

ALASKA DEPARTMENT OF FISH AND GAME  
JUNEAU, ALASKA

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POLAR BEAR REPORT

by  
Jack W. Lentfer

Volume XIV  
Project Progress Report  
Federal Aid in Wildlife Restoration  
Project W-17-4, Jobs 5.1R, 5.3R, 5.4R and 5.5R (2nd half) and  
Project W-17-5, Jobs 5.1R, 5.3R, 5.4R and 5.5R (1st half)

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(Printed March, 1973)

JOB PROGRESS REPORT (RESEARCH)

State: Alaska

Cooperator: Jack W. Lentfer

Project Nos: W-17-4                      Project Title: Big Game Investigations  
W-17-5

Job Nos.: 5.1R                      Job Titles: Polar Bear Distribution  
and Movements

5.3R                                      Polar Bear Age Determination  
Technique

5.4R                                      Polar Bear Reproduction  
and Denning

5.5R                                      Environmental Contaminants  
and Parasites in Polar  
Bears

Period Covered: January 1, 1972 through December 31, 1972

SUMMARY

The Alaska Department of Fish and Game tagged 96 polar bears in the Point Barrow area, and the U. S. Fish and Wildlife Service tagged 59 bears in the Cape Lisburne area. Of 357 tags applied prior to 1972, 63 have been recovered nine months to five years after being applied. Tag returns indicate that bears marked in the Point Barrow area tend to return to that area more commonly than to move to other areas.

Final reports on age determination, reproduction, denning and environmental contaminants and parasites are being prepared in lieu of progress reports.

The Alaska polar bear harvest for July 1, 1971 through June 30, 1972 was 265. Natives, most with the aid of snowmachines, took 15 percent, and trophy hunters, most with the aid of aircraft, took 85 percent of the harvest. Nonresidents took 25 percent of the harvest. The harvest was 80 percent males. The mean number of days hunted by each hunter utilizing aircraft was 1.6.

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## BACKGROUND

There is worldwide interest and a wide range of views about polar bear management. These range from the concept that bears are highly desired trophy animals that should be managed so as to furnish a maximum amount of hunting, to the concept that they are a unique and possibly endangered species that should be given complete protection. Polar bears are under the jurisdiction of five nations, each with different management philosophies. The Alaska Department of Fish and Game was responsible for management of polar bears in United States territory until December 21, 1972. At that time, the Marine Mammal Protection Act of 1972 placed a moratorium of unspecified length on the hunting of polar bears other than by Alaskan coastal natives for subsistence or to obtain hides for manufacture into traditional items of clothing. The Marine Mammal Protection Act transfers regulatory authority for the harvesting and capturing of bears from the State of Alaska to the U. S. Department of Interior. The Act makes it possible for management authority to be transferred back to the state if the state proposes a management program which meets the intent of the Act.

Much of the past work of the Department of Fish and Game to develop a management program has been an assessment of hunter harvest and the gathering of abundance and composition data. The relationship of bears to different types of sea ice and the effects of ice formation, ice movements and long-term climatic fluctuations on bear abundance, distribution, and movements have also been studied. More recent efforts have been directed toward determining distribution and movement patterns of bears off the coast of Alaska, with emphasis on identification of subpopulations. These studies are coordinated with those of other nations. Other studies are designed to test the accuracy of the cementum age determination technique, describe breeding biology and denning in the Alaska sector of the polar basin, and determine levels of parasites and environmental contaminants in polar bears.

Present investigations are being terminated and final reports prepared. This progress report is to provide continuity in the presentation of tagging and harvest data and make such data available before final reports are prepared.

## OBJECTIVES

To determine distribution and movement patterns of polar bears off the coast of Alaska with emphasis on identification of subpopulations.

To determine if tooth cementum layering provides accurate age determinations for polar bears.

To determine the extent of past and present denning by polar bears along the coast of Alaska and possible reasons for changes in denning patterns and to obtain an indication of the amount of denning on sea ice.

To determine parasite levels and types and levels of environmental contaminants in polar bears.

## PROCEDURES

Polar bears are immobilized for the sixth year in the Point Barrow area to recapture animals that had been marked in previous years, to mark additional animals, and to obtain data on sex and age composition and reproductive status. Work was conducted from the Naval Arctic Research Laboratory from March 30 through May 15. Aircraft used were a Hiller FH-1100 turbine helicopter and a Cessna 185 fixed-wing plane. Lentfer (1968, 1969, 1971) gives details on immobilizing and marking procedures. The U. S. Fish and Wildlife Service tagged bears in the Cape Lisburne area.

The recovery effort for tags was similar to that of past years. Residents of coastal villages were informed of the marking program and \$25 tag reward. Department personnel stationed in hunting villages to monitor hunting with use of aircraft in February, March and April checked for marked animals in the harvest. U. S. and Canadian icebreaker personnel were asked to examine bears which they saw for marks. Canadian and Russian officials publicized the tagging program and the need for tag return in appropriate areas in their countries.

## FINDINGS

In 1972, the Alaska Department of Fish and Game tagged 96 bears in the Barrow area, and the U. S. Fish and Wildlife Service tagged 59 bears in the Cape Lisburne area (Table 1). Eleven bears tagged in previous years were recovered at Barrow and one was recovered at Lisburne. Hunters in 1972 killed 16 bears that had been tagged in previous years. The total number of animals tagged off the Alaska coast through 1972 is 512 (Table 2, Fig. 1).

Recoveries nine months or longer after tagging are considered significant from a long-term movement standpoint. Sixty-three such recoveries of 357 animals tagged through 1971 have been made through 1972. Animals that have been tagged and then recovered in the Point Barrow area appear

Table 1. Polar bear tagging data, Alaska, 1972.

