area. The majority of these nest sites are located on National Forest lands. The Forest Service currently manages these areas to reduce potential impacts to these nest sites.

The Environmental Baseline, without the proposed project, indicates that human disturbance to these nest sites would continue to be managed to reduce potential impacts thus increasing the chance that these nest sites would continue to be productive.

## **EFFECTS OF THE ACTION**

Documented nest sites occur in the Fremont/proposed Airburst A MOA, the La Veta MOA, and the VR-413 MTR. As mentioned earlier in this opinion, there are also several nest sites located outside of the above MOA's and MTR's that potentially could be impacted. Occasionally, due to emergencies or pilot error, some military aircraft may operate outside of the established MOA's and MTR's. Therefore, the four active nest sites in proximity to the action area and the three active nest sites within the action area will be included in the baseline and considered in this opinion.

The estimated number of low-level sorties to be flown in the proposed Airburst A MOA is 2,461 annually. This equates to approximately seven sorties per day annually. The estimated number of sorties to be flown in the La Veta MOA is 634 in the high and 320 in the low portions of the MOA. This equates to approximately two sorties per day annually for the high and one sorty per day annually for the low. The estimated number of sorties to be flown in VR-413 is 176 annually. This equates to approximately 0.5 sorties per day annually.

Noise levels for military aircraft vary from aircraft to aircraft and by the distance above ground level. At 2,000 feet, an F-16 generates 85 decibels (dB) (U.S. Fish and Wildlife Service, 1993). According to the BA, the Airburst MOA could have up to four F-16 aircraft flying at altitudes between 500 feet AGL and 8,500 feet MSL at the same time. The Service believes that this could significantly increase the noise level during the time that these planes are in the MOA. Given this situation, the Service expects that noise levels will exceed the 65 dB sound exposure level (SEL) during these events. The ANG used this SEL in the EIS and the BA as the acceptable maximum level which would not cause objective interference. Since the ANG already established this as a threshold above which would cause interference, the Service is using this SEL as a reference point and anything above this level will potentially cause problems.

The Service's primary concern is the "startle effect" that could occur when falcons sitting on nests are suddenly surprised by unexpected loud noises. Some loss of young or eggs could be expected from this startle effect (U.S. Fish and Wildlife Service, 1993). Generally, wildlife begin to demonstrate observable effects at 85 to 90 dB (Kull, 1992). Falcons do not build nests but instead lay eggs on a flat ledge of a cliff, and incubate eggs and brood small young in such a way that their large toes and talons are often under the eggs or young. Falcons when startled will often react by jumping or flying from their perch or nest in order to escape the surprising object. Therefore, a startled bird could expel eggs or young from the nest causing mortality. Additionally, a young bird could also be startled causing it to leave the nest prematurely also causing mortality (U.S. Fish and Wildlife Service, 1984 and 1993).

Given that the cumulative effects of low-flying, high speed aircraft on nesting falcons is very difficult to predict, especially when precise information on the number, timing and nature of flights and aircraft in relation to specific nests are not known. The number of estimated sorties could generate sufficient noise that will very likely result in some take of falcons.

## INCIDENTAL TAKE

Sections 4(d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Under the terms of section 7 (b)(4) and section 7 (o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement. The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions for the ANG to adhere to in order for the exemption in section 7 (o)(2) to apply.

The ANG has a continuing duty to regulate the activity that is covered by this incidental take statement. If the agency fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the FLIP, the protective coverage of section 7 (o)(2) may lapse.

The Service anticipates that the proposed military aircraft activity in the Fremont/proposed Airburst MOA will result in incidental take at nest sites. Take may occur in the form of harassment, nest abandonment, premature fledgling, or accidental displacement of young or eggs from the nest by startled adults. When incidental take is authorized, the level of that take must

be monitored to insure that the authorized level of take is not exceeded. If the authorized level of take is exceeded, the ANG and the Service must reinitiate consultation.

The incidental take statement provided in this opinion satisfies the requirements of the Endangered Species Act, as amended.

