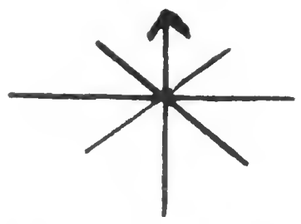
DATE 15 June 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
1500	start observations					
1502	Brown Booby	1	-		sitting on buoy at entrance to Pearl Harbor adult	
15~~30~~ 15	Blued-footed Albatross	1				
1525	Bulwer's Petrel	1				
1533	Noddy Tern	1				
1552	Sooty Tern	9				
	Noddy Tern	2				
	Wedgetail	1				
1555	Wedgetail	4				
1600	Sooty Tern	2				
1602	Wedgetail	1				
1~~6~~04	Sooty Tern	2				
	Noddy Tern	1				
	Wedgetail	1				
1610	Sooty Tern	4				
1612	Wedgetail	2				
	Noddy Tern	1				
1615	Sooty Tern	2				
1618	Sooty Tern	6				
1620	Noddy Tern	1				
1624	Sooty Tern	5				
1625	Wedgetail	1				
1626	Sooty Tern	3				
1630	Sooty Tern	2				
1631	Wedgetail	1				
1635	Wedgetail	2				
	Sooty Tern	1				
1638	Wedgetail	1				
	Sooty Tern	1				
1645	Sooty Tern	1				

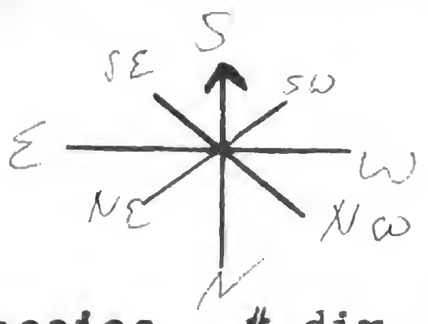
DATE 15 June 64
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1655	Sooty Tern	1				
1705	Red-footed B.	1			sub-adult	
	Sooty Tern	1				
1710	Red-foot B.	1				
	Wedgetail	1				
1720	Wedgetail	2				
1724	Red footed B.	1				
1726	Wedgetail	1				
1730	Wedgetail	2				
1732	Wedgetail	1				
1735	Wedgetail	1				
1736	Red foot B	1				
1740	Sooty Tern	1				
1742	Sooty Tern	1				
1745	Sooty Tern	1				
1746	Wedgetail	1				
	Sooty Tern	2				
1748	Sooty Tern	1				
1749	Red-tailed TB.	1			flushed from water	
1758	Wedgetail	2				
1759	Noddy Tern	6				
1805	Noddy Tern	1				
1810	Red Foot Booby	1				
1811	Sooty Tern	1				
1812	Sooty Tern	2				
1815	Wedge Tails	4				
1818	Wedg Tail S	1				
1820	Noddy Tern	1				
1822	Noddy Tern	8				
1825	Sooty Tern	1			Heading Toward Malaki?	
1826	Sooty Tern	1				
1842	Wedge Tail S	2				
1843	Noddy Tern	1			? Identification by crew member	
1847	Sooty tern	2				
1848	Wedgetail S	2				
1850	Wedgetail S	1				
1855	Sooty Tern	3				



DATE June 15, 1964
Pg.# 3

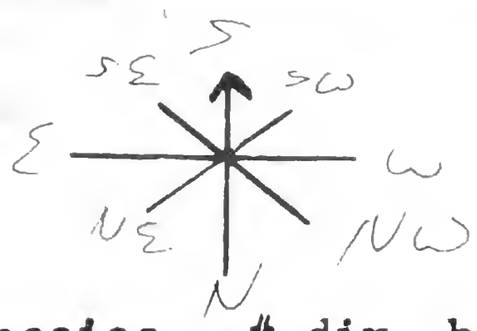
time	species	#	dir.	hgt.	remarks	loc.
1858	Sooty Tern	3				
1900	Wedgetails	4				
1910	Wedgetails	7				
1915	~~Sooty~~ Noddy Tern	2				
1922	Wedgetails	2.				
Ended	observations	1926				



DATE 16 June 64
Pg.#

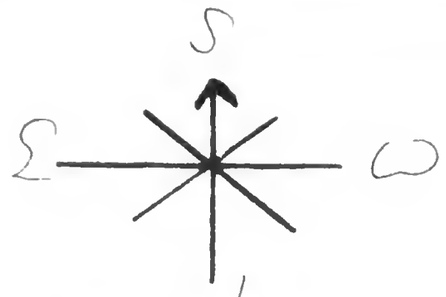
time	species	#	dir.	hgt.	remarks	loc.
0605	begin observations					
0608	Bulwer's P	1	N			
0613	Bulwer's P	1	N			
0617	Newells S.	1	S			
	Bulwers	1	N			
0624	Wedgetail	2	S			
	Sooty Tern	1	NE			
0628	~~S T Te~~ Wedgetail	1	N			
0637	Wedgetail	1	S			
0642	Newell's S.	1	S			
0654	Wedgetail	1	S			
0713	Wedgetail S	1	N			
0755	Wedgetail S	3	SW NE			
0820	Bulwers P.	1	NE			
0835	Bulwers P.	1	N			
0842	Wedgetail	8			flushed from waters 1 dark phase	
0852	Wedgetail	2			flushed from Water 1 dark phase.	
0859	Bulwers P	1				
0902	Dark Rump P	3			? Identification by crew member.	
0920	Flock of wedgetails and sooty T, estimate 30 of each				looked like they were feeding	
0930	Wedgetail S	2				
0933	Wedgetail	1				
0935	Wedgetail	2				
0937	Wedgetail	3				
1028	Sooty Tern	75			2 + minatures	
	Wedgetail	50			3 sitting on waters	
	Fairy Tern	5			feeding flock	
	Newell's S.	1				
1029	Fairy Tern	1				
1030	Wedgetail	2				
	Newell's S.	1				
	shear/petrel	1			all dark, smaller than Wedgetail - seen by watch	
1040	Sooty Tern	1	SE			
1107	Sooty Tern	50				
	Fairy Tern	2	N		travelling	
	Wedgetail	5				

JTP



DATE 16 June 64
Pg.# 2

	time	species	#	dir.	hgt.	remarks	loc.
	1127	Sooty Tern	1	NE			
	1128	Bulwers P	1	SW			
BWP	1144	~~Bonin Is P~~	1	W			
JTP	1145	~~Dark rumped~~ Petrel	1	N		sitting on water	
		Wedgetail S.	1				
		Bulwers P	1				
	1148	Wedgetail S.	2			sitting on water	
	1152	Bulwers P	1	N			
BWP	1153	~~Bonin IS P~~	1	W			
	1208	Wedgetail	1				
	1219	Wedgetail S	1				
	1226	Bulwers P	1	SW			
	1243	Frigate	1	(9)			
	1244	stormPetrel?	1			seen by watch	
	1246	Wedgetail	1	N			
	1317	Fairy Tern	1	S			
BNP	1321	~~Bonin I S P.~~	1	NW			
	1410	Wedgetal S	2	SW			
BNP	1422	Bonin Is. P ?	1	NW			
	1431	Wedgetail S	1	SW			
	1440	Wedgetail S	3	SW			
	1445	Wedgetail S	2	S			
	1459	Wedgetail S	1	SW			
BNP	1452	~~Bonin Is P.~~	2	≈		molting - touched down on water	
	1524	Wedgetail	1	N			
	1532	Wedgetail	1	≈			
BNP	1724	~~Bonin Is P.~~	1	NW			
	1743	Newells S?	1			seen by Watch	
BNP	1747	~~Bonin Is P.~~	1	≈			
	1751	Sooty Tern	2	E			
	1828	Wedgetail	1				193 45
BNP		~~Bonin Is P~~	3			small travelling flock in rain squall	
		Bulwers P.	1				
	1831	Wedgetail	1	S			

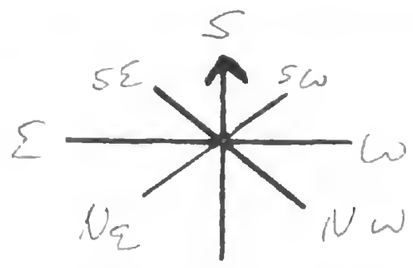


DATE 16 June 64
Pg.# 5

time	species	#	dir.	hgt.	remarks	loc.
1855	Wedgetail	2	SE			
Ended observations at 1910						

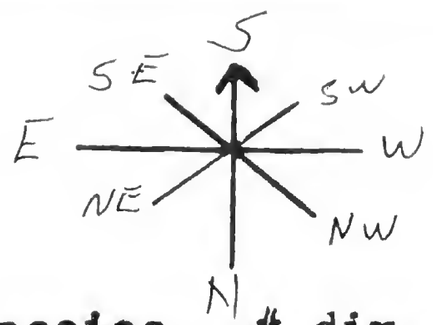
2·1
1·1
1/
135
158

336



DATE 17 June 64
Pg.# 1

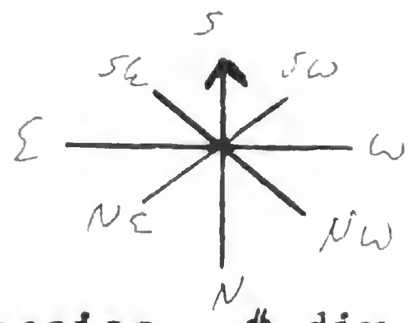
time	species	#	dir.	hgt.	remarks	loc.
0602	wedgetail S.	1			seen by watch	
0605	begin observations					
0615	shear/petrel	1	SW			
0620	Sooty Tern	1	E			
0621	Shear/petrel	1			seen by watch	
0624	Wedgetail	1			"	
0710	Wedgetail	1			"	
0715	~~Bonin Is P.~~	1				
0734	~~Bonin Is P~~	2	SW			
0742	Wedgetails	1				
0759	Sooty Tern	2				
0800	Wedgetail	3			seen by watch	
0814	~~Dark-rumped~~ Petrel	2	N		both molting	
0816	petrel	1	N			
0826	~~Bonin Is P~~	6				
	Dark-rumped P.	2	S		travelling flock	
0845	Dark-rumped P.	1	S		new plumage	
0851	Shear/petrel	1	N			
0902	Bonin Is P	2	NW		new plumage	
0904	Bonin Is P	1	N			
0906	Dark-rumped P.	1	S		molting	
0915	~~Bonin Is P.~~	1	NW		new plumage	
0920	Harcourts S.P.	1	NW			
0922	Bonin Is P.	1	SW			
1017	White-necked Petrel	1	NW		molting	
1037	Red-tailed T.B.	1				
	Fairy Tern	1	S	50 Ft		
		1		25 Ft		
1042	Petrel sp	1	SE			
1048	White-necked P.	1	-		sitting on water, molting	
1125	white-necked P	1				
1130	Wedgetail S	2	-		very dark.	
1132	Wedgetail S	1	SW			
1155	Shearwater Petrel	1	W			
1334	Bulwer's P.	1	S			
1440	Dark rumped P	1	SW			
1439	Bulwers P	1	S			



DATE 17 June 64
Pg.# 2

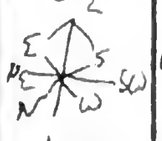
time	species	#	dir.	hgt.	remarks	loc.
1500	Bulwers P	1			identified by crew member	
	Wedgetail S	2			Darkphase.	
1530	Bonin Is P	1	SW			
1533	Harcourts S.P.	1	S			
1550	Petrel sp	1	N			
1612	White-necked P	1	N			
1617	petrel/shear	1	N			
1620	Sooty Tern	25	±4		feeding flock	
	White Nodal P	1+				
	Dark-rumped P	2+				
	Wedgetail	6+			all dark	
	Bonin Is P	6+				
1706	Shearwater sp	9±2			feeding flock	
1712	Sooty tern	3				
	Dark Rumped Petrel	2				
	wedgetail shearwater	5±1			feeding flock (Wedgetails dark)	
1714	Tropicbird sp?	2			Identified by crew member	
1739	Bonin Is P.	1	W			
1812	Bonin Is P	1			sitting on water, molting	
1817	Bonin Is P.	1	NW			
1820	Bonin Is P	1	N			
1825	Dark-rumped P.	1	W		fresh plumage	
1900	end observations					

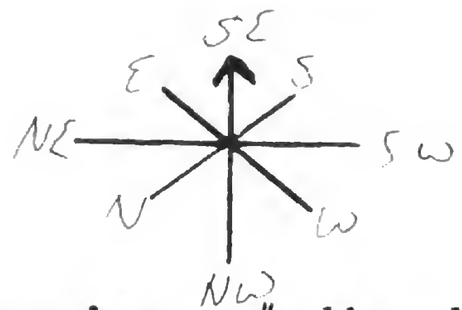
17
23
25
31
14
12
122



DATE 18 June 64
Pg.# 1

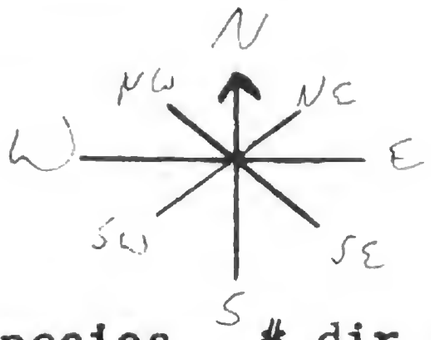
time	species	#	dir.	hgt.	remarks	loc.
0500	Wedgetail S	1			landed on pantail - collected # 0505	
0500	begin observations				dark phase	
0615	Dark-rumped P	1	E			
0620	Wedgetail	6	S		dark - small flock - sitting on water	
0625	Wedgetail	1			dark	
	Sooty Tern	1	E			
0632	Wedgetail	1				
0640	Bonin Is P.	1	E		dark, molting	
0644	Wedgetail S	1	S			
0652	Wedgetail	1	SE		dark	
	Petrel sp	3				
		3			travelling flock seen by watch	
0655	Wedgetail	2	SE			
0658	Dark rumped P	1			dark	
	Wedgetail	1	NE			
0700	Wedgetail	1			dark	
		1	SE			
0715	Wedgetail S	5	Se		dark All dark.	
0717	Bonin Is. P	1	SW			
0732	Dark. rumped Petrel	1	NE		molting	
0815	Dark-rumped P	1	SE			
0832	Shearwater Petrel	1				
0837	Bonin I. P	1	SW			
0849	Bonin Is P	1	S			
0918	Dark-rumped P.	1	NW			
0945	Petrel sp.	1	SE			
1015	Dark rumped P	1	SW			
1032	Bonin Is P	1	NW			
1037	Wedgetail S	1	Ne		molting	
1052	Blue Faced Booby ?	1	Se		Followed along and behind ship for 10-15 min, either immature or molting	
1058	Petrel shearwater	2	Ne			
1120	Dark-rumped P.	2	SW			
1145	Wedgetail	2	SW		dark	
1152	Dark-rumped P	1	SE			
1203	Bonin Is P	1	NE			
1210	Bulwer's P.	1	SE			





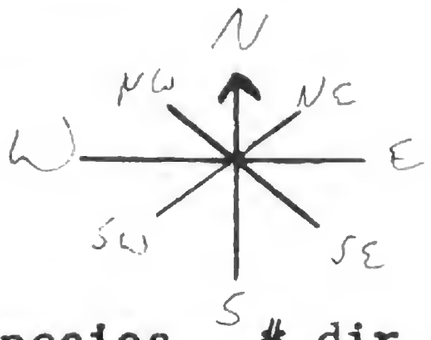
DATE 18 June 64
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1512	Wedgetail	1	E		dark	
1517	Bonin I S P.	1	SW		molting	
1527	Wedgetail	1	SE			
	Newell's S.	2	S		flying close together	
~~1543~~	~~Dark rumped P~~	~~1~~	~~S~~		~~molting~~	
1543	Dark rumped P	1	S		molting	
1609	Sharwater Petrel	1	SW			
1614	Dark rumped P	1	S			
1620	Wedgetail S	1	Se		all dark	
1625	Dark rumped P	1	Se			
1646	Wedgetail S	1	Se		dark	
1709	Wedgetail	2	NE		dark	
1715	Wedgetail	1	NW		dark molting	
1716	Bonin I S P.	2	SW		molting	
1720	Wedgetail S.	1	N		dark	
1742	Bulwers P	1	NW			
1754	Bonin Is P	1	N			
1802	Red tailed T.B.	1	(S)			
	Sooty Tern	1	NW			
	Petrel sp.	1	SE		came within 30 yds of ship, almost at eye level. All dark brown except for light splotches under wings along center. Flew typically petrellike. Bill visible at close range - small & dark. medium - large chunky shaped. dark Harold's P.?	
1850	end observations					



DATE 19 June 64
Pg.# 1

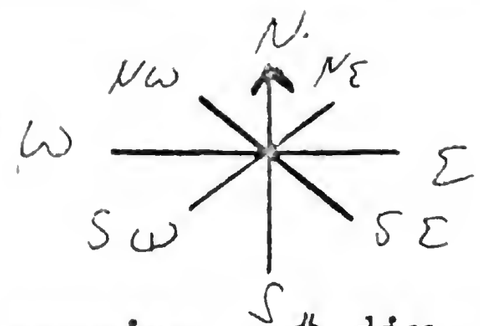
time	species	#	dir.	hgt.	remarks	loc.
0605	Wedgetail	1			Dark	
0610	begin observations					
0628	Bonin Is P.	1	S			
0635	Petrel sp.	1	NW			
0647	Wedgetail	1	N		dark	
0648	Bonin Is P.	1	N			
0658	Bonin Is P.	1	NE			
0715	wedgetail	1	S		dark	
0806	Wedgetails	2	N		dark	
	Shearwater Petrel	1	N			
0815	Wedgetail S	1	W		dark	
0800	Wedgetail	1			light seen by watch	
0817	Wedgetail	1	N		light	
0824	Wedgetail	1	E		light	
	Dark-rumped P.	1	E			
0825	Wedgetail	1	NE		dark	
0829	Dark rumped P.	1	E			
0830	Wedgetail	1	E		light	
0831	Wedgetail	2	E		dark	
0835	Wedgetail	3	E		2 dark, 1 light	
0845	Wedgetail	1	E		dark	
0912	Dark rumped P	1	E			
0917	Wedgetail	1	E		dark.	
0956	Dark rumped P	2	E			
1055	Wedgetail	1	E		dark	
1057	Bonin Is P	1	N		molting	
1132	Dark-rumped Petrel	1	NW		in middle of rain squall	
1135	Bonin Is P.	1	S		not molting	
1154	Wedgetail	1	N		dark	
1158	Shear/petrel	1				
1207	Wedgetails	1	NE		dark	
1214	Wedgetail S	3	NW		all dark.	
1220	Wedgetails	5	NW		all dark	movements more directional than normal
1232	Dark-rumped P. Wedgetail	2	N		molting dark	



DATE 19 June 64
Pg.# 1

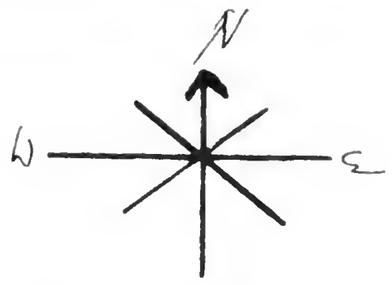
time	species	#	dir.	hgt.	remarks	loc.
0605	Wedgetail	1			Dark	
0610	begin observations					
0628	Bonin Is P.	1	S			
0635	Petrel sp.	1	NW			
0647	Wedgetail	1	N		dark	
0648	Bonin Is P.	1	N			
0658	Bonin Is P.	1	NE			
0715	wedgetail	1	S		dark	
0806	Wedgetails	2	N		dark	
	Shearwater Petrel	1	N			
0815	Wedgetail S	1	W		dark	
0800	Wedgetail	1			light seen by watch	
0817	Wedgetail	1	N		light	
0824	Wedgetail	1	E		light	
	Dark-rumped P.	1	E			
0825	Wedgetail	1	NE		dark	
0829	Dark rumped P.	1	E			
0830	Wedgetail	1	E		light	
0831	Wedgetail	2	E		dark	
0835	Wedgetail	3	E		2 dark, 1 light	
0845	Wedgetail	1	E		dark	
0912	Dark rumped P	1	E			
0917	Wedgetail	1	E		dark.	
0956	Dark rumped P	2	E			
1055	Wedgetail	1	E		dark	
1057	Bonin Is P	1	N		molting	
1132	Dark-rumped Petrel	1	NW		in middle of rain squall	
1135	Bonin Is P.	1	S		not molting	
1154	Wedgetail	1	N		dark	
1158	Shear/petrel	1				
1207	Wedgetail S	1	NE		dark	
1214	Wedgetail S	3	NW		all dark.	
1220	Wedgetail S	5	NW		all dark	Movements more directional than normal
1232	Dark-rumped P. Wedgetail	2	N		molting dark	

47



DATE 19 June 64
Pg.# 2

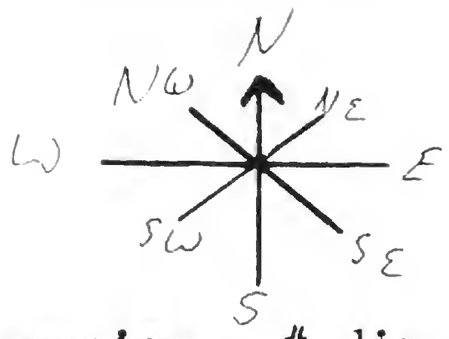
time	species	#	dir.	hgt.	remarks	loc.
1243	Wedgetail	1	NW		dark	movements more directional than normal
	Bonin I. P.	1				
1246	Wedgetail	1	NW		dark	
1248	Wedgetail	1	NW		dark	
1250	Wedgetail	2	NW		dark	
1252	Wedgetail	1	NW		dark	
1255	Wedgetail	1	NW		dark	
1256	Wedgetail	1	NW		dark	
1305	Wedgetail	1	NW		dark - identified by watch	
1323	Wedgetail	2	NW		dark	
1330	Sooty Tern	25±	S			
	Wedgetails	25±	S		all dark but 1 feeding flock	
1347	Wedgetails	35±	S NW			
	Sooty Terns	2±1	NW		all dark wedgetails, fucking flock.	
1355	Wedgetail	1	N		dark	
FP 1420	Dark-rumped P.	1	E			
1500	Petrel Shearwater	1			seen by watch	
1534	Wedgetail	1	E		dark	
1558	Wedgetail	1	SW		dark	
1615	Sooty Tern	2		100ft		
1616	Wedgetail	3/4	N		dark - 3 of 4 showing molt signs	
1617	Bulwer's P	1			seen by watch	
1618	Newells S.	1	S		joined 4 Wedgetails	
FP 1625	Dark-rumped P.	2	N		both molting - one with light rump	
FP 1631	Dark-rumped	1	N			
1635	Skua	1	E		very large clumsy all brown bird, pointed wings, constant slow flapping, white shafts to primaries, upper & lower seen, tail dark, slightly fanshaped, not long. came within 75 yds dark	
1636	Wedgetail	1	NE			
1643	Wedgetail	2	N		dark	
1644	Wedgetail	1	N		light	
1645	Sooty Tern	1	W			
1648	Wedgetail	1	N		light	
1658	Fairy Tern	1	N			
1707	Wedgetail	1	N		dark	
	White-necked P.	1	N		molting	



DATE 19 June 64
Pg.# 3

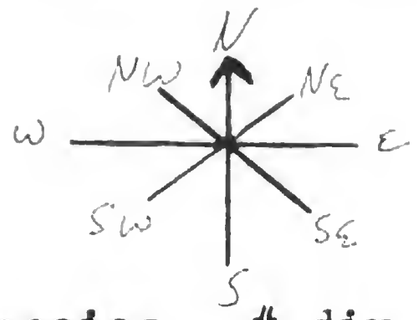
time	species	#	dir.	hgt.	remarks	loc.
1725	Sooty terns	150±	20 Ne	180±		
	Wedgetail S	50±	5		feeding flock	
1727	Fairy Tern	1	Ne			
1732	Sooty Tern	6			1 miniature small travelling flock	
1733	Bonin I. S P	1	NW		resting	
1828	Bonin Is. P	2			Seen by watch	
1850	quiet observations					

210
382



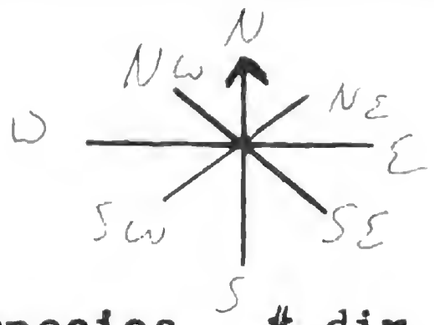
DATE 20 June 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0545	begin observations					
0550	Wedgetail	1	N		light	
0620	Shearwater/Petrel	1			Seen by watch	
0625	white Necked P	1	NW		molting	
0600	Wedgetail	1			behind ship	
0655	Dark rumped P.	1	⊂		molting	
0705	White-necked P.	1	⊂			
0707	petrel sp	2	NW		D.R.P. or W.N.P.	
0734	Dark Rumped P	1	W			
0754	Dark Rumped P	1	S			
0839	Wedgetail S	1	SW		Molting - dark	
0925	Bonin Is. P	1	SE			
0942	White necked P	1	N.		Molting	
0945	Wedgetail S	2	SW		Light Phase	
	White necked P	2	SW			
1010	Newells S.	1	W			
1030	Bulwers P.	1				
1126	Dark-rumped P.	1	NW			
1145	Bonin Is P.	1	NW			
1149	Wedgetail	1			dark - behind ship	
1235	petrel sp	1			D.R.P. or W.N.P.	
1442	Wedgetail	1	N		Dark	
1531	Wedgetail	2	N		light	
1535	Shear/petrel	2	N		Seen by watch	
1536	Bulwers P	1	N			
1542	Dark-rumped P	1	N		molting	
1730	Wedgetail	2	NW		dark	
1742	Shear/petrel	1	SW			
1758	White-necked P.	1	W		molting	
	Bonin Is P	1			"	
1831	Shear/petrel	1	N			
1846	Shear/petrel	1	S			
1855	End observations					



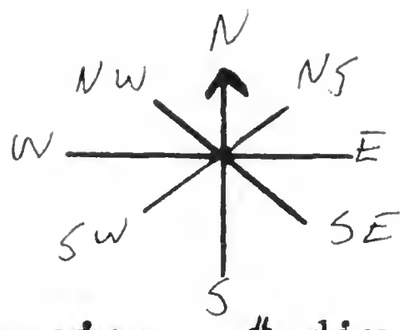
DATE 21 June 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0545	begin observations					
0554	Sooty Tern	3	E	50 Ft above ship	Heard a definite chirp from one.	
0602	Petrel sp	1	N		Probably dark rumped or Bonin Is.	
0629	~~Bonin Is~~ P	1	S			
0641	Petrel sp	1	W		Probably Dark Rumped or Bonin Is.	
0805	~~Dark rumped P~~	1	W			
0915	~~Bonin Is~~ P	1	W			
0928	Wedgetail s	1	E		Light phase.	
1032	Wedgetail	3			light	
	Sooty Tern	3			1 immature } small travelling flock	
	Fairy Tern	1				
1055	Fairy Tern	1	E			
1102	Bulwers P.	1	S			
1222	Bulwers P	1	N			
	Wedgetail S	1	N		Dark phase	
1227	Sooty Tern	15±	4		feeding flock	
	Fairy Tern	1				
1445	Skipjack school seen - no birds overhead - 5-6 lbs. around 50 tons.					
1512	Wedgetail	1	N		Light	
1528	shear/petrel	1				
1608	Wedgetail	1	NW		light	
1621	Wedgetail	1	W		light	
1655	Wedgetail	1			light	
1704	Wedgetail	1	N		light	
1745	Sooty Terns	60±	15	NE	Feeding flock.	
	Wedgetails	25±	5	NE	Light	
1810	Wedgetail	1	N	W		
	Dark rumped P	1	S			
1837	Wedgetails.	3	N		light	
1855	Sooty Tern	50+	5			
	Wedgetail	5			feeding	
1905	end observations					