	Ear Tag Nos.		Tattoo No.	Location	Date	Sex	Age Class
	Left	Right					
Lisburne*	1400	1400	1400	70°44'N 168°00'W	3-6	F	Ad.
	1401	1401	1401	70°44'N 168°00'W	3-6	M	1
	1402	1402	1402	70°44'N 168°00'W	3-6	M	1
	1403	1403	1403	70°48'N 168°05'W	3-6	M	Ad.
	1451	1451	1451	69°30'N 167°32'W	3-7	F	Ad.
	1452	1452	1452	69°30'N 167°32'W	3-7	M	1
	1453	1453	1453	69°30'N 167°32'W	3-7	F	Sub-Ad.
	1454	1454	1454	69°44'N 168°12'W	3-7	M	Ad.
	1455	1455	1455	69°10'N 166°20'W	3-8	M	Ad.
	1456	1456	1456	69°12'N 166°04'W	3-8	F	Ad.
	1457	1457	1457	69°02'N 166°53'W	3-8	M	Ad.
	1458	1458	1458	69°32'N 166°04'W	3-8	F	Ad.
	1459	1459	1459	69°32'N 166°04'W	3-8	M	2
	1460	1460	1460	69°32'N 166°04'W	3-8	F	2
	1461	1461	1461	69°12'N 167°57'W	3-9	F	Sub-Ad.
	1462	1462	1462	69°42'N 166°04'W	3-9	M	Sub-Ad.
	1463	1463	1463	69°42'N 166°04'W	3-9	M	Ad.
	1464	1464	1464	69°42'N 166°04'W	3-9	F	Sub-Ad.
	1465	1465	1465	69°48'N 166°55'W	3-10	F	Sub-Ad.
	1466	1466	1466	69°48'N 166°55'W	3-10	F	Ad.
	1467	1467	1467	69°48'N 166°55'W	3-10	M	2
	1468	1468	1468	69°48'N 167°00'W	3-10	M	Sub-Ad.
	1469	1469	1469	68°52'N 167°40'W	3-10	M	Sub-Ad.
	1470	1470	1470	69°18'N 168°34'W	3-11	F	Ad.
	1471	1471	1471	69°18'N 168°34'W	3-11	F	2
	1472	1472	1472	69°18'N 168°34'W	3-11	F	Ad.
	1473	1473	1473	69°18'N 168°34'W	3-11	M	2
	1474	1474	1474	69°18'N 168°34'W	3-11	M	2
	1475	1475	1475	69°38'N 167°53'W	3-13	M	Ad.
	1476	1476	1476	69°38'N 167°53'W	3-13	F	Ad.
	1477	1477	1477	69°38'N 167°53'W	3-13	M	Ad.
	1478	1478	1478	69°10'N 166°50'W	3-14	F	Sub-Ad.
	1479	1479	1479	69°10'N 166°50'W	3-14	F	Ad.
	1480	1480	1480	69°10'N 166°50'W	3-14	M	2
	1481	1481	1481	69°38'N 167°53'W	3-14	F	Ad.
	1482	1482	1482	69°38'N 167°53'W	3-14	M	1
	1483	1483	1483	69°58'N 167°08'W	3-14	F	Sub-Ad.
	1484	1484	1484	69°58'N 167°08'W	3-14	F	Ad.
	1485	1485	1485	69°58'N 167°08'W	3-14	M	2
	1486	1486	1486	69°58'N 167°08'W	3-14	F	2
	1487	1487	1487	68°52'N 168°10'W	3-15	M	Ad.
	1488	1488	1488	69°11'N 166°04'W	3-15	F	Ad.
	1404	1404	1404	69°44'N 166°50'W	3-21	F	Sub-Ad.
	1405	1405	1405	69°44'N 166°50'W	3-21	F	Ad.

\*Brackets indicate family groups.

Table 1 (cont'd.) Polar bear tagging data, Alaska, 1972.

	Ear Tag Nos.		Tattoo No.	Location	Date	Sex	Age Class
	Left	Right					
Lisburne	1406	1406	1406	69°44'N 166°50'W	3-21	F	Ad.
	1407	1407	1407	69°44'N 166°50'W	3-21	M	2
	1408	1408	1408	69°44'N 166°50'W	3-21	F	2
	1409	1409	1409	69°48'N 168°22'W	3-28	F	Sub-Ad.
	1410	1410	1410	69°48'N 168°22'W	3-28	F	Ad.
	1412	1412	1412	69°53'N 167°03'W	3-28	F	Ad.
	1413	1413	1413	69°53'N 167°03'W	3-28	F	2
	1414	1414	1414	69°52'N 166°04'W	3-30	F	Ad.
	1415	1415	1415	69°52'N 166°04'W	3-30	M	2
	1416	1416	1416	68°52'N 166°10'W	3-31	F	Sub-Ad.
	1417	1417	1417	69°18'N 167°06'W	3-31	F	Ad.
	1418	1418	1418	69°38'N 167°53'W	4-1	F	Ad.
	1419	1419	1419	69°38'N 167°53'W	4-1	M	2
	1420	1420	1420	69°38'N 167°53'W	4-1	F	2
1421	1421	1421	69°44'N 168°12'W	4-1	M	Ad.	
Barrow	1491	1176	1491	71°28'N 156°32'W	3-20	F	Sub-Ad.
	1492	1178	1492	72°05'N 157°43'W	3-20	F	Ad.
	1494	1179	1494	72°05'N 157°43'W	3-20	M	2
	1496	1186	1496	72°05'N 157°43'W	3-20	F	2
	1155	1155	1155	71°05'N 158°35'W	3-21	F	Ad.
	1151	1151	1151	71°05'N 158°35'W	3-21	M	Ad.
	1182	1183	1182	71°07'N 160°15'W	3-22	F	Ad.
	1185	1184	1185	71°07'N 160°15'W	3-22	M	1
	1200	1200	1200	71°07'N 160°15'W	3-22	F	Ad.
	1180	1497	1180	71°07'N 160°15'W	3-22	M	2
	1165	1166	1165	71°07'N 160°15'W	3-22	M	2
	1498	1498	1498	71°18'N 158°55'W	3-24	F	Sub-Ad.
	1499	1499	1499	71°38'N 158°30'W	3-24	F	Ad.
	1435	1435	1435	71°38'N 158°30'W	3-24	M	1
	1436	1436	1436	71°38'N 158°30'W	3-24	M	1
	1438	1438	1438	71°52'N 154°55'W	3-25	M	2
	1439	1439	1439	71°57'N 156°01'W	3-26	F	Ad.
	1440	1440	1440	71°57'N 156°01'W	3-26	M	Ad.
	1441	1441	1441	72°03'N 156°00'W	3-26	F	1
	1442	1442	1442	72°03'N 156°00'W	3-26	M	1
	1443	1443	1443	71°59'N 156°04'W	3-26	F	Ad.
	1444	1444	1444	71°59'N 156°04'W	3-26	M	1
	1445	1445	1445	71°59'N 156°04'W	3-26	F	1
	1448	1448	1448	72°30'N 156°05'W	3-27	F	Ad.
	1446	1446	1446	72°30'N 156°05'W	3-27	M	1
	1447	1447	1447	72°30'N 156°05'W	3-27	M	1
	1449	1449	1449	72°07'N 155°27'W	3-27	F	Sub-Ad.
1493	1493	1493	72°18'N 154°50'W	3-28	F	2	
1495	1495	1495	72°18'N 154°50'W	3-28	F	2	
1450	1450	1450	72°52'N 153°55'W	3-28	M	Ad.	
1490	1490	1490	72°46'N 154°07'W	3-28	F	Sub-Ad.	

Table 1 (cont'd.) Polar bear tagging data, Alaska, 1972.

