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Bird Use of Port Valdez and Valdez Arm
Winter 1977-1978

Final Report

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INTRODUCTION

During the winter of 1977-1978 Special Studies biologists, U.S. Fish and Wildlife Service, conducted bird surveys in Port Valdez and parts of Valdez Arm. Valdez Port is the site of the Trans-Alaska Pipeline oil terminal. The tanker route for this oil is in and out of Valdez Arm and Port, and across Prince William Sound to Hinchinbrook Entrance. Jack Bay and Galena Bay in Valdez Arm have been proposed as containment sites for leaking tankers. The primary objective of the surveys was to assess the extent of bird use in an area susceptible to environmental degradation from petroleum related development or catastrophic events such as an oil spill. A second objective was to collect wintering seaducks for analysis of food habits in order to define habitat preferences of an important component of the Prince William Sound ecosystem. Seaducks are abundant and widely distributed in the Sound in the winter (Dwyer et al. 1976). Alcids and seaducks are the main victims of oil pollution (Vermeer and Vermeer 1975) and large numbers of seaducks which winter in the Sound could be affected by oil pollution or find their food source altered by spills.

METHODS

Five shoreline surveys were made on the following dates: 19-24 November, 1977; 4-7 January; 17 and 18 February; 21-25 March; and 19-22 April, 1978. Personnel involved in each survey were: D. Derksen, T. Rothe, M. Sangster in November; Derksen, W. Eldridge, K. Metzner in January; Eldridge and Rothe in February and March; and Eldridge in April. Surveys were conducted from a 5 m Boston Whaler. Weather was a limiting factor and the areas surveyed each month varied due to weather

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conditions. The initial proposal called for a shoreline survey of Port Valdez, Valdez Narrows, Sawmill Bay and Jack Bay (Fig. 1). This route was completed in November. In January and February Port Valdez and Valdez Narrows were surveyed with the addition of Galena Bay in January. In March it was again possible to census Sawmill Bay in addition to Port Valdez and Narrows but subsequent winds prevented a trip to Jack Bay. In April the original route was surveyed as well as Galena Bay. Between 72 and 130 km of shoreline were censused.

Waterfowl were collected for analysis of stomach contents. Birds were killed with a 12 gauge shotgun and the entire alimentary canal was injected with 10% formalin, removed and preserved in 70% ethanol. The species and numbers of birds collected on each survey are presented in Table 1. Analysis of food items will be presented in a separate report.

Birds were identified to species or family group. Limited information was collected on the sex ratios of waterfowl. In large flocks it was not always possible to determine sex and poor light conditions often made estimates difficult. In looking at the recorded ratios it should be taken into consideration that immature males of some diving seaduck species are difficult to separate from females (Nilsson 1970). Sex ratios of waterfowl determined from survey records are presented in Table 2.

Because each survey covered different areas, the results are presented by geographic location. The birds recorded on each survey in Port Valdez and Valdez Narrows are presented in Table 3. Other areas presented are: Shoup Bay, Table 4; Sawmill Bay, Table 5; Jack Bay, Table 6; and Galena Bay, Table 7. Table 8 presents the total birds recorded on each

survey. Observations of marine mammals were also recorded and these are presented in Table 9.

RESULTS AND DISCUSSION

Diving ducks were the most abundant birds in Port Valdez and Valdez Arm in the winter of 1977-1978. Diving ducks averaged 10.3 birds/km of shoreline. The average in this area was lower than Dwyer's (1976) estimate of 20/km in winter surveys in Prince William Sound in 1972 and 1973.

Goldeneyes (Bucephala sp.) were the most abundant species building to a peak density of 10.3 birds/km in April. An average of 4.9 birds/km of shoreline (November-March) was similar to the 1972 and 1973 winter surveys (Dwyer et al. 1976). The doubling of the goldeneye population in April probably represents the influx of migrant birds. Scoters (Melanitta sp.) averaged 1.9 birds/km and buffleheads (Bucephala albeola) remained consistently at 1.5 birds/km throughout the winter (Table 10). Harlequin ducks (Histrionicus histrionicus) were found in small, scattered groups and only averaged 0.6 birds/km. Common merganser (Mergus merganser) numbers were highest (2.8 birds/km) in February but few birds were seen in March and April and the overall winter average was 1.1 birds/km.