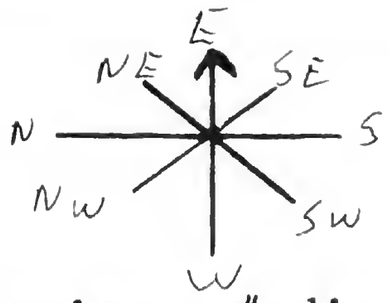
DATE 22 June 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0530	Sooty Tern	30			sighted by engineer from stern	
0510	begin observations					
0552	Sooty Tern	1	N			
0610	Wedgetail	1	S			
0614	Sooty Tern	1	S			
	Shear/petrel	1	S			
0636	Sooty Tern	3	S			
0642	Sooty Tern	1	S			
0714	White-tailed T.B.	1	SE			
0730	Shear/petrel	1			seen by watch	
0753	[redacted]	1	W			
	Fairy Tern					
0831	Wedgetail	1	S		light phase	
0935	Shear/petrel	1	S			
	Sooty Tern	1	S			
0938	Sooty Tern	30	±2			
	Wedgetail	1			feeding	
0954	Sooty Tern	4				
1002	Sooty Tern	2				
1015	Sooty Tern	200	±50		} feeding flock	
	Wedgetail	10	±5			
1033	Wedgetail	5			light ; sitting on water	
1036	Fairy Tern	1	E			
1048	Harcourts S.P.	1	E			
1100	Sooty Tern	90±	20 SE		} Feeding flock	
	Wedgetail	15±	5 SE			
1115	Sooty Tern	1	SE			
1118	Sooty Tern	1	W			
1122	Sooty Tern	1	SE			
1125	Sooty Tern	2	NE			
1130	Sooty Tern	4	SE			
1146	Wedgetails	1	N			
1155	Petrel-Shearwater	1	N			
1210	Sooty Terns	13	N		Feeding	
	Wedgetails	1	N			



DATE 22 June 64
Pg. # 2

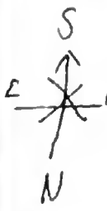
time	species	#	dir.	hgt.	remarks	loc.
1226	Sooty Tern	~~8~~ 9	E		scattered flock	
1241	Bulwer's Petrel	1			flying around glass ball	
1318	Red-tailed T.B.	1	E		adult	
1320	Sooty Tern	10	N		travelling	
1350	Harcourt's S.P.	1	N			
1537	Bulwer's P.	1	S			
1559	~~Bonin Is P.~~	1	N			
1607	Bulwers P.	1	S			
1642	Wedgetail	2			1 dark - identified by First Mate J. Liefting.	
1730	Wedgetail	1	N		light	
1758	~~Bonin Is P~~	1				
1821	Bulwer's P	1	S			
1907	Ended Observations					

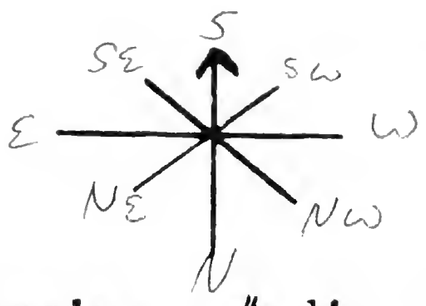


DATE 23 June 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0512	begin observations					
0520	Wedgetail	1			Light	
0547	~~Bonin Is P~~	2	N			
0548	Bulwers P	1			Seen by watch	
0619	~~Wedgetails~~ ~~Bonin Is P~~	1	S		~~Light~~	
0720	Bonin Is P	1				
0655	Wedgetail	1				
	Bulwer's P	1				
0730	Nawell's S.	1			seen by watch	
0735	Wedgetail S	1				
0745	Sooty Tern	2	W			
0829	shear/petrel	1	W			
0900	Tropicbird sp.	1	S			
0925	Bonin Is P.	1	W			
1008	Bonin Is. P	1	SW			
1050	Petrel Shearwater	1	SW			
1100	Bonin Is P	2	SW			
1105	Bonin Is P.	1	SW			
1106	Dark-rumped P.	1	SW		not molting	
1108	Bonin Is P.	1			sitting twice on water - molting heavily	
1310	White-tailed T.B.	1	(9)			
1538	Bonin Is P.	1	E		molting	
1552	Bonin Is P.	1	E			
1602	Bulwers P	1	N			
1722	Bulwers P.	1	S			
1732	Bulwers P.	1	S			
1735	Bulwers P.	2	S			
	Bonin Is P	1			molting	
1810	Harcourts SP.	1	N			
1844	Bonin Is. P.	1				
1845	Sooty Tern	2				
1850	Sooty Tern	2			1905 end observations	

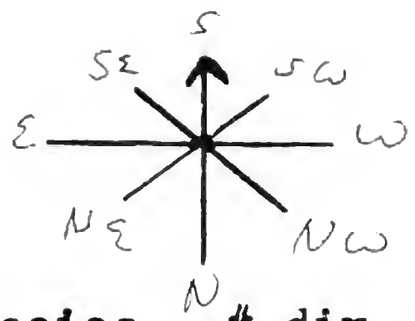
JFP/





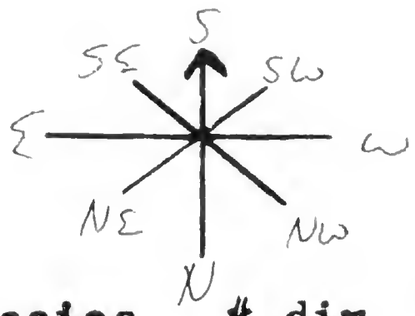
DATE 24 June 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0550	begin observations					
0600	Newells. S	1	NE			
0605	Jaegers sp?	1	E		large, clumsy bird size of Skua, brown above underparts white with brown breast band, underwings mottled brown. Pointed wings, short neck, head appeared to have much white on it. Constant jaegerlike flapping - no glides. Fairly close - well seen. Tail not long as Pom. Jaeger.	
0742	Bonins P.	1	N			
0858	Bulwer's P	1				
0916	Wedgetail	1				
0932	Wedgetail	1	S		light	
0940	Bonins P	1	"		"	
0953	Red-tailed T.B.	3	E		short tails	
1007	Tropicbird sp	2				
1015	Tropicbird sp	1				
1940	Bonins P	1	S			
1445	Shearwater Pet sp	1	SW			
1450	Sooty Terns	8	E		Feeding Flock	
1510	Wedgetail sp	1	SW		Light	
1518	Petrel/Shearwater	1	W			
1530	Sooty Tern	1	W			
1600	White-tailed Tropicbird	1	E			
1629	Sooty Tern	1	E		tried at but missed	
1710	Petrel Shearwater	1	W			
1724	w/edgetail	1	NW			
1810	Bonins P	1	S			
1845	end observations					



DATE 25 June 64
Pg.# 1

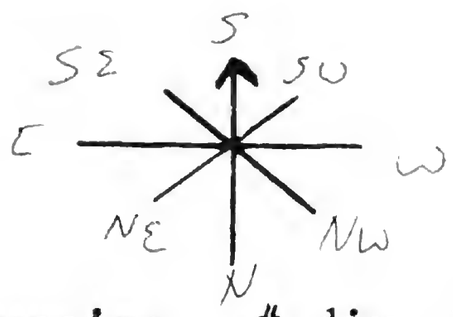
time	species	#	dir.	hgt.	remarks	loc.
0537	begin observations					
0546	Bonins P	1	N			
0604	Dark-rumped P	1	W		New plumage? from a distance it showed up ~~very~~ white	
0612	Sooty Terns	20±	S			
	~~Dark-rumped or Bonin?~~ Ls P. Shear/petrel	30±	5 W		Feeding flock - The birds were a long ways out, but they were all white underneath with a more clear cut distinction between white and dark than is shown on a wedgetail, also they had tighter and steeper arcs and banks.	
0621	~~Harcourts storm~~ P	1	NW			
0635	Wedgetail	1	W		Light	
0640	Shearwater - Petrel	2	S		Seen by watch	
0658	Shearwater - Petrel	1	SW			
0715	~~Sh~~ Petrel sp	5	SW		Feeding flock, either Bonin Is, or Dark rumped Petrel	
0722	Dark rumped P	1	W			
0810	Petrel sp	3				
0820	petrel sp	1			seen by watch	
0843	petrel/shear	1	S		"	
0846	Dark-rumped?	1	N		molting	
0847	petrel sp	1				
0848	White-necked P	1	N		molting	
0850	white necked P	1	N		"	
0853	Bonin Is P	1	W		"	
0855	petrel sp	1			DRP or WNP	
0900	Newell's S	1				
0902	Dark rumped P	1	W		molting	
0910	Petrel sp.	2	W			
0911	White-necked P	1	NW		molting	
0913	petrel sp	1	NW			
0915	shear/petrel	1	SW			
0918	Red-tailed T.B.	1	9			
0929	Sooty Shear	1	NW		silver linings sea	
0931	Petrel sp	1	NW		DRP or WNP	
0934	White-necked P.	2	≈		molting	
0955	~~Dark rumped~~ P	3	SW			
	Wedgetail	1	SW			
1000	Petrel - Shearwater	1	S			
1012	Bulwer's Petrel	1	NW			
1028	Wedgetail	1	S		light	



DATE 25 June 64
Pg.# 2

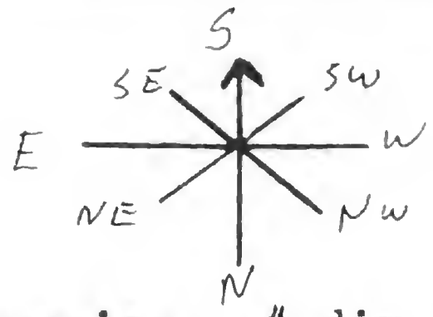
time	species	#	dir.	hgt.	remarks	loc.
1107	Shear/petrel	2				
1303	Shearwater-Petrel	1	S		Seen by watch	
1312	~~Dark-rumped~~ P	1	SW			
1325	~~white-necked~~ P	1	NW			
1337	Wedgetails	1			Light	
1340	Wedgetails	1			Light	
1344	Wedgetails	1			Light	
1347	Wedgetail	1			Light	
1447	Bulwers P.	1				
1452	Sooty Terns	8				
	Wedgetail	2				
	~~Dark-rumped~~ P	3			small feeding flock	
	Bonin Is P.	1				
	White-necked Petrel	2				
1502	White-necked Petrel	1	W		moulting	
1515	Bonin Is P	1			sitting on water, moulting	
1420	Red-tailed T.B.	1			seen from stern	
1545	Bonin Is P	1	W			
	Dark-rumped	1	W			
1546	Sooty Terns	300±	100 W			
	Shearwater sp Petrel	200±	100 W		Probably wedgetails, feeding flock	
1550	White-necked P	1	NW			
1552	~~Petrel sp~~.	2	NW		DRP or WNP	
1556	Shearwater-Petrel	1	SW		Seen by watch	
1601	Shearwater Petrel	2	SW			
1625	Sooty Terns	30±	5 W		Feeding flock.	
	Petrel-Shearwater	15±5	W			
1634	Wedgetail	1	NW		Light	
1715	Bonin Is Petrel	1	W			
1720	Wedgetail	1	SW		Light	
1747	Bonin Is P.	1	SW		~~sitting~~	
1752	Bonin Is P.	1	W			
1753	Wedgetail	1	NW		Light	
1845	and observation					

15
12
14
10
17
358
257
+ 3
683



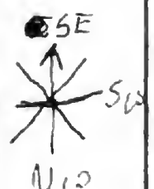
DATE 26 June 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0535	begin observations					
0552	Newell's Shear	1	E		primaries missing on both sides - molting?	
0605	Dark-rumped Petrel	1	SE			
0609	Dark rumped P.	1	S			
0611	Dark rumped P.	1	S			
0612	Dark rumped P	3	⌒			
	White-necked P	1	⌒		behind ship	
0615	White-necked P	2	⌒		behind ship	
0617	Dark-rumped P	1	∩			
0618	Dark-rumped P.	1	-			
0619	~~Dark~~ White-necked P	1.			landed in water 100 ft from ship and started to chew on fish or squid just below surface. Dipped head off again pink legs & black lower 2/3 of feet clearly visible, also bill. Not molting - plumage fresh	
0620	Petrel sp.	2+				
0630	Scooty Tern	4				
	Wedgetail	2+			feeding flock	
	Shearwater/ Petrel	25	±5			
0632	Petrel sp	6	S		travelling	
0634	Dark-rumped P	1	S			
0642	Wedgetail	1	S		dark	
0645	petrel sp	1	-			
0650	Petrel sp	1	S			
0709	Bonin Is P.	1	SW		molting - landed on water	
0712	Bonin Is P	1	NW		new plumage, not molting	
0725	Bonin Is P.	1	W		" " " "	
0728	petrel/shear	2	N			
0731	Dark-rumped P	1	W			
0732	Newells S.	1	W			
0733	Red-tailed T.B.	1				
0758	Bonin Is P	1	S		sat in water astern of ship	
0820	Petrel sp.	1	SW			
0846	Bonin Is P	1	S		was sitting in water ~~off~~ bow	
0852	white necked P	1	S			
0853	Dark rumped P	1	SW			
0902	Dark rumped P	1	NW		was sitting on water	
0905	Bonin Is P	1	SW		sitting on water - molting	
0922	White necked P	1	S			
0931	white necked P	1	NW			
0941	Tern sp ?	1	E		The bird had a tern like flight with somewhat pointed wings. The head was all dark with a lighter bill. Flew about 75 ft above stern of ship, heading directly East. Bill was straight and somewhat lighter at base	



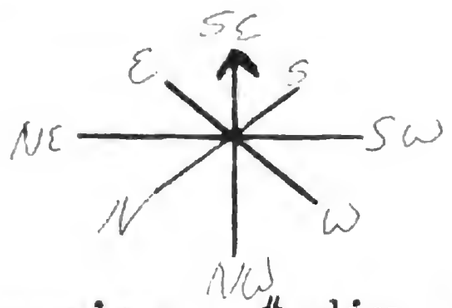
DATE 26 June 64
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
0951	white necked P	1	W			
0952	white necked P	1	E			
1010	Sooty Tern	1	S		immature	
1020	Bonin Is P.	2	S		molting	
1042	Bonin Is P	1	N		"	
1100	Bonin Is P	1	-		" sitting on water	
1135	Bonin Is. P	1	S			
1140	Bonin Is P	2	SW			
1150	Petrel Shearwater	15	SE±5		breeding Flocks	
	Sooty Terns	25±5				
1158	Bonin Is P	1	SW			
1210	Petrel-Shearwater	1	NE			
1215	Dark-rumped P	1	E			
1227	Bonin Is P	1	S			
1233	Bonin Is P.	1	NW		not molting, new plumage	
1237	Red-tailed T.B.	1	(9)		short tail	
1422	Bonin Is P	1				
1507	Dark-rumped P.	1	SW		not molting	
1515	Wedgetail	1	SW		dark - molting	
1517	Bonin Is P.	1	SW		not molting	
1520	petrel/shear	1	SW		seen by watch	
1525	petrel/shear	1	SW			
1529	Wedgetail	1	N		dark	
1532	Dark-rumped P.	1	N			
1535	Bonin Is P.	1	S		not molting	
1656	Dark rumped P	1	SW			
1702	Dark rumped P	1	NE			
1715	White necked P	1	E			
1717	Dark rumped P	1	S			
1720	Shearwater Petrel	1	NE			
1802	Wedgetail S.	1	SE		light!	
1820	Nawell's S.	1			sitting on water	
1930	End observations					



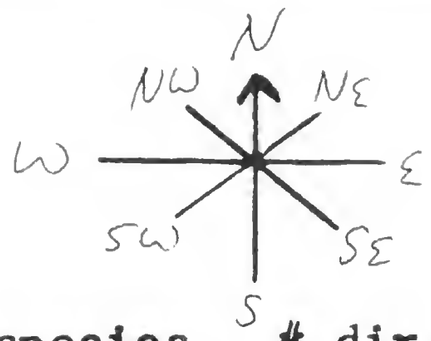
12
19
30
18
10
11
+46

146



DATE 27 June 14
Pg.# 1

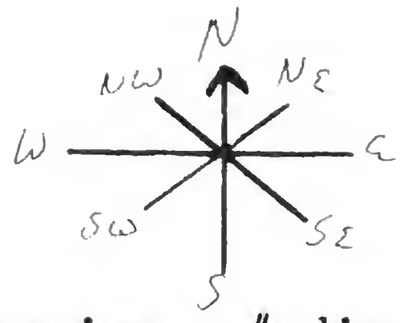
time	species	#	dir.	hgt.	remarks	loc.
0540	begin observations					
0546	Bulwers P	1	SW		Seen by watch	
0558	Dark rumped P	1	E			
0612	white necked	1	E			
0617	Shearwater Petrel	1	S			
0630	Sooty Terns	4	S		feeding	
	Wedgetails	2	S			
0631	Wedgetail	1	SW		dark.	
0634	Wedgetail	2	S		dark	
0637	Sooty Tern	1	N			
0639	Dark rumped P	1	NW			
0641	Dark rumped P	1	NE			
0642	white necked P	1	SW			
0645	Wedgetail	1	W		dark	
	Bonin Is P	2	W			
0650	Petrel sp.	1	SW		either WNP or DRP	
0652	Wedgetail	1	E		dark	
0659	Wedgetail	1	SE		dark	
	Dark rumped	1	SE			
0700	Wedgetail	1	E		dark.	
0702	Bonin Is P	3	SW			
	White necked P	1	SW			
	Shearwater Petrel	1	SW		- may have been Pink-footed S. - flapped more like jaeger - light underneath - underwing mostly light seen by Termite	
0707	Wedgetails	2	N		Dark Phase	
0708	Bonin Is P	1	NE		Seen by Watch	
0709	Sooty Tern	1	SE			
0715	Bonin Is P	2	SW			
0720	Bonin Is P	1	S		seen by watch	
0730	Bonin Is P	3				
0734	Wedgetail	2			dark } seen by watch	
	wedgetail	1			light }	
0742	Dark rumped	2				
0807	Bonin Is P.	1	SW		molting	
0815	Dark rump P.	1	SW		molting	
0845	Bonin Is P.	1	NW			



DATE 27 June 64
Pg.# 2

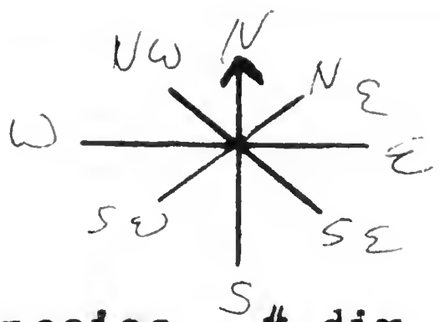
time	species	#	dir.	hgt.	remarks	loc.
0856	Wedgetail S.	1	W		dark	
1000	Bonin Is P	1	NW			
1044	Shearwater Petrel	1	NW		The captain says it was all dark. I just saw the back of it and the back was dark. It was smaller than a wedgetail, about the size of a Bonin Is. P. The captain thinks it is a Christmas Is. S. ?	
1201	White-necked P	1				
	shear/petrel	1	N			
1211	Wedgetail S	1	NW			
1217	Wedgetail S	1	E		dark	
1218	Bonin Is. P	1	W			
1230	Dark-rumped P	2	NE			
1256	Dark rumped P	2	W			
1302	Bonin Is P	1	W			
1347	Bonin Is P.	1				
	Dark rumped P	2	SW			
1402	shear/petrel	1	SW		seen by watch	
1410	Bonin Is P	1	E			
1428	Bonin Is P.	1	N			
1432	petrel sp.	1	W		seen by watch	
1435	Dark-rumped P.	1	SE		molting heavily	
1510	Dark-rumped P.	1	E		"	
1550	Bonin Is P.	1	E		new plumage	
1625	Dark rumped P	1	NE			
1650	Bonin Is P.	1			seen by watch.	
1706	Petrel sp	1	SE			
1720	shear/petrel	1			seen by watch.	
1758	Shearwater Petrel	1	SW			
1830	Dark-rumped P.	1	W		new plumage	
1835	end observations					

21
17
22
17
77



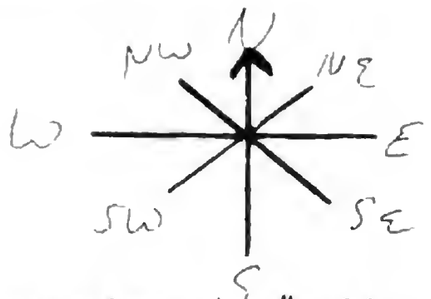
DATE 28 June 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0530	begin observations					
0643	Shear/petrel	1				
0722	~~Bonin Is P~~	1	W		Molting	
	Dark-rumped P.	1			"	
0747	Shear/petrel ~~w/ tropicbird~~	1	W		seen by watch	
0750	shear/petrel ~~w/ tropicbird~~	1	W		Seen by watch	
0802	Bonin Is P	1	W			
0817	Dark-rumped P	1	N		molting	
	White-necked P	1			"	
0830	Petrel sp	1				
0859	Dark-rumped P.	1	NW		"	
0905	Bonin Is P.	1	W			
1012	Bonin Is P	2	W			
1014	Bonin Is P	1	W			
1037	Red-tailed T.B.	1			sitting in water	
1045	Bonin Is P.	1	W		sitting on water	
1052	Shear/petrel	1	W			
1058	Shear/petrel	1	W			
1102	Dark rumped P	1	W			
1144	Bonin Is P	1	W			
1212	Bonin Is P	1	W			
1225	Dark rumped P	1	N			
1256	Dark-rumped P.	1	W			
1313	Dark-rumped P	2	W			
1328	Bonin Is Petrel	1			sitting in water	
1340	Bonin Is P.	1			seen by watch	
1358	Dark-rumped P.	3			"	
1424	~~Sooty~~ Terns	2	NW			
	~~white~~ Shearwater Petrel	1	NW			
1426	Shearwater Petrel	3	SW			
1437	Dark rumped P	1	NW			
1525	Bonin Is. P	1	SE			
1550	Shear/petrel	1	NW			



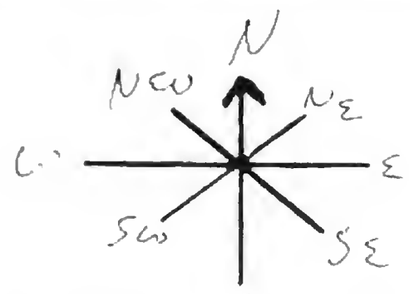
DATE 28 June 64
Pg.# 2

	time	species	#	dir.	hgt.	remarks	loc.
JFP	1612	Dark-rumped P.	1	NW			
JFP	1642	Dark-rumped P.	1			seen by first mate	
JFP	1717	Dark-rumped P	1	NE			
BIP	1719	Bonin Is P	1	NW			
	1723	Bulwers P	1	NW		seen by watch	
JFP	1725	Dark-rumped P	2	NW			
BIP		Bonin Is P	1	NW			
JFP	1721	Dark-rumped	2	NW			
BIP		Bonin Is P	2	NW			
		Storm Petrel sp.	1	NW		either DRP or BIP	
	1735	shear/petrel	1	W			
JFP	1738	Dark-rumped P.	1	W			
JFP	1803	Dark-rumped P.	1	W			
1 JFP/ ORP	1831	Dark-rumped P.	2	S		1 new plumage, 1 molting	
1 JFP	1840	end observations					



DATE 29 June 64
Pg.# 1

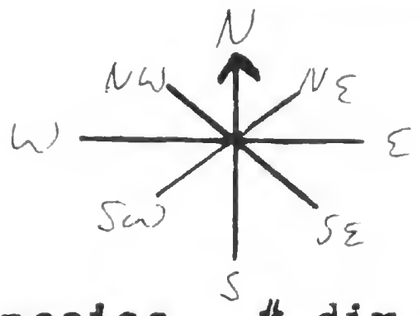
time	species	#	dir.	hgt.	remarks	loc.
0500	begin observations					
0551	Dark rumped P	1	W			
0553	Bonin Is P	1	NW		molting?	
0631	Petrel sp.	1	NW			
0758	Shearwater Petrel	2	NW		seen by watch	
0808	shear/petrel	1	W		seen by watch	
0817	Dark-rumped P.	4			3 sitting on water molting	
0819	Dark-rumped P.	2			1 sitting on water molting	
0831	Dark-rumped P.	1			seen by watch	
0840	Bonin Is P	1	N			
0924	Dark-rumped P	1	W			
0934	~~Dark-rumped P~~ Petrel sp.	2			sat in water - seen by watch	
1051	Dark rumped P	1	SE		molting	
1106	Petrel sp	1	SW			
1151	shear/petrel	1	N			
1156	shear/petrel	1				
1258	Dark-rumped P	~~5~~ 2	N		molting, 1 sitting on water - rest flock scattered	
1305	Dark-rumped P	1			seen by watch	
1315	Wedgetail S.	1	W		dark	
1404	Dark rumped P	1	E			
1440	Dark rumped P	4	E		dark } Feeding - D.R.P. (2) molting	
	Wedgetails	4	E			
	Shearwater Petrel	3	E			
1606	Dark-rumped P.	2	W		molting	
1614	Wedgetail	1	NW		light	
1616	Dark-rumped P	2	N		molting	
	Shear-petrel	1				
1632	Wedgetail	1	E		dark	
1714	Wedgetail	1	NW		dark	
1729	Dark rumped P	1	SW		First seen by 1st mate	
1715	bird sp ~~seen~~	1			seen by engineers - brown, chunky with thick wings small bill. Flapped hard. ?	
1819	Dark-rumped P.	1	N			
1850	end observations					



DATE 30 June 64
Pg.# 1

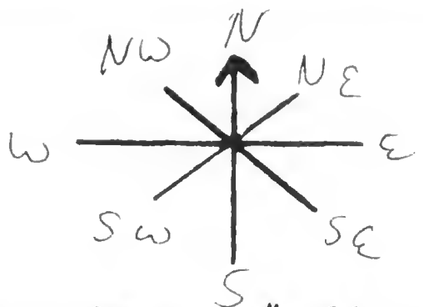
time	species	#	dir.	hgt.	remarks	loc.
0515	begin observations					
0530	Dark rumped P	1	W			
0540	Dark rumped P	1			sitting in water. didn't flush at approaching ship -	
0547	wedgetails.	1	N		Passed 75 yds to port	
0640	shear/petrel	1			light	
0710	Wedgetail	1	E			
0722	Shear/petrel	1	S		light	
0728	Dark-rumpeds	1	N			
0731	Bonin Is P	1	W			
0745	Shear - Petrel	1	W		seen by watch	
0756	Dark rumped P	2	NW			
0802	Bonin Is P	1	NW			
0810	Dark rumped P	1	NW		Sitting on water	
0814	Dark rumped P	1	N		Sitting on water, molting	
	Wedgetail S	1	NW		Light	
	Dark rumped P	1	NE			
0819	Dark rumped	3	N		sitting on water, 2 molting	
0820	Petrel sp.	3	W		sitting on water, never flew	
0830	Shear - Petrel	2	NW		seen by watch	
0835	Dark rumped P	1	NW		Sitting on water.	
0840	Sooty Terns?	100±	10 W		Feeding, long distance off.	
	Shear - Petrel	50±	10 W			
0900	Shear - Petrel	1	NW			
0905	Dark rumped P	1	W			
0906	Wedgetail	2	E		light	
0915	Dark rumped P	4	W		molting, sitting on water	
0916	Wedgetail	2	NW		light	
0917	Dark rumped P	2	NW		sitting on water, Primaries showing when they took off.	
0920	Dark rumped P	1	[illegible]		sitting on water, didn't fly	
0925	Fairy Tern?	1	NW		seen by watch - George said it was small white small bird	
0931	Dark rumped P	1	W		seen by Captain.	
0942	Dark rumped P.	1	NE			
1013	Dark rumped P	4	W		nothing	
1025	Dark - rumped P	1	W		at least 2 on water	
1035	Dark - rumped P	1	W		new plumage	
					molting	