	Ear Tag Nos.		Tattoo No.	Location	Date	Sex	Age Class
	Left	Right					
Barrow	1491	1491	1491	71°46'N 156°38'W	3-30	M	Sub-Ad.
	1492	1492	1492	71°36'N 156°38'W	3-30	M	Sub-Ad.
	1494	1494	1494	71°20'N 158°38'W	3-30	M	Ad.
	1496	1496	1496	71°32'N 155°33'W	3-31	M	Sub-Ad.
	1497	1497	1497	71°47'N 157°20'W	4-1	F	Sub-Ad.
	1095	1095	1095	72°00'N 157°20'W	4-1	F	Sub-Ad.
	1301	1301	1301	71°40'N 156°35'W	4-3	M	Sub-Ad.
	none	1302	1302	71°57'N 156°32'W	4-3	F	Ad.
	1303	1303	none	71°57'N 156°32'W	4-3	F	Cub
	1304	1304	none	71°57'N 156°32'W	4-3	F	Cub
	1305	1305	1305	71°45'N 158°30'W	4-3	F	Ad.
	1306	1306	1306	71°45'N 158°30'W	4-3	F	1
	1307	1307	1307	71°45'N 158°30'W	4-3	F	Ad.
	1308	1308	1308	71°45'N 158°30'W	4-3	M	1
	1312	1312	1312	71°55'N 157°50'W	4-5	F	Ad.
	1311	1311	1311	71°55'N 157°50'W	4-5	M	1
	1310	1310	1310	71°55'N 157°50'W	4-5	F	1
	1313	1313	1313	71°27'N 159°30'W	4-5	F	Ad.
	1314	1314	1314	71°46'N 155°20'W	4-6	F	Sub-Ad.
	1316	1316	1316	71°41'N 155°45'W	4-7	F	Ad.
	1317	1317	1315**	71°41'N 155°45'W	4-7	F	2
	1318	1318	1318	71°72'N 155°00'W	4-8	F	Ad.
	1319	1319	1319	71°41'N 157°30'W	4-10	F	Sub-Ad.
	1320	1320	1320	71°33'N 155°05'W	4-10	M	Ad.
	1321	1321	none	71°20'N 157°30'W	4-14	F	Cub
	1322	1322	1322	71°20'N 157°30'W	4-14	F	Ad.
	1323	1323	1323	71°29'N 156°45'W	4-14	F	Ad.
	1324	1324	1324	72°03'N 158°25'W	4-14	F	1
	1325	1325	1325	72°03'N 158°25'W	4-14	F	Ad.
	1326	1326	1326	71°39'N 157°40'W	4-15	F	Ad.
	1327	1327	1327	71°57'N 158°00'W	4-15	M	Ad.
	1328	1328	1328	71°57'N 158°00'W	4-15	F	Ad.
	1329	1329	1329	71°57'N 158°00'W	4-15	F	2
	1330	1330	1330	71°57'N 158°00'W	4-15	F	2
	1331	1331	1331	71°56'N 158°30'W	4-15	F	2
	1332	1332	1332	71°38'N 157°30'W	4-16	F	Sub-Ad.
	1333	1333	1333	72°03'N 158°53'W	4-16	F	Ad.
	1335	1335	1335	72°03'N 158°53'W	4-16	F	2
	1336	1336	1336	71°47'N 155°29'W	4-17	F	Ad.
	1337	1337	1337	71°47'N 155°29'W	4-17	M	1
	1338	1338	1338	72°13'N 156°30'W	4-20	F	Ad.
	1339	1339	none	72°13'N 156°30'W	4-20	F	Cub
	1340	1340	none	72°13'N 156°30'W	4-20	M	Cub
	1341	1341	1341	71°56'N 156°30'W	4-20	F	Sub-Ad.

\*\*Tattooed 1315 instead of 1317 by mistake.

Table 1 (cont'd.) Polar bear tagging data, Alaska, 1972.

	Ear Tag Nos.		Tattoo	Location	Date	Sex	Age
	Left	Right	No.				Class
Barrow	1342	1342	1342	72°02'N 155°56'W	4-28	M	Ad.
	1344	1344	1344	71°52'N 155°50'W	5-1	F	Ad.
	1345	1345	1345	71°34'N 156°40'W	5-2	M	Sub-Ad.
	1346	1346	1346	71°38'N 156°10'W	5-3	F	2
	1348	1348	none	71°45'N 155°50'W	5-3	F	Cub
	1349	1349	1349	71°45'N 155°50'W	5-3	F	Ad.
	1350	1350	1350	72°12'N 155°33'W	5-3	F	Ad.
	1351	1351	1351	72°12'N 155°33'W	5-3	F	1
	1352	1352	1352	72°12'N 155°33'W	5-3	F	1
	1353	1353	1353	72°07'N 158°13'W	5-5	F	Ad.
	1354	1354	1354	72°12'N 158°19'W	5-5	M	Ad.
	1355	1355	1355	72°16'N 158°21'W	5-5	F	Ad.
	1356	1356	1356	72°16'N 158°21'W	5-5	F	2
	1357	1357	1357	72°16'N 158°21'W	5-5	F	2
	1358	1358	1358	72°03'N 156°06'W	5-10	F	Ad.
	1359	1359	1359	71°58'N 155°35'W	5-10	F	Ad.
	1360	1360	1360	71°58'N 155°35'W	5-10	F	1
	1361	1361	1361	71°58'N 155°35'W	5-10	M	1
	1363	1363	1363	72°15'N 157°22'W	5-11	M	2
	1364	1364	1364	71°32'N 157°02'W	5-11	F	Sub-Ad.
	1366	1366	1366	71°54'N 155°35'W	5-15	F	Sub-Ad.



Table 2. Location and sex and age composition of polar bears tagged in Alaska, 1967-1972.

	<u>Cub-of-year</u>			<u>Yearling</u>		<u>2-year-old</u>		<u>Sub-adult</u>		<u>Adult</u>		<u>Total</u>
	<u>M</u>	<u>F</u>	<u>Unk.</u>	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>	
<u>Bering Strait</u>												
1968				1			2			4	3	10
<u>Lisburne*</u>												
1968				2	4	3	4	8	7	7	15	50
1969								1	2	4		7
1970				1	5	4	2	1	5	1	8	27
1971				3	3			1		9	6	22
1972				4		9	6	3	9	9	19	59
				<u>10</u>	<u>12</u>	<u>16</u>	<u>12</u>	<u>14</u>	<u>23</u>	<u>30</u>	<u>48</u>	<u>165</u>
				22 (13%)		28 (17%)		37 (22%)		78 (47%)		
<u>Barrow</u>												
1967				3	3	4	2	2	4	4	9	31
1968				8	1	3	7	6	11	7	37	80
1969			2		1		4	2	2	2	9	22
1970	2	2	1	4	8	3	3	4	4	5	18	54
1971	3	3		5	4	3	2	1	8	7	16	52
1972	1	5		10	8	5	11	5	12	9	30	96
	<u>6</u>	<u>10</u>	<u>3</u>	<u>30</u>	<u>25</u>	<u>18</u>	<u>29</u>	<u>20</u>	<u>41</u>	<u>34</u>	<u>119</u>	<u>335</u>
	19 (6%)			55 (16%)		47 (14%)		61 (18%)		153 (46%)		
<u>Barter Island</u>												
1969				1	1							2
Totals	<u>6</u>	<u>10</u>	<u>3</u>	<u>42</u>	<u>38</u>	<u>34</u>	<u>43</u>	<u>34</u>	<u>64</u>	<u>68</u>	<u>170</u>	512
	19 (4%)			80 (16%)		77 (15%)		98 (19%)		238 (46%)		

\*Bears at Lisburne tagged by U. S. Fish and Wildlife Service.

