

Wildlife Inventory Plan
Alaska Maritime National Wildlife Refuge
Protocol #23

Version 1.3

Parameter: Background beached birds and oil

PURPOSE

To document background levels of dead birds and oil on beaches. Having such baseline data on dead birds and oil on beaches is crucial to assessing damage following an oil spill. In addition, identifying wrecks is important in that they may indicate changes in the marine environment; information gathered about wrecks can be used to help identify those changes.

PROCEDURES – COASST SURVEYS (DEAD BIRDS)

Data collection.—The Coastal Observation and Seabird Survey Team (COASST) is a citizen science program established to track the deposition of beached bird carcasses along the coast of the North Pacific. Data are currently being collected on more than 250 beaches in Alaska, Washington, Oregon and California. Because COASST data include foot type, standard measurements, and photographs, data are independently verifiable and can be used in a court of law.

The Alaska Maritime National Wildlife Refuge (AMNWR) has partnered with COASST to incorporate beached bird surveys in the seasonal field site data collection. COASST surveys should be conducted twice a month on designated beaches at AMNWR monitoring sites. This survey frequency has been chosen to capture both beaching events and scavenging/carcass loss rates specific to Alaska.

COASST surveys entail searching a beach for dead birds and then identifying, measuring, tagging, and photographing any carcasses found. By recording new birds and previously-tagged birds found on each survey, we collect data on both deposition and persistence rates of carcasses. Each camp has a copy of COASST protocols – refer to this for details on how to conduct surveys and record data. At each site, from one to five beaches are surveyed (see island-specific sections on the following pages for information on which beaches are surveyed where). For islands with multiple beach transects, all beaches do not need to be surveyed on the same day but try to do them as close together as possible.

Although both COASST surveys and oil surveys (described below) often occur on the same beaches, do not conduct both surveys at the same time. Each has a very different search image and search technique (i.e., covering the whole beach for COASST surveys versus a 5m swath for oil surveys) and **you will miss dead birds or oil if you are searching for both at the same time.**

Abbreviated ANMWR-COASST protocol: see full protocol in field camps for more details (page references in parentheses below refer to full protocol).

How to Conduct a COASST Survey

- At the start of survey, record: beach, date, survey start time, data collector names (pg. S-7-S-8)
- Walk slowly and search the beach, moving in a zigzag or sawtooth pattern that spans, peak-to-trough, 1/4 (working in a pair) to 1/2 (working alone) of the beach (pg. S-3-S4)
- If the tide is going out: survey high beach first; if the tide is coming in: survey low beach first
- Search for birds on the outbound and return legs, along the entire width of the beach from the surf line to the high beach (e.g., vegetation line or dune edge)
- At the turnaround point, record: weather, oil, wood, wrack (pg. S-9-S-12)
- On the return leg of your survey, record: human tracks (Y/N) , # of humans, vehicle tracks (Y/N), # of motorized vehicles (includes ATVs; pg. S-12)
- Record beached bird data for every bird that you find, including refinds

Collecting Beached Bird Data

- COASST birds are defined as any bird where *at least one measurement is possible*: wing chord, bill (must have sheath intact), tarsus. When you find a bird, do the following:
 - (1) Record: where found, refound, collected, foot condition, eyes, body parts, entanglement, and oil (pg. BB-7-BB-11)
 - (2) Measure and record: bill length, wing chord, tarsus length (**note: you do not need to measure refinds, but record all other data as usual; pg. BB-18-BB-22)
 - (3) Use Beached Birds: A COASST Field Guide to identify the bird to foot-type-family and species unless you are absolutely certain of ID (**note: make measurements regardless of certainty)
 - (4) Record: foot-type-family and species (pg. BB-12-BB-18; BB-22-BB-26)
 - (5) Record: age, plumage, and sex (if possible; pg. BB-26-BB-27)
 - (6) Mark the bird with a unique number using cable tie(s) and record: cable tie number, color sequence, and where tagged (**note: refer to cable tie numbering system in back cover of COASST data book; pg. BB-27-BB-31)
 - (7) Write the beach name, date and cable tie number of the photo slate
 - (8) Take two photographs (dorsal and ventral sides) with the photo slate and photographic ruler in the frame; make sure diagnostic plumage and/or body parts can be seen (**note: photographs may be taken with the disposable cameras provided by COASST or your AMNWR digital camera; pg. BB-32-BB-35)
 - (9) Clip the ends of the cable tie(s)
 - (10) Leave the bird where you found it on the beach
- For details on data fields, refer to the keys provided in the inside cover of your COASST data book. Additional information is provided in the full COASST protocol.

Don't Forget

- All COASST surveys must be completed in full (outbound and return leg), covering the exact same stretch of beach each time, for standardized data collection
- Surveys should be conducted approximately every 13-15 days
- All physical data must be filled out even if you find no birds
- Measurements and photographs are essential for data verification; without these data can not be used
- All refinds must be recorded and photographed (to track persistence and scavenging), but you do not have to repeat the measurements; be sure to record which body parts remain

Data Management

- All COASST data should be recorded in the COASST Rite-in-the-Rain notebooks provided
- Survey data and physical data (listed under *How to Conduct a COASST Survey* above) should be recorded in the front, and beached bird data (listed under *Collecting Beached Bird Data* above) should be recorded in the back (**note: be sure the beach name and survey date are recorded in both locations)
- If using a digital camera, please name files using the following convention: Beach Name (11 or fewer characters), Survey Date (yyyymmdd), Species Code, Cable Tie Number, lowercase letter if you took more than one photo of the same bird. For example, two photos from Landing Cove taken on July 15th, 2006 of a Sooty Shearwater, cable tie #17 should be labeled: Indingcove20060715sosh17a.jpg and Indingcove20060715sosh17b.jpg
- At the end of the season, all pages of the COASST Rite-in-the-Rain notebooks should be photocopied and all photos should be burned onto a cd labeled with the field site and season; photocopies and digital photos) should be sent to:

