4K93-17

PROJECT OPERATIONAL PLAN FOR THE 1990 BRISTOL BAY RED KING CRAB TEST FISHERY PROJECT

by

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Regional Information Report[1] No. 4K93-17

Alaska Department of Fish and Game
Division of Commercial Fisheries
211 Mission Road
Kodiak, Alaska 99615

April 1993

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ALASKA DEPARTMENT FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

PROJECT OPERATIONAL PLAN

Title: Bristol Bay Red King Crab Test Fishery Project

Yellowbook Project No.: TF-960

Principal Investigator:	Dr. Dana Schmidt	PCN:1202
Project Leader:	Leslie J. Watson	PCN:1857
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Assisting Personnel:	William Donaldson	PCN:1213

Date Submitted (original): July 25, 1990
(final): April 2, 1993

Region: Westward
Fishery Unit: Bering Sea/Aleutian Islands Crab
Fishery: Bristol Bay Red King Crab
Fishery Management Plan: Fishery Management Plan for the Commercial King and Tanner Crab Fisheries in the Bering Sea/Aleutian Islands
File Name: C:POP90LJW.493

APPROVALS

Level	Signature	Date
Project Leader:	_____	_____
Regional Biometrician:	_____	_____
Research Supervisor:	_____	_____
Regional Supervisor:	_____	_____
Headquarter's Receipt:	_____	_____
Headquarter's Approval:	_____	_____
Headquarter's Recommendation:		
Further Review:	_____	_____
Approval:	_____	_____

NOTE: The original POP was submitted and signed through the level of Headquarter's receipt on July 25, 1990. It was reviewed by Headquarters in October, 1990, but the file containing this information has been lost. What follows is a recreation of the latest known version of the POP and to the authors' knowledge, reflects accurately the original content of it.

FOREWORD

The Bristol Bay red king crab tagging project will be funded under the State of Alaska Test Fishery program. Due to the late notice of project (after the FY91 budgets had been approved), it does not appear in the FY91 Yellowbook in its true form. There are two budgets for this program, TF-960 (Bering Sea Crab Test Fishery) and 39571 (Bering Sea King Crab Tagging). Authorized allocations for the two budgets are respectively, $28.9K and 241.2K, for a project total of $270.1K. However, test fishery receipts for the project totalled $284K; this latter figure reflects the amount spent on the project in FY91.

INTRODUCTION

The Bristol Bay red king crab *Paralithodes camtschaticus* fishery has historically been one of Alaska's most valuable shellfish fisheries. The abundance of Bristol Bay red king crab has been assessed annually since 1969 from trawl surveys conducted in the eastern Bering Sea by the National Marine Fisheries Service (NMFS) (Stevens and MacIntosh 1990). Over the course of the fishery and its assessment many unanswered questions concerning stock status and the dynamics of the Bristol Bay red king crab population have arisen.

For example, annual population estimates of red king crab in Bristol Bay have shown relatively major variations (Table 1), some of which are not explicable by natural mortality. Variations appear to be larger than probable errors caused by lack of precision. Because of the uncertainty associated with the estimate, in-season fishery performance data has been used to modify the guideline harvest level. In-season adjustments also have significant uncertainty associated with them, because the effort component associated with current short term fisheries is subject to variations caused by weather, tides, annual changes in fishing practices, competition from more gear, and possibly other reasons.

In an effort to address these apparent variations in population abundance, NMFS has tagged crab and released them during annual eastern Bering Sea trawl surveys. Subsequent recoveries have been sporadic and inconsistent, and the resulting overall low numbers of recoveries have been insufficient to address major questions concerning population dynamics.

This research is an intensive tagging project, utilizing new tag technology (Passive Integrated Transponders or PIT tags) to determine the recovery ratio of tagged/untagged legal and pre-recruit male red king crabs in a portion of the Bristol Bay commercial crab fishing area. Preliminary testing of PIT tags on small numbers of the dungeness crab *Cancer magister* (Prentice 1986), and red king crabs (W.E. Donaldson, pers. comm.) indicates that these tags are retained through molting and could be detected without sacrificing the tagged animal.

Data from the project will be useful for determining fishing mortality, natural mortality, and population size. Growth parameters, molting rates and migration will also be obtained. If feasible, data from the first year will be used to determine if the population estimate from the trawl survey corresponds with that based on tag recoveries. If the project is successful, subsequent years data will provide improved estimates of natural mortality, growth and migration. These data can then be applied to the historical trawl survey data to provide improved estimates of population size and historical fishing rates.

OBJECTIVES

The short-term goal of this study is to assess the feasibility of utilizing PIT tag technology in an effort to provide an accurate estimate of the population of legal male red king crabs in Bristol Bay during the summer of 1990. Long-term goals are to obtain information on the exploitation rate and natural mortality rate of this population, and the effects of biological parameters on these rates. Specific objectives of the study are as follows:

1. Determine the feasibility of Passive Integrated Transponder (PIT) tag mark and recapture studies during the initial year by PIT-tagging 2500 legal males and 2500 sublegal males. Additionally, half of the PIT-tagged legal males (1250) and half of the PIT-tagged sublegal males (1250) will also be externally marked with isthmus (or Floy) tags (referred to hereafter as dual-tagged crabs).

2. Examine approximately 50% of the 1990 Bristol Bay red king crab commercial catch for recovery of PIT-tagged crabs.

3. Monitor the 1990 Bristol Bay red king crab harvest for recovery of dual-tagged crabs to provide an estimate of PIT tag loss rates.

4. Estimate the fishery exploitation rate by analysis of marked/unmarked crab ratios from the commercial fishery.

5. If the first year of the tagging program is successful, plans will be developed for automated recovery procedures at shorebased canneries and expansion into other Bering Sea crab fisheries considered.

Tasks to be accomplished are as follows:

1. Issue a contract under the State of Alaska Test Fishery Program for a vessel to conduct the tagging project. The vessel must also harvest sufficient quantities of red king crabs to pay the cost of the project ($270,100).

2. Release tagged crabs in accordance with planned procedures (see below).

3. Conduct the tag recovery program during the 1990 commercial crab fishery, in accordance with planned procedures (see below).

4. Analyze the data and prepare a report to be distributed prior to the 1991 Alaska Board of Fisheries meeting.

METHODS

The project will be conducted in two phases: (1) tagging survey and cost recovery, and (2) tag recovery.

Tagging Survey and Cost Recovery

Phase 1 of this project will be conducted approximately from August 7 to September 7, 1990 in Bristol Bay (Figure 1). A chartered vessel will be contracted using the test fishery account for the purpose of the tagging survey and cost recovery. The contract shall state that the vessel will retain 50% of the male red king crab 6 inches or greater in carapace width during the first 20 days of the charter. Legal size Tanner crab *Chionoecetes bairdi* may also be retained based on product quality. A competitive bid for the sale of the cost recovery crabs will be tendered prior to embarkation; crabs will be delivered to Dutch Harbor to allow for charter logistics and a pre-season test of PIT tag recovery methodology. Four biologists will be on-board the vessel to conduct biological sampling and tagging.

Tagging Station Locations and Itinerary

The Bristol Bay red king crab management area (Area T) is too large to cover in a 20 day charter. Tagging effort must therefore be restricted to a smaller study area within Area T that supports a significant portion of the harvestable population (Figure 1).

Five contiguous ADF&G statistical areas (615630, 625600, 625630, 635600, and 635630) were chosen to be the tagging study area. This area of approximately 5,100 nm^2 has produced over half of the harvest in the last five commercial red king crab seasons. These five statistical areas also tend to be in the top five producing statistical areas in the last five seasons. Each of the last five commercial seasons began on 25 September and ended in early October, roughly one to one-and-one-half months later in the year than this year's mid-August tagging study. The annual NMFS trawl survey, which visits Bristol Bay in June, also indicates that these five statistical areas support a large portion of the legal crab in Bristol Bay: approximately 70%, 50%, and 40% of the legal males in Bristol Bay were caught within these statistical areas during the 1990, 1989, and 1988 NMFS trawl surveys, respectively. Because of the time constraints on the charter, and because no legal red king crabs were caught at the four NMFS trawl stations within statistical

area 635600 in 1990, sampling for tagging will be limited to statistical areas 615630, 625600, 625630, and 635630.

75 sampling stations have been identified. The location of these stations are given in Appendix A.1. and illustrated in Appendices A.2. through A.6. Each station is made of 14 pots, set in a 1.625 nautical mile (nm) east to west line with a spacing of 1/8 (.125) nm between pots (Appendices A.7. and A.8.). The location identified for a station in Appendix A.1. is the midpoint of the string of 14 pots.

The 75 stations are arrayed south to north in groups of five; i.e., stations 1 through 5, 6 through 10, 11 through 15, etc. (Appendices A.2. through A.6.). The distance between stations within an array is 3 nm, giving a total length of 12 nm for a five station array (Appendices A.7. and A.8.). All the stations within an array will be set or picked in the same day. An itinerary for setting and picking pots in a station is given in Appendix A.9. On most days one array of 5 stations will be picked and another array of five stations will be set; i.e., on most days 70 pots will be set and 70 pots will be picked.

The itinerary in Appendix A.9. is based on the following assumptions:

1) running speed for the vessel is 8 knots;

2) the average time to set a pot and move on 1/8 nm to the next pot in the same station is 2.5 minutes; and,

3) the average time to pick a pot, dump it, stack it and move onto the next pot in the same station is 5 minutes.

Under these assumptions, the average time to set the 14 pots in a station is 35 minutes and the expected time to travel the 3 nm between two stations within an array is 22.5 minutes, giving an expected time of 4 hours and 25 minutes to set 70 pots in the five stations of an array. Also, the assumed average time to pick the 14 pots in a station is 1 hour and 10 minutes. Including running time between stations this gives an expected time of 7 hours and 20 minutes to pick 70 pots in the five stations of an array.

On a day when an array of five stations (70 pots) is picked and another array of five stations (70 pots) is set, the total estimated time to pick and set pots and to travel between arrays of stations is 15 hours (7 hours and 20 minutes to pick an array, 2 hours and 8 minutes to travel 17 nm to the next array, 4 hours and 25 minutes to set that array, and 1 hour and 4 minutes to travel to the array that will be picked on the next day.

For the two days when two arrays are set (9 and 14 August in the itinerary), the total estimated time for setting and travel is 12 hours and 45 minutes (4 hours and 25 minutes to set each of the two arrays, 1 hour and 50 minutes to travel between the first array and second array, and 1 hour and 4 minutes to travel from the second array back to the first).

Under the itinerary in Appendix A.9., the pots will soak two nights before picking except for those in stations 1 through 5 and stations 21 through 25; pots in stations 1 through 5 and 21 through 25 will soak one night before picking. All station location data will be recorded as shown in the pilot house log form (Appendix B.1.).

Catch Sampling

The contents of each sampled pot will be unloaded onto a sorting table where the catch of king and Tanner crabs are sorted by species and sex. From each pot, one half of the male red king crabs with carapace widths (CW) between 6 and 6.5 inches and one half of the male red king crabs greater than 6.5 inches CW will be retained for charter cost recovery. Each sampled crab (tagged or untagged) will be measured, assessed for shell condition, egg clutch condition, and disease. Crabs unsuitable for tagging will be released alive as soon as possible. In instances where large numbers of Tanner crabs, immature male red king crabs and female red king crabs are encountered, the catch will be subsampled to allow additional deck time for tagging.

Sampling of Crabs for Tagging

At each pot one half of the legal male red king crabs greater than 6.5 inches CW and one half of the sublegal male red king crabs between 6 and 6.5 inches CW will receive PIT tags and released. At each pot, one half of the legal crabs receiving PIT tags and one half of the sublegal crabs receiving PIT tags will also receive isthmus (Floy) tags. Only healthy, non-injured crabs will be tagged; tagged crabs will be handled in a gentle manner and returned on station to the sea as quickly as possible.

Carapace length, legal/sublegal status as determined from carapace width, shell condition, and where appropriate, tag number(s) will be recorded for all sampled crabs as shown in the crab research data form (Appendix B.2.).

Tagging Procedure

Crabs that will be PIT-tagged will be injected with a 10-mm Destron/IDI TX1400L 125 kHz Passive Integrated Transponder. The PIT tag will be injected longitudinally into the proximal segment of the fifth, right leg as shown in Figure 2. Following injection, the crab will be scanned with a Destron/IDI HS5102L 125 kHz portable PIT tag detector to verify that the tag has been successfully injected; the 12-digit PIT tag identification number will be stored on the detector for subsequent merging with the attendant catch sampling data for that crab. Crabs that will be dual-tagged will also receive a isthmus or Floy tag as described by Gray (1965); that Floy tag number will also be recorded on the crab research data form (Appendix B.2.).