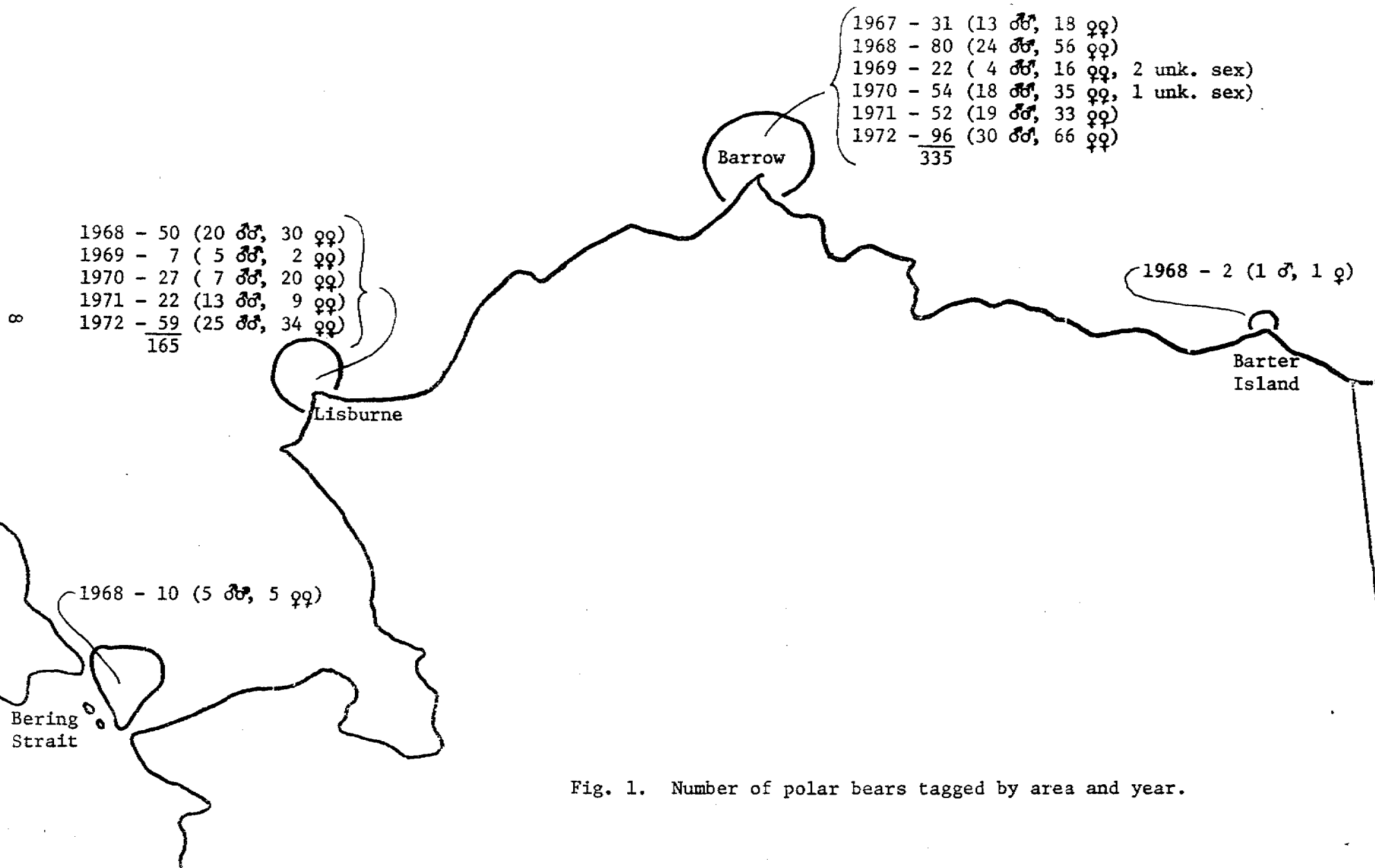


Fig. 1. Number of polar bears tagged by area and year.

most frequently in the recovery data. Quantitative comparisons of the rate of recovery in different areas cannot be made when recapture and hunter harvest data are combined, however, because recovery effort by class of bear is not uniform from area to area. Females with young are sought by tagging-recapture teams, but not by hunters, and are therefore recovered at higher rates in areas where tagging and recapture effort is high as compared to areas where tagging and recapture effort is low.

A comparison can be made of bears killed by hunters alone. Such a comparison shows the percentages of tagged bears from each tagging area as they appear in the harvest of each major hunting area. Through 1972, 42 tagged bears have been killed by hunters nine months or longer after being tagged (Figs. 2 and 3).

The number of recoveries is so low that data must be interpreted with caution. Nevertheless, it appears that bears tagged at Cape Lisburne may be harvested on the coast between Point Lay and Franklin Point at a significantly higher rate than elsewhere. It also appears that bears of both sexes tagged at Barrow are harvested nine months to five years after tagging at a significantly higher rate in the Barrow area than in the Chukchi Sea, which is the other major hunting area. Only 0.9 percent of the males and none of the females harvested in the Chukchi Sea were tagged at Barrow; 6.0 percent of the males and 9.2 percent of the females in the Barrow harvest were tagged at Barrow. More females than males are recovered in the same location where tagged, or conversely, males tend to range over greater distances than females. The data then suggest that bears to the west of Alaska and bears to the north of Alaska form essentially discrete populations with only a limited amount of movement between them. A line extending northwest from Point Lay has been chosen as a rather arbitrary dividing line between these populations.

Two bears tagged north of Barrow were recovered near Herschel Island in northwestern Canada, and one bear tagged by the Canadian Wildlife Service northeast of the MacKenzie Delta was recovered north of Alaska's Colville Delta. It appears the amount of movement between the area north of Alaska and northwest of Canada is limited, but a detailed analysis will have to be done in cooperation with Canadian workers to verify this point.