COASST
 School of Aquatic and Fishery Sciences, University of Washington
 Box 355020
 1122 NE Boat St.
 Seattle, WA 98195 (206) 221-6893

Data analysis.—At the end of the season, make a copy of your COASST data (whether you recorded data in a Rite-in-the-Rain notebook or datasheets provided by COASST) and any accompanying photos. *Keep a copy for the Homer files* and send a copy to the appropriate COASST representative (see above address).

COASST will provide a summary of data but we summarize data our own way using parameters that are of specific interest to the refuge monitoring program. If multiple beach transects were surveyed, keep summary for each separate. Tally the following for each species and all species combined:

- The number of new birds found on each survey (a)
- The number of previously-tagged birds refound on each survey (b)
- The total number of all birds encountered (new and previously-tagged) on each survey (c = a+b)

From these, calculate the following summary parameters for each species and all species combined:

- Number of Individuals – Number of new birds only, a quantification of numbers of dead birds on the beach over the season; this comes from (a) above. Calculate:
 - Total = sum (a) across all surveys
 - Mean = average (a) across all surveys
 - SD = SD (a) across all surveys
- Encounter rate – An index of total birds encountered, adjusted for length of beach segment and number of surveys for comparison among sites; this provides a baseline for how many dead birds would be expected on a beach at a given site. Data comes from (c) above. Calculate:
 - Total encounters = sum (c) across all surveys
 - Encounter rate = Total encounters / length of beach (km) / number of surveys

For example, if you conducted three surveys on a 0.5 km beach and your data looks like this:

Species	9 Jun		8 Jul		4 Aug	
	# New birds	# Refound	# New birds	# Refound	# New birds	# Refound
Bald eagle	2	0	0	2	0	2
Parakeet auklet	1	0	1	0	2	0
Song sparrow	2	0	1	2	1	3

Then your data summary would be:

Species	Number of individuals			Encounter rate	
	Total	Mean	SD	Total	Enc. rate
Bald eagle	2	0.7	1.2	6	4.0
Parakeet auklet	4	1.3	0.6	4	2.7
Song sparrow	4	1.3	0.6	9	6.0

Hint, when calculating the summary statistics for number of individuals, completely ignore the refound birds, pay attention only to the new ones each time. When calculating the summary statistics for encounters, pay attention to BOTH new and refound individuals.

PROCEDURES – OIL SURVEYS

Data collection.—Oil contamination surveys are conducted just once or twice a summer (if once, conduct early in the season; if twice, conduct early and late). To survey, walk an assigned beach along the mean high tide line and search a 5m wide swatch (2.5m above and 2.5m below) for oil. You will need to conduct these surveys during minus tides to allow access to the subtidal area. Consult your tide tables to determine good survey periods. During low tides, it is sometimes difficult to determine the exact location of the mean high tide line. Use clues such as water level stains on beach rocks, absence of littoral vegetation and mollusks to give you an idea of where to walk.

Record all oil you find, describing the size and type of oil spot or blob in the correct category on the data form (Figure 1; if you choose to record data into a Rite-in-the-Rain[®] notebook, transcribe data onto oil survey form afterwards). Record all unusual tarballs, blobs or pancakes under the “other” category and describe each adequately. Also classify each beach type (Table 1) and note if substrate type changes along the transect route. Incidental to other work, record all observations of any oiled wildlife. Do not be too concerned with oil outside your 5m survey strip but obvious instances of oil found outside the transect boundaries can be recorded under the comments section of the data form.

Table 1. Beach type classifications for oil surveys. Beaches should be classified based on the major component (> 75%) of substrate.

Beach type	Substrate size	
Sand	< 2 mm	Pencil lead size
Gravel	2-64 mm	Tennis ball size
Cobble	65-264 mm	Bowling ball size
Boulder	> 264 mm	Larger than bowling ball
Bedrock	-	Solid rock formation

Although both COASST surveys (described above) and oil surveys often occur on the same beaches, do not conduct both surveys at the same time. Each has a very different search image and search technique (i.e., covering the whole beach for COASST surveys versus a 5m swatch for oil surveys) and **you will miss dead birds or oil if you are searching for both at the same time.**

If there is a major oil event, it may be valuable to collect a sample for analysis. At least 10g of material is needed, oil must be stored in acid-washed collection jars and collected using sterile (untouched by human hands or plastic of any kind) wooden tongue depressors; *if these are unavailable, you will probably not be able to collect usable oil samples.* Depressors should be stored in aluminum foil before use. After collecting a sample, place a clean depressor from the same package in a second jar for comparative analysis. Also collect one blank sample (leave an empty collection jar open on the beach for 10 minutes) for every day and/or 10 oil samples you collect. Store samples away from heat, if possible, freeze samples as soon as possible. Keep careful records for all samples, including sample number, date, collector, and location (include island and beach).

Data analysis.—At the end of the season, put oil survey forms in the Homer data files. If any samples were collected, check with the Unit Biologist about what to do with them.