Tag Recovery

ADF&G personnel will be stationed at shore-based crab processing facilities in Dutch Harbor, Akutan, and King Cove and at several floating processors in the Bristol Bay area for the purpose of recovering PIT-tagged and dual-tagged red king crabs from the November 1990 commercial fishery. Each sampler will receive instructions and equipment to conduct sampling at their assigned station as outlined in Appendix C.1.

PIT Tag Recovery

Samplers will scan the tail sections from butchered crabs using Destron/IDI HS5102L 125 kHz portable PIT tag detectors and will record the vessel name from which the sample was taken, the number of tail sections scanned and the PIT tag identification numbers of any tail sections that have detectable PIT tags. Any tail sections that are identified as having PIT tags will be retained for later analysis. Data will be recorded on the PIT tag recovery program-wander data form (Appendix C.1).

Dual-tagged (PIT and Floy Tags) Crab Recovery

Dockside samplers, shellfish observers and PIT tag samplers will solicit tag returns of Floy-tagged crab from vessel and processing crews at the processing facilities where they are stationed. Floy-tagged crabs will be measured and shell-aged, and scanned for the presence of PIT tags. The tail sections from these crab will be cut off and retained for later analysis. The crab will then be returned to the offloading brailler for delivery. All dockside sampling information, capture location data, and names and addresses of those vessel crews and/or processing workers who returned tags or tagged crabs will be recorded on the tag recovery form (Appendix C.1).

Tag Reward Lottery

Following the closure of the 1990 fishery, all Floy tag returns will be entered in a random drawing for cash awards ranging from $50 to $500. Captains, vessel crewmembers, and processing workers who return tags or tagged crabs to ADF&G will be eligible for the random drawing. Observers who forward tags to ADF&G are not eligible for the drawing. Details of the tag reward program are outlined in several news releases shown in Appendix C.1.

Release of Original Tagging Data to Vessel Captains

Following the closure of the 1990 fishery and the subsequent return of Floy tags and/or capture information, participating vessel captains will receive the original tagging information for the tagged crabs they captured.

SCHEDULES

	DATE(S)	PERSONNEL	ACTIVITY
1	1/90-6/90	Schmidt, Donaldson, Pengilly, Watson	Project planning, secure vessel charter, equipment purchasing, hiring, bid for sale of cost recovery crabs.
2	8/90-9/90	Schmidt, Donaldson, Clay, Stallmach, Watson	Conduct tagging survey and cost recovery fishing, FV Kristen Gail.
3	9/90-10/90	Watson, Schmidt	Test PIT tag recovery methods, plan tag recovery effort.
4	11/90	Watson, Schmidt, Pengilly, et al.	Tag recovery effort.
5	11/90-12/91	Watson, Pengilly	Data edit, entry, analysis, and report prep.

REPORTS

DATE	PERSONNEL	REPORT
10/91	Watson, Pengilly, Donaldson, Schmidt	A pilot mark-recapture study using external tags and implantable Passive Integrated Transponder (PIT) tags on red king crab in Bristol Bay, Alaska. RIR No. 4K91-21.
1992	Donaldson,Schmidt, Watson, Pengilly	Development of a technique to tag adult red king crab, *Paralithodes camtschaticus* (Tilesius, 1815), with Passive Integrated Transponder Tags. Jour. Shellf. Res. 11(1):91-94.
4/93	Watson, Pengilly	Project Operational Plan for the 1990 Bristol Bay red king crab Test Fishery project. RIR No. 4K-93-17.

LITERATURE CITED

Gray, G.W., Jr. 1965. Tags for marking king crabs. Progr. Fish-Cult. 27:221-227.

Prentice, E.P. 1986. A new internal telemetry tag for fish and crustaceans. In A.K. Sparks, editor. Marine farming and enhancement; proceedings of the fifteenth U.S.-Japan meeting on aquaculture, Kyoto, Japan, October 22-23, 1986.

Stevens, B.G. & R.A. MacIntosh. 1990. Report to industry on the 1990 eastern Bering Sea crab survey. Ak. Fish. Sci. Center Proc. Rpt. 90-09.

Table 1. Annual abundance estimates (millions of crabs) for red king crab (*P. camtschatica*) in Bristol Bay and the Pribilof District from NMFS surveys (after Stevens and MacIntosh 1990).

	Males				Females			
Size[a] (mm)	<110	110-134	≥135		<90	≥90		Grand
Width (in)	<5.2	5.2-6.5	≥6.5	Total	<3.5	≥3.5	Total	Total
1969	41.0	20.3	9.8	71.1	18.3	28.5	46.8	117.9
1970	9.5	8.4	5.3	12.2	4.9	13.0	17.9	41.1
1972[b]	14.1	8.0	5.4	27.5	7.0	12.1	19.1	46.6
1973[c]	50.0	25.9	10.8	86.7	24.8	76.8	101.6	188.3
1974[c]	59.0	31.2	20.9	111.1	37.7	72.0	109.7	220.8
1975	84.9	31.7	21.0	137.6	70.8	58.9	129.7	267.3
1976	70.2	49.3	32.7	152.2	35.9	71.8	107.7	259.9
1977	80.2	63.9	37.6	181.7	33.5	150.1	183.6	365.3
1978	62.9	47.9	46.6	157.4	38.2	128.4	166.6	324.0
1979	48.1	37.2	43.9	129.2	45.1	110.9	156.0	285.2
1980	56.8	23.9	36.1	116.8	44.8	67.6	112.5	229.3
1981	56.6	18.4	11.3	86.3	36.3	67.3	103.6	189.9
1982	107.2	17.4	4.7	129.3	77.2	54.8	132.0	261.3
1983	43.3	10.4	1.5	55.2	24.3	9.7	34.0	89.2
1984	81.8	12.6	3.1	97.6	57.6	17.6	75.1	172.7
1985	13.7	10.1	2.5	26.3	6.9	6.8	13.7	39.9
1986	11.8	12.3	5.9	30.1	4.5	5.4	9.8	39.9
1987	20.1	12.6	7.9	40.6	16.8	18.3	35.1	75.7
1988	8.5	6.4	6.4	21.3	2.7	15.7	18.4	39.7
1989	8.6	9.4	11.9	29.9	4.4	16.9	21.2	51.1
1990	8.2	10.2	9.2	27.6	7.2	17.5	24.7	52.2
Limits[d]								
Lower	4.1	4.9	6.5	18.5	0.0	6.0	8.6	27.1
Upper	12.3	15.4	11.9	36.7	14.9	29.1	40.7	77.4
±%	50	52	29	33	108	66	65	48

[a]Carapace length (mm).
[b]Limited survey in 1971, not used for population estimate.
[c]1973 and 1974 estimates considered unreliable.
[d]Mean ± 2 standard errors for most recent year.

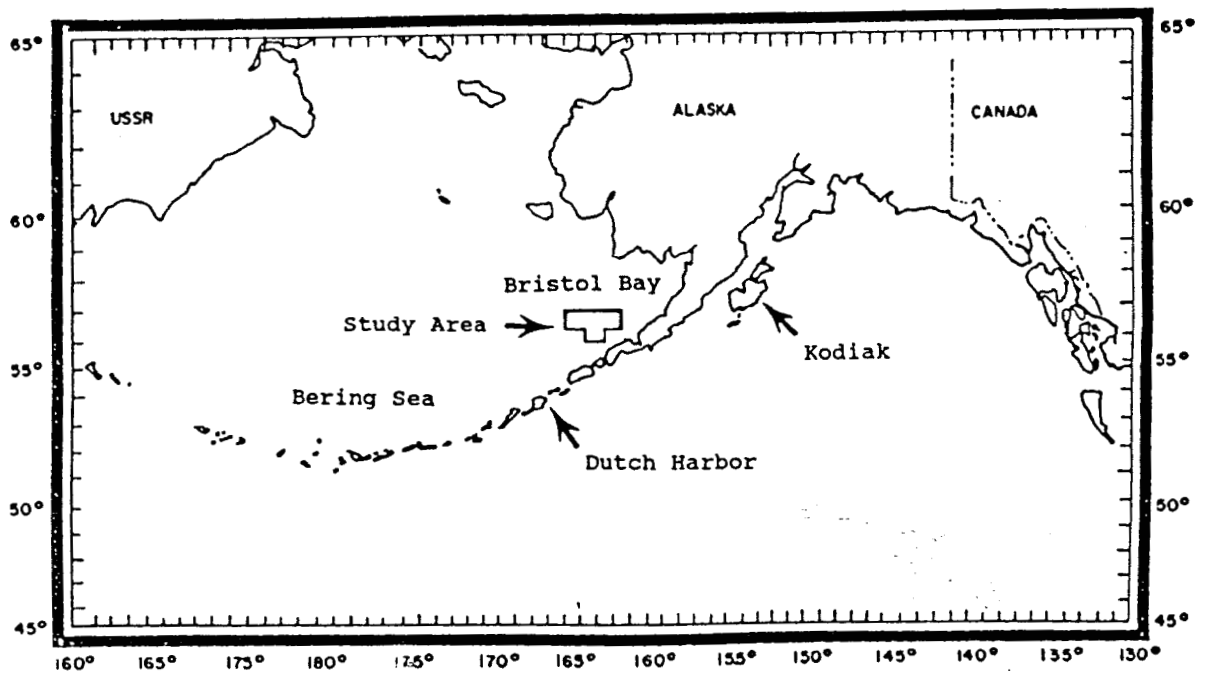


Figure 1. Location of the 1990 Bristol Bay red king crab tagging study.

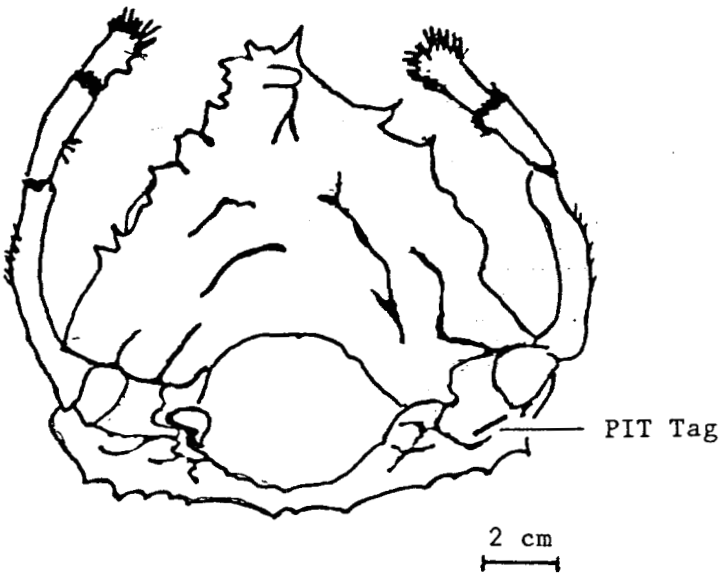


Figure 2. Ventral aspect of a red king crab abdomen showing the placement of the 10-mm PIT tag in the proximal segment of the right, fifth leg.