#### RECOMMENDATIONS

Prior to the Marine Mammal Protection Act, which became effective December 21, 1972, the State of Alaska's polar bear regulations permitted hunting for food throughout the year by residents and recreational hunting from October 15 through May 30 by residents and nonresidents. Hunting with use of aircraft was not allowed. Natives were being encouraged to act as guides for sport hunters. The number of bears harvested under such a management plan would have been well below the reproductive capability of the population. This type of management for the renewable polar bear resource seems acceptable to all but the most extreme preservationists. It is recommended that the state revise its regulations so they fit within the framework of the Marine Mammal Protection Act and then apply to the

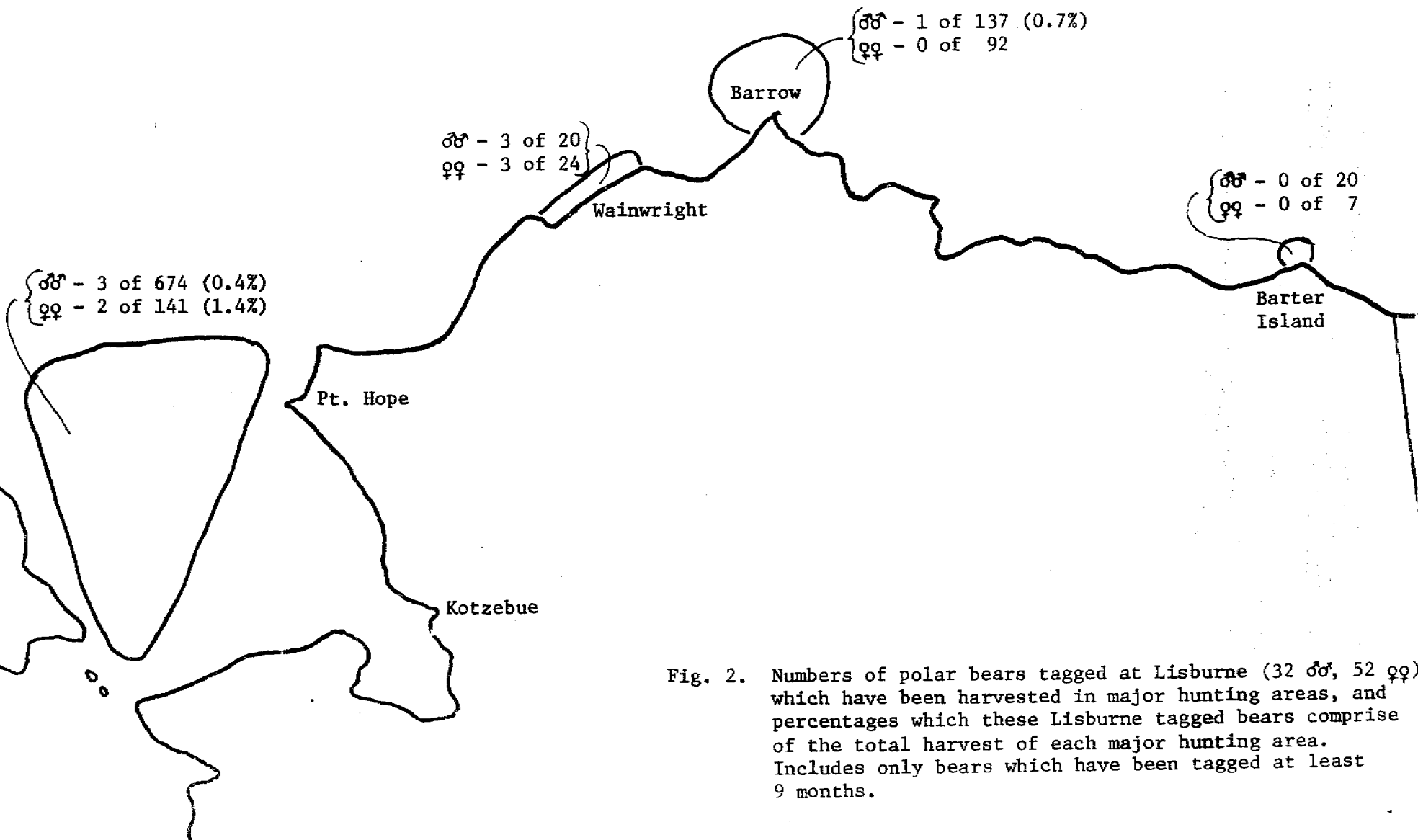


Fig. 2. Numbers of polar bears tagged at Lisburne (32 ♂♂, 52 ♀♀) which have been harvested in major hunting areas, and percentages which these Lisburne tagged bears comprise of the total harvest of each major hunting area. Includes only bears which have been tagged at least 9 months.