Oil Survey Form

Island: _____ Transect: _____ Date: _____

Weather: _____ Temp: _____ Tide height: _____

Observer: _____ Start/Finish time: _____

Other limiting factors: _____

Section	Oil type	Diameter of spots (cm)				Other* (tarball, pancake, etc.)
		<1.0	1.0-2.5	2.5-5.0	> 5.0	
	hard					
	tacky					
	hard					
	tacky					
	hard					
	tacky					
	hard					
	tacky					
	hard					
	tacky					
	hard					
	tacky					
	hard					
	tacky					
	hard					
	tacky					

Samples collected:

Number	Location (section/substrate)	Spot location	Photo taken?

Comments (concentrations, distributions, oiled wildlife, etc.):

* Describe in Comments section all oil not classified as a spot (diameter, thickness, consistency, color, substrate, material embedded, general appearance, etc.).

Figure 1. Oil survey form used for recording data during oil surveys.

Attachment A. Aiktak Island specifics (includes Figure A1, Table A1)

PROCEDURES SPECIFIC TO AIKTAK

Oil surveys are conducted on five beach transects on Aiktak, four on the northern shore and one on the southern coast (Figure A1 and Table A1). COASST surveys have been conducted on two beaches in the past (Figure A1 and Table A1) but the beach at Petrel Valley Cove is difficult to survey with any confidence because it is comprised of large, mostly inaccessible beach boulders so data quality is questionable. Therefore, only the COASST transect Old to New Camp Beach should be surveyed.

Begin COASST surveys in late May or early June and repeat every two weeks for the entire summer. For oil surveys, conduct one or two surveys (ideally one at the beginning and one at the end of the season); at Aiktak, work load at the beginning and end of the season is not too intense so you should be able to get two surveys done.

Table A1. Descriptions of COASST and oil survey transects at Aiktak Island.

Transect	Length	Substrate	Description
COASST			
Old-New Camp Beach	1.3 km	cobble/sand	Pleasure Cove to Upland Access
Petrel Valley Cove	0.1 km	boulder	Petrel Valley Cove
Oil			
A	-	cobble	Old Camp Beach and Pleasure Cove
B	-	cobble/sand	New Camp Beach (Guillemot Rock to the Dike)
C	-	cobble	Ivory Cove
D	-	cobble	Tower Cove
E	-	boulder	Petrel Valley Cove

Specific Requirements at Aiktak - COASST

Dates: Begin surveys in late May or early June, continue through entire season.

Optimal sample size: One survey once every two weeks.

Time of day: Any time, but high tide is preferred (less beach to survey).

Weather: Any weather, but times of heavy surf may make surveys difficult or impossible.

Equipment needed: COASST equipment kit (fanny pack in cabin), COASST Rite-in-the-Rain[®] notebook or data sheets, two pencils, camera, and hard hat.

Specific Requirements at Aiktak – Oil Surveys

Dates: Ideally once early and once late in season.

Optimal sample size: One or two complete round(s) of surveys (A-E).

Time of day: Any time, but a minus tide is preferred.

Weather: Any weather but times of heavy surf may make surveys difficult or impossible.

Equipment needed: Rite-in-the-Rain[®] notebook or data sheets, two pencils, camera, hard hat, oil collection equipment (if available).