Oldsquaw (Clangula hyemalis) were recorded only on three surveys, February, March and April. Most abundant diving ducks in the Sound, based on the 1972 and 1973 winter surveys were goldeneyes, oldsquaws, harlequin ducks and scoters (Dwyer et al. 1976). With the exception of oldsquaw these species were the major birds seen during the 1978 surveys in Port Valdez and Valdez Arm. A high density (1.0 birds/km) of oldsquaws

were seen only in March, 1978. The Sound winter surveys of 1972 and 1973 were conducted in March and the high densities of oldsquaws (1.0-1.6 birds/km) may represent spring migrants rather than part of a wintering population.

An average of 2.7 gulls/km was estimated in November. These numbers were almost evenly divided between glaucous-winged gulls (Larus glaucescens) and herring gulls (Larus argentatus) with some mew gulls (Larus calurus) (Table 8). Few gulls were seen January through March (0.7 birds/km) but glaucous-winged gulls returned to the area in April and the average rose to 13.4 birds/km. Black-legged kittiwakes (Rissa tridactyla) were not seen until March when 200 were counted in Shoup Bay, site of an active colony of 190 breeding pairs (Lensink and Bartonek 1976). In April 400 kittiwakes were counted at the colony and nest building was in progress.

The most abundant alcid in the Valdez waters in the winter was the common murre (Uria aalge) with an average of 3.4 birds/km and peak numbers in February and March (Tables 8 and 10). Murrelets (Brachyramphus sp.) were not commonly seen (0.4 birds/km) and pigeon guillemot (Cephus columba) sightings were extremely rare. The low alcid numbers were in contrast to winter surveys throughout the Sound in 1972 and 1973 when marbled murrelets and pigeon guillemots were the most abundant alcids and occurred in 50% of the shoreline areas censused (Dwyer et al. 1976).

The average density of bald eagles (Haliaeetus leucocephalus) was 0.4/km (Table 10). Over 70% of the bald eagles counted on surveys in November through March were adult eagles but in April an influx of immatures created a 3:5 ratio of adults to immatures. The average of

0.7 eagles/km of shoreline in April compares to 0.3 birds/km found during a survey made over the same route in September 1976 (Hodges 1976). However, the composition of the populations on these two surveys was not similar because in the September 1976 survey 77% of the birds were adults while in April 1978, only 38% of the birds were adults. Further monitoring of the eagle population is needed before it can be determined whether these differences represent yearly changes or seasonal fluctuations in the populations. The eagle population in Valdez Port and Arm may serve as an effective indicator species in assessing the effect of development from the pipeline terminus and oil tankers and it is recommended that eagle surveys be made throughout the year.

Some obvious patterns of distribution were noted during the winter surveys. Canada geese (Branta canadensis) were found only in Valdez Port usually in the flats east of Valdez. Approximately 200 mallards (Anas platyrhynchos) were counted every month in Port Valdez (Table 3). Several hundred mallards also wintered in Jack, Sawmill and Galena Bays, but were absent from these Bays in April and had possibly migrated out of the Sound by this time. An aerial survey of east Prince William Sound on 22 March showed mallards concentrated on alluvial flats of river deltas. Shoup Bay spit and glacial mudflats were important habitat for rock sandpipers (Calidris ptilocnemis) where 96% of the total population was observed. Higher densities of murrelets were found in Shoup Bay than any other area censused. Almost all scaup (Aythya marila) were found in Sawmill Bay until April when several hundred were also observed in Jack Bay.

Jack Bay and Galena Bay support large numbers of wintering birds (Tables 6 and 7). If the need for a containment site arises it would

not be possible to determine, on the basis of the two 1978 surveys, which area supports more birds in the winter. It is recommended that additional surveys be conducted to compare seasonal bird use of Jack Bay and Galena Bay before any conflicts develop. Aerial surveys may be the most efficient means to meet this objective. Further studies defining the habitat needs of wintering diving ducks should be initiated. The Sound is an important wintering ground for large numbers of waterfowl and spills in any part of the Sound will affect this widespread resource. Winter ecology of waterfowl, particularly seaducks, has received little attention. Studies in Prince William Sound offer an opportunity to collect information on seaducks that is necessary for proper management and decision making.

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Table 1. Bird species and numbers collected during winter surveys, 1978 in Port Valdez and Valdez Narrows.

	November	January	February	March	Total
Greater scaup	3	-	-		3
Barrow's goldeneye	7	5	2	3	17
White-winged scoter	2	2	1	1	6
Surf scoter	1	3	5	3	12
Harlequin duck	1	1	2	2	6
Oldsquaw			10	1	11

Table 2. Percentage of male, female and unidentified waterfowl determined from winter surveys (January, February, March) 1978 in Valdez Port and Valdez Narrows (n in parentheses).