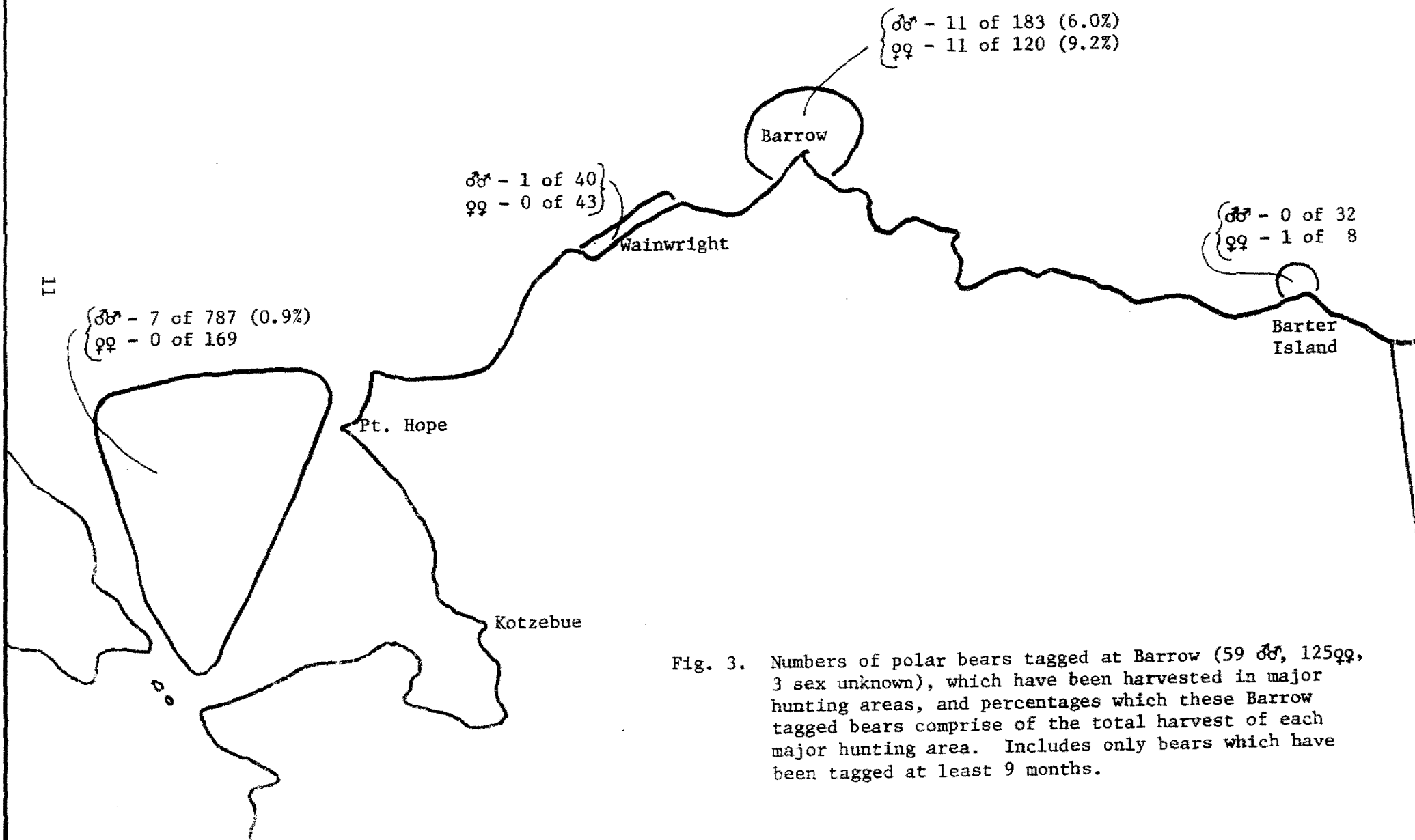


Fig. 3. Numbers of polar bears tagged at Barrow (59 ♂, 125 ♀, 3 sex unknown), which have been harvested in major hunting areas, and percentages which these Barrow tagged bears comprise of the total harvest of each major hunting area. Includes only bears which have been tagged at least 9 months.

Secretary of the Interior for management jurisdiction as authorized in Section 109 of the Act.

Although the Marine Mammal Act prohibits sport hunting, it greatly liberalizes hunting by natives. Natives may now take bears, including females with young and their young, without limit and without restriction on method or means. This will cause a change in the pattern of harvest, and it is recommended that the state continue its sealing program to obtain harvest information.

## APPENDIX

### Harvest Characteristics

Harvest figures presented here are for the regulatory period July 1, 1971 through June 30, 1972. This was the last regulatory year that aircraft could be used as an aid in the taking of bears. Two regulatory changes were in effect. The February 1 through April 30 season for trophy hunting was shortened to February 15 through April 15 for the West Area (west and south of a line extending northwest from Point Lay) and March 1 through April 30 for the North Area (north and east of a line extending northwest from Point Lay). This reduced time and expense required by the Department to monitor hunting activity. Guides were no longer limited in the number of hunts in which they could participate. This had been nearly impossible to enforce and was not considered necessary after the number of permits issued to hunters was limited.

Other regulations were similar to those of the preceding year. Applications for permits to sport hunt were received until August 31, 1971. A drawing was held September 4 to choose 210 permittees for the West Area and 90 permittees for the North Area. The bag limit was one bear provided a bear had not been taken during the preceding three regulatory years. Nonresidents were required to hire guides. Residents were allowed to take bears at any time without a permit and without limit for food provided aircraft were not used. Cubs (bears not yet 2 years old) and females with cubs were protected. Hides and skulls had to be presented to a Department representative within 30 days of the date of kill for examination, sealing and removal of a tooth for age determination. The only skins which could be sold were those from bears taken without the aid of aircraft.

A total of 1,020 applications were received for the 300 permits (Table 3). This was an increase of 62 percent over 1971 when 621 applications were received. Considerably more state residents applied than have taken bears in the past. Some applicants applied because they thought this would be the last year they could hunt with aircraft; others applied who were not seriously interested in hunting but who might consider it if they had a permit; others applied in order to obtain permits which could be used illegally in some manner to enable hunters without permits to take bears; and others applied to obtain permits which would not be used and which would thus "save" bears.

Table 3. Number of applications received and permits issued for trophy hunting of polar bears, Alaska, 1972.

Hunting Area	Applications		Permits Drawn		Total
	Resident	Nonresident	Resident	Nonresident	
West	523	282	148	62	210
North	183	32	75	15	90
Total	706	314	223	77	300

Department personnel monitored the harvest from Nome, Kotzebue, Point Hope and Barrow during the sport hunting season. Information was obtained on marked bears that were seen and killed and bears that were presented for sealing. Information obtained at time of sealing included date and location of kill; method of hunting; time spent hunting; sex; hide length and width; and skull length, width and condylobasal length. A tooth ( $P_1$  or  $M_3$ ) was obtained from all bears for age determination, and reproductive tracts were obtained from females.

Harvest statistics for 1972 and comparative data for preceding years are presented in Tables 4-10 and Fig. 4.

Changes from year to year in age composition of the harvest may be indicative of changes in the population. A regulation enacted in 1966 whereby a tooth is obtained from each bear harvested has provided age composition data for the harvest each year since then. Generally non-resident hunters are more selective than resident hunters for large animals, which means they are seeking older males. Changes in age composition of males taken by nonresidents might reflect changes in abundance of older males in the population, and changes in age composition of males taken by residents might indicate changes in the entire hunttable male population, i.e., all males older than 2 years.

West of Alaska, the average age of males taken both by nonresidents and residents using aircraft has fluctuated since 1966, but does not show any definite trend. Also, the ratio of males to females harvested west of Alaska has remained fairly static. North of Alaska, the average age of males harvested declined sharply in 1970 and 1971, perhaps indicating a reduced number of older males caused by high harvests during the years 1965-68. An increase in the average age of males harvested in 1972 may be the result of reduced harvests since 1968. Similarly, the percentage of females harvested north of Alaska indicates a declining trend in the proportion of males in the population through 1971.

Changes over a period of years in the amount of hunting effort required to harvest a bear could reflect changes in relative abundance. Successful hunters reported an average hunting period of 1.6 days to harvest a bear in 1972 (Table 11). This is similar to 1.5 days reported in 1970 and 1.6 days reported in 1971, the other two years for which this type of information is available.

#### ACKNOWLEDGEMENTS

Larry Jennings, Mike Vierthaler and Johnny Leavitt assisted with polar bear tagging. James Brooks of the U. S. Fish and Wildlife Service tagged bears at Cape Lisburne. Persons monitoring the harvest at the different hunting bases were: Nome, Bob Pegau; Teller and Shishmaref, Pete Kashevorof; Kotzebue, Phil Conner, Carl Grauvogel, Spencer Linderman, Ralph Mann and Jerry McGowan; Point Hope, Carl McIlroy, Tony Smith, Bob Stephenson and John Trent; Barrow, Mel Buchholtz, Johnny Leavitt and Mike Vierthaler. The Anchorage laboratory prepared tooth sections.