APPENDIX

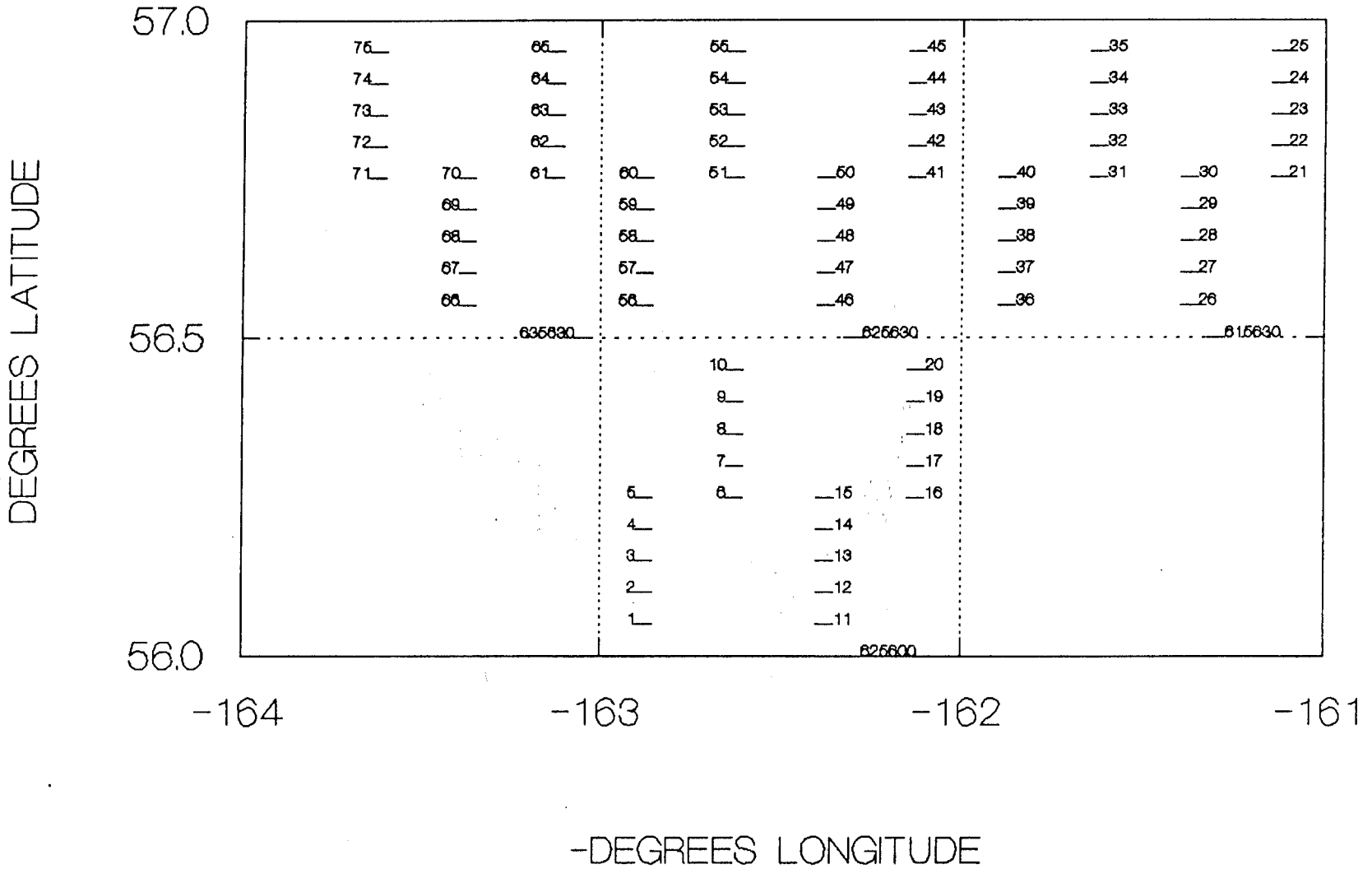
Appendix A.1. Tagging study station locations.

STATION	NORTH LATITUDE			WEST LONGITUDE		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
1	56	3	0	162	52	30
2	56	6	0	162	52	30
3	56	9	0	162	52	30
4	56	12	0	162	52	30
5	56	15	0	162	52	30
6	56	15	0	162	37	30
7	56	18	0	162	37	30
8	56	21	0	162	37	30
9	56	24	0	162	37	30
10	56	27	0	162	37	30
11	56	3	0	162	22	30
12	56	6	0	162	22	30
13	56	9	0	162	22	30
14	56	12	0	162	22	30
15	56	15	0	162	22	30
16	56	15	0	162	7	30
17	56	18	0	162	7	30
18	56	21	0	162	7	30
19	56	24	0	162	7	30
20	56	27	0	162	7	30
21	56	45	0	161	7	30
22	56	48	0	161	7	30
23	56	51	0	161	7	30
24	56	54	0	161	7	30
25	56	57	0	161	7	30
26	56	33	0	161	22	30
27	56	36	0	161	22	30
28	56	39	0	161	22	30
29	56	42	0	161	22	30
30	56	45	0	161	22	30
31	56	45	0	161	37	30
32	56	48	0	161	37	30
33	56	51	0	161	37	30
34	56	54	0	161	37	30
35	56	57	0	161	37	30
36	56	33	0	161	52	30
37	56	36	0	161	52	30
38	56	39	0	161	52	30
39	56	42	0	161	52	30
40	56	45	0	161	52	30
41	56	45	0	162	7	30
42	56	48	0	162	7	30
43	56	51	0	162	7	30
44	56	54	0	162	7	30
45	56	57	0	162	7	30
46	56	33	0	162	22	30

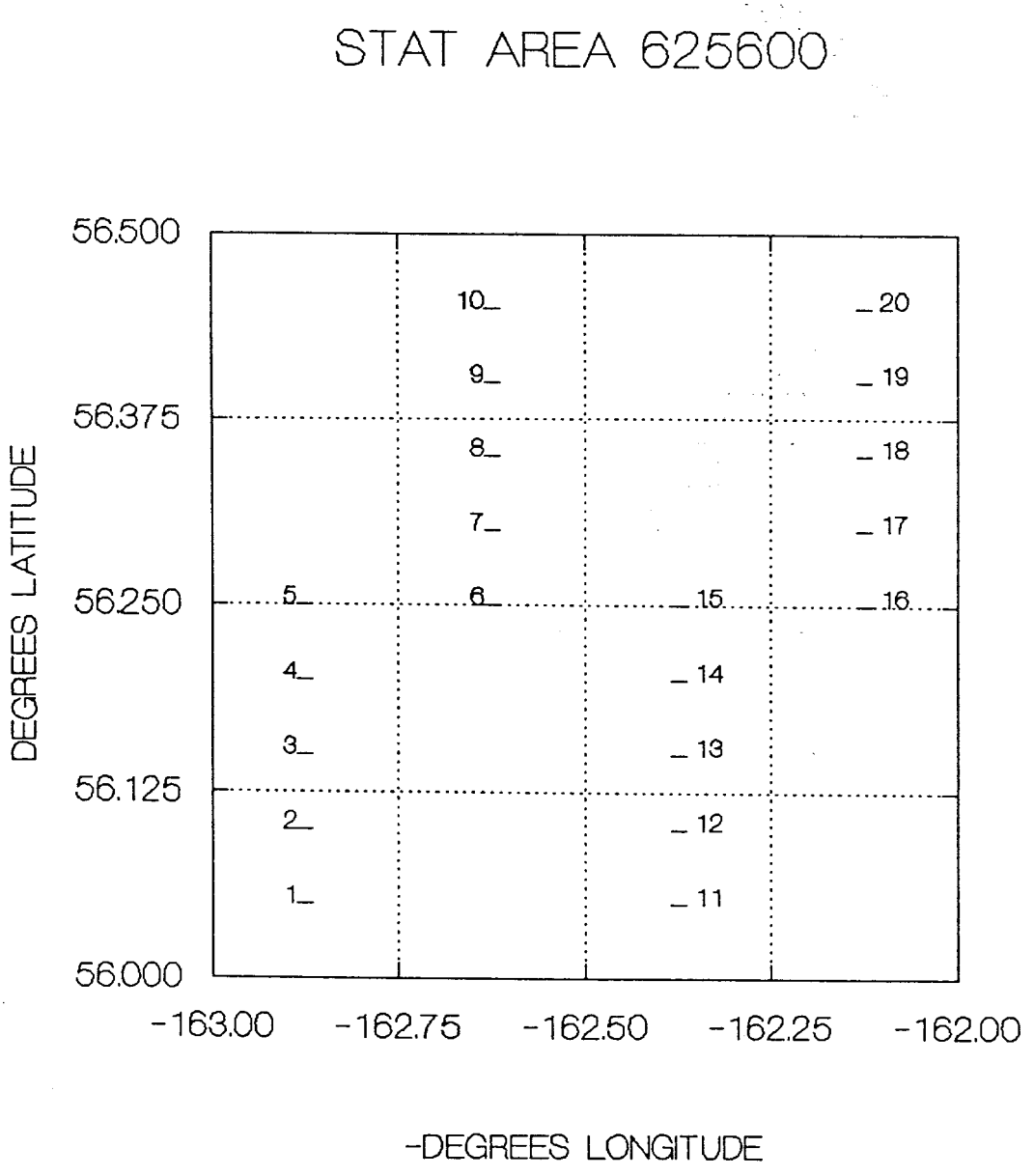
Appendix A.1. (page 2 of 2)

STATION	NORTH LATITUDE			WEST LONGITUDE		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
47	56	36	0	162	22	30
48	56	39	0	162	22	30
49	56	42	0	162	22	30
50	56	45	0	162	22	30
51	56	45	0	162	37	30
52	56	48	0	162	37	30
53	56	51	0	162	37	30
54	56	54	0	162	37	30
55	56	57	0	162	37	30
56	56	33	0	162	52	30
57	56	36	0	162	52	30
58	56	39	0	162	52	30
59	56	42	0	162	52	30
60	56	45	0	162	52	30
61	56	45	0	163	7	30
62	56	48	0	163	7	30
63	56	51	0	163	7	30
64	56	54	0	163	7	30
65	56	57	0	163	7	30
66	56	33	0	163	22	30
67	56	36	0	163	22	30
68	56	39	0	163	22	30
69	56	42	0	163	22	30
70	56	45	0	163	22	30
71	56	45	0	163	37	30
72	56	48	0	163	37	30
73	56	51	0	163	37	30
74	56	54	0	163	37	30
75	56	57	0	163	37	30

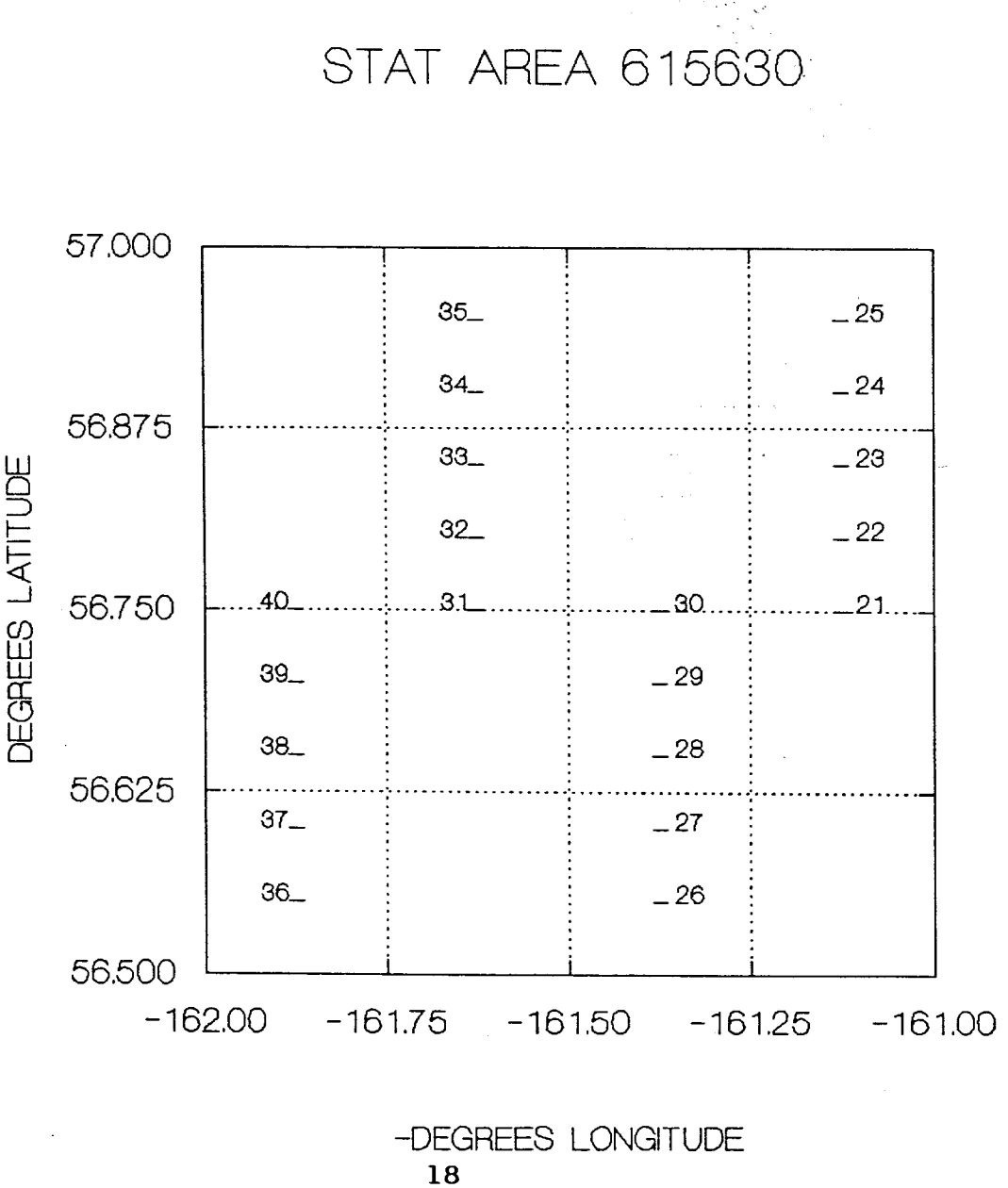
Appendix A.2. Layout of the 75 tagging stations. 615630, 625600, 625630, and 635630 designate ADF&G statistical areas.