10
14
33
69
104
223



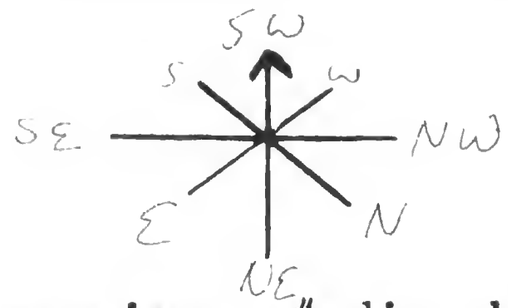
DATE 30 June 64
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1045	Dark-rumped P	1	W		sitting on water - molting	
1051	Dark rumped P	1	W		molting	
1156	Bulwers P	1	NW		seen by watch	
1157	Shearwater Petrel	1	NW			
1300	shear/petrel	1			seen by watch	
1306	shear/petrel	1	W		"	
1316	Shear - Petrel	1	NE			
1410	Bonin Is P.	1	E		not molting	
1415	Sooty Tern	4				
	Wedgetail	4			feeding flock	
1435	Dark-rumped	1	S		molting	
1436	Bonin Is P.	1	W		new plumage	
1500	Wedgetail	1			light	
1501	White-tailed T.B.	1			light.	
1651	Wedgetail	1	E			
1732	Dark rumped P	1	NW			
1746	Dark-rumped P	1	E		molting	
1810	shear/petrel	1	W			
1817	shear/petrel	1	W			
1840	Wedgetail	1	E		dark	
1845	end observations					



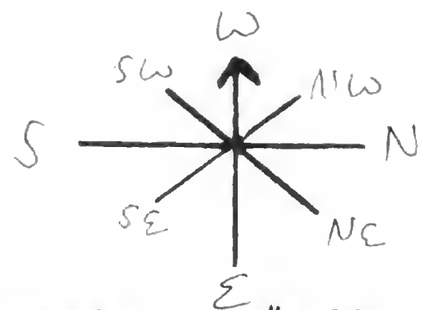
DATE 1 July 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0510	begin observations					
0730	Wedgetail	1	W		light	
0905	Wedgetail	1	SE		light	
0918	Wedgetail	3	W		light	
0931	Wedgetails	3/	S		light - sitting on water	
1108	Bulwers P	1	S		identified by Termite	
1135	Bulwers P	1	S			
1239	Wedgetail	1	N		light	
1446	Petrel - Shearwater	1	W		seen by watch	
1350	Wedgetail	1	W		light	
1706	Red Tailed Tropicbird	1			seen by watch	
1855	end observation					



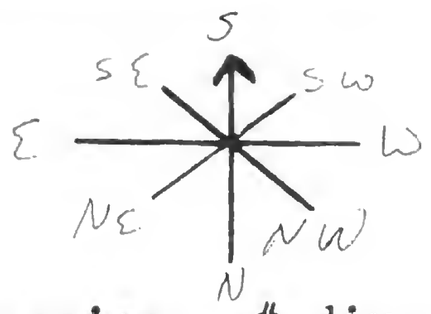
DATE 2 July 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0520	begin observations					
0701	White-tailed Tropic.	2	(N)		Long tails	
0740	Shear/petrel	1	NW		seen by watch	
0853	Bulwers P	1	SE		Looked all dark - long distance out	
0854	Shear/Petrel	1	SE		Light	
1147	Wedgetail	1	W			
1240	Bulwers P.	1				
1250	Wedgetail	1	SE		seen by watch	
14154	Bulwers P	2	SE		seen by Termite	
1501	Bulwers P	1	SW		" " "	
1546	Wedgetail	1	NE		light	
1724	Short-Petrel	1	SW			
1728	Shear/petrel	1	NW			
1754	Bonin I. P	1	NW		new plumage	
1800	Wedgetail S.	1	NW			
1826	Wedgetail S	1	S		Light	
1834	Short-Petrel	1	S		Seen by Watch	
1659	End Observations					



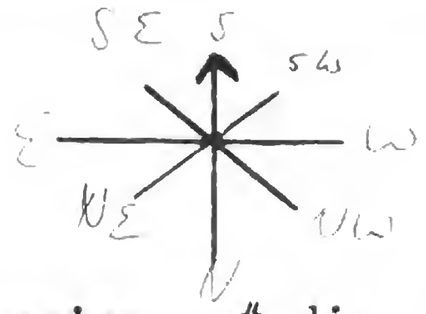
DATE 3 July 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0550	begin observations					
0558	Wedgetail	3	S		light	
0530?	Petrel - Shear	5			seen by watch - not in a flock	
0615	Wedgetail S	3			2 light, 1 dark	
0617	Sooty Terns	2	E			
0650	~~Bonin Is~~ P	1	S			
0710	Bulwers P	1	SW			
0740	Shear - Petrel	4			seen by watch	
1045	Wedgetail	2	SW		Light	
1103	Wedgetails	2	E		Light	
1104	Bonin Is P	1			seen by watch	
1111	Harcourts SP	1	S			
1120	Bulwers P	1	S			
1125	Wedgetail	1	SE		light	
1135	Shear/petrel	1	SE			
1140	Wedgetail	5	SW		light following ship - not flocking	
1141	Bulwers P	1	S			
1205	Frigatebird	2	(9)		1 adult 1 imm.	
1635	Wedgetail	3	(E)			
1655	Wedgetail	1	SE		light	
1700	Wedgetail	1	S		light	
1802	Wedgetails	2	SW		Light	
1830	~~Bonin Isl~~	1	SW			
1920	End Observations					



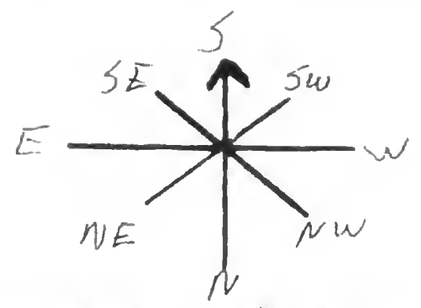
DATE 4-July 64
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
0545	Begin Observations					
0603	wedgetails	3	S		light	
0607	Wedgetail	1			"	
0610	~~Bonin Is P~~	1	W			
0622	Wedgetail	1				
0623	Wedgetail	1			sitting on water	
0625	Wedgetail	2			following ship	
0640	Wedgetail	1			now 5 following ship	
0641	Shear/petrel	1			now 6	
0646	Sooty Tern	1			way off bow - seen by watch.	
0647	Wedgetail	1	N			
0649	~~Bonin Is. P.~~	1			seen by watch	
0656	~~Shear~~/petrel	1	W			
0706	~~Bonin Is P.~~	1	SW			
0715	Wedgetail	3	W			
0725	Sooty Tern	2				
0735	Dark-rumped P.	1			molting - seen by watch	
0740	Wedgetail	1				
0750	Sooty Tern	2	SW		~~Light~~	
0755	Wedgetail	1	S		Light	
0803	Shear - Petrel	1	W		seen by watch	
0807	~~Bonin Is P~~	1	W			
0826	~~Bonins Is P~~	2	SW ½ (S)		one sitting on water	
	Dark rumped P	1	SW			
0830	~~Bonins Is P~~	1	SW			
0845	Wedgetail	4	W		~~light~~ long ways away	
0850	~~Bonin Is P~~	1	S			
0853	Shear - Petrel	1	W		seen by Watch	
0903	Wedgetail	1	SW		Light	
0917	Bulwers P	1	SE			
0932	Shear - Petrel	1	SW		seen by Watch	
0935	~~Bonin Is P~~	1	W			
	Wedgetail	1	W		Light	
0937	Bonin Is P.	1	SW			
0943	Wedgetail	1	SE		light	
0949	Shear/Petrel	1				



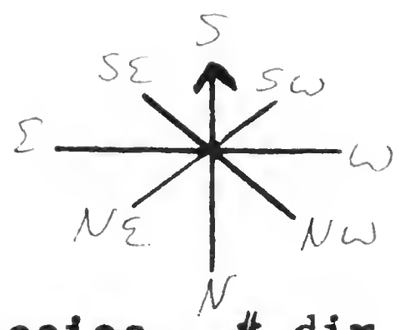
DATE 4 July 64
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
0953	Dark-rumped P.	1	N		new plumage	
0955	Bonin Is Petrel	1	~~S~~ S		molting	
0958	Tropicbirdsp	1	N			
1010	Bonin Is Petrel	1	N			
1012	Bonin Is P.	1	SW		new plumage	
1017	Wedgetail S.	1	S		light	
	Bonin Is P.	1	S			
1022	Shear/petrel	1	E			
1041	shear/petrel	1				
1050	White tailed Tropicbird	1			sitting on water.	
1104	Bonin Is P	1	NE			
1123	Wedgetail	1	W		Light	
1124	Shear-Petrel	1	SW			
1126	Sooty Terns	10	SW		Light } Feeding Flock.	
	Wedgetails	06	SW		Very close to ships	
	Bonin Is P	2	SW			
	Dark rumped P	1				
1135	Wedgetail	1	S		Light	
1140	Wedgetail	1	S		Dark. Very close	
1145	Red Tailed Tropic Bird	1	S			
1150	Bonin Is P	2	SE			
1155	Shear-Petrel	1	W			
1250	Bonin Is P.	1	NE		new plumage	
1420	Sooty Tern	2	SE			
1425	Wedgetail	1	NE		Light	
1442	Wedgetail	2	W		Light	
1450	Wedgetails	2	NE		Light	
1454	Wedgetails	1	W		Light	
1456	Wedgetails	2	S		Light	
1458	Wedgetails	4	W		Light - Sitting in water eating. Ships passed within 30 ft of them before they flew, then they returned to same spot. One of them had something in its bill, looked like a part of a squid?	
1505	Wedgetail	1	SE		Light	
1507	Wedgetail	2	W		Light - Sitting on water, other one kept flying low and skipping butt and bill in water	
1511	Wedgetail	1	W		Light	



DATE 4 July 64
Pg.# 3

time	species	#	dir.	hgt.	remarks	loc.
1517	Wedgetail	1	SW		Light	
1544	Wedgetail	2	S		light	
1615	Red-tailed T-B	1	NE			
1617	Sooty Tern	1	N			
1620	~~Wedgetail~~ Great/petrel	1	W			
1633	Wedgetail	1	S			
1700	Sooty Tern	300	±50		adults + immatures - 1 collected	
	Wedgetail	100	±25		all light 1 collected, band # 615-15018	
	Dark-rumped P.	1			new plumage feeding on 4 or 5 lb skipjack	
	Frigate	1			adult male - collected	
	Fairy Tern	1				
	Pomarine Jaeger?	1				
1720	Sooty Tern	1	S		chasing Sooty Tern	
1735	Sooty Tern	100	±25			
	Wedgetail	50	±25		feeding flock	
	Frigate	2				
1740	Wedgetail	2				
1742	Sooty Tern	1				
1800	Sooty Tern	35	±5			
	Wedgetail	25	±10		feeding flock	
1805	Sooty Tern	3	S			
1807	Wedgetail	2	N			
1811	Wedgetails	~~2~~	S			
	Sooty Tern	3	S			
1814	Sooty Tern	~~250~~	±50		feeding	
	Wedgetail	75	±25			
	Dark-rumped P	1			new plumage	
1818	Sooty Tern	100	±50			
	Wedgetail	50	±25		feeding	
1820	Sooty Tern	1				
1830	Wedgetail	1				
1834	Sooty Tern	3				
1850	Sooty Tern	100	±25			
	Wedgetail	25	±10			



DATE 4 Sept 64
Pg.# 4

time	species	#	dir.	hgt.	remarks	loc.
1854	Wedgetail	1				
1856	Wedgetail	3				
	Sooty Tern	6			travelling	
1900	Sooty Tern	1	S			
1902	~~Bass Is?~~	1	E			
1925	land observation					

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 15 June 64

Time at sunrise 1500 = Position at sunrise = 21°19'N 157°58'W

Time at sunset 1909 = Position at sunset = 20°47'N 157°26'W

Miles traveled from 0000 hours to sunrise = ———

Miles traveled from sunrise to sunset = 44 mi

Miles traveled from sunset to 2400 hours = 32 mi

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

DATE 16 June 64

Time at sunrise 0550 = Position at sunrise = 19°14'N 157°00'W

Time at sunset 1903 = Position at sunset = 17°14'N 157°00'W

Miles traveled from 0000 hours to sunrise = 68 mi

Miles traveled from sunrise to sunset = 120

Miles traveled from sunset to 2400 hours = 50

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 17 June 64

Time at sunrise = 0558 Position at sunrise = 15°38'N 157°00'W

Time at sunset = 1856 Position at sunset = 13°25'N 157°00'W

Miles traveled from 0000 hours to sunrise = 46 mi

Miles traveled from sunrise to sunset = 133

Miles traveled from sunset to 2400 hours = 33

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

DATE 18 June 64

Time at sunrise = 0606 Position at sunrise = 11°40'N 157°00'W

Time at sunset = 1844 Position at sunset = 10°45'N 155°27'W

Miles traveled from 0000 hours to sunrise = 72

Miles traveled from sunrise to sunset = 116

Miles traveled from sunset to 2400 hours = 54

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 19 June 64

Time at sunrise = 0556 Position at sunrise = 4°55'N 154°02'W

Time at sunset = 1842 Position at sunset = 12°57'N 154°03'W

Miles traveled from 0000 hours to sunrise = 46 mi

Miles traveled from sunrise to sunset = 132 mi

Miles traveled from sunset to 2400 hours = 54 mi

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

DATE 20 June 64

Time at sunrise = 0548 Position at sunrise = 13°57'N 154°00'W

Time at sunset = 1851 Position at sunset = 16°02'N 154°01'W

Miles traveled from 0000 hours to sunrise = 56

Miles traveled from sunrise to sunset = 125

Miles traveled from sunset to 2400 hours = 41

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 21 June 64

Time at sunrise ≅ 0541 Position at sunrise = 17° 32' 154° 00'

Time at sunset ≅ 1858 Position at sunset = 19° 47' 153° 56'

Miles traveled from 0000 hours to sunrise = 49 mi

Miles traveled from sunrise to sunset = 135 mi

Miles traveled from sunset to 2400 hours = 36

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

DATE 22 June 64

Time at sunrise ≅ 0534 Position at sunrise = 21° 31' 154° 00'

Time at sunset ≅ 1905 Position at sunset = 23° 32' 153° 53'

Miles traveled from 0000 hours to sunrise = 68

Miles traveled from sunrise to sunset = 126

Miles traveled from sunset to 2400 hours = 37

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 23 June 64

Time at sunrise = 0523 Position at sunrise = 23°31'N 152°16'W

Time at sunset = 1841 Position at sunset = 22°27'N 150°59'W

Miles traveled from 0000 hours to sunrise = 60

Miles traveled from sunrise to sunset = 139

Miles traveled from sunset to 2400 hours = 41

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

DATE 24 June 64

Time at sunrise = 0525 Position at sunrise = 20°42'N 150°56'W

Time at sunset = 1845 Position at sunset = 18°35'N 151°03'W

Miles traveled from 0000 hours to sunrise = 64

Miles traveled from sunrise to sunset = 127

Miles traveled from sunset to 2400 hours = 52

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 25 June 64

Time at sunrise 0532 = Position at sunrise = 16° 56 N

Time at sunset 1817 = Position at sunset =

Miles traveled from 0000 hours to sunrise = 47

Miles traveled from sunrise to sunset = 140

Miles traveled from sunset to 2400 hours = 45

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

DATE 26 June 64

Time at sunrise 0544 = Position at sunrise = 12° 51 N 150°

Time at sunset 1827 = Position at sunset =

Miles traveled from 0000 hours to sunrise = 55

Miles traveled from sunrise to sunset = 133

Miles traveled from sunset to 2400 hours = 55

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 27 June 64

Time at sunrise = Position at sunrise =

Time at sunset = Position at sunset =

Miles traveled from 0000 hours to sunrise = 61

Miles traveled from sunrise to sunset = 109

Miles traveled from sunset to 2400 hours = 40

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

DATE 28 June 64

Time at sunrise = Position at sunrise =

Time at sunset = Position at sunset =

Miles traveled from 0000 hours to sunrise = 58

Miles traveled from sunrise to sunset = 119

Miles traveled from sunset to 2400 hours = 54

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 29 June 64

Time at sunrise = 0522 Position at sunrise = 16°29'N 117°59'W

Time at sunset = 1833 Position at sunset = 18°41'N 120°54'W

Miles traveled from 0000 hours to sunrise = 48

Miles traveled from sunrise to sunset = 123

Miles traveled from sunset to 2400 hours = 42

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

DATE 30 June 64

Time at sunrise = 0525 Position at sunrise = 20°25'N 118°00'W

Time at sunset = 1840 Position at sunset = 22°15'N 121°?'W

Miles traveled from 0000 hours to sunrise = 62

Miles traveled from sunrise to sunset = 111

Miles traveled from sunset to 2400 hours = 54

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 1 July 64

Time at sunrise = 0515 Position at sunrise = 23°51'N 147°56'W

Time at sunset = 1846 Position at sunset = 25°02'N 147°57'W

Miles traveled from 0000 hours to sunrise = 41

Miles traveled from sunrise to sunset = 71

Miles traveled from sunset to 2400 hours = 49

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

45
71
41

DATE 2 July 64

Time at sunrise = 0503 Position at sunrise = 26°32'N 147°55'W

Time at sunset = 1857 Position at sunset = 25°12'N 150°35'W

Miles traveled from 0000 hours to sunrise = 41

Miles traveled from sunrise to sunset = 165

Miles traveled from sunset to 2400 hours = 44

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 3 July 64

Time at sunrise = 0524 Position at sunrise = 25° 00'N 152° 36'W

Time at sunset = 1915 Position at sunset = 24° 57'N 155° 22'W

Miles traveled from 0000 hours to sunrise = 74

Miles traveled from sunrise to sunset = 150

Miles traveled from sunset to 2400 hours = 49

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

DATE 4 July 64

Time at sunrise = 0543 Position at sunrise = 24°47'N 157°00'W

Time at sunset = 1917 Position at sunset = 22°28'N 157°00'W

Miles traveled from 0000 hours to sunrise = 52

Miles traveled from sunrise to sunset = 139

Miles traveled from sunset to 2400 hours = 28

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

SI-MNH-955b
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS

AT SEA SURVEY CHART B

DATE 5 July 64

Time at sunrise = 0559 Position at sunrise = 21°18'N 157°[illegible]W

Time at sunset = 1700 Position at sunset = 21°19'N 157°[illegible]W

Miles traveled from 0000 hours to sunrise = 58

Miles traveled from sunrise to sunset = 6

Miles traveled from sunset to 2400 hours =

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

DATE_____

Time at sunrise = Position at sunrise =

Time at sunset = Position at sunset =

Miles traveled from 0000 hours to sunrise =

Miles traveled from sunrise to sunset =

Miles traveled from sunset to 2400 hours =

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

June 1964 B. C. F. Townsend Cromwell Cruise

The June 1964 Townsend Cromwell cruise was the fifth of a series of cruises run by the U. S. Fish and Wildlife Bureau of Commercial Fisheries covering a fixed grid to the east of the main Hawaiian Islands for the purpose of determining variations in structure of the water masses and currents of this area.

Pacific Project personnel have taken part in four of these cruises. On the June cruise Project personnel maintained daily sunrise to sunset bird observations for a total of 256.2 hours. In addition Project personnel aided on recording weather observations and in taking bathythermograph traces. Project personnel included Warren King and Dayle Husted.

Upon availability of oceanographic data, an attempt will be made to correlate bird distribution with prevalent oceanographic conditions of the cruise.

Warren King
Research Assistant
U. S. National Museum

SPECIES ACCOUNT

Black-footed Albatross

Only one of this species was seen in the grid area in June, several miles outside of Pearl Harbor. It did not follow the ship.

Wedgetailed Shearwater

Numbers of this species decreased 40% from 1637 in May to 985 in June. Molt was noted on the dark, southern population birds. The decline in numbers of this species in June is accounted for mainly by the relative paucity of dark phase birds in the southern part of the grid. The dark phase birds also penetrated farther north than previously reported, to 17°N, and were distributed more diffusely. Two of this species were collected. One, taken 150 miles north of Oahu on 4 July, was banded on Popoia Island, Oahu on 8 May 64.

Sooty Shearwater

One of this species was seen on 25 June heading northwest, no doubt a straggler, since this species' northward migration ended a month previous to this date.

Newell's Shearwater

Numbers of this species decreased 77% from 66 in May to 15 in June, presuming a concentration of this species more local to its nesting areas.

Bonin Island Petrel

Numbers of this species increased 155% from 69 in May to 176 in June. Molt was noted in more than 80% of these birds. The species

was distributed throughout all but the northern end of the grid area, indicating a northward spread from its May distribution. Many of this species, in every case molting birds, were observed sitting on the water.

Dark-rumped Petrel

Numbers of this species increased 42% from 131 in May to 186 in June. A northward trend in distribution was noted, with relatively fewer birds seen in the southern corners of the grid. Over 90% of the birds seen south of 20°N were still undergoing heavy molt, whereas 90% of the birds north of 20°N had new plumage, thus lending further support to the theory that the birds seen in the southern portion of the grid are from the Galapagos Island population. Many of the molting birds were observed sitting on the water.

White-necked Petrel

This species increased 9% in number from 34 in May to a June total of 37. This slight increase was accompanied by a northward trend in distribution, up to 16°N. Molt was noticed on all birds of this species again this month. Many of this species were observed sitting on the water.

Harcourt's Storm Petrel

This species declined 89% in number from 64 in May to 7 in June. The species' distribution was, as in the past, random over most of the grid area.

Bulwer's Petrel

This species decreased 72% in number from 178 in May to 50 in June, due undoubtedly to a localization of the species' distribution during breeding season nearer the breeding areas.

Red-tailed Tropicbird

This species decreased in numbers 40% from 25 in May to 15 in June. As in past months, distribution of this species remains relatively random throughout the grid area.

White-tailed Tropicbird

The 71% decrease in numbers from 24 in May to 7 in June can be accounted for to a large extent by the fact that the May cruise passed within sight of a nesting area of this species on Maui. As in previous months no concentrations of this species were noted.

Blue-faced Booby

Only one of this species, an immature, was seen in June, at the southern end of the grid area, where the species has appeared in past cruises.

Brown Booby

One of this species, an adult, was observed perched on a buoy at the mouth of Pearl Harbor.

Red-footed Booby

Due to the fact that the ship passed during darkness the area where the great majority of this species is usually seen, the area just north of Oahu, numbers decreased 91% from 108 in May to six in June. These six were seen just south of Oahu.

Great Frigatebird

Six of this species were seen in the grid area in June, a 45% reduction in numbers from 11 in May. All were seen within 300 miles of land. One of this species, an adult male, was collected.

Sooty Tern

Numbers of this species decreased 23% from 3117 in May to 2413 in June. The largest concentration of this species was again found within 150 miles of Oahu where large flocks, at least half of which were composed of this species, were encountered. One of this species was collected. It disgorged a fresh, undigested squid from its craw. It was taken at 1700 on 4 July from a feeding flock, indicating a diurnal surface availability of squid in this area.

Noddy Tern

Twenty-three of this species were seen in June, all just south of Oahu.

Fairy Tern

Numbers of this species increased 157% from 7 in May to 18 in June. Most of these were seen within feeding flocks of Sooty Terns and Wedgetailed Shearwaters. One was observed diving just under the surface for fish in a manner similar to that which Sooty Terns employ during diurnal feeding. All were observed in the western half of the grid area.

Skua

One of this species was carefully observed on 19 June at close range.

Pomarine Jaeger ?

Two birds, thought to be this species, were observed in June. One was seen chasing a Sooty Tern in the middle of a feeding flock.

TABLE I

Date		Minutes of Observation	Miles Covered
June	15	249	44
	16	793	120
	17	778	133
	18	750	116
	19	766	132
	20	783	125
	21	797	135
	22	811	126
	23	798	139
	24	800	127
	25	785	140
	26	767	133
	27	762	109
	28	777	119
	29	791	123
	30	805	111
July	1	811	71
	2	834	165
	3	831	150
	4	814	139
Total	20	15310	2457
Average		765.5	122.9

TABLE II

Date	Total Birds	Total Sightings	Birds/Sighting	Birds/ Mile	Total Flocks	Total Birds in Flocks
June 15	137	60	2.28	3.11	6	44
16	338	57	4.53	2.82	5	261
17	122	48	2.54	.92	4	67
18	71	45	1.58	.61	3	17
19	382	66	5.79	2.89	5	298
20	37	29	1.28	.29	0	0
21	187	22	8.50	1.39	4	163
22	458	39	11.74	3.63	8	414
23	37	29	1.28	.27	0	0
24	31	21	1.48	.24	1	8
25	683	58	10.78	4.88	5	618
26	146	64	2.28	1.10	3	77
27	77	52	1.48	.71	2	11
28	57	40	1.43	. 48	0	0
29	51	28	1.82	.41	1	11
30	223	50	4.46	2.01	2	158
July 1	15	10	1.50	.21	0	0
2	18	16	1.13	.11	0	0
3	44	22	2.00	.29	0	0
4	1360	87	15.63	9.78	9	1250
Total	4474	843	-	-	58	3397
Average	223.7	42.2	4.18	1.81	2.9	169.9

TABLE III

Date	Procellariids	Tropicbirds	Terns	Boobies	Frigatebirds
June 15	48	1	82	7	0
16	168	0	169	0	1
17	87	3	32	0	0
18	67	1	2	1	0
19	193	0	188	0	0
20	37	0	0	0	0
21	53	0	134	0	0
22	50	2	406	0	0
23	29	2	6	0	0
24	13	7	10	0	0
25	323	2	358	0	0
26	113	2	30	0	0
27	71	0	6	0	0
28	54	1	0	0	0
29	50	0	0	0	0
30	117	1	105	0	0
July 1	14	1	0	0	0
2	16	2	0	0	0
3	40	0	2	0	2
4	428	4	923	0	3
Total	1971	29	2453	8	6
Average	98.6	1.5	122.7	.4	.3

TABLE IV

PROCELLARIID BREAKDOWN

Date	Black-footed Albatross	Wedgetail	Newell's Shearwater	Dark-rumped Petrel	White-necked Petrel
June 15	1	45	1	0	0
16	0	135	4	4	0
17	0	23	0	12	5
18	0	32	2	12	0
19	0	165	1	12	1
20	0	11	1	5	6
21	0	44	0	2	0
22	0	38	0	0	0
23	0	3	1	1	0
24	0	4	1	0	0
25	0	12	1	14	10
26	0	6	3	18	10
27	0	17	0	17	4
28	0	0	0	23	1
29	0	8	0	27	0
30	0	14	0	33	0
July 1	0	11	0	0	0
2	0	5	0	0	0
3	0	23	0	0	0
4	0	389	0	6	0
Total	1	985	15	186	37
Average	.05	49.3	0.8	9.3	1.9

TABLE IV cont.

Date	Bonin Island Petrel	Bulwers Petrel	Storm petrel	Miscellaneous and unidentified Procellariids
June 15	0	1	0	0
16	11	11	0	3
17	25	3	2	17
18	10	2	0	9
19	9	1	0	4
20	3	2	0	9
21	2	2	0	3
22	2	4	2	4
23	14	7	1	2
24	4	1	0	3
25	8	2	1	275
26	19	0	0	57
27	22	1	0	10
28	16	1	0	13
29	2	0	0	13
30	4	1	0	65
July 1	0	2	0	1
2	1	5	0	5
3	3	3	1	10
4	21	1	0	11
Total	176	50	7	514
Average	8.8	2.5	.4	25.7

B. C. F. TOWNSEND CROMWELL July 1964 CRUISE

The July 1964 Townsend Cromwell cruise was the sixth of a series of cruises run by the U. S. Fish and Wildlife Bureau of Commercial Fisheries covering a fixed grid to the east of the main Hawaiian Islands for the purpose of determining variations in the structure of water masses and currents of this area.

This is the fifth cruise in which Pacific Project personnel have taken part, maintaining daily sunrise to sunset bird observations for a total of 244.8 hours. In addition Project personnel aided in recording weather observations and in taking bathythermograph traces. Project personnel included Warren King and Dayle Husted.

Warren L. King
Research Assist.
Pacific Project

SPECIES ACCOUNT

Wedgetailed Shearwater

Numbers of this species decreased 18% in number from 985 in June to 807 in July. South of 16°N dark phase birds predominated, and north of 16°N chiefly light phase birds were seen. Light phase birds were concentrated in areas closer to the islands than previously noted. The largest concentrations of dark-phase birds were still found at the southern end of the grid area.

Christmas Island Shearwater

One of this species was positively identified on 26 July. A second bird was tentatively identified as this species on 21 July.