Table 4. 1972 known polar bear harvest by Alaska based hunters. Data are categorized on the basis of hunting base, type of hunter, and sex of bear.

Hunting Base	NONRESIDENT		RESIDENT- WHITE		RESIDENT- NATIVE		T O T A L					
	M	F	M	F	M	F	M	F	All Bears	% of Total Kill	% Male	% Non-Res.
Nome	1	-	2	-	-	-	3	-	3	1.1	100	33
Teller	5	-	2	-	-	-	7	-	7	2.7	100	71
Diomede	-	-	-	-	1	-	1	-	1	0.4	100	0
Shishmaref	5	-	10	2	-	-	15	2	17	6.4	88	29
Kotzebue	35	2	59	4	-	-	94	6	100	37.7	94	37
Kivalina	-	-	-	-	1	2	1	2	3	1.1	33	0
Pt. Hope	4	-	18	12	5	4	27	16	43	16.1	63	10
Wainwright	-	-	-	-	5	3	5	3	8	3.0	68	0
Barrow	7	2	34	12	9	5	50	19	69	26.0	71	13
Colville	2	3	-	-	-	-	2	3	5	1.9	40	100
Beechy Pt.	-	-	-	-	2	-	2	-	2	0.8	100	0
Barter Is.	1	-	2	-	1	3	4	3	7	2.6	57	14
Subtotal	60	7	127	30	24	17	211	54	265	100	80	25
Percent	90	10	81	19	58	42	80	20				
Total	67	(25%)	157	(59%)	41	(15%)						

Table 5. 1972 known polar bear harvest by Alaska based hunters. Data are categorized on the basis of management area, type of hunter, and sex of bear.

Mgmt.* Area	NONRESIDENT		RESIDENT- WHITE		RESIDENT- NATIVE		T O T A L					
	M	F	M	F	M	F	M	F	All Bears	% of Total Kill	% Male	% Non- Res.
West	50	2	91	18	7	5	148	25	173	65	86	30
North	10	5	36	12	17	12	63	29	92	35	68	16
Subtotal	60	7	127	30	24	17	211	54	265	100	80	25
Percent	90	10	81	19	58	42	80	20				
Total	67	(25%)	157	(59%)	41	(15%)						

\*West management area is south and west of a line extending northwest from Point Lay; North management area is north and east of this line.

Table 6. Alaska polar bear harvest and sex ratios, 1961-1972.

Year	<u>Non-Resident</u>		<u>Resident White</u>		<u>All Sport Hunters</u>		<u>Resident Native</u>		<u>All Hunters</u>	
	No.	% Male	No.	% Male	No.	% Male	No.	% Male	No.	% Male
1961	70	93	59	57	129	77	23	52	152	73
1962	78	85	103	60	181	70	16	50	201	69
1963	106	88	57	68	163	81	22	68	189	79
1964	142	89	86	60	228	78	23	69	253	77
1965	159	89	116	64	275	79	21	50	296	76
1966	195	89	152	66	347	79	52	46	399	74
1967	124	97	42	69	166	90	25	50	191	80
1968	184	84	56	66	240	80	111	61	351	74
1969	227	76	44	63	290	69	27	56	298	72
1970	217	79	83	65	300	76	15	53	316	72
1971	78	87	98	64	176	74	27	54	203	70
1972	67	90	157	81	224	84	41	59	265	80

Table 7. Average age based on tooth cementum layering of polar bears in hunter harvest, Alaska, 1966-72.

	MALE			FEMALE	
	Airplane		Ground	Airplane	Ground
	Nonresident	Resident			
<u>West Area*</u>					
1966	9.1(64)**	7.0(13)	--	7.2(14)	3.0(1)
1967	7.0(39)	7.0(7)	--	6.0(12)	--
1968	8.2(76)	5.8(21)	--	8.3(8)	4.0(3)
1969	6.3(106)	4.6(10)	--	5.4(27)	4.5(2)
1970	6.5(133)	6.3(30)	--	5.9(30)	--
1971	7.0(53)	6.0(38)	--	5.5(24)	--
1972	7.7(44)	5.7(83)	3.0(5)	5.2(17)	5.0(3)
<u>North Area*</u>					
1966	10.1(16)	7.2(13)	10.6(4)	6.6(8)	5.0(6)
1967	7.7(17)	6.0(10)	4.5(2)	7.0(8)	5.0(2)
1968	8.1(21)	6.4(7)	5.6(28)	5.8(22)	6.2(23)
1969	7.4(25)	5.8(8)	6.0(15)	5.6(28)	4.6(8)
1970	6.8(19)	4.9(9)	4.0(4)	7.1(26)	5.0(3)
1971	5.3(3)	4.2(11)	6.0(5)	3.3(7)	2.9(9)
1972	5.4(8)	6.4(30)	4.4(14)	4.5(14)	6.4(12)

\* West area is west and south of a line extending northwest from Point Lay; North area is north and east of this line.

\*\*Numbers in parentheses are numbers in sample.

Table 8. Average skull size\* in inches of polar bears taken by airplane hunters based in Alaska, 1966-1972.

	<u>Nonresident</u>		<u>Resident-White</u>		<u>Total</u>	
	Male	Female	Male	Female	Male	Female
<u>West Area**</u>						
1966	25.1(139)	21.0(9)	24.1(48)	21.4(20)	24.8(187)	21.5(29)
1967	24.9(79)	21.2(6)	23.1(14)	22.1(4)	24.1(4)	21.6(10)
1968	25.2(121)	21.3(12)	24.5(24)	19.1(4)	25.0(145)	20.8(16)
1969	24.5(119)	21.3(24)	24.0(10)	21.3(3)	24.4(129)	21.3(27)
1970	24.4(142)	21.5(23)	23.6(36)	21.2(16)	24.2(178)	21.4(39)
1971	24.7(61)	21.6(11)	24.3(44)	21.6(19)	24.6(105)	21.6(30)
1972	24.8(49)	22.9(2)	24.2(89)	20.9(17)	24.4(138)	21.1(19)
<u>North Area</u>						
1966	24.0(25)	20.5(6)	22.4(44)	19.9(26)	23.0(69)	20.0(32)
1967	23.6(22)	20.0(5)	22.6(14)	19.9(7)	23.2(36)	19.9(12)
1968	23.7(23)	21.1(12)	23.0(5)	19.7(10)	23.6(28)	20.4(22)
1969	23.4(20)	21.2(20)	22.5(10)	20.0(7)	23.1(30)	20.9(27)
1970	23.4(24)	20.5(19)	22.3(14)	20.0(11)	23.0(38)	20.3(30)
1971	23.1(5)	- (0)	22.0(11)	20.7(12)	22.4(16)	20.7(12)
1972	23.2(9)	21.3(5)	23.2(35)	19.7(12)	23.2(44)	20.2(17)

\* Skull size is greatest length without lower jaws plus greatest width.