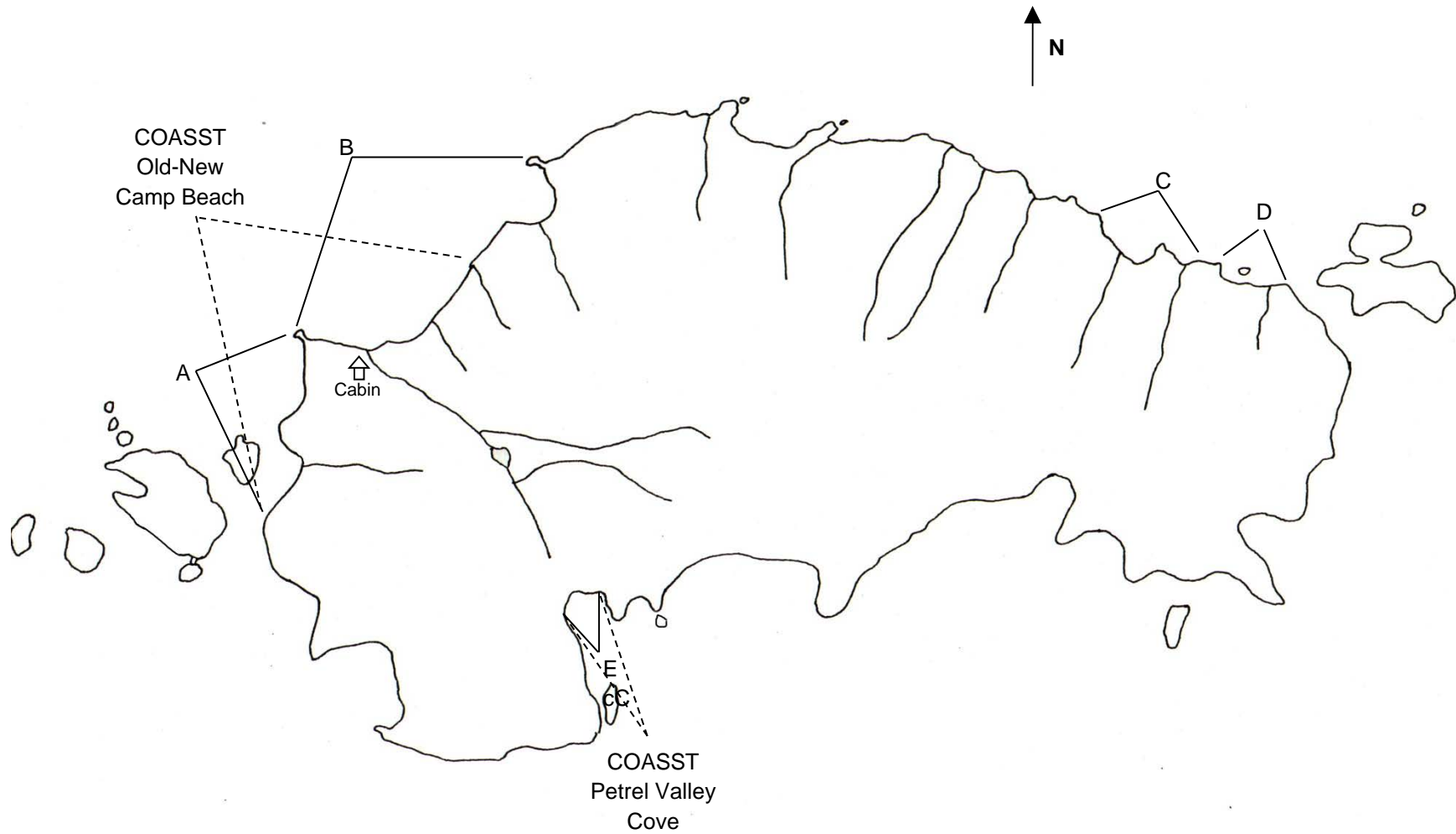


Figure A1. Locations of COASST and oil survey transects at Aiktak Island. COASST survey transects are shown with dashed lines, oil survey transects (A-E) are shown with solid lines; Petrel Valley Cove may not be surveyed for COASST in all years.

Attachment B. Buldir Island specifics (includes Figure B1 and Table B1)

PROCEDURES SPECIFIC TO BULDIR

COASST and oil surveys are conducted on five beach transects on Buldir, four on the northern shore and one on the southeast beach (Figure B1 and Table B1). GPS coordinates are also available on the camp laptop. When surveying beaches at Buldir, it is recommended to wear a hardhat for protection against both rock falls and aggressive gulls.

Begin COASST surveys in late May or early June and repeat every two weeks for the entire summer. For oil surveys, conduct one or two surveys (ideally one at the beginning and one at the end of the season), depending on work loads.

Table B1. Descriptions of COASST and oil survey transects at Buldir Island.

Transect	Length	Substrate	Description
A	0.8 km	boulder	begins: W tip of NW Point ends: where Camp Valley meets NW Ridge
B	0.5 km	sand/cobble	begins: immediately at the eastern end of A ends: approx. 75m past Tattler Creek as the beach turns NE toward Crested Point
C	1.0 km	boulder/cobble	begins: immediately at the eastern end of B ends: large boulders at Main Talus
D	1.0 km	boulder/cobble	begins: directly below Peregrine Point ends: northern end of population plot A
E	1.4 km	cobble	begins: Petrel Valley Creek ends: W end of Gull Slide

Specific Requirements at Buldir - COASST

Dates: Begin surveys in late May or early June, continue through entire season.

Optimal sample size: One complete round of surveys (A-E) once every two weeks.

Time of day: Any time, but high tide is preferred (less beach to survey).

Weather: Any weather, but times of heavy surf may make surveys difficult or impossible.

Equipment needed: COASST equipment kit (fanny pack in main cabin), COASST Rite-in-the-Rain[®] notebook or data sheets, two pencils, camera, and hard hat.

Specific Requirements at Buldir – Oil Surveys

Dates: Ideally once early and once late in season.

Optimal sample size: One or two complete round(s) of surveys (A-E).

Time of day: Any time, but a minus tide is preferred.

Weather: Any weather but times of heavy surf may make surveys difficult or impossible.

Equipment needed: Rite-in-the-Rain[®] notebook or data sheets, two pencils, camera, hard hat, oil collection equipment (if available).