Newell's Shearwater

Numbers of this species increased 40% from 15 in June to 21 in July. This species was concentrated in the area of the grid near the islands and in the southern end.

Kermadec Petrel

Three of this species, all dark phase, were positively identified in the grid area in July, and two more were tentatively identified. This is the first occurrence of this species in the grid area.

Bonin Island Petrel

Numbers of this species decreased 34% from 176 in June to 116 in July. This species was distributed fairly randomly over all but the northeastern

corner of the grid area. This species completed its post breeding molt during July, as evidenced by the preponderance of birds seen in July with immaculate new plumage.

Dark-rumped Petrel

This species increased 227% in number from 186 in June to 609 in July. By the end of the month most birds seen had finished molting. This species was distributed throughout the grid area except for the northwest corner. Several feeding flocks composed exclusively of this species were noted. Two birds were observed catching flying fish. Five of this species were collected, all of which were molting. One, collected in the afternoon, had a fresh squid in its craw. Three of the birds were losing brood patch feathers and the reproductive organs of these birds were beginning to enlarge, indicating that they are possibly just preparing to breed. This suggests an August breeding season for the birds of this species appearing in the grid area. Study of the collected specimens should reveal the land base of these birds.

White-necked Petrel

Thirty-eight of this species was seen in July, one more than in June. This species was seen as far north as 22°N, and was invariably in the company of Dark-rumped Petrels. One of this species was collected. It was molting heavily.

Bulwer's Petrel

Fifty-eight of this species were seen in July, a 16% increase over the 50 seen in June. Almost all of these were observed close to the

Bulwer's Petrel con't.

islands. Twenty-eight were seen within a period of one-half hour during the evening of 13 July, all heading toward Lanai, less than ten miles distant.

Harcourt's Storm Petrel

Only two of this species were seen in the grid area, both toward the southern end. This species has steadily decreased in numbers in the grid area from a peak of 129 birds in April.

Red-tailed Tropicbird

Numbers of this species increased 47% from 15 in June to 22 in July. This species was fairly randomly distributed throughout all but the south-eastern corner of the grid area. Two very young birds were seen, both heavily vermiculated on the back and lacking central retrices altogether.

White-tailed Tropicbird

This species increased in numbers 57% from seven in June to eleven in July. All of these were seen in the northern half of the grid area.

Brown Booby

Two of this species were seen on 1 August heading toward Moku Manu, only fifteen miles distant.

Red-footed Booby

Seventeen of this species were observed in July. All but one of these were seen in the vicinity of Oahu. The other, an immature, was seen 400 miles northeast of Oahu, further from land than any Red-footed Booby seen thus far in the grid area.

Great Frigatebird

Numbers of this species increased 133% from six in June to fourteen in July. All were observed within 400 miles of Oahu.

Sooty Tern

Sooty Terns increased in numbers in July to 2555, a 5% gain over the 2413 seen in June. Concentrations were heaviest just south of Oahu and in an area from 275 to 325 miles northeast of Oahu. Immature birds were seen often, usually in flocks or accompanied by an adult, but on two occasions immature birds were observed flying alone. In the southern half of the grid area birds were seen changing to adult plumage.

Noddy Tern

Three hundred eight of this species were seen in July, all within sight of Oahu. Four were seen on one occasion perched on a small floating branch. As the ship approached Oahu on 1 August, Noody Terns far outnumbered Sooty Terns for the first time during these cruises, indicating that the majority of Sooty Terns breeding in the area had completed their breeding cycles and had dispersed, while the Noddy Terns were still raising chicks.

Fairy Tern

Numbers of this species increased 28% from 18 in June to 23 in July. All were seen within 400 miles of Oahu.

Shorebird sp.

On 19 July an all brown shorebird circled the ship twice. It may possibly have been a Golden Plover. This was the first shorebird to have been seen in the grid area since the April cruise.

TABLE I

Date	Minutes of Observation	Miles Covered
July 13	314	51
14	789	125
15	774	145
16	754	140
17	764	127
18	777	137
19	791	118
20	784	121
21	792	122
22	783	130
23	770	141
24	753	138
25	763	120
26	773	125
27	785	126
28	797	144
29	814	159
30	808	89
31	809	142
Aug. 1	300	68
Total	14685	2468
Average	734.3	123.4

TABLE II

Date	Total Birds	Total Sightings	Birds/ Sighting	Birds/ Mile	Flocks	Total Birds in Flocks
July 13	944	51	18.51	18.51	6	869
14	196	60	3.27	1.57	4	114
15	140	45	4.22	1.31	4	132
16	171	44	3.89	1.22	1	116
17	17	15	1.13	.13	0	0
18	283	44	6.43	2.07	4	225
19	382	48	7.96	3.24	4	323
20	910	33	27.58	7.52	7	879
21	206	36	5.72	1.69	5	167
22	427	62	6.89	3.28	12	348
23	138	37	3.73	.98	3	89
24	57	37	1.54	.41	2	18
25	204	59	3.46	1.70	2	120
26	27	23	1.17	.22	0	0
27	37	25	1.48	.29	1	5
28	147	23	6.39	1.02	5	126
29	217	14	15.50	1.36	1	200
30	17	13	1.31	.19	1	5
31	81	22	3.68	.57	3	58
Aug. 1	368	123	2.99	5.41	4	138
Total	4969	814	126.85	52.69	69	3932
Average	248.5	40.7	6.34	2.64	3.5	196.6

TABLE III

Date	Procellariids	Tropicbirds	Terns	Boobies	Frigatebirds
July 13	206	0	726	11	1
14	196	1	87	0	3
15	152	0	38	0	0
16	117	0	54	0	0
17	16	1	0	0	0
18	199	3	81	0	0
19	185	4	191	0	1
20	242	2	663	0	3
21	67	2	135	0	2
22	150	3	273	1	0
23	55	0	83	0	0
24	49	0	8	0	0
25	194	0	10	0	0
26	23	0	4	0	0
27	35	1	1	0	0
28	74	3	70	0	0
29	57	4	156	0	0
30	5	6	5	0	0
31	31	3	43	0	4
Aug. 1	100	3	258	7	0
Total	2153	36	2886	19	14
Average	107.7	1.8	144.3	1.0	0.7

TABLE IV

Procellariid Breakdown

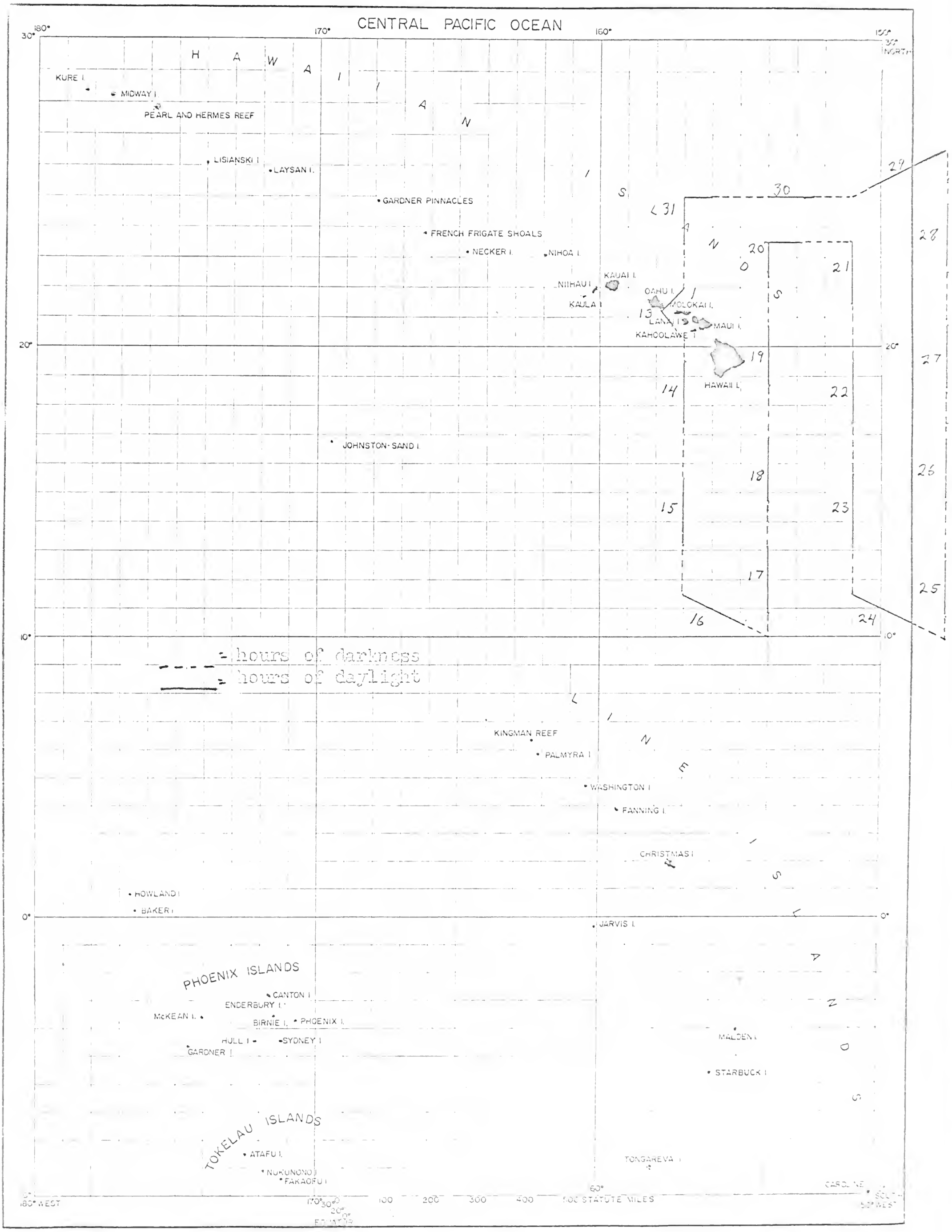
Date	Wedgetailed Shearwater	Newell's Shearwater	Dark-rumped Petrel	White-necked Petrel
July 13	169	0	3	0
14	56	2	19	0
15	23	0	25	5
16	64	5	22	7
17	5	0	3	1
18	64	0	116	0
19	71	3	37	1
20	145	0	1	0
21	16	0	20	2
22	17	2	103	14
23	7	0	35	1
24	17	0	15	1
25	51	0	118	3
26	2	1	10	0
27	0	0	30	1
28	0	0	47	2
29	0	0	5	0
30	0	0	0	0
31	11	5	0	0
Aug. 1	89	3	0	0
Total	807	21	609	38
Average	40.4	1.1	30.5	1.9

TABLE IV (con't.)

Procellariid Breakdown

Date	Bonin Island Petrel	Bulwer's Petrel	Harcourt's Storm Petrel	Miscellaneous Unidentified Procellariids
July 13	1	32	0	1
14	14	11	0	3
15	5	0	0	94
16	13	0	0	6
17	2	0	0	5
18	14	0	0	5
19	24	0	0	49
20	3	1	0	92
21	7	3	0	18
22	3	0	0	11
23	4	0	1	7
24	10	0	1	5
25	10	1	0	11
26	4	0	0	6
27	0	0	0	4
28	0	0	0	25
29	0	1	0	51
30	1	2	0	2
31	1	1	0	13
Aug. 1	0	6	0	2
Total	116	58	2	410
Average	5.8	2.9	.1	20.5

DOF July-August Cruise Track



CENTRAL PACIFIC OCEAN

30° 180° 170° 160° 150° 35° NORTH

H A W A I I A N

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.

20°

JOHNSTON-SAND I.

10°

KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.

0°

HOWLAND I.
BAKER I.
JARVIS I.

PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.

TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.

LINE ISLANDS

10° 180° WEST 170° 160° CAROLINE 150° WEST

100 200 300 400 500 STATUTE MILES

CENTRAL PACIFIC OCEAN

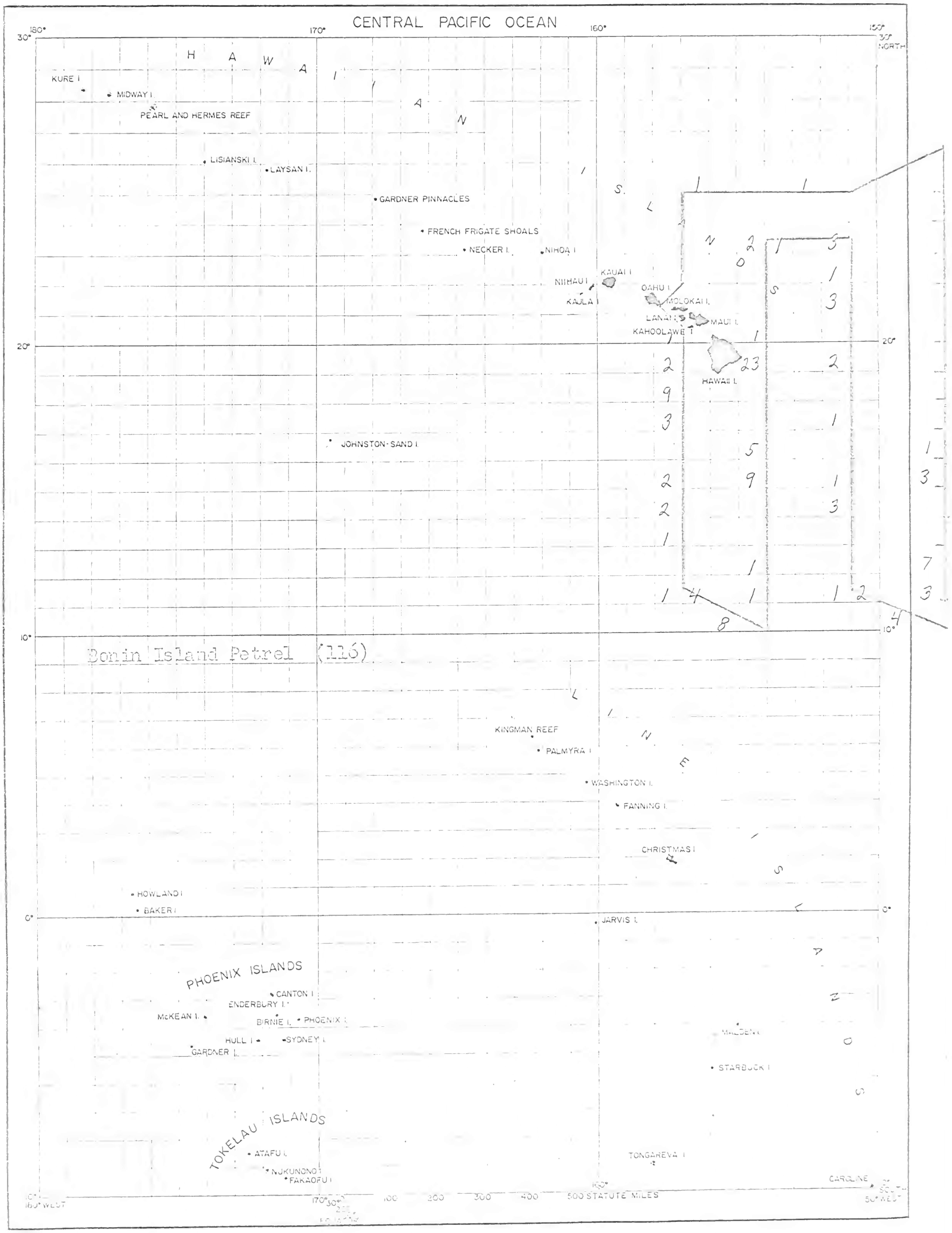
30° 170° 160° 30° NORTH

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAULA I.
KAUAI I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BARNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

20°
10°
0°

H = Harcourt Storm Petrel (?)
P = Great Frigatebird (14)
RF = Red-Footed Booby (17)
BB = Brown Booby (2)
N = Noddy Tern (200)
WT = White Tern (23)

160° WEST 170° 30° 20° 100 200 300 400 500 STATUTE MILES EQUATOR 150° WEST


CENTRAL PACIFIC OCEAN
180°
170°
160°
150°
30°
30° NORTH
20°
10°
0°
H A W A I I A N I S L A N D S
KURE I
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I
KAUAI I
NIIHAU I
KAULA I
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I
HAWAII I.
JOHNSTON-SAND I.
Bonin Island Petrel (116)
L I N E I S L A N D S
KINGMAN REEF
PALMYRA I
WASHINGTON I.
FANNING I.
CHRISTMAS I
JARVIS I.
STARBUCK I
TONGAREVA I
CAROLINE
HOWLAND I
BAKER I
PHOENIX ISLANDS
CANTON I
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I
SYDNEY I.
GARDNER I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I
FAKAOFU I
160° WEST
100
200
300
400
500 STATUTE MILES
150° WEST

CENTRAL PACIFIC OCEAN

180° 170° 160° 150°

30° NORTH

20°

10°

0°

HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU
MOLOKAI I.
LANAI
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.

SOLLINE

10 82 14 5
0 49 3
96 8
18
162 50 2
12 3 11
43 4
1 22 2
42 1
5 1 1
1
18 5
1 38
4 4 3 12
62 9 2

Wedge-tailed Shearwater (807)

KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.

PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.

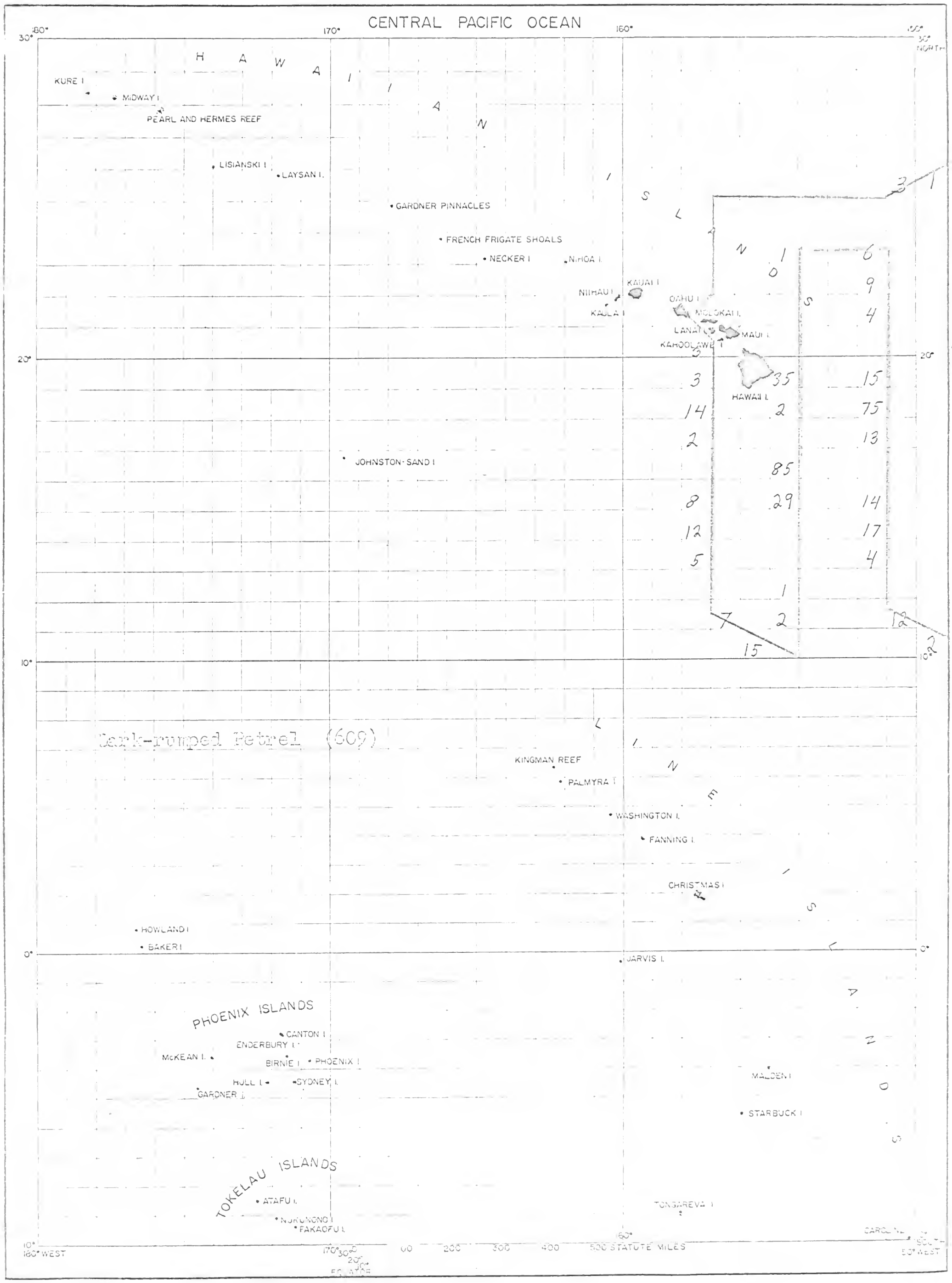
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.

TONGAREVA

CAROLINE

180° WEST 170° 160° 150° 140° WEST

0 100 200 300 400 500 STATUTE MILES



Dark-rumped Petrel (609)

CENTRAL PACIFIC OCEAN

180° 170° 160° 150°

30° NORTH

20°

10°

0°

HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
WALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.

1R 1W 3R 1W 1R 2R 1R 1W 1R 1W 2R 2W 1R 1T 1R 1T 2W 1R 2R 1R 2R 1R

R = Red-tailed Tropicbird (22)
W = White-tailed Tropicbird (11)
T = Unidentified Tropicbird (2)

180° WEST 170° 160° 150° WEST

0 100 200 300 400 500 STATUTE MILES

CENTRAL PACIFIC OCEAN

180° 170° 160° 150°
30° NORTH
20°
10°
0°
180° WEST 170° 160°

HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

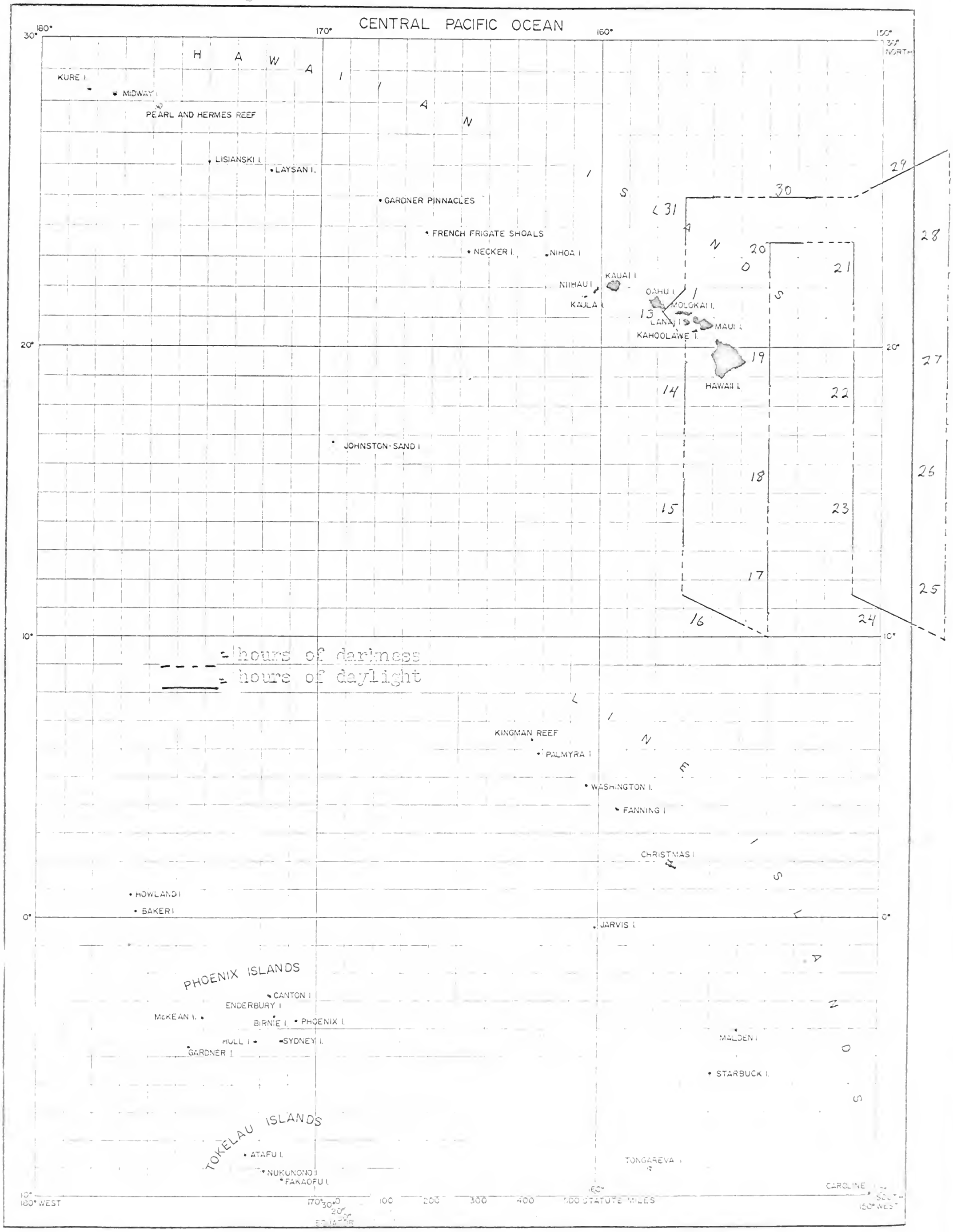
1N 2N 1B
2N 1N 1B 1B 2K
0 2B 2W 2W
9B
3N
293 3N
78
2N 2N
3B 1W 12W
1B
1W 1K
4W 1W 1N
1W
2W
2W 1W 1B 1W
4N 5W
4N

N = Morelli's Shearwater (21)
B = Bulwer's Petrel (59)
W = White-necked Petrel (30)
K = Kermadec Petrel (3)
C = Christmas Island Shearwater (1)

0 100 200 300 400 500 STATUTE MILES
EQUATOR

BOF July-August Cruise Track

TC #6



CENTRAL PACIFIC OCEAN

180° 170° 160° 150°

30° NORTH

20°

10°

0°

180° WEST 170° 160° 150° WEST

HAWAIIAN

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.

PHOENIX ISLANDS

CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.

TOKELAU ISLANDS

ATAFU I.
NUKUNONO I.
FAKAOFU I.

TONGAREVA I.