	Males	Females	Undetermined	Sex ratio of identified males to females
Mallard	42.1% (43)	21.6% (22)	36.3% (37)	1.9:1.0
Barrow's goldeneye	36.0% (404)	24.5% (275)	39.5% (444)	1.5:1.0
Bufflehead	48.6% (153)	16.5% (110)	34.9% (52)	1.4:1.0
Harlequin duck	39.1% (27)	42.0% (29)	18.9% (13)	0.9:1.0
Common merganser	40.2% (133)	17.5% (58)	42.3% (140)	2.3:1.0
Oldsquaw	39.2% (31)	26.6% (21)	34.2% (27)	1.5:1.0

Table 3. Birds observed in Valdez Port and Narrows, winter 1977-1978.

	Nov.	Jan.	Feb.	March	April
Common loon	8				
Red-throated loon	1		1		
Loon sp.		8			
Red-necked grebe	4	6	10	30	
Horned grebe	6	17	17	24	6
Grebe sp.		1	2		
Double-crested cormorant	7				
Pelagic cormorant	8	3	17		2
Cormorant sp.	1	7	5	17	
Great blue heron	2				
Canada goose	163	17	16	11	52
Mallard	238	102	221	218	222
Scaup sp.	6				
Barrow's goldeneye	152	148	422	366	506
Goldeneye sp.	32	43			
Bufflehead	35	57	87	105	106
Oldsquaw	1	2	55	32	3
Harlequin duck	29	17	46	86	11
White-winged scoter	41	14	105	37	89
Surf scoter	1	30	33	50	9
Scoter sp.			1		6
Common merganser	21	90	200	5	2
Red-breasted merganser					10
Merganser sp.	27		6		
Rock sandpiper	8	44			
Glaucous-winged gull	71	6			1799
Herring gull	-		35		2
Mew gull	-		23	2	94
Imm. gull	29			1	
Unident. gull	40	1		38	96
Common murre	29	43	53	81	3
Marbled murrelet		22			
Murrelet sp.	31	20	15	51	1
Northwestern crow	89	84	30	25	38
Bald eagle - adult	25	10	18	15	6
- imm.	2	3	3	7	2
Northern shrike	1				
Raven	22				
Black-billed magpie	3				2

Table 4. Birds observed in Shoup Bay, winter 1977-1978.

	Nov.	Jan.	Feb.	March	April
Arctic loon	3				
Red-necked grebe	1		2	7	20
Horned grebe	4	5	2	3	2
Grebe sp.			1		
Double-crested cormorant	1				
Pelagic cormorant	13	3	2		
Cormorant sp.			3	1	
Mallard					53
Barrow's goldeneye	22	64	37	45	53
Goldeneye sp.	14	1			
Bufflehead	28	27	20	28	21
Oldsquaw			15	47	
Harlequin duck		2			10
White-winged scoter	33	2		2	
Surf scoter	1	1	8	63	198
Scoter sp.		5			
Common merganser	7	12		16	
Merganser sp.	5				
Rock sandpiper	230	144	600	250	
Glaucopus-winged gull				20	327
Herring gull	2				
Mew gull			7		
Unident. gull		12		5	
Common murre	41	54	463	348	211
Marbled murrelet		6			
Murrelet sp.	9		2	8	
Northwestern crow				4	25
Bald eagle - adult	2	2	3	2	
- imm.		1	-		
Raven		1			
Black-legged kittiwake				200	400
Pintail					5

Table 5. Birds observed in Sawmill Bay, winter 1977-1978.

	Nov.	March	April
Red-throated loon	1		
Horned grebe		6	3
Grebe sp.	4		
Pelagic cormorant	2		
Cormorant sp.	1	2	1
Great blue heron	1		
Mallard	220	165	20
Scaup sp.	35	56	30
Barrow's goldeneye	22	18	83
Goldeneye spp.	80		
Bufflehead	38	29	57
Harlequin duck	6		4
White-winged scoter	68	11	14
Common merganser	12		9
Merganser sp.	25		
Rock sandpiper	1		
Glaucous-winged gull	60		66
Unident. gull	21		
Common murre	3		
Murrelet sp.	11	1	
Northwestern crow			30
Bald eagle - adult	2		2

Table 6. Birds observed in Jack Bay, winter 1977-1978.