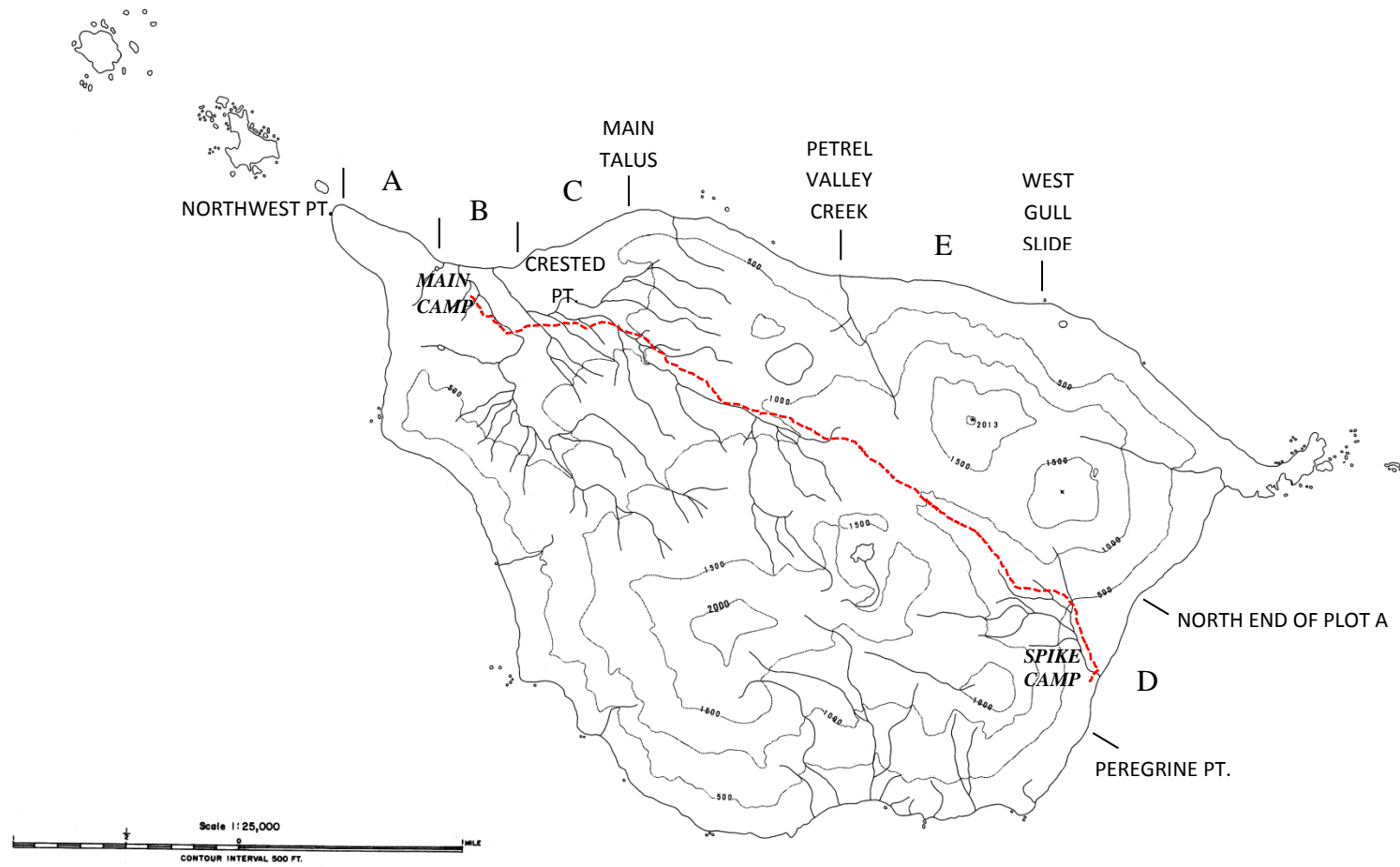


Figure B1. Location of COASST and oil survey transects A- E on Buldir Island. The red dashed line indicates the approximate route from Main Camp to Spike Camp.

Attachment C. Chowiet Island specifics (includes Figure C1 and Table C1)

PROCEDURES SPECIFIC TO CHOWIET

COASST and oil surveys are conducted on two beach transects on Chowiet, at Landing Cove and South Bay (Figure C1 and Table C1). Begin COASST surveys in late May and repeat every two weeks for the entire summer. For oil surveys, conduct one or two surveys (ideally one at the beginning and one at the end of the season); at Chowiet, work load at the beginning and end of the season is not too intense so you should be able to get two surveys done. If aggressive gulls are present at South Bay, it is recommended to wear a hardhat for protection.

Table C1. Descriptions of COASST and oil survey transects at Chowiet Island.

Transect	Length	Substrate	Description
Landing Cove	0.1 km	cobble	Entire length of Landing Cove Beach
South Bay	0.2 km	cobble	begins: immediately at west end of beach; 56.024 N, 156.716 W ends: East end of beach where GWGU prod. plot A starts; 56.023 N, 156.715 W Identical start and end as beach passerine transect

Specific Requirements at Chowiet - COASST

Dates: Begin surveys in late May and continue through entire season.

Optimal sample size: One complete round of surveys (both beaches) once every two weeks.

Time of day: Any time, but high tide is preferred (less beach to survey).

Weather: Any weather, but times of heavy surf may make surveys difficult or impossible.

Equipment needed: COASST equipment kit (fanny pack in main cabin), COASST Rite-in-the-Rain® notebook or data sheets, two pencils, camera, and hard hat.

Specific Requirements at Chowiet – Oil Surveys

Dates: Ideally once early and once late in season.

Optimal sample size: One or two complete round(s) of surveys (both beaches).

Time of day: Any time, but a minus tide is preferred.

Weather: Any weather but times of heavy surf may make surveys difficult or impossible.

Equipment needed: Rite-in-the-Rain® notebook or data sheets, two pencils, camera, hard hat, oil collection equipment (if available).