LINE ISLANDS

0 100 200 300 400 500 STATUTE MILES

Booby Farm (2555)

CENTRAL PACIFIC OCEAN

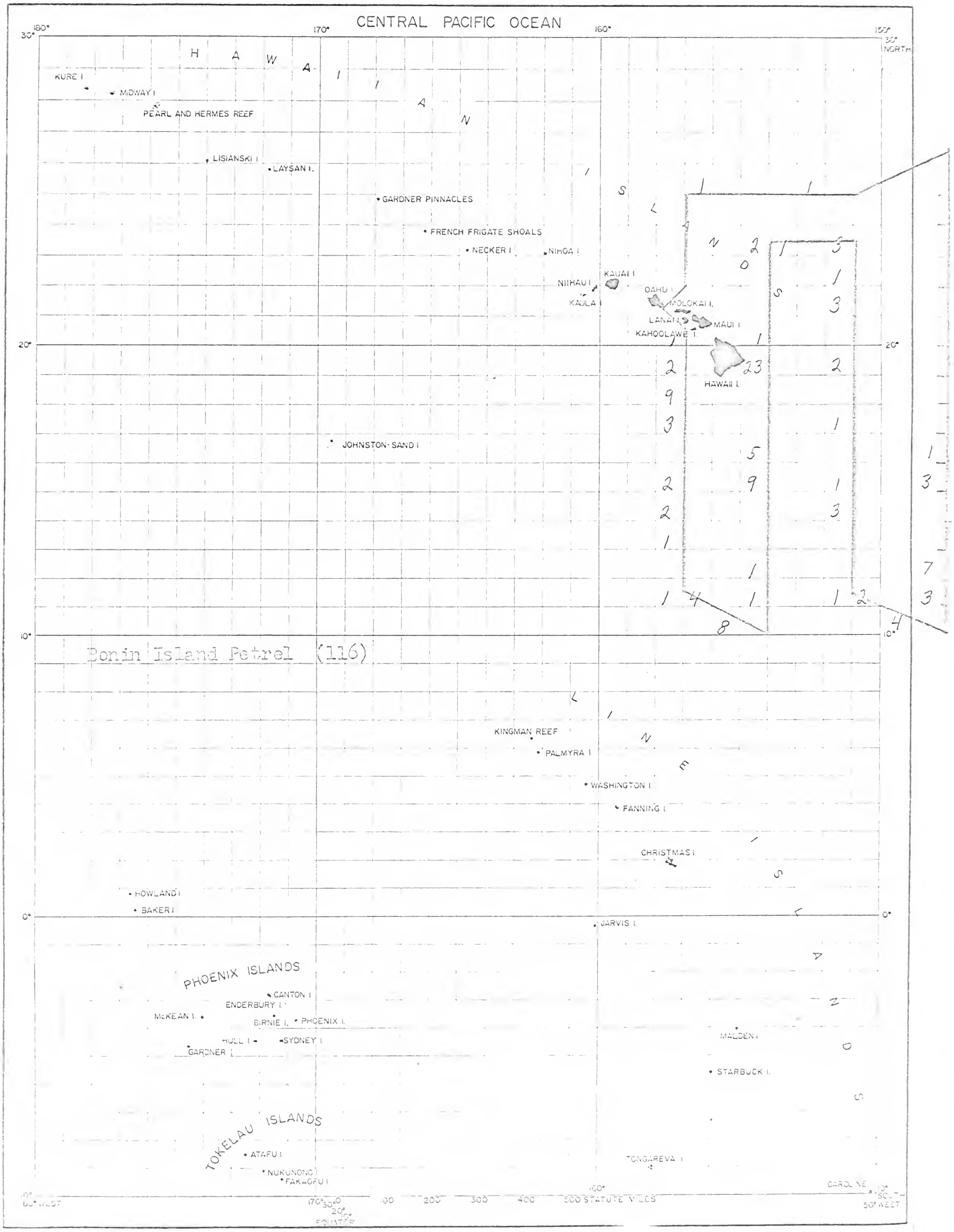
30° 180° 170° 160° 150° 30° NORTH

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAULA I.
KAUAI I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

20° 10° 0°

H	= Harcourt Storm Petrel	(2)
F	= Great Frigatebird	(14)
RT	= Red-footed Booby	(17)
BB	= Brown Booby	(2)
N	= Noddy Tern	(208)
FT	= Fairy Tern	(23)

180° WEST 170° 30° 0 100 200 300 400 500 STATUTE MILES 50° WEST



Bonin Island Petrel (116)

CENTRAL PACIFIC OCEAN

180° 170° 160° 150°

30° NORTH

20°

10°

0°

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAULA I.
KAUAI I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

HAWAIIAN ISLANDS

Hedge-tailed Shearwater (307)

180° WEST 170° 30° 20° 100 200 300 400 500 STATUTE MILES 160° 150° WEST

CENTRAL PACIFIC OCEAN

180° 170° 160° 150° WEST

30° 20° 10° 0° NORTH

HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.

JOHNSTON-SAND I.

KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.

HOWLAND I.
BAKER I.
JARVIS I.

PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.

MALDEN I.
STARBUCK I.

TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.

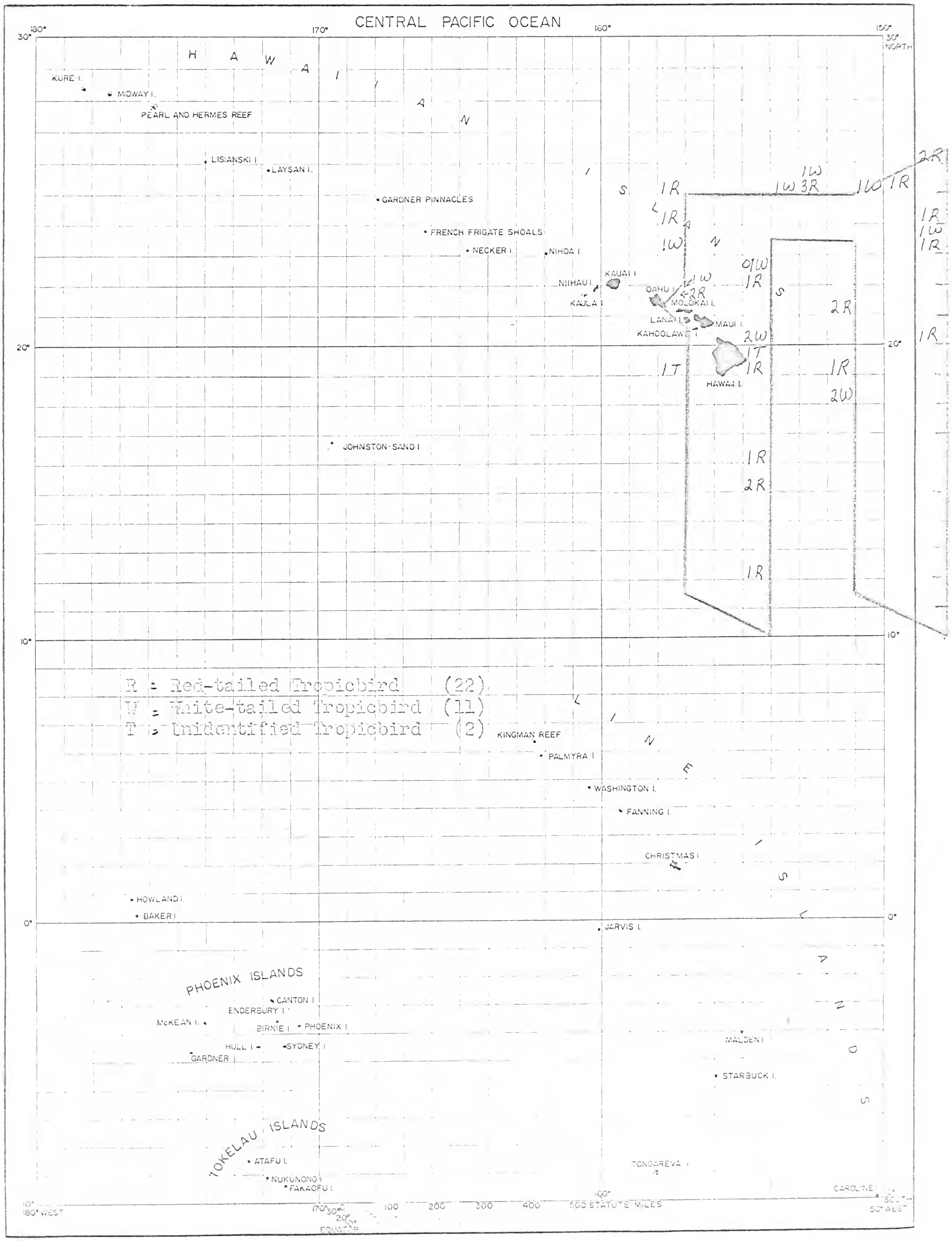
TONGAREVA I.

LINE ISLANDS

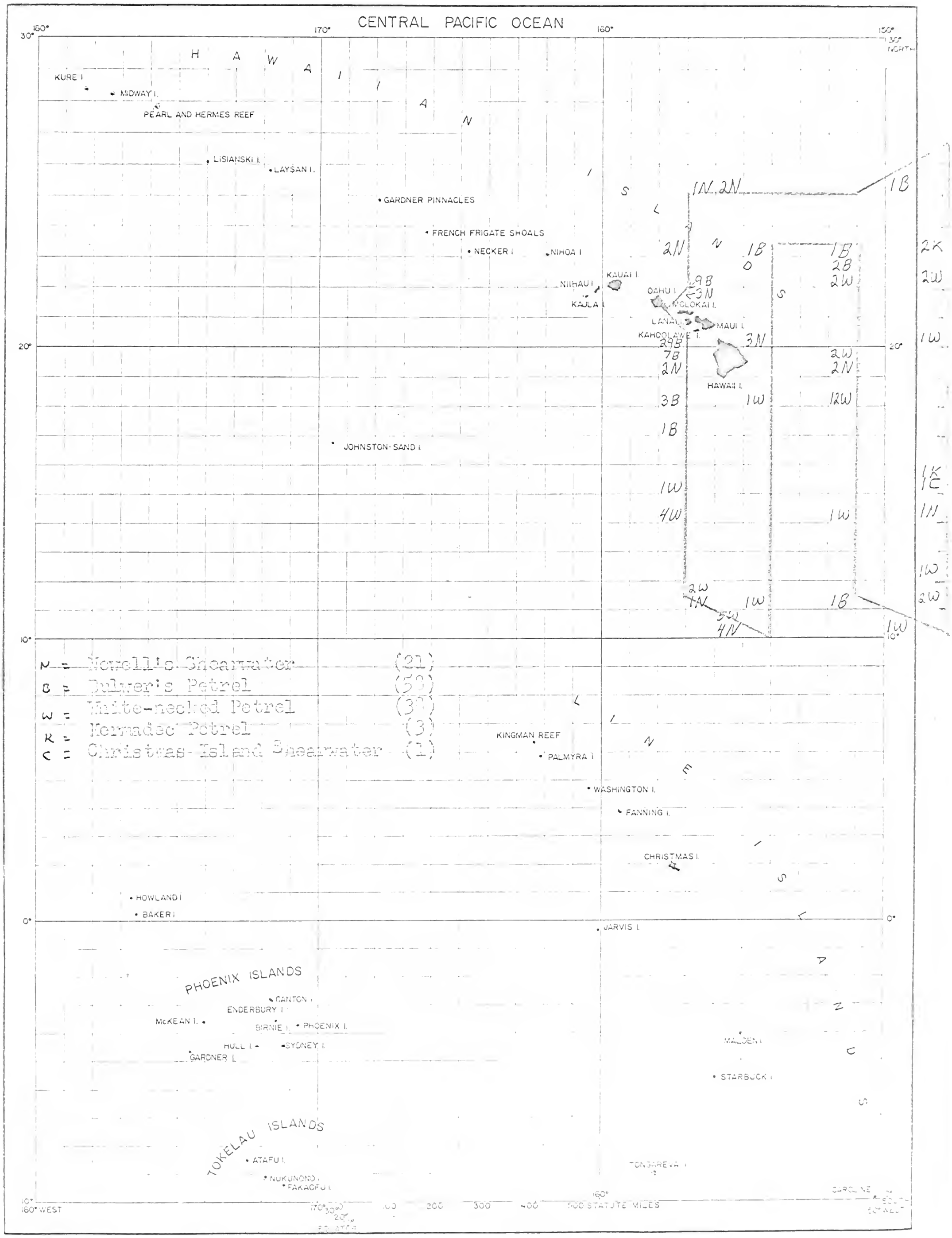
Dark-rumped Petrel (609)

1 3 1
1
35
11
25
5
1
7
2
90
27
2
2
6
9
4
3 35 15
14 2 75
2 13
85
8 29 14
12 17
5 4
1
7 2 12
15 10 2

0 100 200 300 400 500 STATUTE MILES


CENTRAL PACIFIC OCEAN
180°
170°
160°
150°
30°
30° NORTH
20°
10°
0°
H A W A I I A N I S L A N D S
KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
KAULA I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
1R
1R
1W
1W
1W 3R
1W 1R
2R
1R
1W
1R
0 1W
1R
1W
←2R
2R
2W
1T
1R
1T
1R
2W
1R
1R
2R
1R
R = Red-tailed Tropicbird (22)
W = White-tailed Tropicbird (11)
T = Unidentified Tropicbird (2)
L I N E I S L A N D S
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE
10° 180° WEST
170°
100
200
300
400
500 STATUTE MILES
160°
10° SOUTH 150° WEST
EQUATOR

CENTRAL PACIFIC OCEAN



N = Norfolk's Shearwater (21)
B = Bulwer's Petrel (59)
W = White-necked Petrel (3?)
K = Kermadec Petrel (3)
C = Christmas-Island Shearwater (1)

B. C. F. Townsend Cromwell July 1964 CRUISE

The July 1964 Townsend Cromwell cruise was the fifth of a series of cruises run by the U. S. Fish and Wildlife Bureau of Commercial Fisheries covering a fixed grid to the east of the main Hawaiian Islands for the purpose of determining variations in the structure of water masses and currents of this area.

This is the fifth cruise in which Pacific Project personnel have taken part, maintaining daily sunrise to sunset bird observations for a total of 244.8 hours. In addition Project personnel aided in recording weather observations and in taking bathythermograph traces. Project personnel included Warren King and Doyle Husted.

Warren B. King
Research Assist.
Pacific Project

SPECIES ACCOUNT

Wedgetailed Shearwater

Numbers of this species decreased 18% in number from 98% in June to 807 in July. South of 16°N dark phase birds predominated, and north of 16°N chiefly light phase birds were seen. Light phase birds were concentrated in areas closer to the islands than previously noted. The largest concentrations of dark-phase birds were still found at the southern end of the grid area.

Christmas Island Shearwater

One of this species was positively identified on 26 July. A second bird was tentatively identified as this species on 21 July.

Newell's Shearwater

Numbers of this species increased 40% from 15 in June to 21 in July. This species was concentrated in the area of the grid near the islands and in the southern end.

Kermadec Petrel

Three of this species, all dark phase, were positively identified in the grid area in July, and two more were tentatively identified. This is the first occurrence of this species in the grid area.

Bonin Island Petrel

Numbers of this species decreased 34% from 176 in June to 116 in July. This species was distributed fairly randomly over all but the northeastern

corner of the grid area. This species completed its post breeding molt during July, as evidenced by the preponderance of birds seen in July with immaculate new plurage.

Dark-rumped Petrel

This species increased 22% in number from 186 in June to 609 in July. By the end of the month most birds seen had finished molting. This species was distributed throughout the grid area except for the northwest corner. Several feeding flocks composed exclusively of this species were noted. Two birds were observed catching flying fish. Five of this species were collected, all of which were molting. One, collected in the afternoon, had a fresh squid in its craw. Three of the birds were losing brood patch feathers and the reproductive organs of these birds were beginning to enlarge, indicating that they are possibly just preparing to breed. This suggests an August breeding season for the birds of this species appearing in the grid area. Study of the collected specimens should reveal the land base of these birds.

White-necked Petrel

Thirty-eight of this species was seen in July, one more than in June. This species was seen as far north as 22°N, and was invariably in the company of Dark-rumped Petrels. One of this species was collected. It was molting heavily.

Bulwer's Petrel

Fifty-eight of this species were seen in July, a 16% increase over the 50 seen in June. Almost all of these were observed close to the

islands. Twenty-eight were seen within a period of one-half hour during the evening of 13 July, all heading toward Lanai, less than ten miles distant.

Harcourt's Storm Petrel

Only two of this species were seen in the grid area, both toward the southern end. This species has steadily decreased in numbers in the grid area from a peak of 129 birds in April.

Red-tailed Tropicbird

Numbers of this species increased 47% from 15 in June to 22 in July. This species was fairly randomly distributed throughout all but the south-eastern corner of the grid area. Two very young birds were seen, both heavily vermiculated on the back and lacking central retrices altogether.

White-tailed Tropicbird

This species increased in numbers 57% from seven in June to eleven in July. All of these were seen in the northern half of the grid area.

Brown Booby

Two of this species were seen on 1 August heading toward Molu Lanu, only fifteen miles distant.

Red-footed Booby

Seventeen of this species were observed in July. All but one of these were seen in the vicinity of Oahu. The other, an immature, was seen 400 miles northeast of Oahu, further from land than any Red-footed Booby seen thus far in the grid area.

Great Frigatebird

Numbers of this species increased 133% from six in June to fourteen in July. All were observed within 400 miles of Oahu.

Sooty Tern

Sooty Terns increased in numbers in July to 2555, a 5% gain over the 2413 seen in June. Concentrations were heaviest just south of Oahu and in an area from 275 to 325 miles northeast of Oahu. Immature birds were seen often, usually in flocks or accompanied by an adult, but on two occasions immature birds were observed flying alone. In the southern half of the grid area birds were seen changing to adult plumage.

Noddy Tern

Three hundred eight of this species were seen in July, all within sight of Oahu. Four were seen on one occasion perched on a small floating branch. As the ship approached Oahu on 1 August, Noody Terns far outnumbered Sooty Terns for the first time during these cruises, indicating that the majority of Sooty Terns breeding in the area had completed their breeding cycles and had dispersed, while the Noddy Terns were still raising chicks.

Fairy Tern

Numbers of this species increased 28% from 18 in June to 23 in July. All were seen within 400 miles of Oahu.

Shorebird sp.

On 19 July an all brown shorebird circled the ship twice. It may possibly have been a Golden Plover. This was the first shorebird to have been seen in the grid area since the April cruise.

TABLE I

Date	Minutes of Observation	Miles Covered
July 13	314	51
14	789	125
15	774	145
16	754	140
17	764	127
18	777	137
19	791	118
20	784	121
21	792	122
22	783	130
23	770	141
24	753	138
25	763	120
26	773	125
27	795	126
28	797	144
29	814	159
30	808	89
31	800	142
Aug. 1	300	68
Total	14685	2468
Average	734.3	123.4

TABLE II

Date	Total Birds	Total Sightings	Birds/ Sighting	Birds/ Mile	Floats	Total Birds in Floats
July 13	944	51	11.51	11.51	6	240
14	196	60	3.27	1.57	4	124
15	140	45	3.22	1.31	4	132
16	171	44	3.89	1.22	1	116
17	17	15	1.13	.13	0	0
18	283	44	6.43	2.07	4	228
19	332	43	7.96	3.24	4	320
20	910	33	27.58	7.52	7	378
21	206	36	5.72	1.69	5	167
22	427	62	6.89	3.20	12	340
23	138	37	3.73	.98	3	99
24	57	37	1.54	.41	2	19
25	204	59	3.46	1.70	2	180
26	27	23	1.17	.22	0	0
27	37	25	1.48	.29	1	5
28	147	23	6.39	1.02	3	126
29	217	11	19.50	1.36	1	200
30	17	13	1.31	.19	1	5
31	81	22	3.68	.57	3	59
Aug. 1	363	123	2.99	5.41	4	138
Total	4969	814	126.35	52.69	69	3332
Average	248.5	40.7	6.34	2.64	3.5	196.6

TABLE III

Date	Procellariids	Tropicbirds	Terns	Boobies	Frigatebirds
July 13	206	0	726	11	1
14	196	1	37	0	3
15	152	0	30	0	0
16	117	0	54	0	0
17	16	1	0	0	0
18	199	3	81	0	0
19	185	4	191	0	1
20	242	2	663	0	3
21	67	2	135	0	2
22	150	3	273	1	0
23	55	0	33	0	0
24	49	0	8	0	0
25	194	0	10	0	0
26	23	0	4	0	0
27	35	1	1	0	0
28	74	3	70	0	0
29	57	4	156	0	0
30	5	6	5	0	0
31	31	3	43	0	4
Aug. 1	100	3	258	7	0
Total	2153	36	2386	19	14
Average	107.7	1.8	144.3	1.0	0.7

TABLE IV

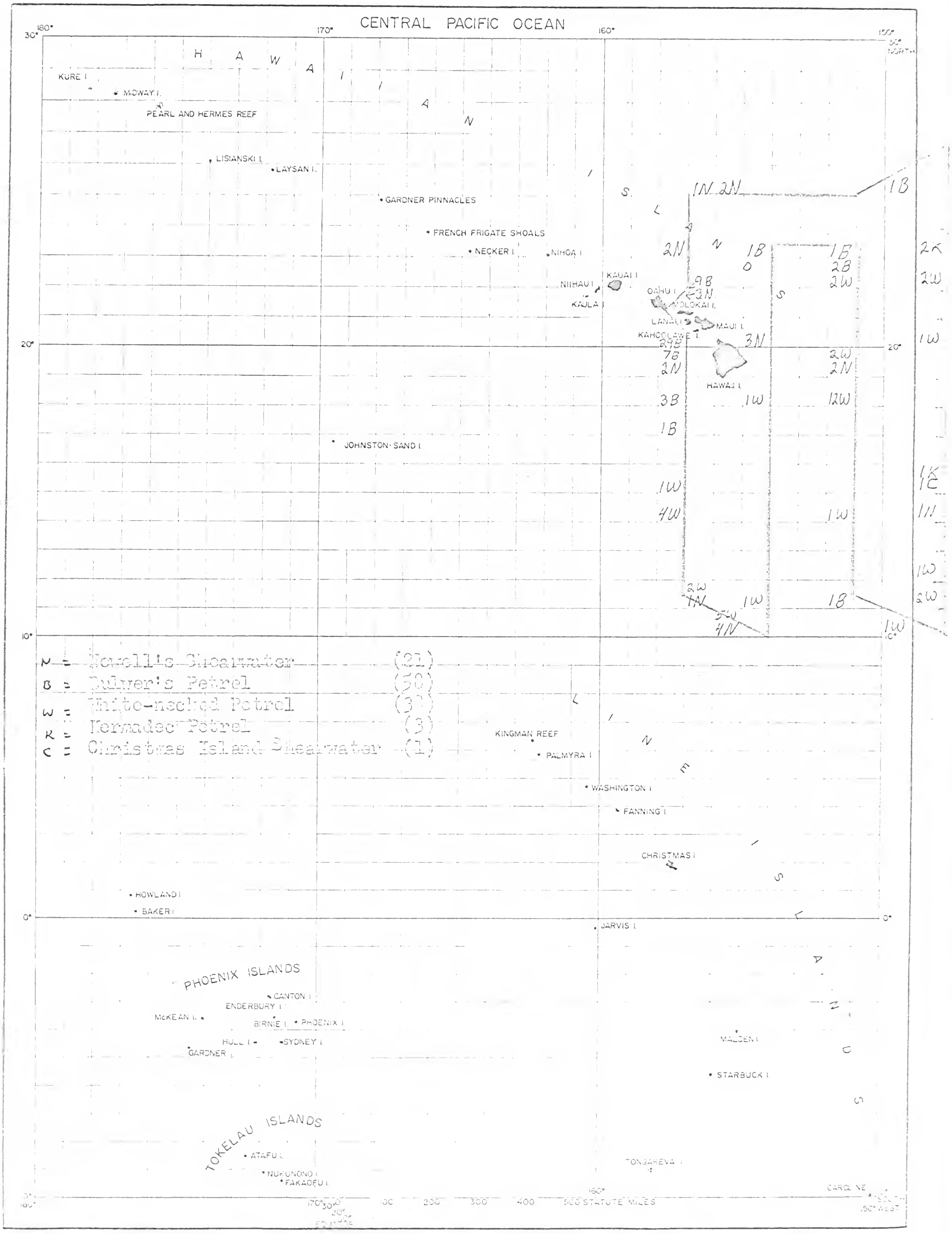
Procellariid Breakdown

Date	Wedgetailed Shearwater	Newell's Shearwater	Dark-rumped Petrel	White-necked Petrel
July 13	169	0	3	0
14	56	2	19	0
15	23	0	25	5
16	64	5	22	7
17	5	0	3	1
18	64	0	116	0
19	71	3	37	1
20	145	0	1	0
21	16	0	20	2
22	17	2	103	14
23	7	0	35	1
24	17	0	15	1
25	51	0	118	3
26	2	1	10	0
27	0	0	30	1
28	0	0	47	2
29	0	0	5	0
30	0	0	0	0
31	11	5	0	0
Aug. 1	89	3	0	0
Total	807	21	609	38
Average	40.4	1.1	30.5	1.9

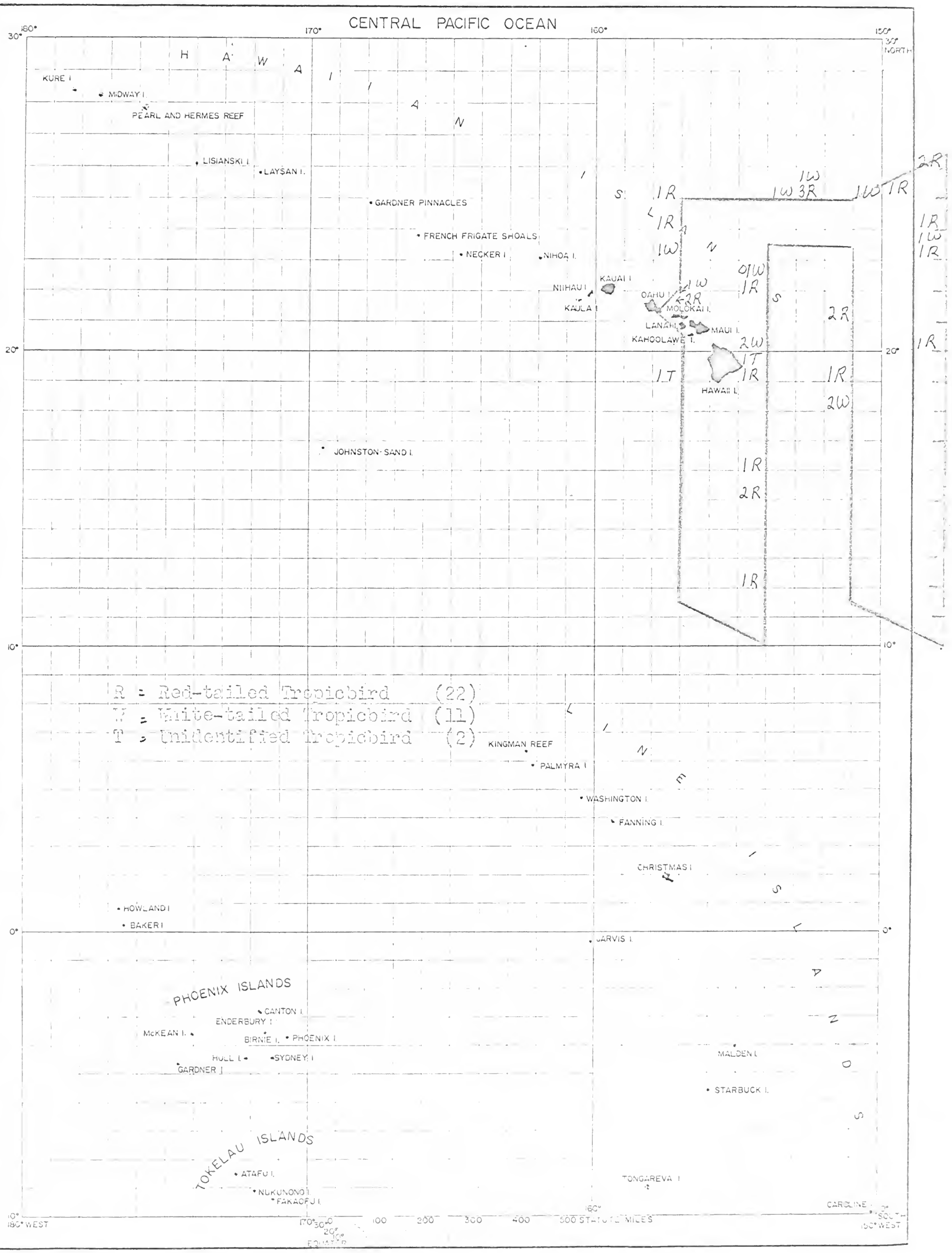
TABLE IV (con't.)