	Nov.	April
Common loon	3	
Red-throated loon	2	
Red-necked grebe	6	
Horned grebe	7	4
Pelagic cormorant	12	10
Cormorant sp.	3	38
Canada goose		4
Mallard	139	55
Scaup sp.		239
Barrow's goldeneye	74	533
Goldeneye sp.	100	
Bufflehead	51	2
Harlequin duck	22	2
White-winged scoter	25	
Common merganser	6	10
Merganser sp.	1	
Glaucous-winged gull	23	858
Herring gull	45	
Mew gull	5	
Common murre	7	2
Murrelet sp.	2	
Northwestern crow	19	5
Bald eagle - adult	9	24
- imm.	-	47
Black-billed magpie	1	
Northern shrike	1	
Pigeon guillemot		5

Table 7. Birds observed in Galena Bay, January and April 1978.

	Jan.	April
Red-necked grebe	2	
Horned grebe	19	5
Pelagic cormorant	8	1
Cormorant sp.	2	11
Swan sp.		12
Mallard	118	
American wigeon		2
Scaup sp.	3	
Barrow's goldeneye	386	153
Bufflehead	25	33
Oldsquaw	1	
Harlequin duck	3	53
White-winged scoter	357	50
Surf scoter	43	
Scoter sp.		36
Common merganser	21	20
Glaucous-winged gull	12	895
Herring gull		2
Mew gull		30
Common murre	17	
Marbled murrelet	2	
Murrelet sp.	2	
Northwestern crow	2	32
Bald eagle - adult	14	10
- imm.	1	11

Table 8. Total number of birds observed during winter surveys 1977-1978 in Valdez Port and Valdez Arm.

	Nov.	Jan.	Feb.	March	April
Common loon	11				
Arctic loon	3				
Red-throated loon	4		1		
Loon sp.		8			
Red-necked grebe	11	6	12	37	20
Horned grebe	17	22	19	33	10
Grebe sp.	4	1	3		
Double-crested cormorant	8				
Pelagic cormorant	35	6	19		
Cormorant sp.	5	7	8	20	
Great blue heron	3				
Canada goose	163	17	16	11	56
Mallard	597	102	221	383	330
Scaup sp.	41			56	269
Barrow's goldeneye	265	212	422	489	1175
Goldeneye sp.	226	44			
Bufflehead	152	84	87	181	186
Oldsquaw	1	2	55	79	3
Harlequin duck	55	19	46	96	27
White-winged scoter	198	16	105	50	103
Surf scoter	2	31	41	113	207
Scoter sp.		5	1		6
Common merganser	46	102	200	29	21
Merganser sp.	58		6		
Red-breasted merganser					10
Rock sandpiper	238	188	600	250	
Glaucous-winged gull	95	6	-	20	1430
Herring gull	107		35		2
Mew gull	5		30	2	98
Imm. gull	29		-		
Unident. gull	77	13	-	43	
Black-legged kittiwake				200	400
Common murre	76	127	516	429	216
Marbled murrelet		28			
Murrelet sp.	42	20	17	60	1
Northwestern crow	108	87	30	29	93
Bald eagle - adult	39	12	21	17	30
- imm.	2	4	3	8	49

Table 9. Marine mammals observed during winter survey 1977-1978 in Valdez Port and Valdez Arm.

	Nov.	Jan.	Feb.	March	April
Sea Otter (<u>Enhydra lutris</u>)	6	30 (15 - Galena Bay)	0	18	5
Sea Lion (<u>Eumetopias jubatus</u>)	1	2	0	0	7
Harbor Seal (<u>Phoca vitulina</u>)	68	25	17	37	52
Dall Porpoise (<u>Phocoenoides dalli</u>)	1	-	-	-	-

Table 10. Number of birds/km of shoreline, Valdez Port and Valdez Arm, winter 1977-1978.

	Nov.	Jan.	Feb.	March	April	Average
Grebes	0.2	0.4	0.4	0.8	0.3	0.4
Geese	1.4	0.2	0.2	0.1	0.5	0.5
Mallard	5.2	1.4	0.3	4.6	2.8	2.9
Scaup sp.	0.4	-	-	0.7	0.3	0.3
Goldeneye sp.	4.3	3.6	5.9	5.9	10.3	6.0
Bufflehead	1.3	1.2	1.2	2.2	1.6	1.5
Oldsquaw	-	-	0.8	1.0	0.1	0.4
Harlequin	0.5	0.3	0.6	1.2	0.2	0.6
Scoter sp.	1.8	0.7	2.1	2.0	2.8	1.9
Merganser sp.	0.9	1.4	2.8	0.3	0.2	1.1
Gulls	2.7	0.3	0.9	0.8	13.4	1.2*
Common murre	0.7	1.8	7.2	5.2	1.9	3.4
Murrelet sp.	0.4	0.7	0.2	0.7	-	0.4
Bald eagle	0.4	0.2	0.3	0.3	0.7	0.4