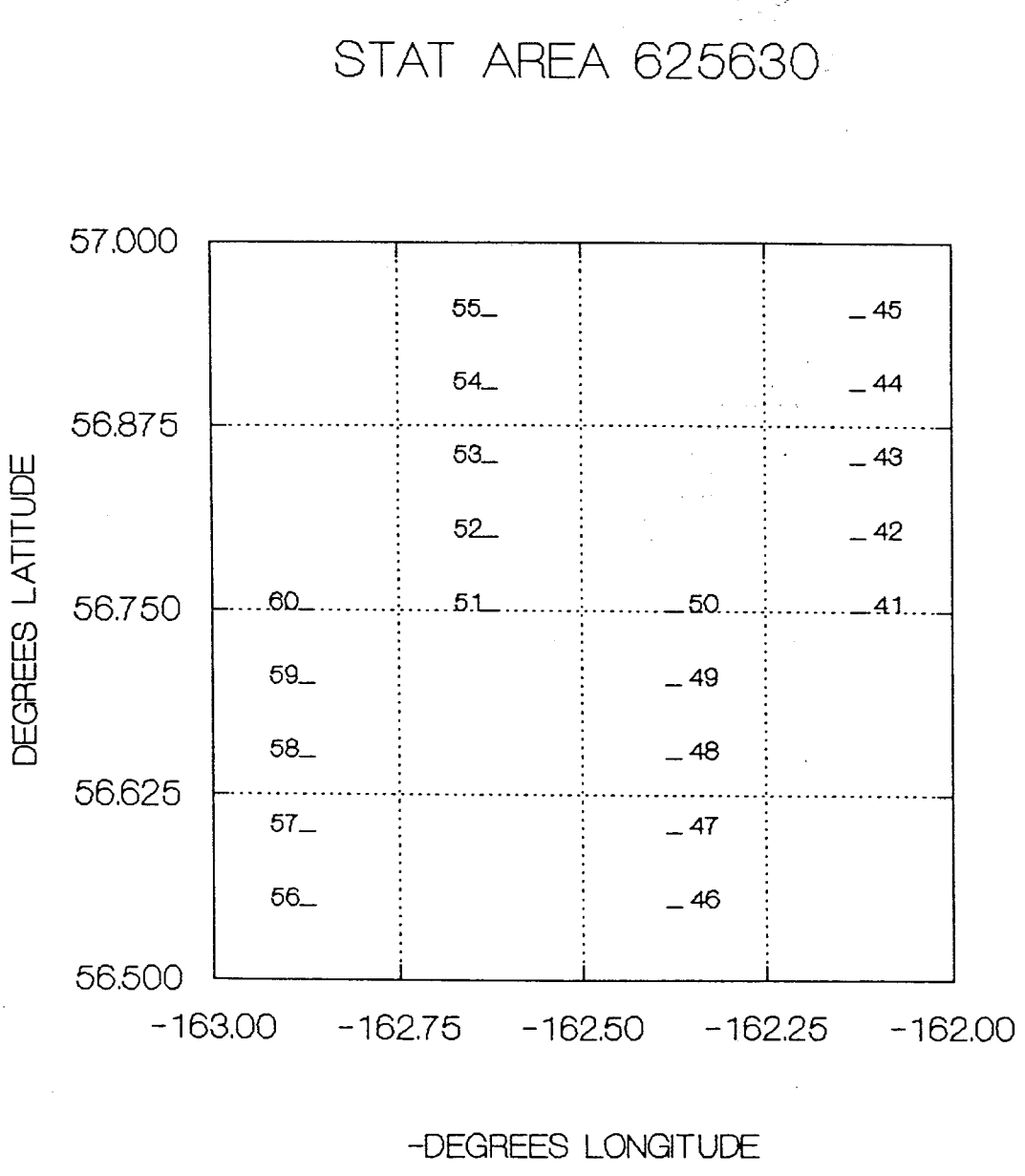
Appendix A.3. Layout of stations 1 through 20 in statistical area 625600



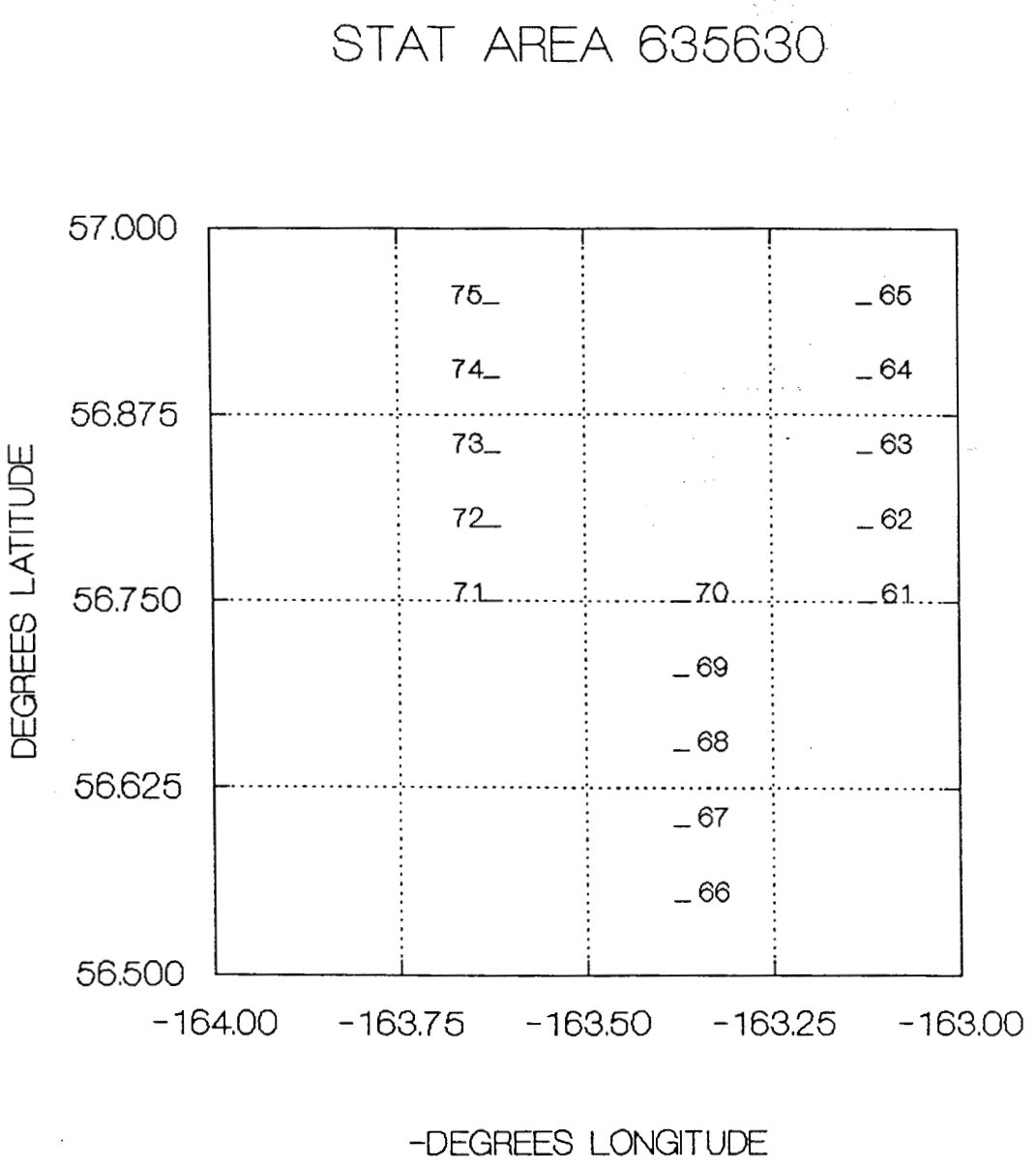
Appendix A.4. Layout of stations 21 through 40 in statistical area 615630.



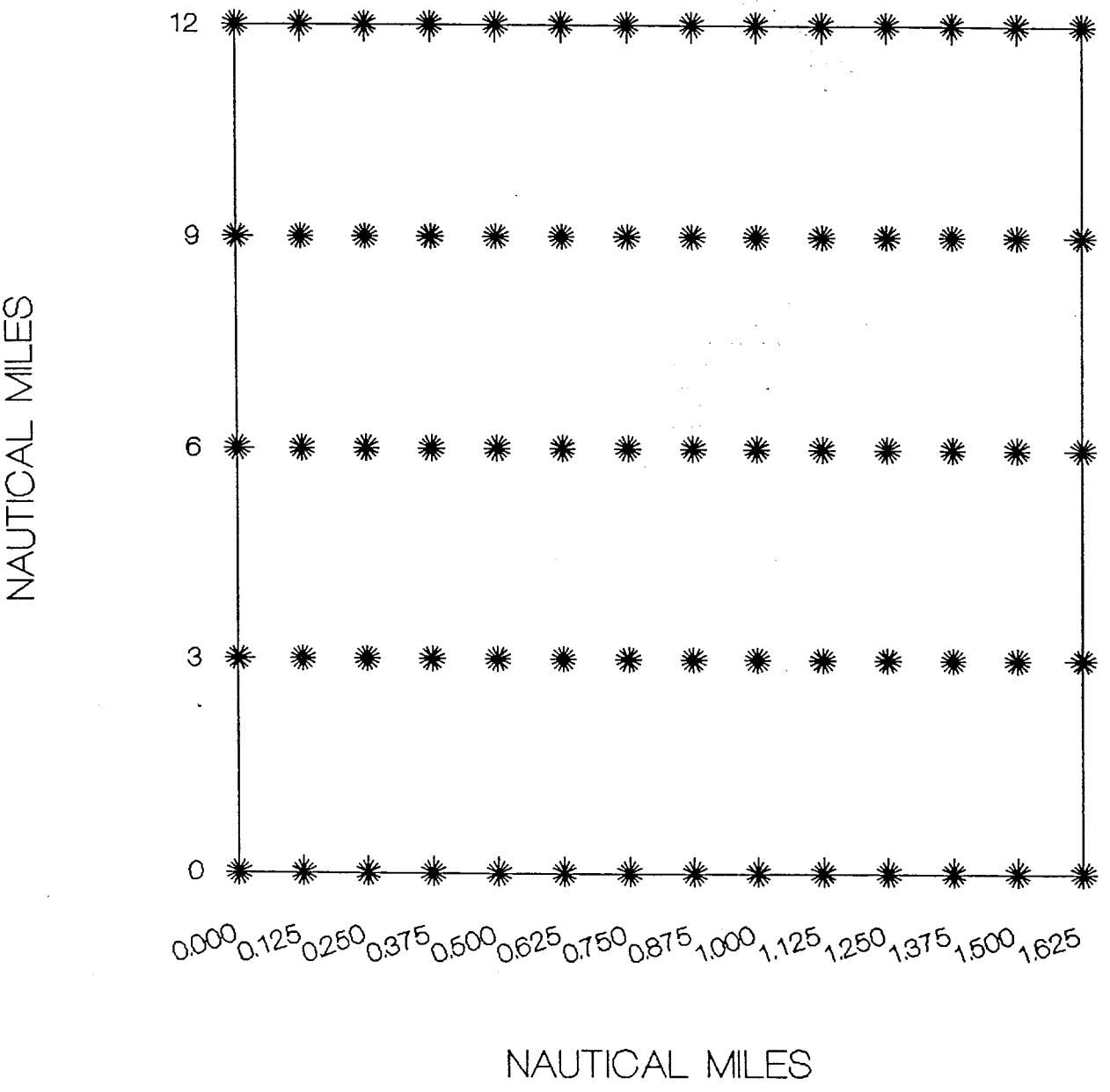
Appendix A.5. Layout of stations 41 through 60 in statistical area 625630.