Procellariid Breakdown

Date		Bonin Island Petrel	Bulwer's Petrel	Ihrecourt's Storm Petrel	Miscellaneous Unidentified Procellariids
July	13	1	32	0	1
	14	14	11	0	3
	15	5	0	0	94
	16	13	0	0	3
	17	2	0	0	5
	18	14	0	0	5
	19	24	0	0	49
	20	3	1	0	92
	21	7	3	0	18
	22	3	0	0	11
	23	4	0	1	7
	24	10	0	1	5
	25	10	1	0	11
	26	4	0	0	6
	27	0	0	0	4
	28	0	0	0	23
	29	0	1	0	51
	30	1	2	0	2
	31	1	1	0	13
Aug.	1	0	6	0	2
Total		116	58	2	410
Average		5.8	2.9	.1	20.5

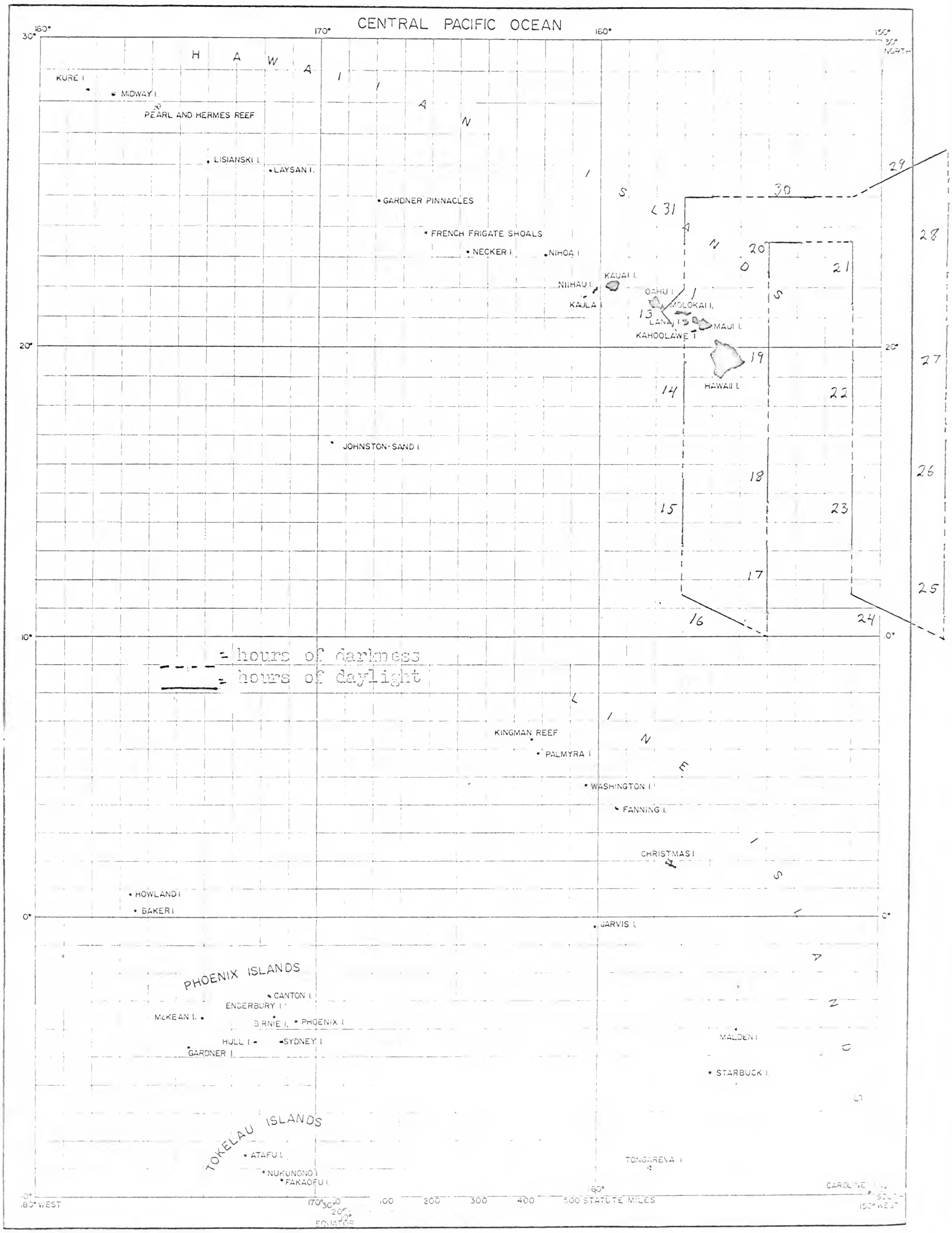

CENTRAL PACIFIC OCEAN
HAWAIIAN ISLANDS
KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
KAULA I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
N = Newell's Shearwater (21)
B = Bulwer's Petrel (50)
W = White-necked Petrel
K = Kermadec Petrel (3)
C = Christmas Island Shearwater (1)
LINE ISLANDS
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
100 200 300 400 500 STATUTE MILES

CENTRAL PACIFIC OCEAN



R = Red-tailed Tropicbird (22)
W = White-tailed Tropicbird (11)
T = Unidentified Tropicbird (2)

BCF July-August Cruise Track



CENTRAL PACIFIC OCEAN

180° 170° 160° 150° 30° NORTH

30° 20° 10° 0°

HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.

JOHNSTON-SAND I.

KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.

PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.

MALDEN I.
STARBUCK I.

TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.

TONGAREVA I.

CAROLINE

1 3 1 1
1 35 11
6 9 4
3 35 15 25 5
14 2 75
2 13
85 1
8 29 14 7
12 17 2
5 4
1 90
7 2 12 27
15 2

Dark-rumped Petrel (609)

100 200 300 400 500 STATUTE MILES

170° 30° 20° 10° EQUATOR 150° WEST

CENTRAL PACIFIC OCEAN

30° NORTH

180° 170° 160° 150°

20°

10°

0°

HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.

Ridge-tailed Shearwater (?07)

KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.

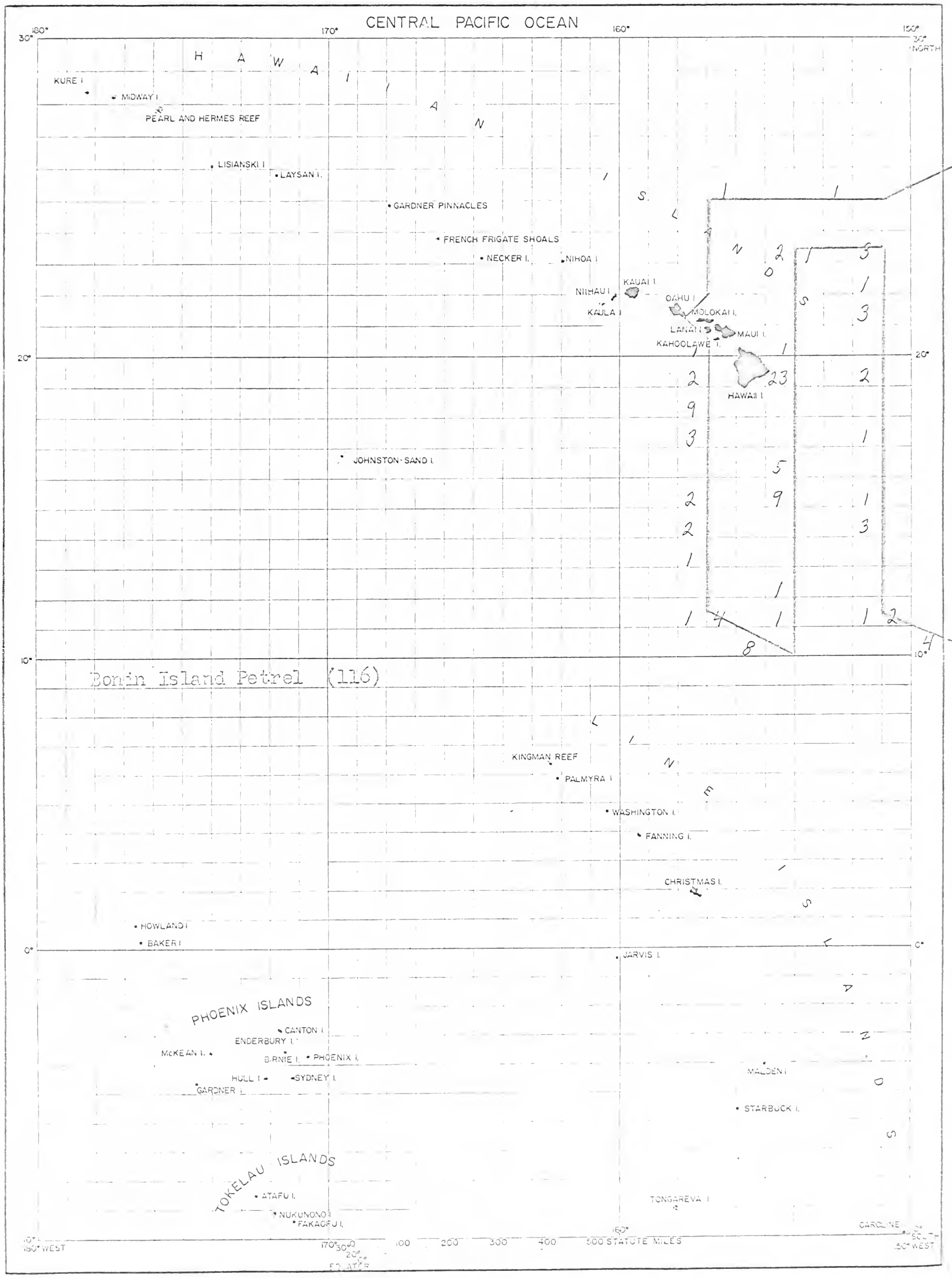
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.

TOKELAU ISLANDS
ATAFU I.
NUKUNONU I.
FAKAOFU I.

LINE ISLANDS
WALDEN I.
STARBUCK I.
TONGAREVA
CAROLINE I.

0 100 200 300 400 500 STATUTE MILES

180° WEST 170° 160° 150° WEST


CENTRAL PACIFIC OCEAN
180°
170°
160°
150°
30°
20°
10°
0°
NORTH
HAWAIIAN
KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
Bonin Island Petrel (116)
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.
150° WEST
160°
170°
100
200
300
400
500 STATUTE MILES

CENTRAL PACIFIC OCEAN

H = Harcourt Storm Petrel (2)
F = Great Frigatebird (14)
RF = Red-footed Booby (17)
BB = Brown Booby (2)
N = Noddy Tern (200)
FT = Fairy Tern (23)

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAULA I.
KAUAI I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

180° WEST 170° 160° 150° WEST
30° NORTH 20° 10° 0° SOUTH
0 100 200 300 400 500 STATUTE MILES

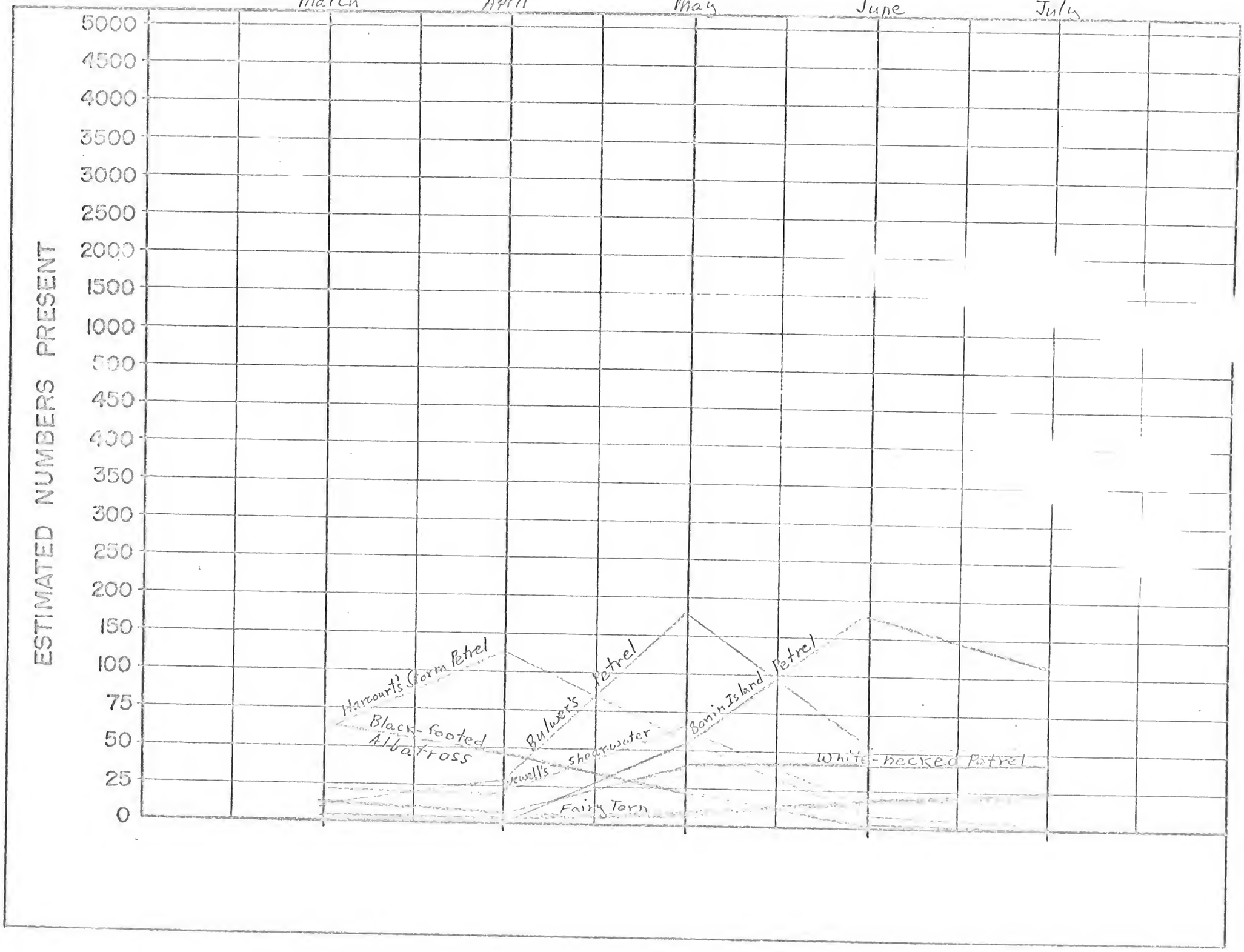
CENTRAL PACIFIC OCEAN

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAOLA
MOLOKAI I.
LANAI
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
WALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.

30° 160° 170° 160° 150° NORTH
20° 20°
10° 10°
0° 0°
180° WEST 170° 160° 150° WEST

0 100 200 300 400 500 STATUTE MILES

Scotty Dorn (2555)


March
April
May
June
July
ESTIMATED NUMBERS PRESENT
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
450
400
350
300
250
200
150
100
75
50
25
0
Harcourt's Storm Petrel
Black-footed Albatross
Bulwer's Petrel
Jewell's Shearwater
Fairy Tern
Bonin Island Petrel
White-necked Petrel


March
April
May
June
July
ESTIMATED NUMBERS PRESENT
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
450
400
350
300
250
200
150
100
75
50
25
0
Sooty Tern
Sooty Shearwater
Wedge-tailed Shearwater
Hawaiian Noddy
Noddy Tern
Dark-rumped Petrel

CENTRAL PACIFIC OCEAN

180° 170° 160° 150°

30° NORTH

20°

10°

0°

10° SOUTH

180° WEST 150° WEST

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
KAULA I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

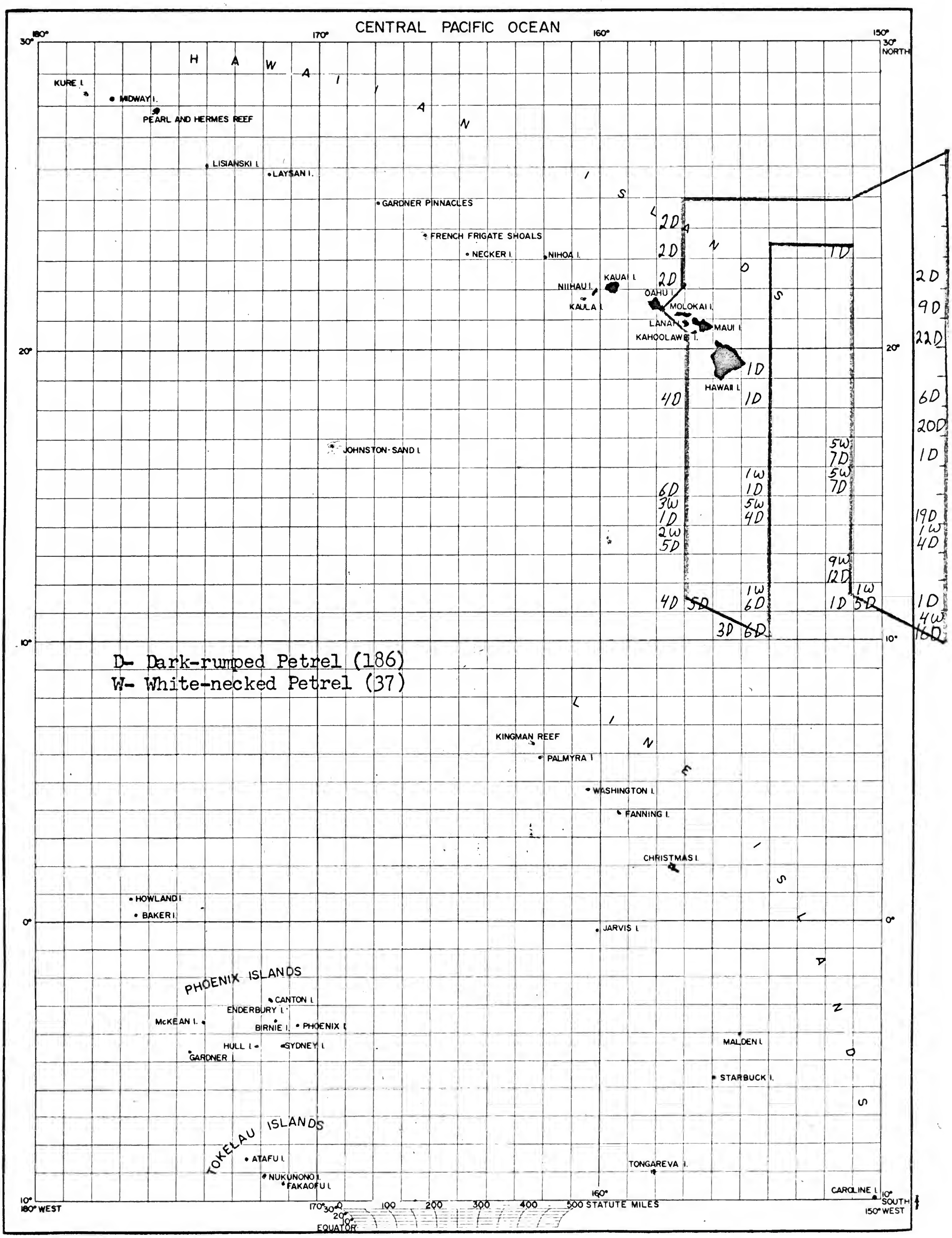
HAWAIIAN ISLANDS

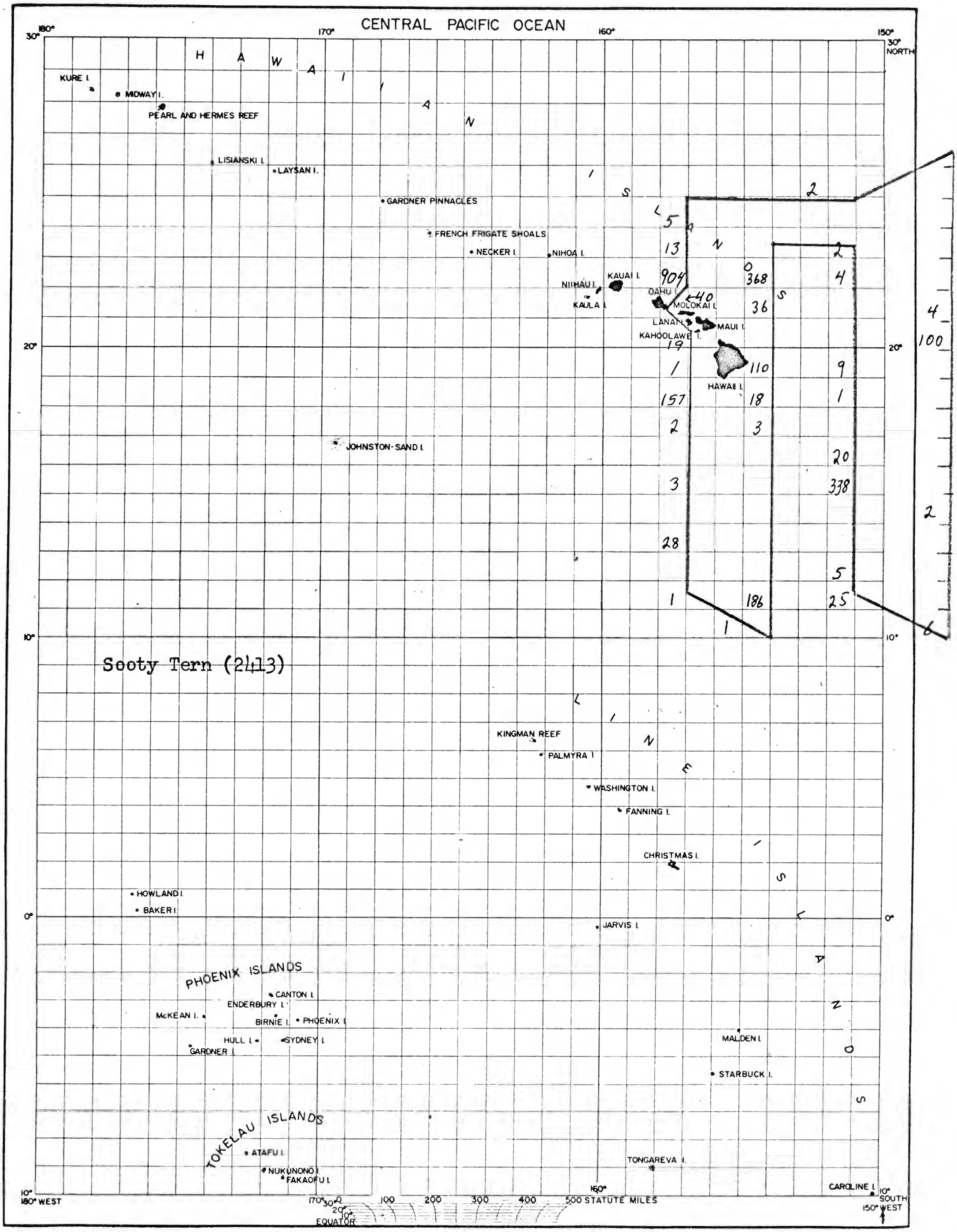
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

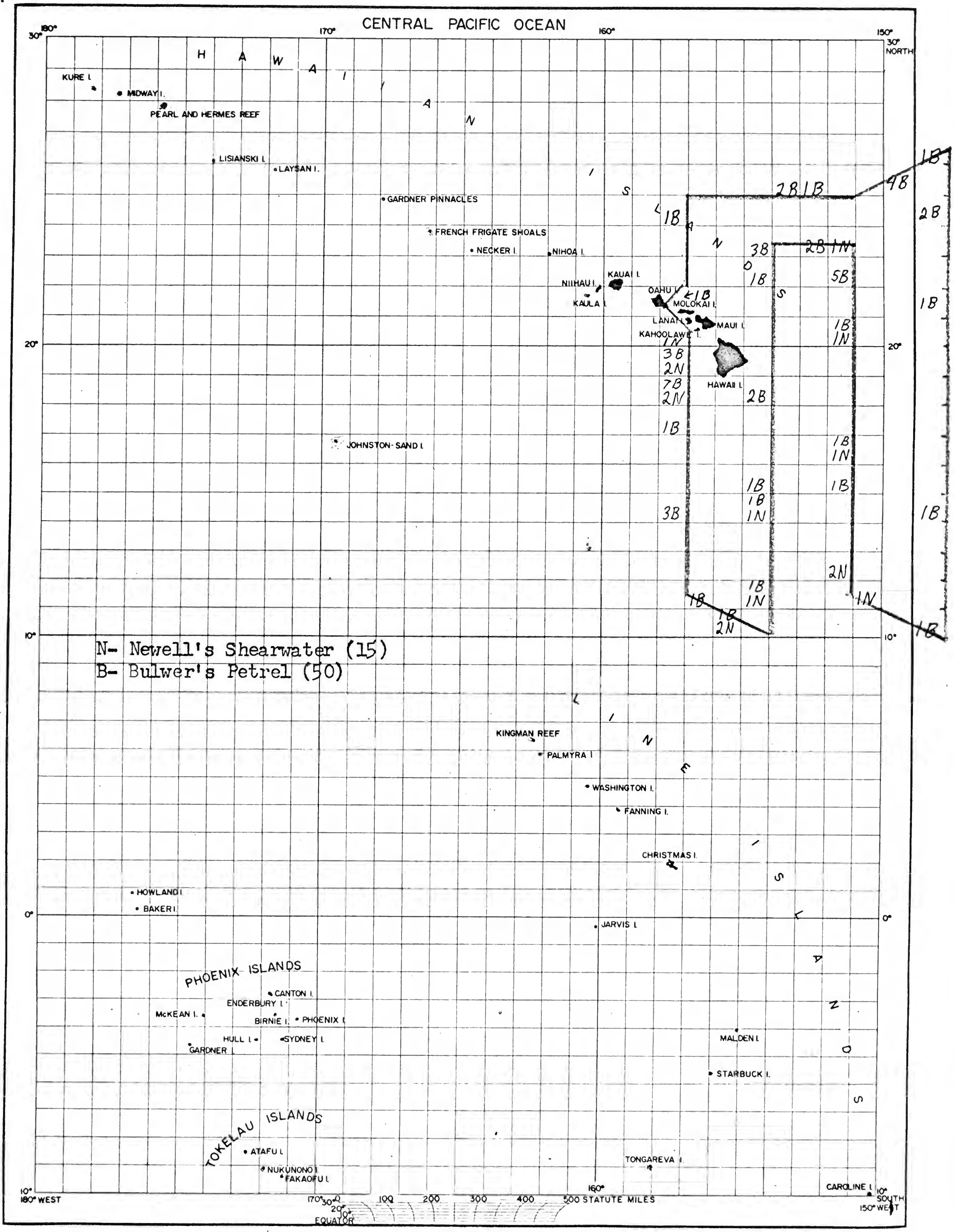
——— hours of daylight
- - - hours of darkness

0 100 200 300 400 500 STATUTE MILES

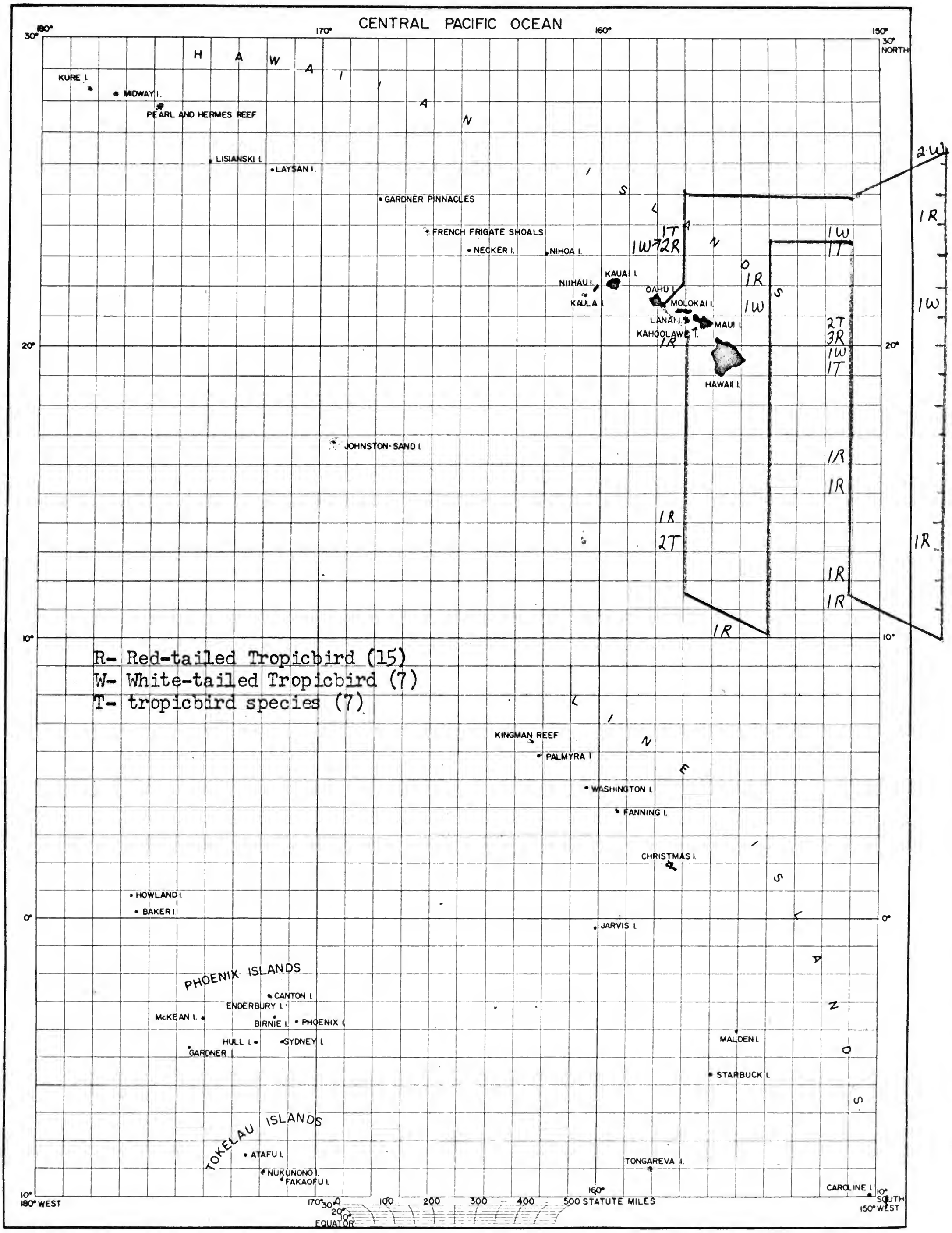
30° 20° 10° EQUATOR


CENTRAL PACIFIC OCEAN
HAWAIIAN ISLANDS
KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
KAUAI I.
NIIHAU I.
KAULA I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
D- Dark-rumped Petrel (186)
W- White-necked Petrel (37)
LINE ISLANDS
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.
180°
170°
160°
150°
30° NORTH
20°
10°
0°
10° SOUTH
180° WEST
150° WEST
EQUATOR
100
200
300
400
500 STATUTE MILES
2D
2D
2D
1D
2D
9D
22D
1D
1D
4D
6D
20D
5W
7D
1D
5W
7D
1W
1D
5W
4D
6D
3W
1D
2W
5D
19D
1W
4D
9W
12D
1W
4D
5D
1W
6D
1D
5D
1D
4W
16D
3D
6D