* April not included in average

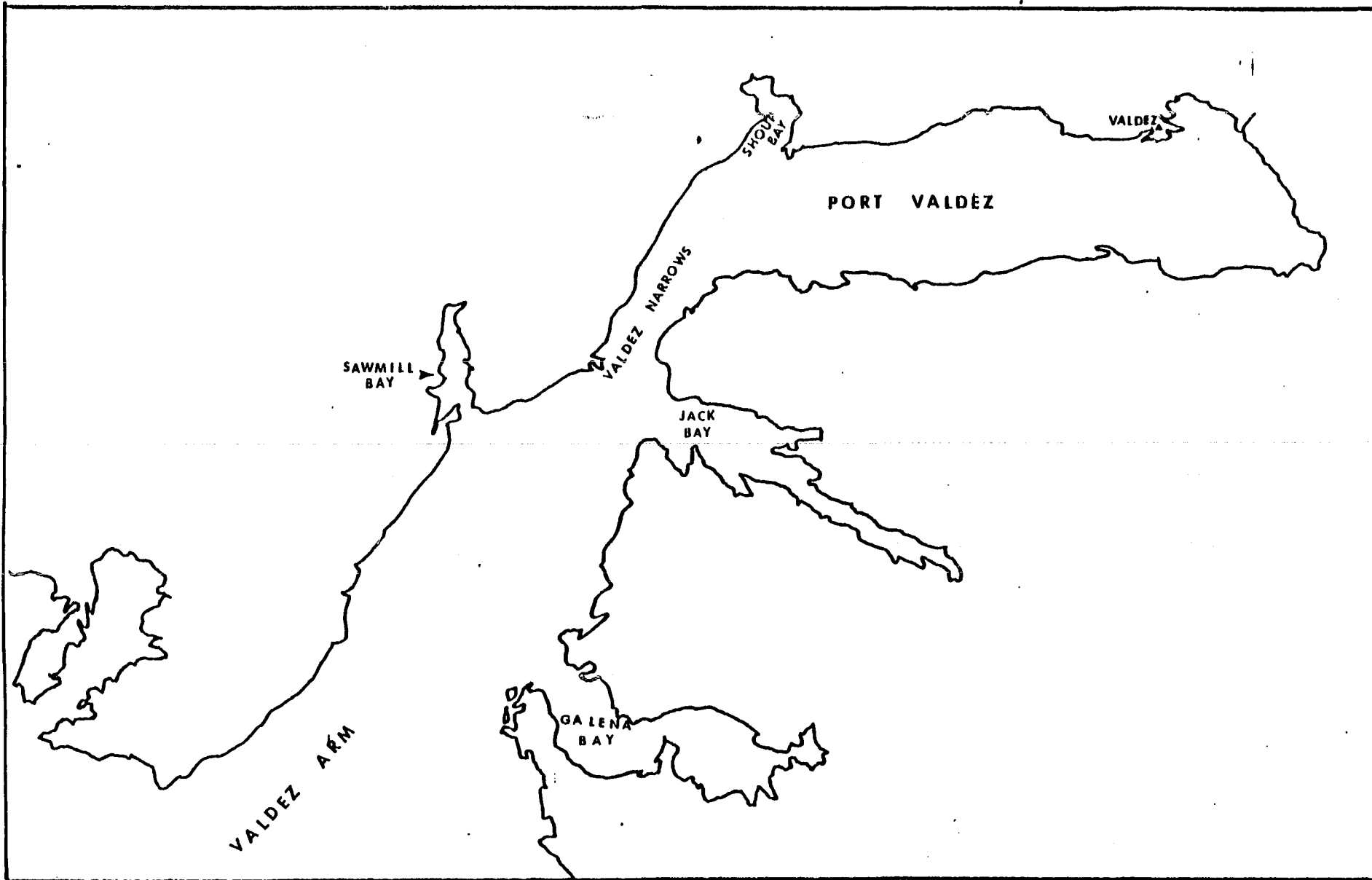


Figure 1. Map of Port Valdez and Valdez Arm.

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