\*\*West area is west and south of a line extending northwest from Point Lay; North area is north and east of this line.

Table 9. Chronology of 1972 Alaska native polar bear harvest.\*

Hunting Site	1971								1972							
	<u>Sept.</u>		<u>Oct.</u>		<u>Nov.</u>		<u>Dec.</u>		<u>Jan.</u>		<u>Feb.</u>		<u>Mar.</u>		<u>Apr.</u>	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diomede									1							
Kivalina															1	
Pt. Hope									2	1	1	2	2			
Wainwright	2		1		1		1	4								
Barrow	5	1	4	2				1								
Beechy Pt.	2															
Barter Is.		3									1					
<b>Total</b>	9	4	5	2	1	-	1	5	3	1	2	2	2	1		

\*Does not include one male and one female killed at Kivalina for which kill dates are unknown.

Table 10. 1972 Alaska polar bear airplane hunting data.

Hunting Base	No. of Guide Teams	No. of Bears Killed on Guided Hunts	No. of Bears Killed on Unguided Resident Hunts	Percent of Airplane Kill
Nome	2	2	1	1
Teller	1	6	1	3
Shishmaref	2	14	3	8
Kotzebue	10	87	13	45
Pt. Hope	4	19	14	15
Barrow	7	39	15	24
Colville	1	5	0	2
Barter Is.	1	1	2	1
Total	28	173	49	100

Figure 4. Chronology of Polar Bear Harvest by Hunters Using Aircraft, 1972.

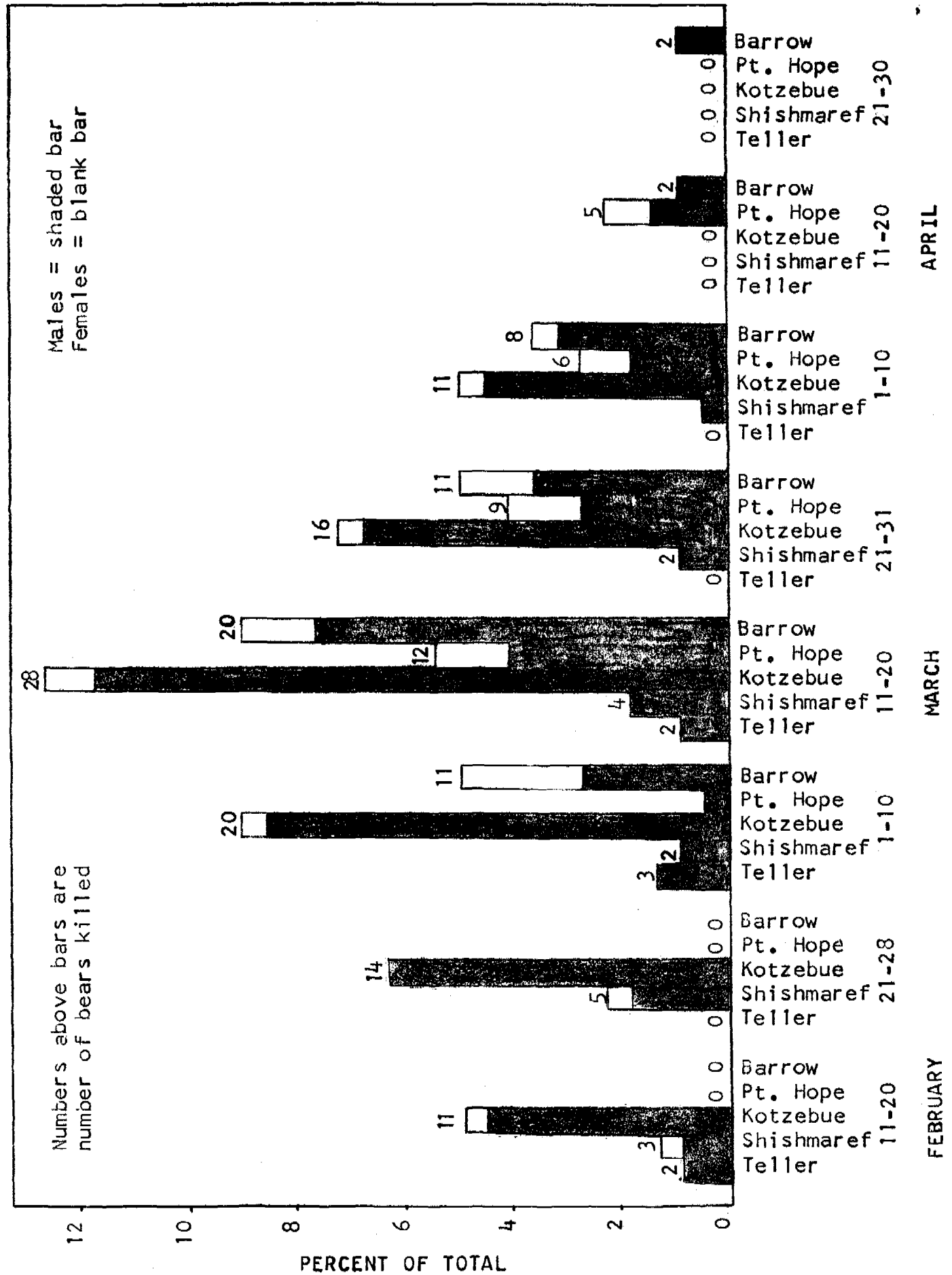




Table 11. Hunting effort expended in days by polar bear hunters using aircraft, Alaska, 1972.

Hunting Base	MALE				FEMALE				TOTAL		No. in Sample
	Resident		Nonresident		Resident		Nonresident		$\bar{x}$	Range	
	$\bar{x}$	Range	$\bar{x}$	Range	$\bar{x}$	Range	$\bar{x}$	Range			
Nome	1.5	1-2	2	2	-	-	-	-	1.7	1-2	3
Teller	1.5	1-2	2	1-4	-	-	-	-	1.8	1-4	7
Shishmaref	3.1	1-8	1.8	1-3	5.5	1-10	-	-	3.1	1-10	16
Kotzebue	1.2	1-3	1.3	1-5	1.2	1-2	2.0	1-3	1.3	1-5	125
Pt. Hope	1.8	1-6	2.2	1-4	1.4	1-3	-	-	1.7	1-6	31
Barrow	1.3	1-3	1.3	1-2	1.2	1-2	1.0	1	1.3	1-3	54
Colville	-	-	-	-	-	-	2.7	1-4	2.7	1-4	3
Barter Island	3.0	3	1	1	-	-	-	-	2.3	1-3	3
All Bases	1.6	1-8	1.5	1-5	1.5	1-10	2.0	1-4	1.6	1-10	209

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