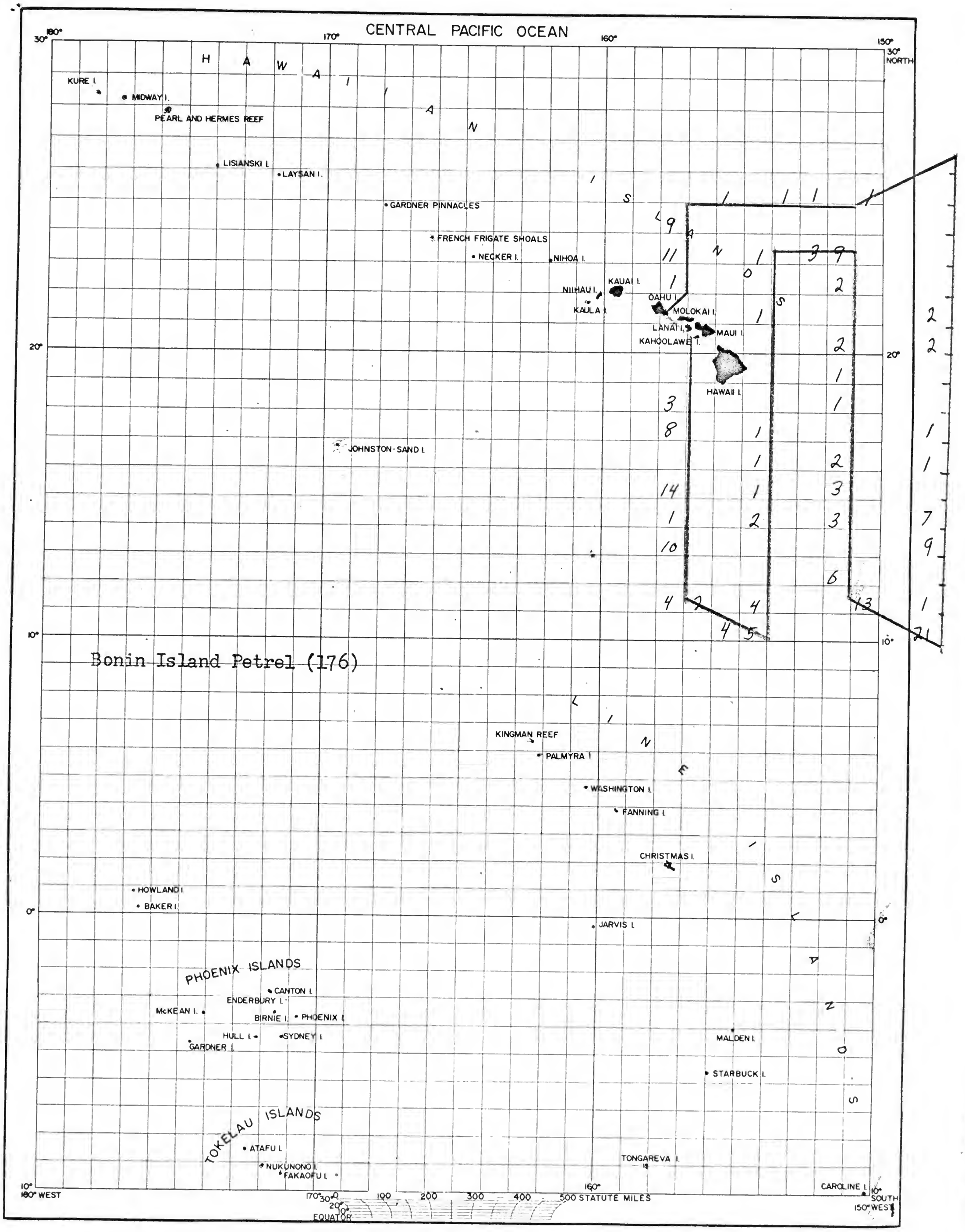

CENTRAL PACIFIC OCEAN
180°
170°
160°
150°
30° NORTH
20°
10°
0°
10° SOUTH
180° WEST
150° WEST
HAWAIIAN ISLANDS
KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.
100 200 300 400 500 STATUTE MILES
EQUATOR
Sooty Tern (2413)
5
13
904
40
36
19
1
157
2
28
1
2
4
368
110
18
3
20
338
186
1
9
1
5
25
4
100
2
6


CENTRAL PACIFIC OCEAN
180°
170°
160°
150°
30°
30° NORTH
20°
10°
0°
10° SOUTH
10°
180° WEST
150° WEST
HAWAIIAN ISLANDS
KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
KAUAI I.
NIIHAU I.
KAULA I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
N- Newell's Shearwater (15)
B- Bulwer's Petrel (50)
LINE ISLANDS
KINGMAN REEF
PALMYRA I
WASHINGTON I.
FANNING I.
CHRISTMAS I.
JARVIS I.
MALDEN I.
STARBUCK I.
TONGAREVA I.
CAROLINE I.
HOWLAND I.
BAKER I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
0 100 200 300 400 500 STATUTE MILES
EQUATOR

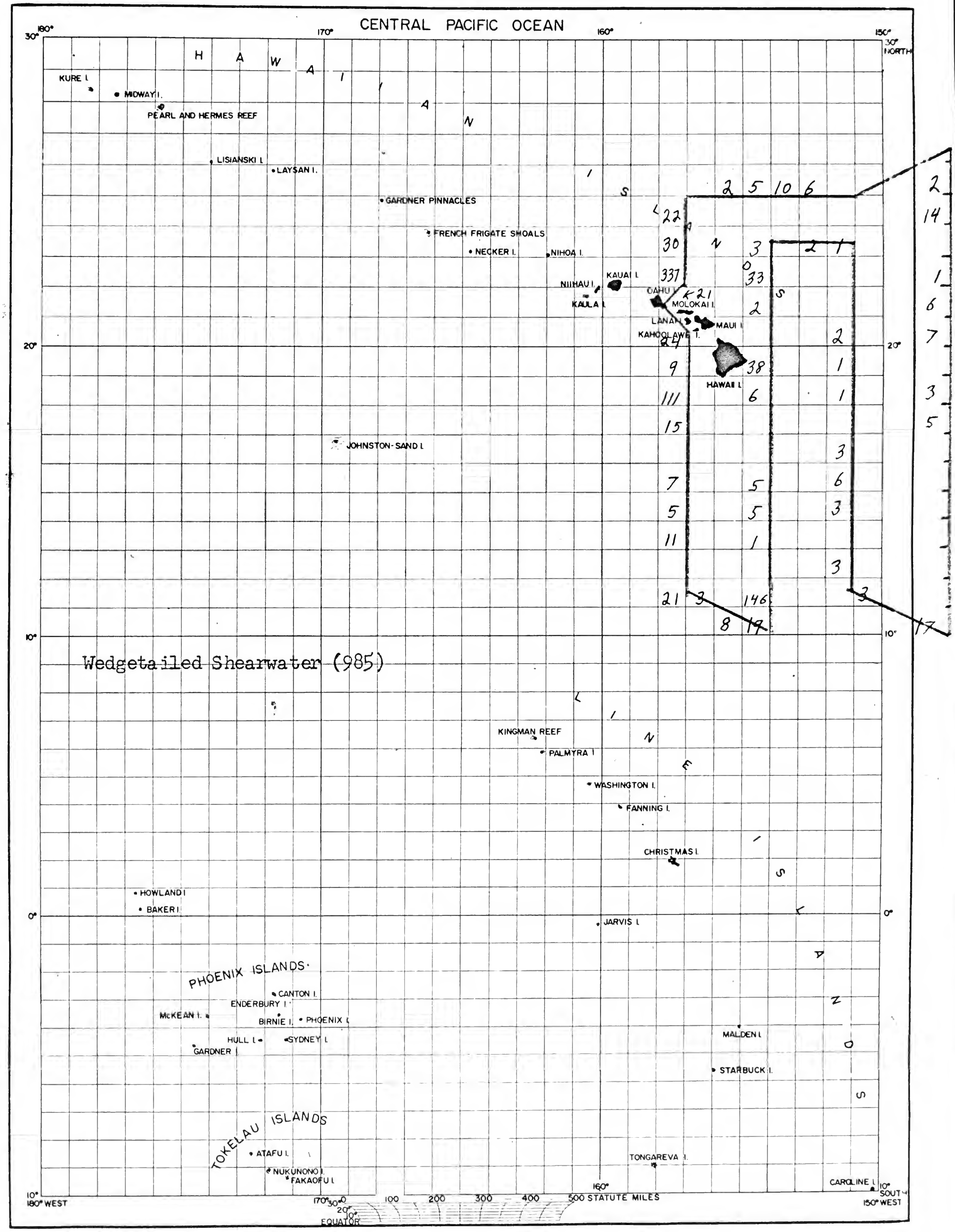
CENTRAL PACIFIC OCEAN



R- Red-tailed Tropicbird (15)
W- White-tailed Tropicbird (7)
T- tropicbird species (7)



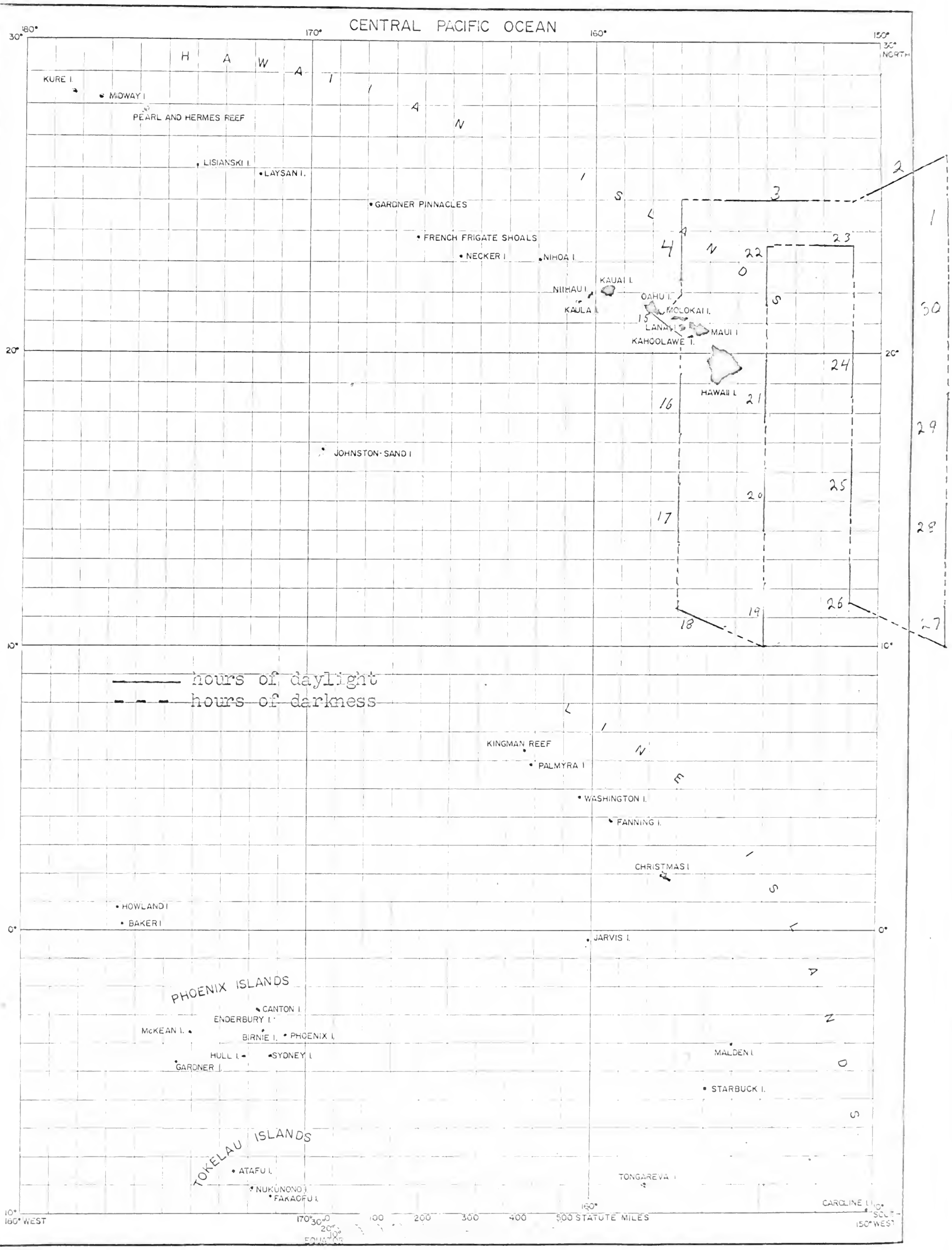
Bonin Island Petrel (176)


CENTRAL PACIFIC OCEAN
Wedgetailed Shearwater (985)
HAWAIIAN ISLANDS
KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
KAUAI I.
NIIHAU I.
KAULA I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
LINE ISLANDS
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.
180° WEST
150° WEST
30° NORTH
10° SOUTH
EQUATOR
100 200 300 400 500 STATUTE MILES

CENTRAL PACIFIC OCEAN

BF- Black-footed Albatross (1)
H- Harcourt's Storm Petrel (7)
MB- Blue-faced Booby (1)
BB- Brown Booby (1)
RF- Red-footed Booby (6)
FB- Great Frigatebird (6)
N- Noddy Tern (23)
F- Fairy Term (18)

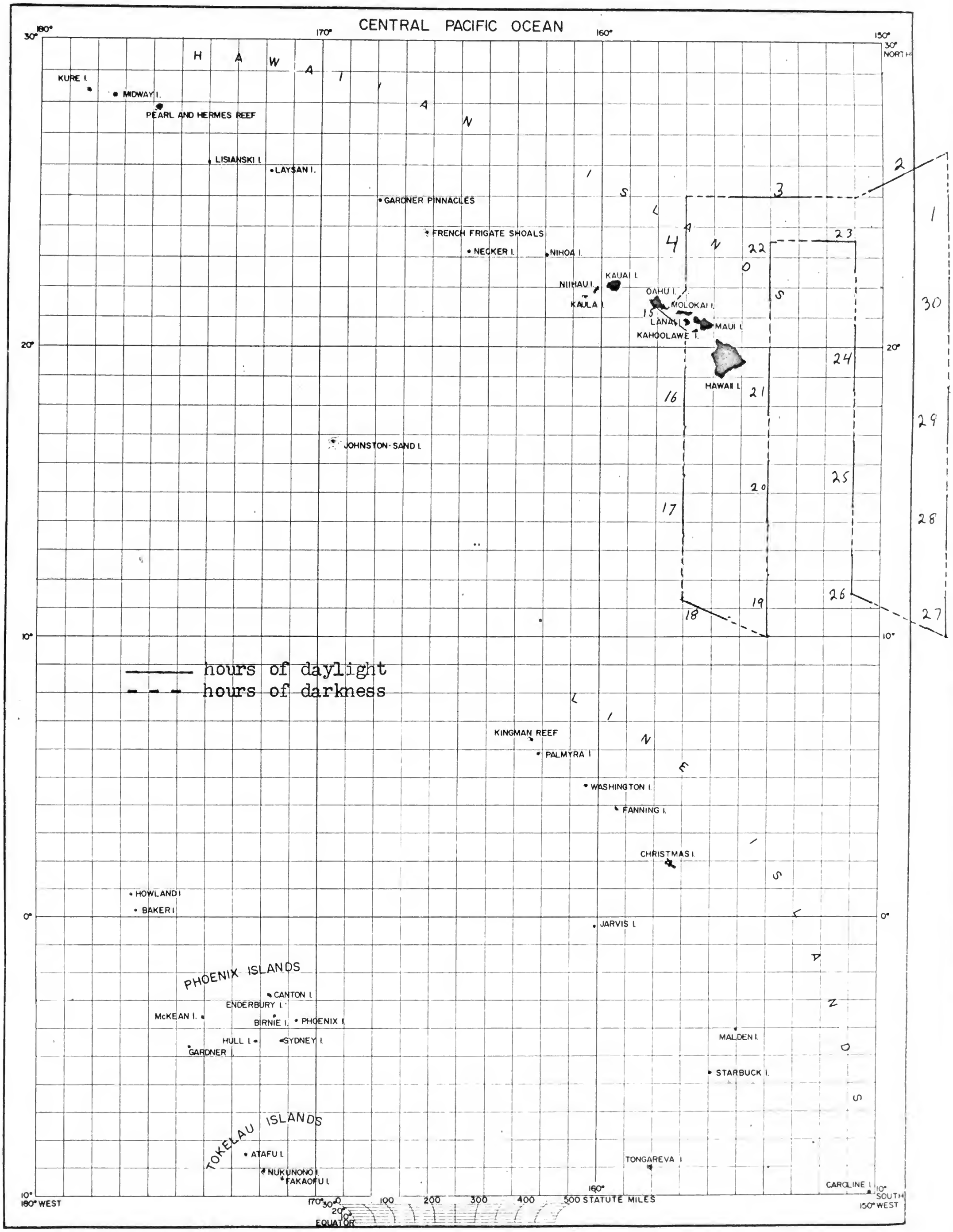
CENTRAL PACIFIC OCEAN



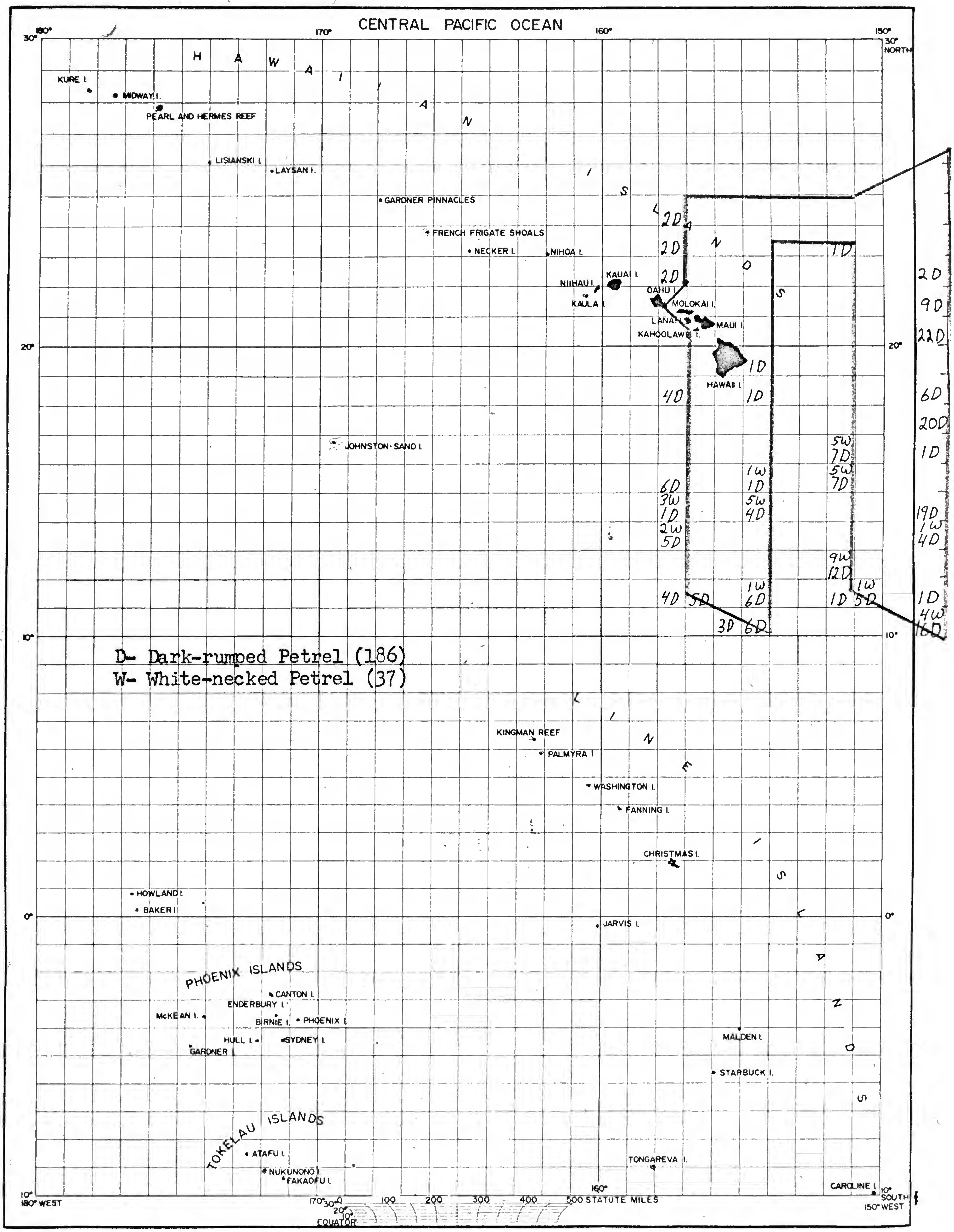
——— hours of daylight
- - - hours of darkness

105

CENTRAL PACIFIC OCEAN



JC 5


CENTRAL PACIFIC OCEAN
180°
170°
160°
150°
30°
30° NORTH
20°
10°
0°
10°
180° WEST
10° SOUTH
150° WEST
HAWAIIAN ISLANDS
KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
KAUAI I.
NIIHAU I.
KAULA I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
2D
2D
2D
1D
1D
1D
4D
2D
9D
22D
6D
20D
1D
5W
7D
5W
7D
1W
1D
5W
4D
6D
3W
1D
2W
5D
19D
1W
4D
9W
12D
1W
6D
4D
5D
1D
1W
5D
1D
4W
16D
3D
6D
D- Dark-rumped Petrel (186)
W- White-necked Petrel (37)
LINE ISLANDS
KINGMAN REEF
PALMYRA I
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.
170° 30° 20° 10° EQUATOR
0 100 200 300 400 500 STATUTE MILES

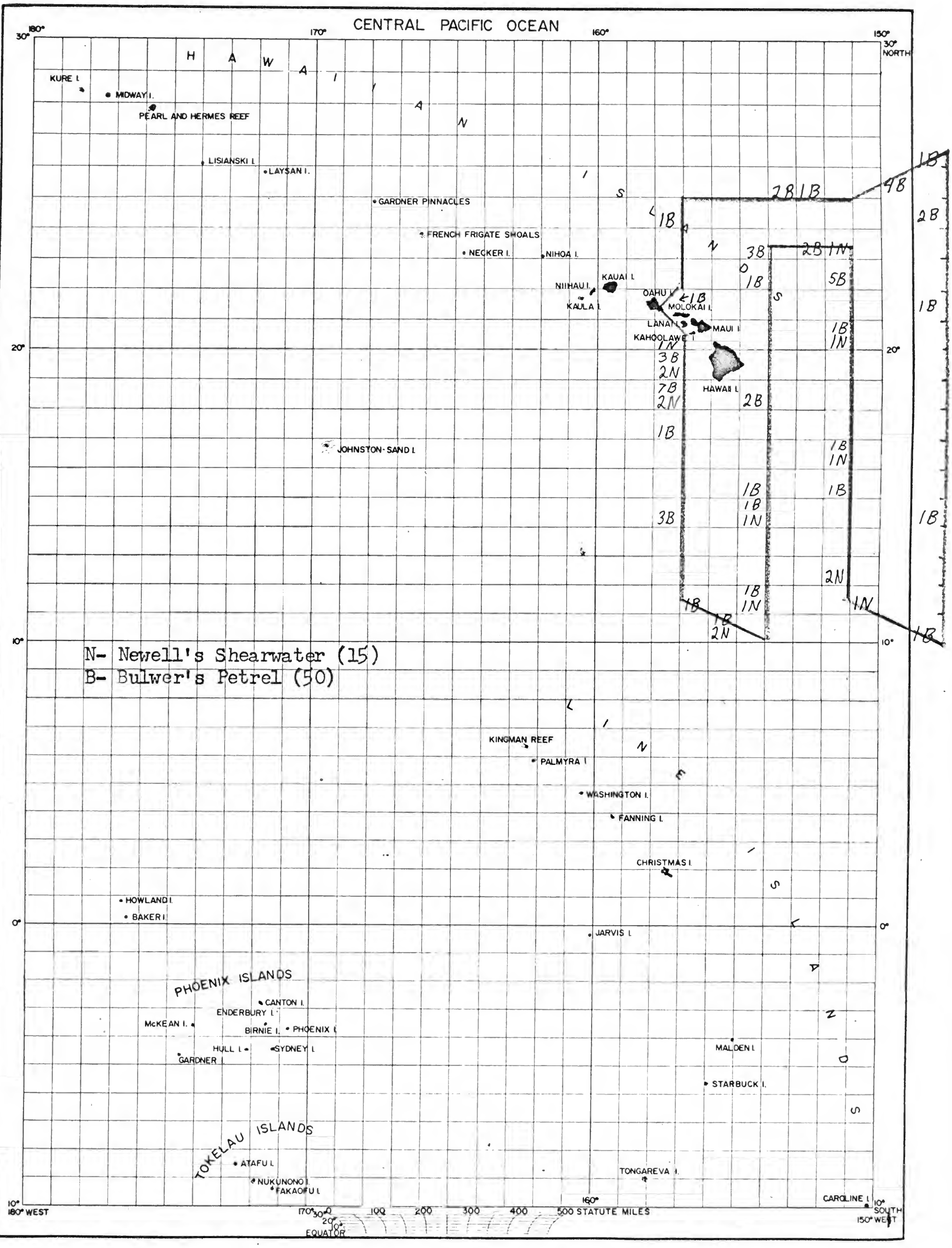
CENTRAL PACIFIC OCEAN

Sooty Tern (2413)

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

180° WEST
170°30'
160°
150°30' WEST
30° NORTH
20°
10°
0°
10° SOUTH
EQUATOR
0 100 200 300 400 500 STATUTE MILES

CENTRAL PACIFIC OCEAN



N- Newell's Shearwater (15)
B- Bulwer's Petrel (50)

CENTRAL PACIFIC OCEAN

180° 170° 160° 150° 30° NORTH

30° HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.

20°

JOHNSTON-SAND I.

10°

R- Red-tailed Tropicbird (15)
W- White-tailed Tropicbird (7)
T- tropicbird species (7)

KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.

0°

HOWLAND I.
BAKER I.
JARVIS I.

PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.

TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

10° SOUTH

180° WEST 170° 160° 150° WEST

0 100 200 300 400 500 STATUTE MILES

30° 20° 10° EQUATOR

CENTRAL PACIFIC OCEAN

180° 170° 160° 150° 30° NORTH

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
KAUAI I.
NIIHAU I.
KAULA I.
OAHU I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.