### Level of Incidental Take

Approximately 2,500 low-level flights are estimated to be flown in the Fremont/proposed Airburst MOA where one nest will most likely be effected. Potentially, there are six other active nests in other airspace or in close proximity to the airspace that could be effected as well. The Service's best judgment is that the proposed activity could result in the loss of eggs or young, primarily through direct mortality associated with the startle affect. The precise level of take is impossible to predict because the intensity, timing, duration, direction, and other factors of low-level flights will vary from day to day. Additionally, the effects from the action could be different for different nest situations or individual birds. Since the Service cannot accurately predict the amount of take, we must make the best reasonable estimate of anticipated take and then develop and implement a monitoring plan to insure that the level of take does not jeopardize the continued existence and recovery of the falcon in Colorado. The Service has determined that the baseline for the effected area is seven nests. The ANG will not be responsible for any additional nest sites that may be established in the action area. The ANG is responsible only to comply with the reasonable and prudent measures listed below in order to minimize any impact to the seven nest sites within the action area. Given this baseline for the action area, the reasonable estimate of anticipated take for the ANG's proposed action is four young per year. The Service will work with ANG to further evaluate the level and impacts of incidental take through a monitoring plan. This monitoring plan will be in place for a two year period. At the end of the second year, the Service and ANG will reevaluate the need for further monitoring.

### Reasonable and Prudent Measures

Section 7 (b)(4) also requires that reasonable and prudent measures, if available, be specified in the incidental take statement to minimize the impact of the take. Implementation by the consulting agency of such measures is mandatory as long as the measures do not significantly modify the original intent of the project.

During a meeting held on February 19, 1997, between the Service and ANG, protective measure to be established around the known falcon nests were discussed and agreed upon by both agencies. As mentioned in the BA, there have been several different protective measures established in other Biological Opinions and also in Recovery Plans. These protective measures were developed to insure that aircraft activity does not negatively impact breeding falcons. Due to the large turning radius required by the F-16 and similar aircraft at high speed and the size of the MOA's

discussed in this opinion, it was not reasonable to following the past protective measures. Therefore, the Service considered the following reasonable and prudent measures and believes that these are necessary and appropriate to minimize take:

1. Between March 15 and July 15, avoid all known peregrine falcon nest sites by 3,000 feet horizontal distance or by 3,000 feet AGL.
2. Ensure that these avoidance measures are included in the curriculum for the pilot education briefings so that visiting pilots as well as local pilots are informed of these measures. These briefings should be a requirement prior to flying in the airspace. However, if some units fly in without landing at Buckley, then this information should also be disseminated to those units that may use the airspace without first attending this briefing.

### Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the Act, the ANG must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are mandatory. Since incidental take is being authorized in this opinion, the ANG is required to monitor and report all such take so that the extent of incidental take cannot result in jeopardy to the species. Because the Colorado Division of Wildlife (CDOW) has tracked falcon nesting success in the past, the Service recommends that the ANG develop an agreement with the CDOW to have them monitor the affected nests and determine nest success, productivity and potential mortality as compared to unimpacted nests elsewhere in the State. This monitoring will occur for a two year period at which time the Service along with the ANG will reevaluate the need for any further monitoring.

In addition to the monitoring effort described above, the ANG must ensure that the information on the impacted nest in the Fremont/proposed MOA and the seasonal restriction of 3,000 feet avoidance is disseminated to all pilots utilizing the airspace.

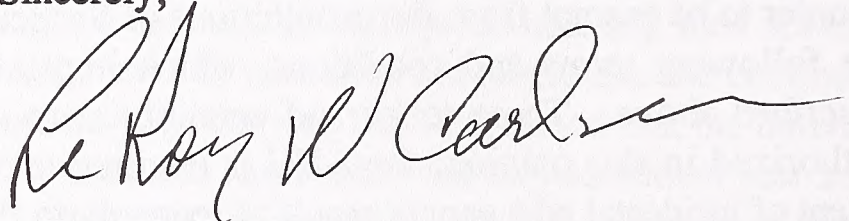
The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impacts of the incidental take that might otherwise result from the proposed action. With implementation of these measures the Service believes that no more than four young per year will be incidentally taken. If, during the course of the action, this level of take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the cause of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

## CONCLUSION

This concludes formal consultation on the action outlined in the request. As required by 50 CFR § 402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an adverse effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be effected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Thank you for your cooperation in the formulation of this biological opinion and your interest in conserving endangered species. If the Service can be of further assistance, please contact Clay Ronish of the Service's Colorado Field Office at (303) 275-2370.