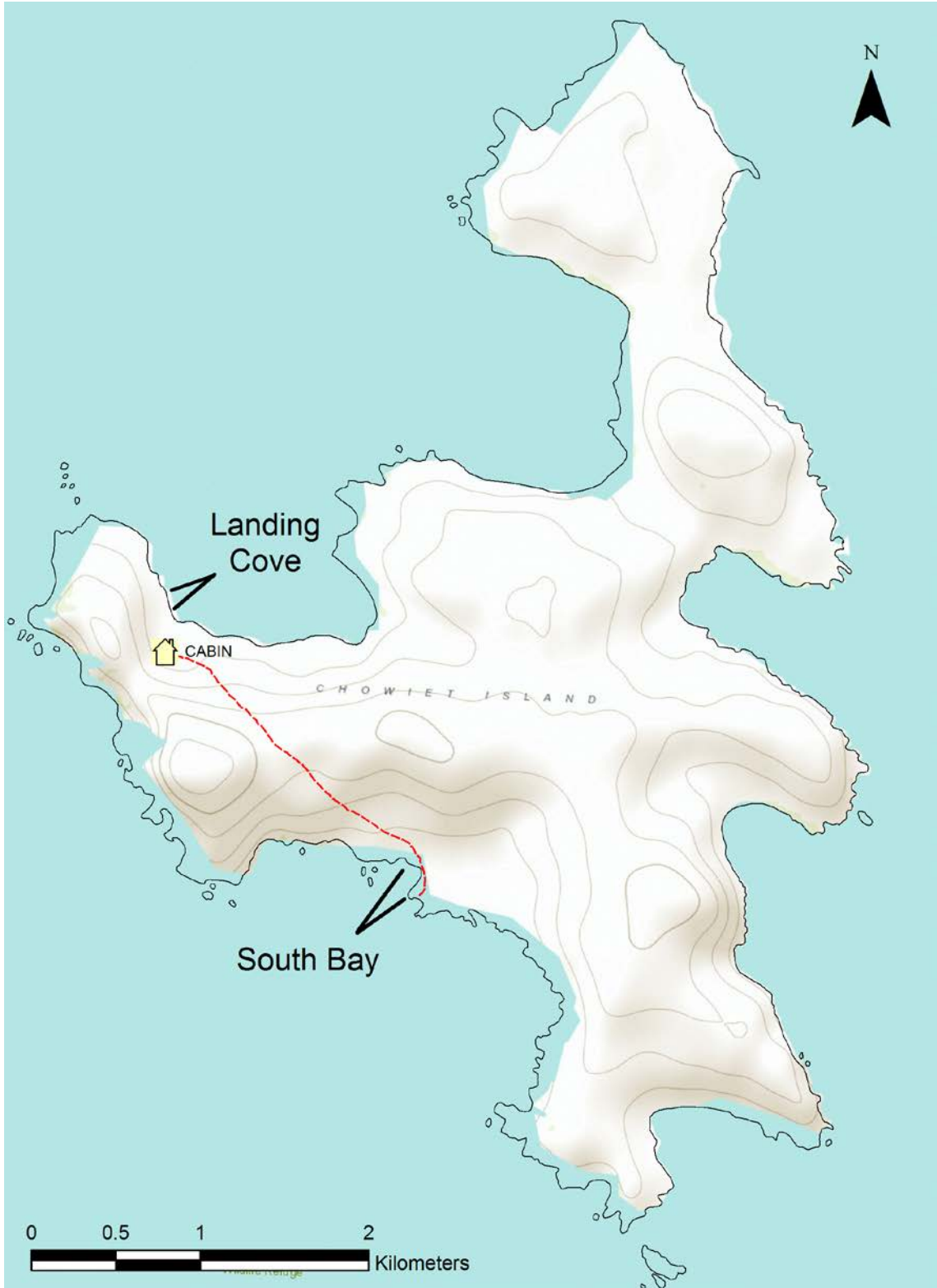


Figure C1. Location of COASST and oil survey transects at Landing Cove and South Bay beaches on Chowiet Island. The red dashed line indicates the approximate route from Main Camp to South Bay.

Attachment D. St. George Island specifics (includes Figure D1 and Table D1)

PROCEDURES SPECIFIC TO ST. GEORGE

No oil surveys are conducted at St. George. COASST surveys are conducted once or twice a month year-round on two beaches (Staraya Artil and Zapadni; Figure D1 and Table D1). AMNWR crews conduct surveys during the summer and the ECO Office at St. George conducts surveys during the rest of the year (mostly by Karin Holser in recent years). Upon getting to the island in May, contact the ECO Office to coordinate taking over the surveys for the summer; at the end of the summer, make sure to meet again to hand over the data. All data is reported to COASST by the ECO Office and then COASST passes it on to the refuge for inclusion in annual reports.

Survey both beaches every two weeks, beginning as soon as possible after arriving on the island (depending on when the beach was last surveyed by the ECO Office: if they surveyed on May 15 and you arrive on the island on May 16, wait two weeks before conducting your first survey). Continuing until you leave again in September. Both Staraya Artil and Zapadni are accessible from the road via truck or ATV.

At the end of the season, check with the Unit Biologist to see if there is any new data from COASST to add to the reports. If so, summarize data as described in the data analysis section (pages 3-4). Data presented in annual reports represents year-round sampling effort, so a complete year's dataset must come from COASST; do not simply summarize the summer surveys you conducted for the report.

Table D1. Descriptions of COASST survey transects at St. George Island.

Transect	Length	Substrate
Staraya Artil	0.9 km	cobble
Zapadni	0.9 km	sand/cobble

Specific Requirements at St. George - COASST

Dates: Begin surveys in late May or early June, continue through entire season.

Optimal sample size: One complete round of surveys (both beaches) once every two weeks.

Time of day: Any time, but high tide is preferred (less beach to survey).

Weather: Any weather, but times of heavy surf may make surveys difficult or impossible.

Equipment needed: COASST equipment kit (fanny pack in main cabin), COASST Rite-in-the-Rain® notebook or data sheets, two pencils, and camera.

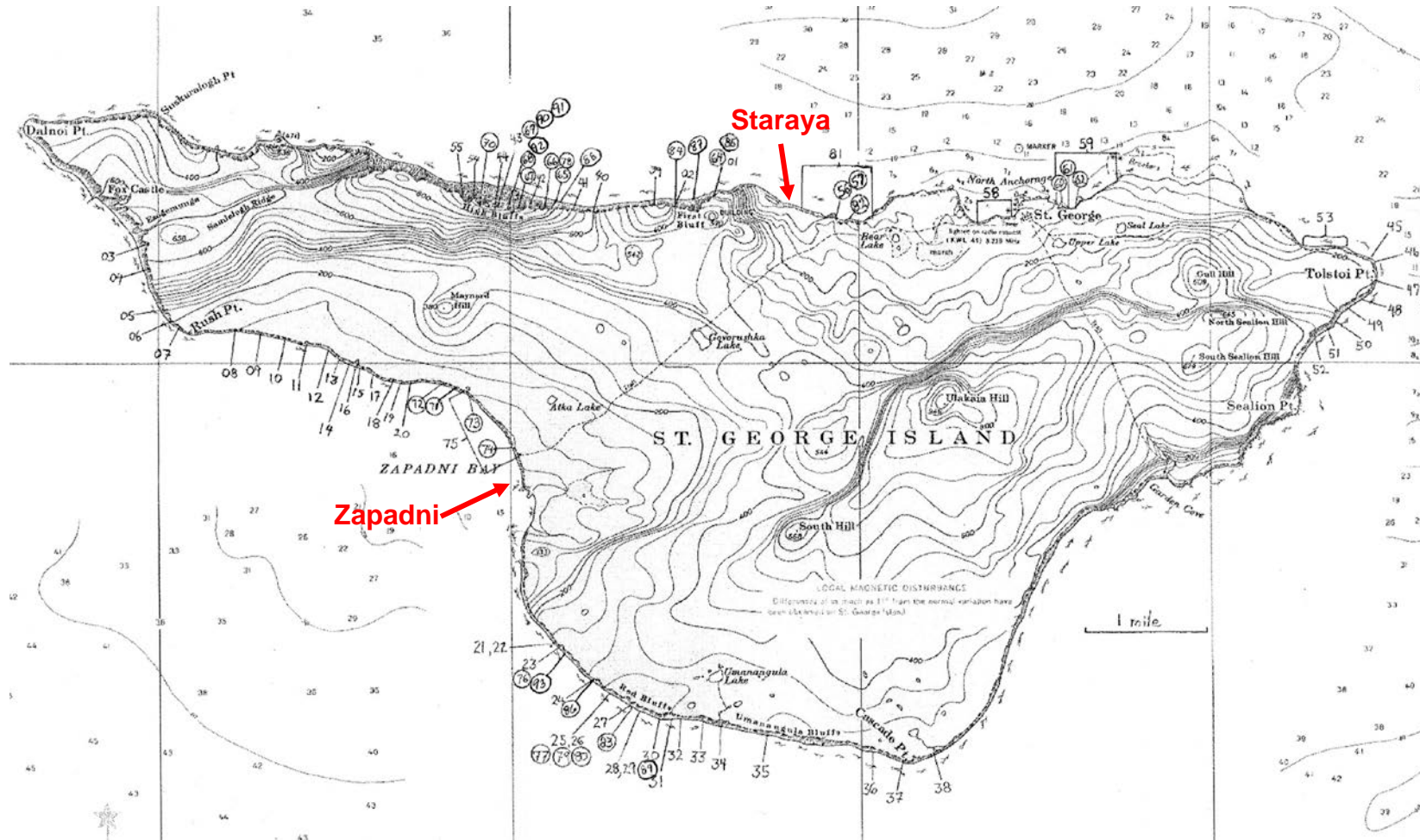


Figure D1. Location of COASST survey transects at St. George Island.

Attachment E. St. Lazaria Island specifics (includes Figure E1 and Table E1)

PROCEDURES SPECIFIC TO ST. LAZARIA

No oil surveys are conducted at St. Lazaria (Is this correct? There are oil survey data in the report). However, COASST surveys are conducted on two beach transects on Kruzof Island (Table F1), approximately two miles north of St. Lazaria and accessible by inflatable skiff. Begin COASST surveys in early June and repeat every two weeks for the entire summer.

Table E1. Descriptions of COASST at Kruzof Island.

Transect	Length	Substrate
SE	0.5 km	Boulder/sand
SW	0.7 km	Boulder/sand

Maps, GPS coordinates, and photographs of these transects as well as locations to anchor the skiff are available in the reference binder. At Kruzof Island, moor the skiff against the large rock outcroppings in front of or just to the east of the drinking water spring (Figure F1). Anchor the skiff in a location where you can easily keep an eye on it and in calm waters where the skiff and outboard will be protected. Getting onto Kruzof for a COASST survey can be difficult if seas/swell/wind conditions are not calm, as even moderate conditions can make it difficult to access the beach or make anchoring the skiff unsafe (i.e., if seas cause the boat to move into undesirable locations or slam against rocks). Additionally, the surf along the south side of Kruzof tends to be heavier in August and September, and may prevent landing the skiff all together. Pay attention to the tide while you are there to ensure that the skiff does not get stranded in an out-going tide or that the incoming tide isn't slamming the skiff into rocks or moving it to undesirable locations.

Specific Requirements at Kruzof Island - COASST

Dates: Begin surveys in early June, continue through entire season.

Optimal sample size: 6-7 replicates ideal but may be difficult to accomplish due to heavier surf later in the season (3-4 replicates acceptable).

Time of day: Any time, but high tide is preferred (less beach to survey).

Weather: Calm winds and calm seas (winds less than 15 knots and seas less than 3 ft). Times of heavy surf along the beach may make access to Kruzof impossible as well as poor sea/swell/wind conditions may make it difficult to anchor the skiff safely. Be aware of the tide on your anchoring location.