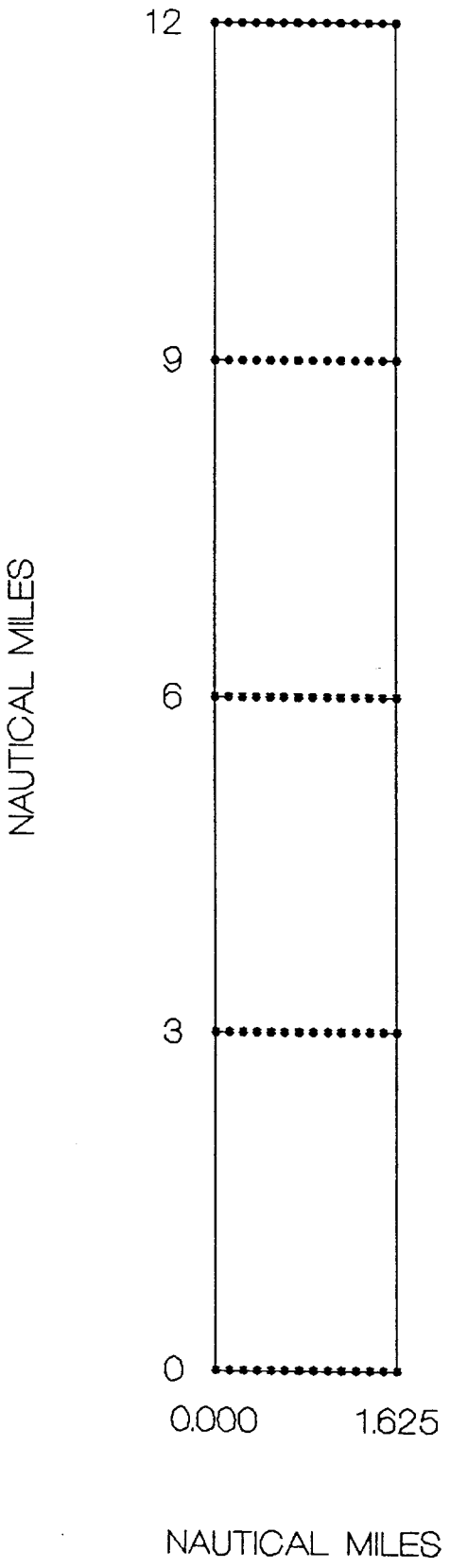
Appendix A.6. Layout of stations 61 through 75 in statistical area 635630.



Appendix A.7. Schematic of 70 pots distributed in an array of 5 stations of 14 pots each. NOT DRAWN TO SCALE.



Appendix A.8. Schematic of 70 pots distributed in an array of 5 stations of 14 pots each. DRAWN TO SCALE.



Appendix A.9. Tagging charter itinerary.

Aug 7	Leave Dutch Harbor.
Aug 8	Arrive at station 1 in Statistical Area 625600.
Aug 9	Set 1-5 and 10-6. Return to 5.
Aug 10	Pick 5-1. Set 11-15. Return to 6.
Aug 11	Pick 6-10. Set 20-16. Return to 15.
Aug 12	Pick 15-11. Return to 16.
Aug 13	Pick 16-20. Travel to 25.
Aug 14	Set 25-21 and 30-26. Return to 21.
Aug 15	Pick 21-25. Set 35-31. Return to 30.
Aug 16	Pick 30-26. Set 36-40. Return to 31.
Aug 17	Pick 31-35. Set 45-41. Return to 40.
Aug 18	Pick 40-36. Set 46-50. Return to 41.
Aug 19	Pick 41-45. Set 55-51. Return to 50.
Aug 20	Pick 50-46. Set 56-60. Return to 51.
Aug 21	Pick 51-55. Set 65-61. Return to 60.
Aug 22	Pick 60-56. Set 66-70. Return to 61.
Aug 23	Pick 61-65. Set 75-71. Return to 70.
Aug 24	Pick 70-66. Return to 71
Aug 25	Pick 71-75. Begin return to Dutch Harbor.
Aug 26	Return to Dutch Harbor.

Notes: Under this plan, stations 1 through 5 and 21 through 25 will soak for only one day before picking; all other stations will soak for two days before picking. Stations 71 through 75 may be dropped to reduce days from first set to last pick to 16. Another option is to not include stations 21 through 25, but to include 71 through 75 -- again, reducing days to 16.

Appendix B.1. **PILOT HOUSE LOG - POT SURVEYS 199 _**

Registration Area _____

STATION | | | | |

If longlining pots - distance between pots on string _____ fm.

Skipper _____

Recorder _____

Vessel _____

SET GEAR			DEPTH IN FMS.	BOTTOM TYPE *	SEQUENTIAL POT NUMBER	BOUY NO.	LIFT GEAR **			LATITUDE - N			LONGITUDE - W or E***			LORAN POSITION (Always record Lat.-Long.)
MONTH	DAY	MILITARY TIME					MONTH	DAY	MILITARY TIME	DEG	MIN	SEC	DEG	MIN	SEC	

24

* Bottom type codes: 1 - Rock; 2 - Sand; 3 - Silt; and 4 - Mud.

** Skipper must tell ADF&G crew if pulling gear in reverse order than set. "Lost Pot" must be recorded under "Lift Gear" section by appropriate pot which was lost. Immediately tell ADF&G deck crew whenever a pot is lost so their deck paperwork can stay in order.

*** Circle either W=west or E=east.

Revised 7/91

Appendix B.2.

ADF&G CRAB RESEARCH DATA FORM

SPECIES _____ STATION NUMBER _____ REGISTRATION AREA Bristol Bay

SEX _____ BUOY NUMBER _____ MEASURER _____

VESSEL KRISTEN GAIL TRAWL HAUL NUMBER _____ RECORDER _____

DATE _____ SAMPLING FACTOR _____ PAGE _____ OF _____

	SEQUENTIAL POT NUMBER	SPECIES	SEX	SIZE CRABS (MM) FISH (CM)	LEGAL	SHELL AGE	EGGS: COLOR	EGGS: DEVELOP	EGGS: CONDITION	EGGS: % CLUTCH	OTHER	TAG NUMBER	PIT I.D. REFERENCE NO.	COMMENTS
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														

Crab Species
1 - L. sequispina
2 - P. camtschaticus
3 - P. platypus
4 - Erimacrus
5 - C. bairdi x opilio
6 - C. bairdi
7 - C. opilio
8 - C. angulatus
9 - Cancer magister
A - L. couesi
D - C. tanneri

Fish & Invert. Species
See coded species list

Sex
1 - Male
2 - Female

Legal
1 - Sublegal
2 - Legal

Shell Age
0 - Soft
1 - New
2 - Old
3 - Very Old

Live Egg Color
1 - Tan
2 - Purple
3 - Brown
4 - Orange
5 - Purple-brown
6 - Pink
7 - Reddish
8 -
9 -
0 - Other, describe in comments

Egg Devel
1 - Uneyed
2 - Eyed

Clutch Condition
1 - Dead eggs not apparent
2 - Dead eggs <20%
3 - Dead eggs >20%

Percent Clutch
1 - Barren, clean pleopods
2 - Barren, with empty eggs cases and/or stalks
3 - Clutch 1-29% full
4 - Clutch 30-59% full
5 - Clutch 60-89% full
6 - Clutch 90-100% full

Others
1 - Dead
2 - Alive
3 - Nemerteans in clutch
4 - Turbellarians in clutch
5 - Black mat
6 - Bitter crab disease
7 - "cottage cheese" disease
8 - Shell rust
9 - B. calliosus

Revised 7/91

Appendix C.1. 1990 Bristol Bay PIT Tag Recovery Program.

1990 BRISTOL BAY PIT TAG RECOVERY PROGRAM

by:

Leslie J. Watson

October 1990

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Bunkhouse Notes 1

Instructions For Samplers 2

Objectives 2

Introduction 2

Equipment 2

Safety 3

Interaction With Processing Staff 3

Managing and Maintaining Your Equipment 4

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Separated ADF&G Floy Tags and Tags From Other Agencies 7

LOGISTICS

It is anticipated that most samplers will be coming to Dutch Harbor around November 9 but it could be sooner or later, depending on the fishery. Be prepared for last minute notification of departure date (Election Day is November 6, so absentee voting is advisable). I will be in Dutch Harbor by October 25; call me there if you have any questions.

Dutch Harbor bunkhouse phone number is: 581-1562
Dutch Harbor ADF&G office number is: 581-1239

The project will be headquartered at the Dutch Harbor bunkhouse (eating, sleeping, down loading data to computers, charging batteries, communications). Most of the staff will be stationed in processing plants in Dutch Harbor. Transportation and meals will be provided. Meals will be provided at either the Dutch Harbor bunkhouse (prepared by all) or at the processing facility you are working at. There will be no charges to restaurants in Dutch Harbor. We will assign staff to grocery shop, as necessary (remit all charges for groceries to Leslie). Per diem claims (if any) will be made after the project is completed and should be submitted to Leslie. Copies of any TRs used and all time sheets should also be submitted to Leslie. Seasonals will be activated on the project on the day they fly to Dutch and deactivated when they return to Kodiak (or town of origin).

Each person will be expected to work 10-12 hour shifts once deliveries begin. All staff will be required to keep track of start/stop times on time sheets. All OT eligible staff will be paid a maximum of 2-4.5 hours of OT per day once sampling starts. No OT eligible staff will work more than 10-12 hours in a single day. Return flights (out of Dutch Harbor) have not been booked; these flights will be full after the fishery closes so plan on stand by status at that time.

<u>Bunkhouse Notes</u>

There will be 12-16 people staying at the facility for 7-10 days. Endeavor to keep both the bunkhouse and yourself as clean as possible. There are not enough beds for all, so remember your sleeping pads. Boots and other wet, smelly gear will not be permitted inside the main living area or bedrooms (there are 2 entrances that can be used to hang up gear). Only local calls can be made from the bunkhouse phone (incoming, non-collect long distance calls can be received, as well). If you need to make long distance phone calls, the airport has several long distance only phones (5 minute walk down the hill). As shift work is anticipated for the project, please keep in mind that people will be trying to sleep at odd hours.

INSTRUCTIONS FOR SAMPLERS

Objectives

The primary objective of this program is to sample the commercial catch of Bristol Bay red king crab for the recovery of PIT (Passive Integrated Transponder) tags. The secondary objective is to determine the loss rate of the PIT tag on individual crab.

Introduction

4,700 legal male red king crab were tagged in the proximal segment of the right, fifth leg in August 1990. Half of these crab (2,350) were also externally marked with a yellow Floy (spaghetti tag) and will hereafter be referred to as PIT-Floy crab. As it is easier to detect PIT tags from the separated tail section of the crab, we will be working almost exclusively with tail sections from butchered crab. In order to fully test the success of the PIT tag, approximately 700,000 to 1,425,000 crab tails will need to be 'scanned'. Per sampler, that's 4,000 - 8,000 tails per day for 10 days! Attached are several news releases that briefly explain the program (diagrams of Floy and PIT tag placement included).

Equipment

Each sampler needs to bring rain gear, boots, sleeping bag and pad, and sufficient clothing for cold, wet working conditions.

ADF&G will supply gloves and all sampling equipment listed below.

1. 1 portable ID Reading System (scanning wand w/rubber cover, reader, carrying strap and manual).
2. Extra battery (Portalac, cord and fanny pack)
3. Battery charger(for both internal and external batteries)
4. Recovery forms (2 forms, 10 each)
5. Time sheets
6. Tallywhacker
7. 1 box Ziplock bags and 1 roll electrical tape
8. News releases
9. Clipboard and pencils
10. Ear plugs
11. Rite-in-rain notebook
12. Sampling Instructions
13. Equipment bag

Safety

DO NOT REACH INTO AUGERS, GRINDERS OR TROUGHS LEADING TO AUGERS OR GRINDERS TO RETRIEVE CRAB TAILS. It will not be necessary to get every single crab tail that goes by. Long hair, scarfs and clothing strings or tabs should be tucked securely away to prevent obvious entangling. If you treasure your hearing, wear the supplied ear plugs. Walkman headsets should not be used while working in the plant. Adhere to whatever safety and sanitary procedures required by the plant.

Interaction With Processing Staff

In order to most efficiently sample the catch, you will probably be stationed directly on the processing line. All processors have been notified that we will be sampling during active processing. You may be assigned a particular processing worker to help you. Because you must know what vessel's catch you are working on, you will have to stay in contact with the unloading foreman, as well.

Managing and Maintaining Your Equipment

As there are no back-up readers, scanners or batteries, you will need to service your gear carefully prior to, and after sampling. When the wand trigger is depressed, maximum power is being drawn from the battery. For this reason, DO NOT TAPE THE TRIGGER DOWN. Also, the internal battery automatically shuts down every 13-18 minutes if the trigger is continuously depressed. Turn the machine off when not in use (breaks, lunch, etc.). When the battery is getting low, you will see an error message in the window which says "LOW BATTERY". (You have very little scanning time left at this point; call for help!!)

CAUTION: If you have turned the reader on and you see a blank window (no message of any kind), YOU ARE NO LONGER SCANNING.

A fully charged internal battery will last from 5-11 hours, depending on use. The extra battery (Portalac 12V) should provide at least 12 additional hours of power. It is recommended that you begin each shift with the reader hooked up to the external battery (power will be drawn directly from the Portalac). After your shift is completed, you will need to recharge the batteries. The internal battery takes 6.5 hours to recharge when fully drained, the Portalac requires 1-3 hours. Keep the Portalac battery out of water (fanny pack supplied).

The readers and scanning wands are not waterproof. To protect the reader, encase in ziplock bags (you can read window and operate buttons through the bag). The scanning wand has a detachable rubber cover that must be in place during scanning as you will be passing this surface directly over the crab tail. After each shift, the reader and wand (rubber cover removed and rinsed) should be wiped clean and left out to air dry overnight.

During breaks, leave equipment in a secure, dry place.

Operating the Reader and Scanner

Complete instructions for operating the reader and scanner are given in the attached manual. Please read it carefully. For quick reference, here are the high points:

1. Scanning wand needs to be firmly attached to reader.

2. There are only three buttons to push on the reader.

   - **Red rocker** switch. Press to the right to turn reader on, press to left to turn off.

   - **MENU** button. This button cycles through the top menu (scan only-scan/send-**SCAN/STORE**-dump mem to port-set up system-then back to scan only).

   - **START/STOP** button. This button will start the function selected on the menu button or will cycle through the sub menus.

3. The main operation mode to be used is **SCAN/STORE** (read all about it on page 6 of attached manual). This mode scans and stores any detected tags. If you get 'lost' on the menu, you can usually get back to scan/store by repeatedly pushing the menu button. If that doesn't work, 'reset' the menu by turning the machine off. The reader retains in memory any ID tag numbers that were read and stored, even if the machine is turned off.

4. The effective scanning distance of the wand is less than 2 inches. Run the wand directly on the tail section to insure contact with tagged body part.

CAUTION: You will want to avoid the sub menu 'CLEAR LAST ID?'. If you inadvertently press the 'start/stop' button when this message is in the window, you will delete the last tag number that you detected. Press 'menu' button until you see READY displayed and continue scanning.

CAUTION: Never respond positively to the sub menu 'CLEAR MEM' as you will delete all of the tag numbers stored in memory.

CATCH SAMPLING

PIT Tags

Samplers must document their sampling activities daily on the PIT TAG RECOVERY PROGRAM - WANDER DATA FORM (see attached example). The basic sampling unit is each vessel's delivery. You must know what vessel's crab you are working on. There may be mixed deliveries; just note both vessel names in the vessel column. If you move to another plant, use a new form. Detailed instructions are as follows:

1. Turn machine on. Press MENU button until you arrive at SCAN/STORE. Press start/stop button to select SCAN/STORE (the word READY should come up in the window). First, scan/store your READER ID NUMBER. This identifies the reader to your data file and should also be done periodically throughout the day to assure you that your reader is working.

2. Scan every tail section possible, regardless of condition. Before you begin working on a new vessel's catch you must scan/store the INTERRUPT ID NUMBER. At the end of your working day, scan the INTERRUPT ID NUMBER before you turn the machine off. You will also be documenting these activities on your WANDER DATA FORM (which will enable us to match the information on the form to the information on the reader). At-sea scanners will follow the same procedure.

3. Collect all tails that have PIT tags in ziplocks and return them to the bunkhouse (or place in cold storage if on vessel).

4. Use the tallywhacker or a notebook to keep track of your sample size as the reader does not have an internal counter. Counting in multiples (5, 10, etc.) will save time. Sample size is determined by counting only the scanned tails bearing the right, fifth leg. You will be scanning the underside of the tail (where all the guts are); make sure you know which is the right leg. The diagram show the right leg from the shell side (outside).

5. Return to bunkhouse as soon as you are done scanning with the machine and completed forms. Data on the readers will be down loaded to a computer, the memory cleared and the machine returned to you for cleaning. Samplers on vessels will not clear the memory at any time.

6. Contact me at the bunkhouse if problems arise or you run out of crab to scan.

PIT-Floy Tags

Occasionally, there will also be whole, tagged crab to sample. These crab will be sampled directly from vessels at the time of delivery, but processing workers may bring these crab to you in the plant, as well. The PIT-Floy crabs have a yellow spaghetti tag which has an orange tab bearing the words 'LEAVE TAG ON CRAB-NOTIFY ADF&G'. There is no reward for the tag. It is imperative that the tag be on the crab in order to test the PIT tag loss rate. Specific instructions are as follows:

1. Use the vessel's measuring stick to determine if the crab is legal. If it is sublegal (less than 6 and 1/2 inches), sample as for legal crab then throw the crab overboard (pull the Floy tag first!).

2. All recovery information must be recorded on the TAG RECOVERY FORM by the sampler (see attached example). Pull the Floy tag off the crab and record the number along with all recovery information provided by the captain. Be sure to get the captain's name and address so that the original tagging information can be forwarded to them.

3. Shell age and size information is not necessary this year, so leave these columns blank.

4. Select SCAN ONLY on the menu button. Scan the tail section area for the PIT tag and record the 10 digit number in the column 'PIT NO'. It's a little harder to scan this area on a live crab; you may have to jockey the fifth leg and the wand around to get close enough to detect the PIT tag. Take your time, we need to be sure the tag is either there or not there.

5. In the column marked PIT, enter appropriate action (1=detected, 2=not detected, 3=not checked, 4=not applicable).

6. Return Floy tags with data forms at end of day.

Separated ADF&G Floy Tags and Tags From Other Agencies

We will take any tags that are turned in, regardless of tagging agency (including loose Floy tags from our own program). The Univ. of Washington tagged crab in Herendeen Bay this summer (see news release) and there may be NMFS tags out, as well.

Take the tag first, then get any available information. Record the information on the TAG RECOVERY FORM and note tagging agency in comments section. Record '4' in the PIT column for all loose tags and return tags with forms at end of day to bunkhouse.

Thanks in advance for all your hard work, and good luck.

COMMERCIAL FISHERIES

NEWS RELEASE

ALASKA DEPARTMENT
OF FISH & GAME

STATE OF ALASKA
Department of Fish and Game
Don W. Collinsworth, Commissioner

Ken Parker, Director
Division of Commercial Fisheries

Westward Region
211 Mission Road
Kodiak, AK 99615

Contact: Leslie J. Watson
Research Biologist

IMMEDIATE RELEASE

Date: October 1, 1990

ATTENTION ALL BRISTOL BAY KING CRAB FISHERMEN AND PROCESSORS

Under the support of the Alaska Department of Fish and Game's test fishery program, a pilot tagging study was implemented for the purpose of providing information on the Bristol Bay red king crab population. Data from this study should provide refined population estimates and exploitation rates along with information on natural mortality, growth, and migration. As an aid towards achieving these goals, the Department is testing a commercial application of a small, internal 'PIT' (Passive Integrated Transponder) tag within commercially important crab populations. It must be stressed that inseason tag recovery data will not affect (or be used to adjust) the announced mid-point guideline harvest level.

The tagging survey was conducted from August 7-27, 1990 on board the chartered crabber, F/V *Kristen Gail*. A total of 490 pots were pulled from 70 locations. Station locations were generally located in historically productive commercial fishing areas.

The tagging effort exceeded presurvey expectations of marking 5,000 male king crab. A total of 6,700 male king crab were PIT-tagged (4,700 legal and 2,000 sublegal). PIT tags were injected into a proximal segment of the fifth, right leg of the crab near its attachment to the tail section. Half of the legal size PIT-tagged crab were also externally marked with yellow spaghetti tags in the isthmus portion of the crab between the carapace and the abdominal flap (see diagram). The purpose of the dual tagging is so that PIT tag loss rates can be evaluated over time as it is not known how long PIT tags will remain in the crab.

Approximately 4,000 *C. bairdi* Tanner crab were also tagged during the survey (recovery of these tags will be addressed in subsequent news releases).

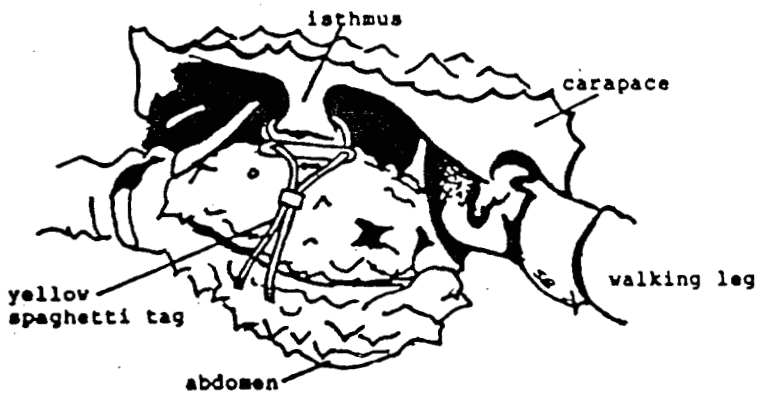
In order to test the program prior to the November fishery, PIT-tagged crab were 'seeded' into the retained-for-sale crab so that detection of the tags could be tested under actual processing conditions. With the cooperation of processing staff at Royal Aleutian Seafoods in Dutch Harbor, ADF&G samplers monitored the delivery by scanning the tail sections of approximately 4,450 butchered crab. This effort was very successful, resulting in an overall recovery rate of 82% of the PIT-tagged crabs (81 of the 99 PIT-tagged crabs were detected).

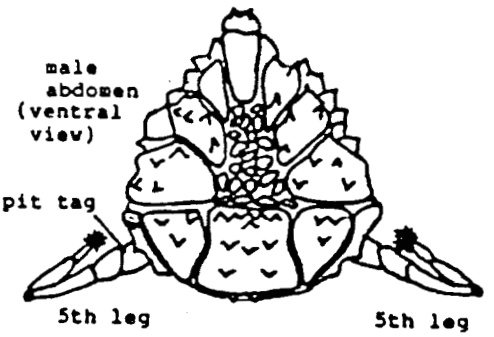
Industry response to the program was quite favorable, with most area facilities indicating general approval to conduct this project within their facilities during processing. The Department is soliciting the cooperation of fishermen, processors and processing workers in the recovery and documentation of tagged, legal male red king crabs during the upcoming November fishery. Department personnel will be stationed in Dutch Harbor and outlying areas to monitor red king crab deliveries during processing. This is a two part program involving one or a combination of both tag types:

- PIT tag program. Recovery methods will be addressed in a separate news release due to the magnitude of the proposed recovery effort. Processing facilities will be contacted individually by the Department for the placement of staff within the plant.

- Dual tag (spaghetti/PIT) program. This program will be directed at vessel captains for the recovery and documentation of dual-tagged crab. As an incentive for return of these crab, the original tagging location data will be forwarded to participating vessel captains after the season closes.

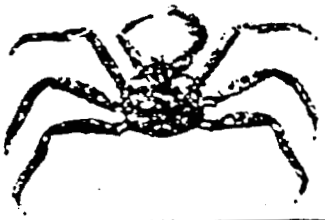
King crab showing tag through isthmus





King crab showing position of pit tag

COMMERCIAL FISHERIES



NEWS RELEASE

ALASKA DEPARTMENT
OF FISH & GAME

STATE OF ALASKA
Department of Fish and Game
Don W. Collinsworth, Commissioner

Ken Parker, Director
Division of Commercial Fisheries

Westward Region
211 Mission Road
Kodiak, AK 99615

Contact: Leslie J. Watson
Fishery Biologist

IMMEDIATE RELEASE

Date: October 15, 1990

ATTENTION ALL BRISTOL BAY CRAB FISHERMEN

The Alaska Department of Fish and Game (ADF&G) is asking for your help in the recovery of tagged red king crab and *C. bairdi* Tanner crab during upcoming commercial fishing seasons. ADF&G tagged legal red king crab, sublegal red king crab and *C. bairdi* Tanner crab in August 1990. Recovery data should provide fishery managers with additional data on crab populations in the Bristol Bay area.

The ADF&G crab tag is yellow with an orange tab which says "LEAVE TAG ON CRAB - NOTIFY ADF&G". All king crab bearing the yellow tag have also been marked with internal PIT tags (see diagram).

The Department is requesting that captains who catch legal size, tagged red king crab do the following:

1. Keep only legal-size red king crabs during the red king crab season. Release undersize king crab and *C. bairdi* Tanner crab with tags intact.

2. Record vessel name, captain's name, tag number, date and location (latitude-longitude) of capture on attached form.

3. If possible, keep tagged crab separate from the rest of the tanked crab (tethered or bagged in burlap).

4. Contact Department personnel or shellfish observer upon arrival at processing facility so that crab can be properly sampled and returned for delivery.

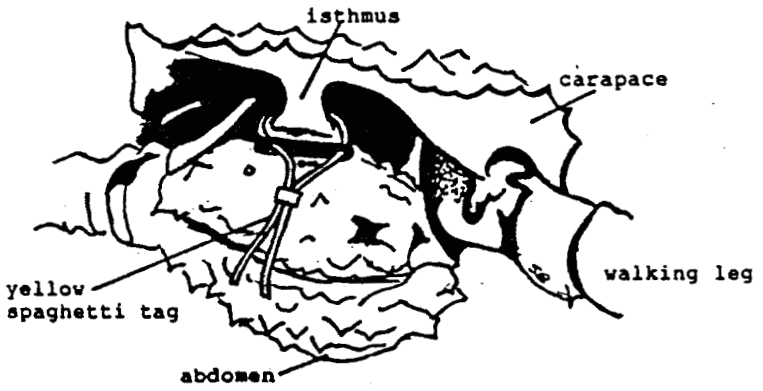
If Department personnel are not available at the dock to sample whole, legal crab:

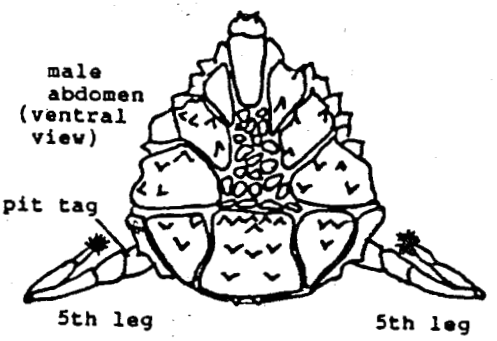
1. Remove tag and either remove entire tail section or pinch off both fifth legs (see diagram). Place all tags and body parts in a ziplock bag and refrigerate or freeze.

2. Record vessel name, captain's name, tag number, date and location (latitude-longitude) of capture on attached form.

3. Notify Department personnel upon delivery so that tags, body parts and capture information can be collected.

King crab showing tag through isthmus





King crab showing position of pit tag

KING CRAB TAG RECOVERY INFORMATION

Vessel Name_____ Captain_____

File No.	Tag Number	Capture Date mm/dd/yr	Latitude - Longitude or Loran C (X - Y)
1			
2			
3			
4			
5			
6			

COMMERCIAL FISHERIES

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211 Mission Road
Kodiak, AK 99615

Contact: Leslie J. Watson
Fishery Biologist

IMMEDIATE RELEASE

Date: October 15, 1990

ATTENTION ALL BRISTOL BAY CRAB FISHERMEN

The University of Washington (UW) has implemented a tagging study of Herendeen Bay red king crab. The Department is assisting in the collection of tags and recovery data during the November fishery. Fishermen finding crab with University of Washington tags are requested to do the following:

1. Remove tag and record sex, date caught, and location (either lat/long or Loran coordinates).
2. Return sublegal male and female red king crab to the sea. Legal male red king crab may be retained for delivery.
3. Notify Department personnel upon delivery so that tags and capture information can be collected.

HERENDEEN BAY KING CRAB TAG RECOVERY INFORMATION

Vessel Name_____ Captain_____

File No.	Tag Number	Capture Date mm/dd/yr	Latitude - Longitude or Loran C (X - Y)	Sex M/F
1				
2				
3				
4				
5				

For more in formation on the U of W program, contact:
Dr. David Armstrong
University of Washington*WH-10
Seattle WA 98195
(206) 543-6132

PIT TAG RECOVERY PROGRAM - WANDER DATA FORM

NAME: SHIFT HOURS: PLANT:

DATE	READER #	VESSEL	SAMPLE SIZE	COMMENTS

TAG RECOVERY FORM

Species_____
Sex_____

Recorder_____

	TAG NUMBER	DATE			LOCATION		DEPTH	SIZE[a]	STATISTICAL AREA	AGE[b]	PIT[c]	ADF&G NUMBER
		MM	DD	YY	LATITUDE LORAN X.	LONGITUDE LORAN Y.						
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

[a] KC - length
TC - width

[b] 1 = new
2 = old
3 = very old

[c] 1 = Detected
2 = Not detected
3 = Not checked
4 = Not applicable

	PIT. NO.
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

COMMENTS (Skipper's Name and Address)

ADF&G TIME AND ATTENDANCE REPORT—TIMESHEET ENTRY SYSTEM (TSE)

Name: ______________________ SSN: ______________________

Payroll RD: ______________ Bargaining Unit ☐ GGU ☐ SU Pay Period Ending: ______________________

Overtime Exempt: YES NO Pay Type: ☐ Salaried ☐ Hourly Division: ______________________

Record start and stop times in military format. Check the "OS" box if the work is related to the oil spill. If you work past midnight, stop at 2400 and start at 0001 the next day.

DATE	START	OS	STOP	START	OS	STOP	START	OS	STOP	START	OS	STOP	START	OS	STOP	SEA DUTY	STANDBY	HAZARD	LEAVE	Collation Code	Ledger Code	Comments

We certify that the information provided above is true and correct.

LEAVE CODES:
A = Annual H = Holiday
S = Sick O = Other ______________
P = Personal **Attach PINK copy of leave slip**

Employee Signature ______________ Date ______ Supervisors Signature ______________ Date ______

Data Entry ______________ Date ______ Approving Officer ______________ Date ______

STATE OF ALASKA
DIVISION OF COMMERCIAL FISHERIES
211 MISSION ROAD
KODIAK, ALASKA 99615

CLAIM FOR PAYMENT OF SUBSISTENCE FOR FISH AND GAME PERSONNEL ABOARD COMMERCIAL FISHING VESSEL OR PRIVATE FACILITIES WHILE ENGAGED IN COLLECTING RESEARCH DATA

Following is the claim for payment of room and/or board provided to:

_____
(Name of Fish & Game Employee)

while he was aboard _____
(Name of Vessel or Facility)

from: _____
(Dates)

while engaged in collecting research data for the Department of Fish & Game

MAXIMUM ALLOWABLE IS: $21.00 per day.

Number of Meals @ $3.00 _____ Total: $ _____

Number of Night's Lodging @ $12.00: _____ Total: $ _____

TOTAL CLAIM IS: $ _____

/s/ _____
Fish & Game Employee

_____
(Authorized Signature of Vessel or Facility

_____
Social Security Number or Company Tax I.D. Number

_____
(Mailing Address)

_____
(City, State and Zipcode)

( ) _____
(Telephone number)

For Department Use Only

_____
(Code for Above Project)

_____
(Supervisor or Project Leader Signature)

SAMPLE

PIT TAG RECOVERY PROGRAM - WANDER DATA FORM

NAME: Jack O. Lantern SHIFT HOURS: 0800 - 1800 PLANT: SEASIDE

DATE	READER #	VESSEL	SAMPLE SIZE	COMMENTS
11-9-89	7F7F 3910X	CANDLE	2462	Began sampling 0800.
11-9-89	"	KYRIE	–	PIT-FLOW Recovery See other form
11-9-89	"	CANDLE	1578	Resume sampling - finished load
11-9-89	"	CLOUD	–	PIT FLOW Recovery See other form
11-9-89	"	BIG SKY/ DELTA	2010	Mixed Delivery Finished sampling 1800.

Species Red King Crab
Sex Male

TAG RECOVERY FORM

Recorder Jack O. Lantern

	TAG NUMBER	DATE MM	DD	YY	LOCATION ✓ LATITUDE LORAN X.	LONGITUDE LORAN Y.	DEPTH (fathoms)	SIZE[a]	STATISTICAL AREA	AGE[b]	PITC[c]	ADF&G NUMBER
1	04992	11	09	89	55°05'30"	164°47'10"	75	—	645501	-	1	01000 1
2												
3												
4												
5												
6												
7												
8												
9												
10												

47

[a] KC - length; TC - width

[b] 1 = new; 2 = old; 3 = very old

[c] 1 = Detected; 2 = Not detected; 3 = Not checked; 4 = Not applicable

	PIT NO.	COMMENTS (Skipper's Name and Address)
1	7F7E2D1965	FV KYRIE - Seaside Sfds - Capt Skip Brown 4483 "A" St. Seattle WA
2		
3		
4		
5		
6		
7		
8		
9		
10		

Portable Reading System

HS5101, HS5102 Series

Destron/IDI User Manual
810-0005-300
ECO # 970, Rev. A
Lit Code #2002
4/20/90

Portable ID Reader

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1
Portable ID Reader

ID READER CAPABILITIES

The portable, radio-frequency (RF) identity-tag reader provides a full range of operational functions in a package small enough to be carried into the lab, the stable, the warehouse, and out into the field for on-the-spot identification of RF tags ranging in size from 3 1/2" disks used in industrial applications down to syringe-implantable veterinary tags.

The reader incorporates a hand-held scanner wand and exciter/reader electronics enclosed in a separate box. Accessories include a nylon carry strap and carry sack.

The reader is battery-operated and can be recharged, or operated directly from any standard 110 VAC outlet, by using the battery charger included with the unit. The reader can be used in a simple "read only" mode, or

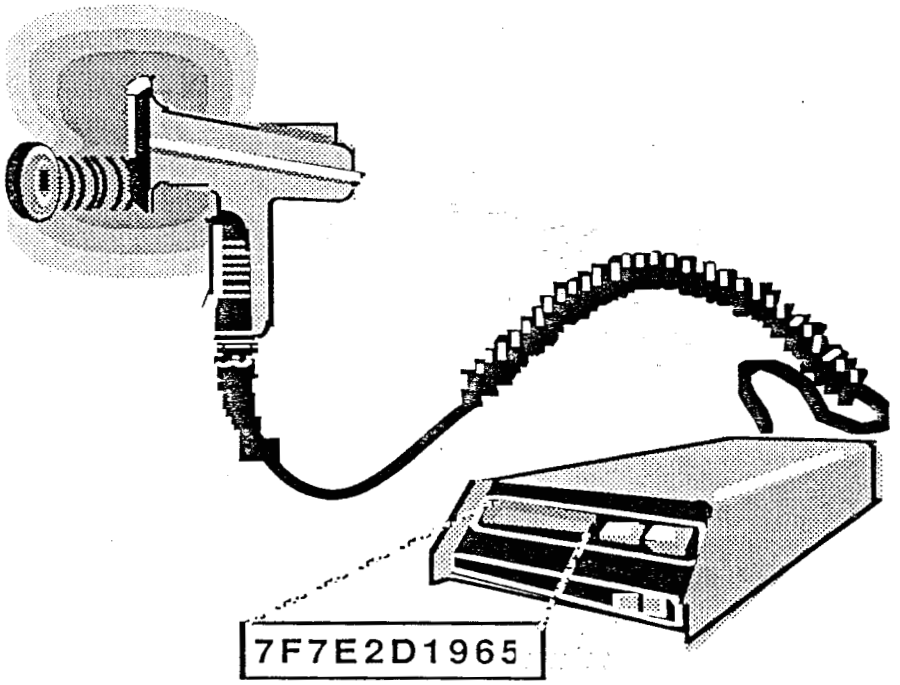

Figure 1—Portable ID Reader

configured to store tag numbers in memory, and/or send numbers to an external computer, printer, or modem.

MENU-BASED DESIGN

For simplified operation, all functions available in the reader can be selected from either the top menu or several submenus. Menu selections are shown in Figure 2.

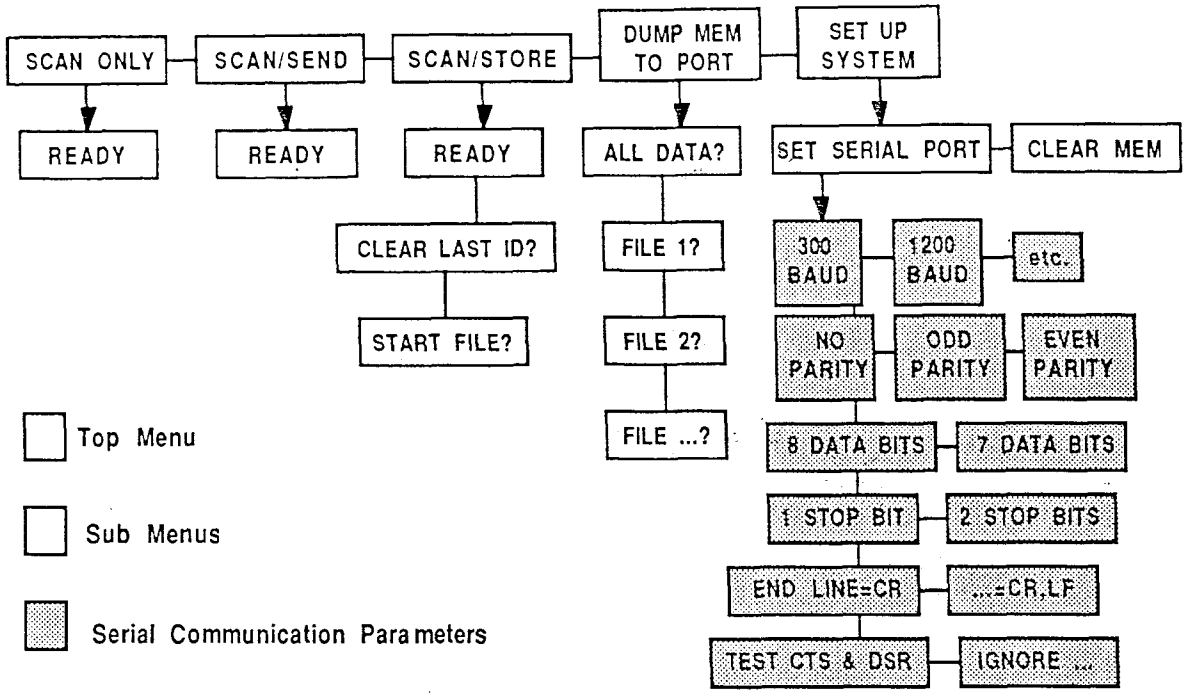

Figure 2—Menu Selections

READER OPERATION

Preparation

To prepare the ID Reader for operation, connect the handwand to the reader by screwing the handwand cable to the rear connector on the reader unit. The connector is keyed, and must be lined up with the keyway by rotating, then by turning the knurled housing clockwise until the connector is securely fastened (about one full turn).

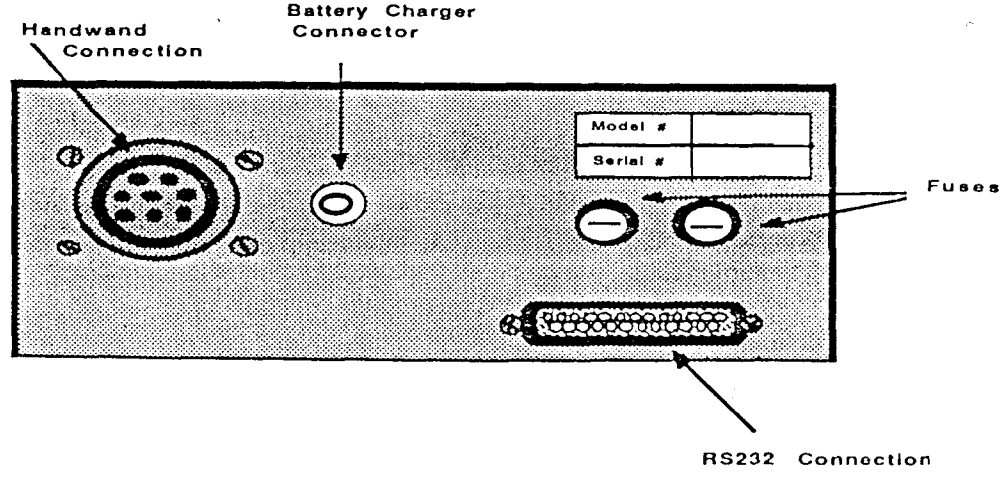

Figure 3—Connection Diagram

Connect the battery charger to the rear of the reader and plug in to any grounded 110 VAC outlet.

On/Off

Press the red rocker switch to the right to turn the reader on and to the left to turn it off. The LCD display will report the top-menu selection last used when the reader was turned off, e.g., SCAN ONLY, SCAN/SEND, or SET UP SYSTEM, or will display LOW BATTERY if the reader requires recharging before use.

If the last function used was CLEAR MEM, the LCD will display SCAN ONLY.

Batteries and Fuses

Reader fuses are 2A 3AG "regular blow." They are replaceable by the user as needed. Fuses are located in the back of the reader unit. Use a large, flat screwdriver and press in slightly on screw slot to depress spring. Turn 1/4 turn counterclockwise to release. Insert new fuse, then depress with screwdriver and turn 1/4 turn clockwise to set in place.

The reader comes supplied with a rechargeable battery pack that can typically support 1000 ID readings before recharging. Each battery has an expected life of 250 charge/discharge cycles. Reorder batteries by part number from Destron/IDI.

Turn the reader off after use to avoid unnecessary battery discharge. To optimize battery life, keep the reader charged and ready for extended use by plugging it into the battery charger when it is to be left for any period of time (overnight, for example). Under normal use, a fully charged reader will work a full eight-hour day without recharging. ***A battery left in a state of deep discharge for an extended period of time (days) may not accept recharging.***

To replace the battery, remove cover, loosen the 4 screws to remove old battery and replace with complete battery assembly, including the two battery packs. Place assembly at right-angle to battery frame. Tighten the 4 screws and replace cover.

Recharging

Recharge the reader batteries by plugging the battery charger into the back of the reader, and connecting the charger to grounded 110 VAC. The two LEDs (Light Emitting Diodes), located on top of the charger, remain lighted while the reader batteries are drawing full power; one LED will blink when the reader is nearing full charge. Note: with the model 8101 D12 or 8618-1

charger, the reader may be used while connected to the charger and to power. This practice is NOT recommended with other charger models.

Automatic Shutdown

The system automatically shuts down when the battery voltage falls below the manufacturer's recommended safe operating threshold.87 This prolongs the useful life of the reader's batteries.

Non-Volatile Memory

The reader is equipped with non-volatile memory, so it retains in memory any ID tag numbers that were read and stored, and not explicitly cleared. This feature not only saves tag numbers from day to day, but also saves stored information even if an operator inadvertently shuts the reader off.

OPERATION MODES

In general, press and release MENU repeatedly to cycle through the top menu until the display reports the desired operational function. Then press and release START/STOP to begin the function or to cycle through the submenus. To terminate the function and/or to re-enter the top menu from a submenu, press and release START/STOP. The display will report the top-menu option from which the submenu selection was made. Use of MENU and START/STOP that is particular to a mode is covered below.

To clear a displayed error message, press and release START/STOP. The message will disappear and the program will then resume. Appropriate corrective actions for specific errors are discussed below.

Scan Only

SCAN ONLY: the simplest tag-reading mode. Select the mode by pressing START/STOP while the display reports SCAN ONLY; then press and hold the handwand trigger, and the display will report WORKING. If the wand antenna is in the vicinity of an RF tag, the reader beeps and the display reports the tag's ID number. In order to read the same tag twice, release the trigger then depress again. To read another tag, release the trigger, move the handwand close to the next tag, then press the trigger again. It is also possible to simply keep the trigger depressed and move the handwand from tag to tag to do a number of reads, however, this method uses more power. This operation can be continued as long as needed. To return to the top menu after a series of successful tag reads, press and release START/STOP.

If no tag is near, the reader continues to display WORKING until the trigger is released, then it displays NO ID FOUND. Press the trigger to return to SCAN mode. Return to the top menu by pressing and releasing START/STOP.

Note that interference may occur if RF tags are close to each other.

Error messages:

LOW BATTERY: Batteries are low. It is recommended that use be discontinued until the batteries are recharged. To continue use, press either MENU or START/STOP.

Scan/Send

SCAN/SEND: displays ID numbers as above, and concurrently sends the numbers to an external device (printer, computer, etc.). This mode transmits each ID number to an external device via the RS232 port on the back of the reader. The ID number is sent with its checksum as a string of printable ASCII characters followed by an end of line (EOL) marker. The characters are converted from hexadecimal to ASCII representation before transmission. EOL can be indicated either with an ASCII carriage return <CR> or ASCII carriage return and linefeed <CR> <LF> depending on how the reader is configured through SET UP SYSTEM mode.

Operation is the same as for SCAN ONLY, if the reader is not hooked up to an external device, and is not configured to test for CTS (Clear To Send) or DSR (Data Set Ready). This operation may be indistinguishable from SCAN ONLY mode. If the reader expects a "handshake" from an external device and does not receive one, an error message (SERIAL PORT ERR) is displayed. Press START/STOP to return to the top menu.

Error messages:

LOW BATTERY: Batteries are low. It is recommended that use be discontinued until the batteries are recharged. To continue use, press either MENU or START/STOP.

SERIAL PORT ERR: Handshake has not been detected within required time (30 milliseconds). Check the cable; press MENU or START/STOP to continue.

Scan/Store

SCAN/STORE: displays IDs as above, and concurrentiy stores each ID number in a numbered memory location. This mode allows the operator to collect a number of ID codes before transmitting them to one or more external devices. After each successful tag read, the ID number is stored in a sequentially numbered location. (The first tag number entered into a freshly-cleared memory will be stored at #1, the next at #2, etc.) The display reports the tag number and its file location.

If the ID numbers are sent to more than one external device with different communication configurations, it will be necessary to set parameters for each device in SET UP SYSTEM mode before transmitting.

SCAN/STORE also contains submenu options that allow the operator to erase the last ID stored, or to divide the available memory locations (over 1300) into a series of files. When MENU is pressed after SCAN/STORE has been selected, the message NNN LINES FREE is displayed to indicate the amount (by number of lines) of available nonvolatile memory. When MENU is released, the first submenu choice CLEAR LAST ID? appears. Press START/STOP to delete the last ID read into the current file, then to display the amount of remaining memory (NNN LINES); the submenu choice is redisplayed when MENU is released. To erase several ID codes, press and release START/STOP repeatedly.

If MENU is pressed while CLEAR LAST ID? is displayed, the message FILE NN indicates the current file number. When MENU is released, the second submenu choice START FILE? is displayed. Press START/STOP to create a new file and display the new file number FILE NN. Release START/STOP to return the reader to SCAN status with READY displayed. Note that writes (and erases) are possible only to the most recently created file.

To terminate the SCAN function and return to the top menu at any time, press and release START/STOP. To terminate the CLEAR LAST ID function, press and release MENU until READY is displayed, then press and release START/STOP.

Stored ID numbers can be kept in memory to be sent to external device(s) through the RS232 port (using DUMP MEM TO PORT mode) at any time, and cleared from memory using the CLEAR MEM function available in SET UP SYSTEM.

Error messages:

DIRECTORY FULL: No more files can be created in the current directory in response to selection of START FILE option.

FILE EMPTY: No ID is found in current file with CLEAR LAST ID? option selected. Releasing START/STOP causes FILE EMPTY, FILE NN, and the READY to be displayed. IDs can then be read into the current file.

LOW BATTERY: Batteries are low. It is recommended that use be discontinued until the batteries are recharged. To continue use, press either MENU or START/STOP.

MEMORY FULL: Displayed if non-volatile memory is full. Press MENU or START/STOP to return to top menu.

MEMORANDUM STATE OF ALASKA

TO: See Distribution DATE: October 23, 1990

FROM: Leslie Watson
Fishery Biologist

SUBJECT: Bristol Bay Red King Crab Sampling Manual

Attached is a sampling manual for your reference. Please remember to bring rain gear, boots, sleeping bags and pads and your sense of humor. Reservations and tickets/TRs have been obtained for your expected travel date to Dutch Harbor (see below). For those of you departing from Kodiak, please see Lucinda for your ticket.

This project should be fun and interesting; see you all in Dutch Harbor. Thanks for all your suggestions and help in setting this up. Please call me if you have any questions.

LOCATION/REPORT DATE		
Dutch Harbor		
George Malone <KOD>		Oct. 25
Dana Schmidt <KOD>		Nov. 5
Susie Byersdorfer <KOD>		Nov. 9
Doug Pengilly <KOD>		Nov. 9
Jim Blackburn <KOD>		Nov. 9
Tom Dinnocenzo <KOD>		Nov. 9
Kim Phillips <KOD>		Nov. 9
Kim Rudge <ANC>		Nov. 9
~~Sue Tuccio~~ <ANC>		Nov. 9
Lon Marifern <SE>		Nov. 9
Gretchen Bishop <SE>		Nov. 9
Tom Easthope <SE>		Nov. 9
Akutan		
Forrest Blau <KOD>	Deep Sea	Nov. 5
Mo Lambdin <ANC>	Trident	Nov. 5
King Cove		
Dave Skordelis <DUT>		
Floaters		
Cort Neff <KOD> - OMNISEA		Oct. 28
*Dave Jackson <KOD> - ALL ALASKAN		Nov. 7
*Bill Donaldson <KOD> - SEALASKA		Nov. 7