Sincerely,



LeRoy W. Carlson  
Colorado Field Supervisor

cc: ES/State Supervisor  
CDOW/Fort Collins (Attn: Jerry Craig)  
CDOW/Salida (Attn: Bruce Goforth)

bcc: AES/TE, Washington, D.C.  
FWS/CO/KS/NE/UT, Denver  
FWS/ES, Grand Junction  
FWS/ES, Lakewood  
FWS/FWMAO, Lakewood  
RO rf, RD rf  
COKANUT rf

File: Reading File  
Project File



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ABBREVIATIONS AND ACRONYMS LIST

ACBT	Air combat training	KIAS	knots indicated airspeed
ACC	Air Combat Command	LANTIRN	Low-Altitude Navigation Targeting Infrared for Night
AFB	Air Force Base	lbs	pounds
AFI	Air Force Instruction	L <sub>dn</sub>	Day-Night Average Sound Level (A-weighted)
AFR	Air Force Regulation	L <sub>dnmr</sub>	Onset Rate-Adjusted Monthly Day-Night Average Sound Level (A-weighted)
AGL	Above ground level	LOWAT	Low-Altitude Air-to-Air Training
AMRAAM	Advanced Medium Range Air-to-Air Missile	MAILS	Multiple Aircraft Instantaneous Line Source
ANG	Air National Guard	MAP	municipal airport
ANGB	Air National Guard Base	MEA	minimum en route altitude
ANGRC	Air National Guard Readiness Center	MOA	Military Operations Area
AQCR	Air Quality Control Region	MOU	Memorandum of Understanding
ATC	Air Traffic Control	mph	miles per hour
BAM	Bird Avoidance Model	MSA	Metropolitan Statistical Area
BASH	bird-aircraft strike hazard	MSL	mean sea level
BDU	Bomb Dummy Unit	MTR	Military Training Route
BLM	Bureau of Land Management	NAAQS	National Ambient Air Quality Standards
CAI	Colorado Airspace Initiative	NEPA	National Environmental Policy Act
CDOW	Colorado Division of Wildlife	NGB	National Guard Bureau
CEQ	Council on Environmental Quality	NHPA	National Historic Preservation Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	NM	nautical mile (approximately 1.15 statute mile)
CFR	U.S. Code of Federal Regulations	NO <sub>2</sub>	nitrogen dioxide
CIG	Citizen Information Group	NOA	Notice of Availability
CO	carbon monoxide	NOAA	National Oceanic and Atmospheric Administration
COANG	Colorado Air National Guard	NOI	Notice of Intent
dB	decibel	NOTAM	Notice to Airmen
DEIS	Draft Environmental Impact Statement	NO <sub>x</sub>	nitrogen oxides
DIA	Denver International Airport	NPDES	National Pollutant Discharge Elimination System
DOD	Department of Defense	NPS	National Park Service
DOPAA	Description of the Proposed Action and Alternatives	NRHP	National Register of Historic Places
DOT	U.S. Department of Transportation	NWR	National Wildlife Refuge
EA	Environmental Assessment	O <sub>3</sub>	Ozone
EIAP	Environmental Impact Analysis Process	OSHA	Occupational Safety and Health Administration
EIS	Environmental Impact Statement	Pb	Lead
EPA	Environmental Protection Agency	PM <sub>10</sub>	particulate matter with aerodynamic diameter less than 10 microns
ESA	Endangered Species Act	ppm	parts per million
FAA	Federal Aviation Administration	PSD	Prevention of Significant Deterioration
FAR	Federal Aviation Regulations	RCRA	Resource Conservation and Recovery Act
FEIS	Final Environmental Impact Statement	ROD	Record of Decision
FEMA	Federal Emergency Management Agency	ROI	region of influence
FG	Fighter Group	SARA	Superfund Amendments and Reauthorization Act
FICON	Federal Interagency Committee on Noise	SAT	Surface Attack Tactics
FICUN	Federal Interagency Committee on Urban Noise	SEL	Sound Exposure Level
FL	Flight Level	SHPO	State Historic Preservation Office
FLIP	Flight Information Publication	SIP	State Implementation Plan
FONSI	Finding of No Significant Impact	SO <sub>2</sub>	sulfur dioxide
FSS	Flight Service Stations	SOP	Special Operating Procedures
FW	Fighter Wing	SO <sub>x</sub>	sulfur oxides
FWS	Fish and Wildlife Service	SR	State Route
FY	Fiscal Year	STR	Strategic Training Range
HAP	high accident potential	THC	total hydrocarbons
HMTA	Hazardous Materials Transportation Act	TIG	Technical Information Group
HUD	Department of Housing and Urban Development	USAF	United States Air Force
Hz	Hertz	USFWS	U.S. Fish and Wildlife Service
I	Interstate	USGS	U.S. Geological Survey
IFR	Instrument flight rules	VFR	visual flight rules
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning	VR	Visual Route
IR	Instrument route	WG	Wing
ISCST	Industrial Sources Complex Short-Term	µg/m <sup>3</sup>	micrograms per cubic meter