Equipment needed: COASST equipment kit (fanny pack in main cabin), COASST Rite-in-the-Rain® notebook or data sheets, two pencils, Southeast Alaska tide book, camera, bear spray, binoculars, GPS coordinates, GPS, navigation maps, Kruzof transect photos, GPS, inflatable skiff with all safety gear (don't forget to bring your safety equipment and VHF!), extra fuel.

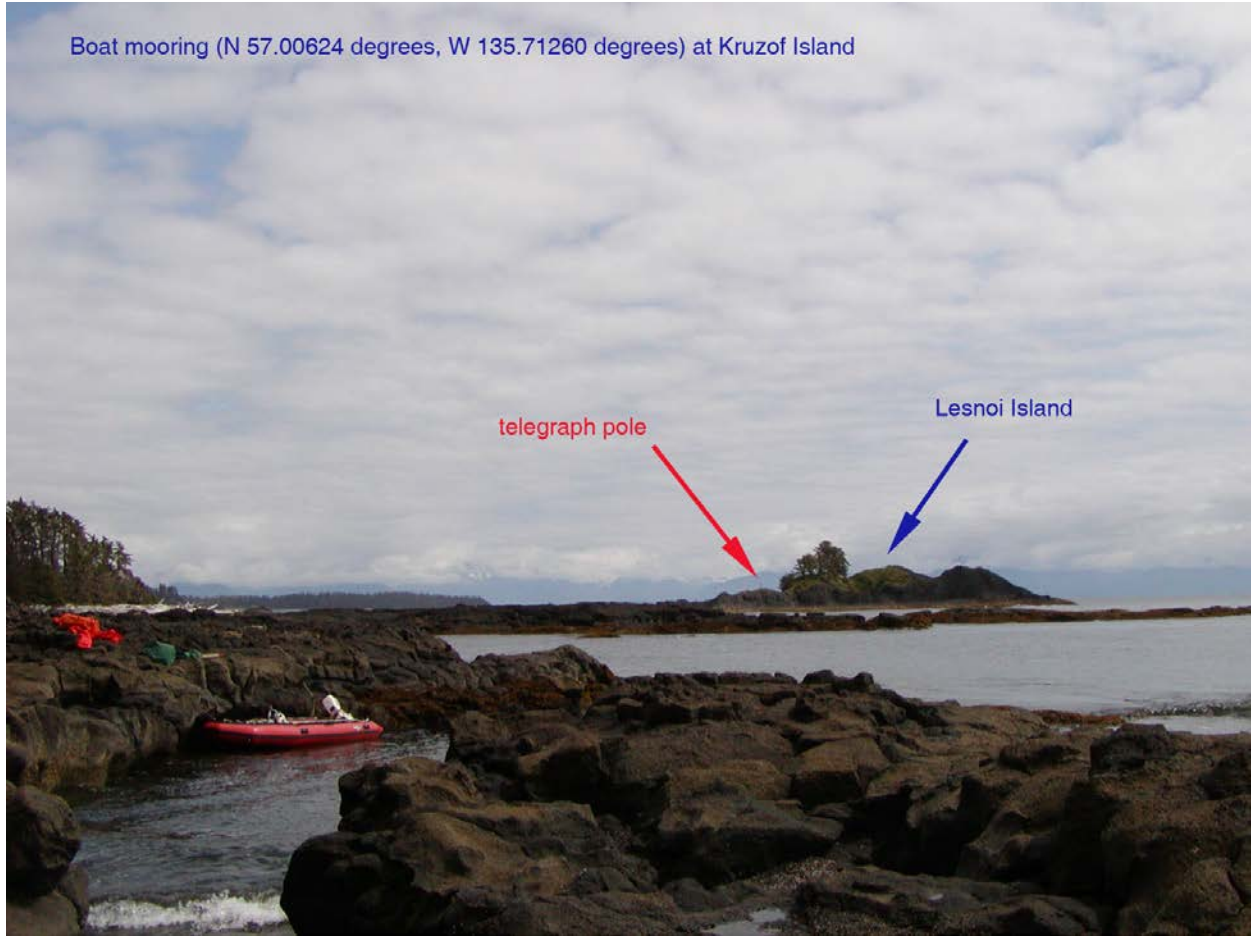


Figure E1. Boat mooring location on Kruzof Island.

Attachment F. St. Paul Island specifics

PROCEDURES SPECIFIC TO ST. PAUL

No oil surveys are conducted at St. Paul. COASST surveys are conducted once or twice a month year-round on four beaches (Benson Beach, Lukanin Beach, North Beach, and Polovina. Currently, however, the ECO Office at St. Paul does all COASST surveys. All data is reported to COASST by the ECO Office and then COASST passes it on to the refuge for inclusion in annual reports.

No data collection is required of AMNWR crews. At the end of the season, check with the Unit Biologist to see if there is any new data from COASST to add to the reports. If so, summarize data as described in the data analysis section (pages 3-4).

Protocol Revision History Log

Revision Date	Changes made	New version #
April 2017	Renumbered protocol from #25 to #23	1.3
April 2015	Made minor clarifications	1.2
April 2014	Changed font to Arial, added revision history log, replaced revision date with version # on first page, added protocol # to first page, changed number format of tables and figures in island attachments, ordered island attachments alphabetically, changed page number format to include protocol #, made minor grammatical edits, clarified summary calculations for COASST surveys with an example	1.1
May 2013	Protocol developed in standardized format from historic protocols, includes St. George, St. Paul, Aiktak, Buldir, Chowiet and St.Lazaria attachments	1.0