20°

10°

Bonin Island Petrel (176)

KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.

0°

PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.

TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.

CAROLINE I.

10° 180° WEST
170° 30° 20° 10° EQUATOR
160°
10° SOUTH 150° WEST

0 100 200 300 400 500 STATUTE MILES

CENTRAL PACIFIC OCEAN

HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

180° WEST
170°
160°
150° WEST
30° NORTH
20°
10°
0°
10° SOUTH
EQUATOR
0 100 200 300 400 500 STATUTE MILES

Wedgetailed Shearwater (985)

CENTRAL PACIFIC OCEAN

180° 170° 160° 150°

30° NORTH

20°

10°

0°

10° SOUTH

180° WEST 150° WEST

HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.
JOHNSTON-SAND I.
KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
PHOENIX ISLANDS
CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.
MALDEN I.
STARBUCK I.
TOKELAU ISLANDS
ATAFU I.
NUKUNONO I.
FAKAOFU I.
TONGAREVA I.
CAROLINE I.

1H
2FB

1F
3FB
18B
6N
01F
2H
1H
1BF
3RF→
1F
3RF→17N
1FB
9F
3F
1H
1F
1H
1H
1HAB
2F

BF- Black-footed Albatross (1)
H- Harcourt's Storm Petrel (7)
MB- Blue-faced Booby (1)
BB- Brown Booby (1)
RF- Red-footed Booby (6)
FB- Great Frigatebird (6)
N- Noddy Tern (23)
F- Fairy Term (18)

0 100 200 300 400 500 STATUTE MILES
0 20 40 60 80 100 200 300 400 500 600 700 800 900 1000 1100 1200 KILOMETERS
EQUATOR

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 15 June 64 Total Minutes: 249 Total Miles 44

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
60	137	2.28	3.11

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
28	24	0	1	48	45	0	1	1.71	1.88	0	1	1.09	1.02	0	.02

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1	1	-	1	1	-	1	1	-	.02	.02	-

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
33	82	2.48	1.86

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
7	0	6	1	7	0	6	1	1	0	1	1	.16	-	.14	.02

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
6	44	.14	0	0	—

1

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 16 June 64 Total Minutes: 793 Total Miles 120

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
57	338	4.53	2.82

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
51	31	10	11	168	135	15	11	3.29	5	1.5	1	1.4	1.13	.13	.09

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
—											

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
9	169	18.78	1.41

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
—			

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
—				—											

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1	1	1	.01

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
5	211	.04	2	191	.02

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 17 June 64 Total Minutes: 778 Total Miles 133

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
48	122	2.54	.92

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
44	10	26	3	87	23·45	3		1.98	2.3	1.73	1	.65	.17	.34	.02

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
2	1		3	1		1.5	1		.02	.01	

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
5	32	6.4	.24

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
-	-		

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
4	67	.03	3	59	.02

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 18 June 64 Total Minutes: 758 Total Miles 116

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
115	71	1.58	.61

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
44	18	23	2	67	32	27	2	1.52	1.78	1.17	1.0	.58	.28	.23	.02

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1	1		1	1		1	1		.01	.01	

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
2	2	1	.02

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B
1	1			1	1			1	1			.01	.01		

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
3	17	.03			

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 19 June 64 Total Minutes: 766 Total Miles 132

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
66	382	5.79	2.89

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
60	41	19	1	1523			1	3.22	4.24	1.21	1	1.46	1.25	.17	.01

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
8	188	23.5	1.42

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
5	298	.04	3	287	.02

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 20 Jun 64 Total Minutes: 783 Total Miles 125

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
29	37	1.28	.29

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
29	8	15	2	37	11	17	2	1.28	1.38	1.13	1	.30	.09	.14	.02

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 21 June 64 Total Minutes: 797 Total Miles 135

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
62	187	3.50	1.39

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
19	12	6	2	344	62			3.67	1			33.04	.21		

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
6	134	22.33	1.00

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
4	163	.03	3	156	.02

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 22 June 64 Total Minutes: 611 Total Miles 126

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
39	458	11.74	3.63

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
22	10	2	4	50	38	2	4	2.27	3.8	1	1	.40	30	.02	.03

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
2	1	1	2	1	1	1	1	1	.02	.01	.01

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
21	406	19.33	3.22

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
8	414	.06	4	360	.03

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 23 June 64 Total Minutes: 798 Total Miles 139

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
27	37	1.28	.27

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
24	3	13	29	136	101	1	34								

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
2	1	1	2	1	1						

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 24 June 64 Total Minutes: 800 Total Miles 127

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
21	31	1.48	.24

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
13	4	4	1	13	4	4	1	1.00	1.00	1.00	1.00	.10	.03	.03	.01

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
4	1	1	7	3	1	1.75	3.00	1.00	.06	.02	.01

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
3	10	3.33	.08

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
1	8	.01	1	8	.01

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 2 5 June 64 Total Minutes: 785 Total Miles 140

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
58	683	10.78	4.88

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
56	11	32	2	323	12	492		5.77	1.09	1.53	1.00	2.31	.09	.35	.01

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
2	2	—	2	2	—	1.00	1.00	—	.01	.01	—

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
4	358	89.50	2.56

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
5	618	.04	5	618	.04

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 26 Jan 64 Total Minutes: 767 Total Miles 135

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
64	146	2.28	1.10

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
60	46		8	158											

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
2	2		2	2		1	1				

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
2	30	15.0	.23

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
3	77	.02	2	71	.02

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 27 June 64 Total Minutes: 762 Total Miles 109

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
52	77	1.48	.71

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
50	1234	1		71	17 4/6	1		1.42	1.42	1.35	1.00	.65	.16	.42	.01

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
3	6	2.00	.06

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
2	11	.02	2	11	.02

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 28 June 64 Total Minutes: 777 Total Miles 119

I. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
70	57	1.43	.48

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
39	0	29	1	54	0	42	1	1.38	0	1.45	1.00	.45	0	.35	.01

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1	1		1	1		1.00	1.00		.01	.01	—

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1	2	2.00	.02

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 29 June 64 Total Minutes: 791 Total Miles 123

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
28	51	1.82	.41

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
27	5	19	0	50	8	33	0	1.85	1.60	1.74	0	.41	.07	.27	0

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
1	11	.01	1	11	.01

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 20 June 64 Total Minutes: 805 Total Miles 111

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
50	223	4.46	2.01

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
47	9	27	1	117	14	40	1	2.49	1.56	1.48	1	1.05	.13	.36	.01

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1	—	1	1	—	1	1	—	1	.01		.01

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
3	105	35.00	.95

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
2	158	.02	2	158	.02

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 1 July 64 Total Minutes: 811 Total Miles 71

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
10	15	1.5	.21

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
9	6	0	2	14	11	0	2	1.56	1.83	0	1	.20	.15	0	.03

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1	1		1	1		1	1		.01		.01

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 2 July 64 Total Minutes: 8 54 Total Miles 165

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
16	18	1.13	.11

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
15	5	1	4	16	5	1	5	1.07	1	1	1.25	.09	.03	.01	.03

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
1		1	2		2	2		2	.01		.01

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 3 July 64 Total Minutes: 831 Total Miles 150

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
22	44	2	.29

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
20	10	3	3	40	23	3	3	.27	.15	.02	.02				

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1	2	2	.01

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
1	2	2	.01

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.

SI-MNH-955a
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART A

DATE: 4 July 64 Total Minutes: 814 Total Miles 139

1. Total Abundance of birds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
27	1360	15.63	9.78

II. Abundance of the Shearwater-Petrel-Albatross Group:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	WT	P	B	T	WT	P	B	T	WT	P	B	T	WT	P	B
72	43	24	1	429	389	27	1	5.94	9.05	1.13	1.00	3.08	2.80	.19	.01

III. Abundance of Tropicbirds:

No. Sightings			No. Birds			Birds/Sighting			Birds/Mile		
T	RT	WT	T	RT	WT	T	RT	WT	T	RT	WT
4	2	1	4	2	1	1.00	1.00	1.00	.03	.01	.01

IV. Abundance of Terns:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
21	923	43.95	6.64

V. Abundance of Shorebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile

VI. Abundance of Boobys:

No. Sightings				No. Birds				Birds/Sighting				Birds/Mile			
T	BF	RF	B	T	BF	RF	B	T	BF	RF	B	T	BF	RF	B

VII. Abundance of Frigatebirds:

No. Sightings	No. Birds	Birds/Sighting	Birds/Mile
2	3	1.50	.02

VIII. Abundance of Flocks:

Total No. Flocks	Total No. Birds	Total No. F/Mi.	No. Feeding Flocks	No. Feeding Birds	No. Feeding F/MI.
9	1250	.07	7	1236	.05

R/V Townsend Cromwell 20 June, 1964

202150Z Weather Broadcast

Part One
unclas gale warning position fair based on ship reports estimated near four zero pt five north one six zero pt five east at 201800z max winds 30 kt near center weakening. radius 30 kt wind 300 mi. fcst movg 050 deg 15 kts. rough seas. fcst posit 210600z 41.8n 164e max winds 25 kts. fcst posit 211800z 43n 167.8e max winds 25 kts. no further warning will be issued unless regeneration occurs.

Part Two
Unclas
FPPA NPM SYNOPSIT 201800z.

1. refer fleweacen kodiak gale wng. ridge 27n 165w 32n 155w etn 177w 40n 175w. cold front 34n 160e 36n 163e 40n 162e mov east 12 kts warm front 40n 164e 37n 168e 31n 173e mov east 10 kts. cold front 30n 169w 35n 163w 40n 159w mov northeast 10 kts. itcz ptn 160e 04n 175e 02n 170w 02n 155w 04n 118w.

2. 24 hr area fcst commencing 202200z ptly cldy with wdly sctd shwrs vcnty fronts and itcz. vsby 10 mi xcpt 2 tp 5 mi in shwrs. winds anticyclonic 15 to 25 kts acrs fronts and itcz. seas slgt to mod. winds and seas higher wng area.

Note Under lined portions believed to be 35N and 05N

JOHN J. McMULLEN ASSOCIATES, INC.
17 Battery Place
New York 4, New York

ROLL RECORD

NUMBER OF ROLLS

DATE	TIME	2°	4°	6°	8°	10°	12°	14°	16°
	START								
	STOP								
	DIFF.								
	START								
	STOP								
	DIFF.								
	START								
	STOP								
	DIFF.								
	START								
	STOP								
	DIFF.								
	START								
	STOP								
	DIFF.								
	START								
	STOP								
	DIFF.								

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 15 June 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100																
0200																
0300																
0400																
0500																
0600																
0700																
0800																
0900																
1000																
1100																
1200																
1300																
1400																
1500	21 19	157 58														
1600	21 13	157 50														
1700	21 06	157 42														
1800	20 56	157 34														
1900	20 48	157 27														
2000	20 39	157 20														
2100	20 35	157 15														
2200	20 35	157 15														
2300	20 30	157 13														
2400	20 20	157 09														

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 16 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	20 10	157 05													
0200	20 00	157 01													
0300	19 48	157 01													
0400	19 36	157 02													
0500	19 24	157 01													
0600	19 12	157 01													
0700	19 01	157 00													
0800	19 00	157 00	01	10	1016.0	25.2	21	84	6		110-3-9	25.4	19	110	S-12
0900	18 54	157 00													
1000	18 42	157 00													
1100	18 30	157 00													
1200	18 17	157 00													
1300	18 06	157 00													
1400	17 54	157 00	02	10	1015.1	25.2	22	85	7		90-3-10	25.6	27	80	S-12
1500	17 44	157 00													
1600	17 33	157 00													
1700	17 30	157 00													
1800	17 26	157 00													
1900	17 15	157 00													
2000	17 03	157 01	20	5	1015.1	24.5	22	88	6		80-3-10	25.0	28	80	S-12
2100	17 00	157 01													
2200	16 48	157 00													
2300	16 36	157 00													
2400	16 24	157 00													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 17 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	16 13	157 00													
0200	16 02	156 59	00	5	1014.9	25.1	22	84	9		80-3-10	25.2	19	80	5-12
0300	16 00	156 59													
0400	15 59	156 59													
0500	15 48	157 00													
0600	15 38	157 00													
0700	15 26	157 00													
0800	15 15	157 00	01	10	1015.2	25.7	22	85	2		80-3-9	25.2	26	60	5-12
0900	15 04	157 00													
1000	14 53	157 00													
1100	14 41	157 00													
1200	14 30	157 00													
1300	14 30	157 00													
1400	14 23	157 00	01	10	1014.5	25.6	22	84	2		80-3-9	25.7	22	70	5-12
1500	14 12	157 00													
1600	14 00	157 00													
1700	13 48	157 00													
1800	13 36	157 00													
1900	13 24	157 00													
2000	13 13	157 00	03	10	1014.4	26.1	21	81	3		80-3-9	26.3	20	70	5-12
2100	13 08	157 00													
2200	12 58	157 00													
2300	12 56	157 00													
2400	12 52	157 00													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 18 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	12 40	157 00													
0200	12 28	157 00	00	5	1013.6	25.7	21	83	9		80-2-9	26.5	24	70	S-12
0300	12 17	157 00													
0400	12 05	157 00													
0500	11 53	157 00													
0600	11 41	157 00													
0700	11 29	157 00													
0800	11 23	157 00	14	10	1014.2	26.1	23	86	7		80-3-7	26.8	04	130	S-12
0900	11 22	156 59													
1000	11 18	156 51													
1100	11 14	156 44													
1200	11 10	156 36													
1300	11 06	156 26													
1400	11 02	156 15	03	10	1013.1	27.5	23	83	7		80-3.5	26.7	04	70	SE-12
1500	10 58	156 05													
1600	10 55	155 55													
1700	10 51	155 45													
1800	10 47	155 35													
1900	10 44	155 25													
2000	10 40	155 15	01	10	1012.6	25.5	24	94	5		80-3.5	26.5	15	80	SE-12
2100	10 36	155 09													
2200	10 30	154 59													
2300	10 24	154 49													
2400	10 19	154 39													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 19 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	10 15	154 37													
0200	10 09	154 27	00	5	1011.3	25.5	23	92	X		80-6-5	26.6	12	80	NE-12
0300	10 04	154 18													
0400	09 59	154 10													
0500	09 55	154 02													
0600	09 55	154 02													
0700	10 07	154 02													
0800	10 18	154 02	03	10	1012.1	26.1	23	87	8		70-6-5	26.8	17	90	N-12
0900	10 29	154 02													
1000	10 40	154 01													
1100	10 50	154 00													
1200	11 02	154 00													
1300	11 14	154 00													
1400	11 26	154 00	16	10	1010.8	26.8	22	81	8		70-6-5	26.6	18	70	N-12
1500	11 30	154 00													
1600	11 35	154 00													
1700	11 47	154 00													
1800	11 59	154 00													
1900	12 11	154 00													
2000	12 23	154 00	01	10	1014.3	26.4	22	83	7		60-6-5	26.6	18	50	N-12
2100	12 27	154 00													
2200	12 39	154 00													
2300	12 52	154 00													
2400	13 01	154 00													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 20 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	13 01	154 00													
0200	13 18	154 00	01	10	1012.0	25.5	21	82	3		60-6-5	26.3	16	60	N-12
0300	13 35	154 [illegible]													
[illegible]00	13 37	154 00													
0[illegible]-00	13 49	154 [illegible]													
0[illegible]00	14 00	154 [illegible]													
0700	14 12	154 00													
0800	14 24	154 [illegible]	03	10	1014.1	25.5	23	88	5		60-6-5	25.4	15	40	N-12
0900	14 30	154 00													
1000	14 30	154 00													
1100	14 30	154 00													
1200	14 39	153 59													
1300	14 51	153 59													
1400	15 03	153 59	02	10	1014.0	25.6	21	83	3		60-6-4	25.6	17	50	N-12
1500	15 15	154 02													
1600	15 27	154 00													
1700	15 39	154 00													
1800	15 51	154 [illegible]													
1900	16 04	154 01													
2000	16 04	154 01	02	10	1014.1	25.3	21	85	4		20-6-5	26.2	16	20	N-12
2100	16 06	154 01													
2200	16 19	154 [illegible]													
2300	16 31	154 00													
2400	16 42	154 00													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 21 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	16 [illegible]	15 4 00													
0200	17 07	154 00	02	10	1014.5	25.0	21	84	4		30-6-5	25.9	16	30	N-12
0300	17 20	154 00													
0400	17 30	154 00													
0500	17 36	154 00													
0600	17 36	154 00													
0700	17 44	154 00													
0800	18 01	153 59	03	10	1012.1	25.1	21	83	7		60-6-5	25.8	16	40	N-12
0900	18 13	153 59													
1000	18 25	153 58													
1100	18 36	153 58													
1200	18 47	153 58													
1300	18 58	153 58													
1400	18 58	153 58	03	10	1012.5	25.2	21	83	5		60-6-5	25.3	16	40	N-12
1500	19 06	153 57													
1600	19 17	153 57													
1700	19 28	153 57													
1800	19 38	153 57													
1900	19 47	153 56													
2000	19 58	153 56	03	10	1011.2	24.4	21	85	3		60-6-5	25.0	17	20	N-12
2100	20 03	153 56													
2200	20 13	153 56													
2300	20 23	153 56													
2400	20 23	153 56													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 22 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	20 37	153 58													
0200	20 49	153 58	02	10	1017.2	24.0	20	85	4		40-6-5	24.8	17	40	N-12
0300	21 01	153 58													
0400	21 13	153 59													
0500	21 24	154 00													
0600	21 36	154 00													
0700	21 47	154 00													
0800	21 58	153 59	14	10	1014.0	23.2	20	87	6		40-6-7	25.0	20	50	N-12
0900	22 08	153 59													
1000	22 17	153 59													
1100	22 17	154 00													
1200	22 28	154 00													
1300	22 40	154 00													
1400	22 51	153 59	14	10	1017.9	24.0	21	87	5		50-6-7	24.3	17	20	E-10
1500	23 03	153 59													
1600	23 14	153 59													
1700	23 26	153 58													
1800	23 32	153 58													
1900	23 32	153 54													
2000	23 32	153 46	20	10	1018.5	23.8	20	88	4		70-5-7	24.5	17	70	E-10
2100	23 32	153 42													
2200	23 32	153 36													
2300	23 32	153 26													
2400	23 32	153 16													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 23 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	23 32	153 04													
0200	23 32	152 53	02	10	1016.9	23.4	18	81	5		70-5-7	24.4	12	110	S-12
0300	23 32	152 41													
0400	23 32	152 30													
0500	23 31	152 20													
0600	23 31	152 10													
0700	23 30	151 59													
0800	23 30	151 48	14	10	1017.0	22.2	18	81	3		60-5-7	24.1	25	90	E-12
0900	23 30	151 37													
1000	23 29	151 26													
1100	23 29	151 15													
1200	23 28	151 04													
1300	23 28	150 58													
1400	23 24	150 58	03	10	1016.0	22.8	19	87	6		70-5-5	24.1	12	90	E-12
1500	23 12	150 57													
1600	23 00	150 56													
1700	22 48	150 57													—
1800	22 35	150 58													
1900	22 23	150 59													
2000	22 12	150 59	01	10	1014.5	21.3	19	84	3		70-5-5	24.3	13	100	E-12
2100	22 07	150 59													
2200	22 02	150 59													
2300	21 58	150 59													
2400	21 46	150 59													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 24 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	21 34	150 58													
0200	21 22	150 58	03	10	1014.0	23.7	20	86	5		70-5-5	24.4	16	90	5-12
0300	21 10	150 57													
0400	20 58	150 56													
0500	20 47	150 56													
0600	20 35	150 56													
0700	20 32	150 56													
0800	20 27	150 56	14	10	1015.4	24.1	20	85	7		70 5-4	24.3	14	90	5-12
0900	20 15	150 57													
1000	20 02	150 59													
1100	19 49	151 00													
1200	19 37	151 01													
1300	19 26	151 01													
1400	19 15	151 01	03	10	1014.7	24.6	23	84	7		90-5-4	24.6	15	90	5-12
1500	19 04	151 02													
1600	19 01	151 02													
1700	18 55	151 02													
1800	18 44	151 03													
1900	18 32	151 03													
2000	18 20	151 03	02	10	1014.6	24.8	22	86	7		90 5-4	24.7	16	90	5-12
2100	18 16	151 03													
2200	18 05	151 01													
2300	17 55	151 00													
2400	17 43	150 58													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 25 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	17 32	150 51													
0200	17 31	150 56	01	10	1013.9	24.5	20	85	3		4-4	24.6	17	70	5-12
0300	17 25	150 55													
0400	17 14	150 54													
0500	17 02	150 53													
0600	16 51	150 51													
0700	16 39	150 50													
0800	16 27	150 57	03	10	1014.5	25.0	21	83	5		4-5-4	24.7	19	70	5-12
0900	16 15	151 02													
1000	16 03	151 03													
1100	15 51	151 03													
1200	15 39	151 04													
1300	15 27	151 04													
1400	15 31	151 03	03	10	1013.2	26.1	25	92	8		90-6-5	26.2	16	100	5-12
1500	15 9	151 03													
1500	15 0	151 02													
1700	14 51	151 02													—
1800	14 42	151 02													
1900	14 32	151 01													
2000	14 28	151 03	01	5	1012.6	25.6	23	84	2		90-6-5	26.7	21	70	5-12
2100	14 23	151 03													
2200	14 15	151 03													
2300	14 03	151 01													
2400	13 51	150 51													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 26 June 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	12 32	150 52													
0200	12 26	150 55	02	10	1012.2	25.2	21	84	4		70-6-5	26.6	20	70	S-12
0300	12 14	150 58													
0400	12 02	151 01													
0500	12 51	151 01													
0600	12 53	150 57													
0700	12 39	150 59													
0800	12 26	150 51	01	25	1013.2	25.2	21	81	3		80-6-5	26.3	16	70	S-12
0900	12 14	150 59													
1000	12 02	151 00													
1100	11 50	151 00													
1200	11 37	151 00													
1300	11 30	151 00													
1400	11 30	151 00	02	25	1011.4	26.2	21	80	4		70-6-5	26.1	17	70	S-12
1500	11 25	150 52													
1600	11 20	150 43													
1700	11 14	150 33													
1800	11 09	150 24													
1900	11 04	150 14													
2000	10 58	150 04	02	5	1011.1	26.1	23	87	8		70-6-5	25.8	20	60	SE-12
2100	10 56	150 01													
2200	10 51	149 50													
2300	10 45	149 40													
2400	10 39	149 30													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 27 June 70

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100															
0200	10 29			10	1010.2			85							
0300	10 23	149 00													
0400	10 15	148 51													
0500		148 42													
0600	10 07	148 32													
0700	10 03	148 22													
0800	10 05	148 11													
0900															
1000															
1100															
1200															
1300															
1400															
1500															
1600															
1700															
1800															
1900															
2000															
2100															
2200															
2300															
2400															

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE _____

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100																
0200									92							
0300																
0400																
0500																
0600																
0700																
0800									91							
0900																
1000																
1100																
1200																
1300																
1400																
1500																
1600																
1700																
1800																
1900																
2000																
2100																
2200																
2300																
2400																

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100															
0200															
0300															
0400															
0500															
0600															
0700															
0800															
0900															
1000															
1100															
1200															
1300															
1400															
1500															
1600															
1700															
1800															
1900															
2000															
2100															
2200															
2300															
2400															

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100																
0200																
0300																
0400																
0500																
0600																
0700																
0800																
0900																
1000																
1100																
1200																
1300																
1400																
1500																
1600																
1700																
1800																
1900																
2000																
2100																
2200																
2300																
2400																

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 13 July 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	23 20	147-56													
0200	23 28	147 56	01	10	1022.1	226	17	80	4		50-5-5	23.4	17	50	N-12
0300	23 29	147 56													
0400	23 39	147-56													
0500	23 48	147 56													
0600	24 00	147 55													
0700	24 00	147 55													
0800	24 00	147 55	03	10	1021.5	230	18	81	3		60-7-4	23.3	15	45	N-12
0900	24 00	147 55													
1000	24 00	147 55													
1100	24 00	147 55													
1200	24 00	147 55													
1300	24 12	147 55													
1400	24 22	147 55	14	10	1020.0	227	19	84	5		70-5-4	23.5	15	80	N-12
1500	24 35	147 56													
1600	24 47	147 57													
1700	24 58	147 57													
1800	25 00	147 57													
1900	25 04	147 57													
2000	25 15	147 57	03	10	1020.1	225	17	82	4		70-6-4	23.1	18	70	N-12
2100	25 20	147 57													
2200	25 31	147 57													
2300	25 41	147 57													
2400	25 51	147 57													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 2 July 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	26 00	147 56													
0200	26 11	147 56	01	10	1021.3	227	17	81	2		70-5-4	72.9	19	40	N - 12
0300	26 22	147 56													
0400	26 32	147 55													
0500	26 32	147 55													
0600	26 29	148 02													
0700	26 24	148 14													
0800	26 18	148 26	02	23	1022.6	238	16	75	5		50 5-4	72.7	16	60	N - 12
0900	26 12	148 38													
1000	26 06	148 50													
1100	26 00	149 01													
1200	25 53	149 14													
1300	25 46	149 26													
1400	25 41	149 38	03	10	1021.4	241	19	78	7		70-5-4	72.8	15	70	SW - 12
1500	25 35	149 50													
1600	25 29	150 02													
1700	25 24	150 13													
1800	25 18	150 25													
1900	25 12	150 36													
2000	25 06	150 47	01	10	1020.9	230	17	83	7		70-5-4	72.6	15	60	SW - 12
2100	25 03	150 54													
2200	25 00	151 00													
2300	25 00	151 05													
2400	25 00	151 19													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 3 July 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	25 00	151 33													
0200	25 00	151 47	80	10	1021.1	22.6	20	88	6		90-5-4	236	16	100	W-12
0300	25 00	152 01													
0400	25 00	152 16													
0500	25 00	152 31													
0600	25 00	152 43													
0700	24 59	152 56													
0800	24 59	153 09	03	10	1022.1	23.9	19	79	7		90-5-5	242	15	110	W-12
0900	24 59	153 22													
1000	24 58	153 35													
1100	24 58	153 47													
1200	24 58	153 59													
1300	24 58	154 00													
1400	24 58	154 12	01	10	1021.1	24.8	19	77	3		120-7-4	242	19	50	W-12
1500	24 58	154 24													
1600	24 58	154 37													
1700	24 58	154 51													
1800	24 57	155 05													
1900	24 57	155 19													
2000	24 57	155 32	01	10	1021.0	24.4	19	81	3		75 7-4	242	14	90	W-12
2100	24 57	155 36													
2200	24 57	155 49													
2300	24 58	156 02													
2400	24 58	156 16													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 4 July 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	24 59	156 29													
0200	25 00	156 43	02	10	1020.8	245	19	77	1		70-2-3	244	16	80	W-12
0300	25 00	156 57													
0400	25 00	156 59													
0500	24 56	157 00													
0600	24 44	157 00													
0700	24 31	157 01													
0800	24 19	157 00	02	10	1020.8	240	19	81	5		80-2-4	243	21	80	5-12
0900	24 07	156 59													
1000	23 55	156 58													
1100	23 43	156 58													
1200	23 31	156 58													
1300	23 30	157 00													
1400	23 28	157 00	15	10	1020.9	238	20	85	8		80-2-4	244	11	90	5-12
1500	23 16	157 00													
1600	23 04	157 00													
1700	22 52	157 00													
1800	22 41	157 00													
1900	22 31	157 00													
2000	22 18	157 00	02	10	1018.5	247	20	82	4		70-6-5	247	20	70	5-12
2100	22 13	156 59													
2200	22 03	156 58													
2300	22 00	156 58													
2400	22 00	156 59													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

SI-MNH-955c
3-4-64

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA SURVEY CHART C

DATE 5 Jul. 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	21 49	157 05														
0200	21 38	157 16														
0300	21 32	157 25														
0400	21 17	157 35														
0500	21 18	157 46														
0600	21 18	157 54														
0700	21 19	157 58														
0800																
0900																
1000																
1100																
1200																
1300																
1400																
1500																
1600																
1700																
1800																
1900																
2000																
2100																
2200																
2300																
2400																

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES; WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS