

SEAN Sea otter monitoring SOP 1: Aviation Safety and Training

Revision History Log:

Previous SOP version	Effective Date	Revised By	Changes Made	New SOP version
-	September 2018	Jamie Womble	Initial version	1.0

Overview

This SOP describes the safety and training requirements necessary to conduct a safe and successful field season for monitoring sea otters in Glacier Bay, Alaska, using aerial photographic surveys. It includes links to park specific safety information and an example of a Green, Amber, Red (GAR) Risk Assessment for climate monitoring fieldwork.

Every NPS employee has the right to a safe workplace and the right to refuse unsafe work. A primary goal of the Southeast Alaska (SEAN) Network is to ensure the safety of its staff and partners while conducting inventory and monitoring activities in parks. Encountering hazardous situations is inherent in outdoor monitoring activities, and supervisors need to be aware and committed to ensuring that all monitoring staff receive adequate training on National Park Service (NPS) safety procedures, incident reporting, field communications, and emergency response prior to field work.

There are four different levels of training and safety related policies that need to be followed in order to conduct a safe and successful climate monitoring program: 1) National/NPS level policy, 2) Network or Inventory and Monitoring (I&M) policy, 3) Regional policy, and 4) Park level policy.

For Alaska-based fieldwork, the Alaska Region Communication Center (ARCC) staff are available to answer radio or satellite phone calls 24 hours a day/ 7 days a week throughout the field season. Flight, float, or backcountry plans are filed with either park-based dispatch or the ARCC prior to the field mission, which include established check-in times.

Safety Procedures

1. Each year prior to the field season the staff involved in with aerial surveys will discuss safety, training, and any other field requirements or procedures that contribute to a safe work environment.
2. Specific park hazards, emergency contact information, and procedures should be reviewed with the staff at the start of each field season and before each field trip. All park safety protocols must be reviewed and adhered to. This will take good coordination between the I&M staff and all of the parks that they will be working in. Links to park specific safety policies are included in Appendix SOP3-A.
3. All of the aviation safety requirements must be adhered to including all prerequisite training that is required according to the Regional Aviation Policy (RM 60) and the Glacier Bay Aviation Plan.

Follow the matrix of required training on the Interagency Aviation Training (IAT) website according to the specific role you will fill for the project. All complex field operations involving aircraft are required to complete a Project Aviation Safety Plan (PASP) at least three weeks in advance of the field dates. The plan is signed by the program manager and the aviation manager. See Appendix SOP 3-B for a PASP example. Proper personal protective equipment (PPE) is required for flights and survival gear must be carried at all times.

4. Prior to daily field events, all staff, including the pilot(s) and boat captain(s) and anyone else who has joined the immediate team, will review potential safety concerns (Table SOP 3-1) and complete a Green, Amber, Red (GAR) risk matrix to make sure everyone feels comfortable going forward with the field plan.
5. For field communications, each climate field crew will have a satellite phone plus a personal locating beacon (PLB) or an emergency GPS Communicator (e.g., InReach, Spot). In addition, a park radio is helpful in those parks that have repeaters and an air-to-ground radio is useful for contacting aircraft from the ground. Crews are required to check in with the appropriate park staff upon arrival in the park and when they leave the park at the end of the field visit.
6. Daily check-ins with the Alaska Region Communication Center (ARCC) will occur at times referenced in the flight plan that has been submitted prior to the field mission. Having established lines of communication and a Check-in/Check-out procedure ensure timely assistance can be provided in case of a mishap or delay. These procedures are described on the ARCC intranet website (<https://sites.google.com/a/nps.gov/arcc-region/>).
7. Immediately report any work-related injury to your supervisor. Depending on severity or nature of accident, further reporting may be required. All vessel, aircraft, and motor vehicle related accidents are to also be reported to a Law Enforcement Ranger. Access the Safety Management Information System (SMIS) at <https://www.smis.doi.gov> to report your injury and complete the necessary forms to file for worker's compensation as soon as possible, but no later than 30 days after your injury to qualify for benefits. Reporting of near misses is also encouraged as we want to learn from these events to prevent a future injury from occurring.

Table SOP 1-1. Potential safety concerns for aerial surveys for sea otters.

General Job Activity	Basic Job Step	Potential Hazards	Potential Mitigations
Communication	Daily check-ins with ARCC	Satellite phone does not work, battery dies, system is down	Test phone prior to departure. Bring extra batteries and redundant communication devices.
	Communication between field crew and pilot/boat captain	Radio does not work, communication plan not set-up	Conduct radio check and verify plans have been received by park dispatch or ARCC, prior to departure. Bring

			extra batteries and redundant communication devices.
Aviation	Fixed wing flight point to point/helicopter access to remote locations	Changing weather conditions, visibility, pilot condition, hazardous cargo, weight and balance, other passengers, condition of unimproved landing areas, military flight activity, other flights in area, loading and unloading, terrain	Identify a sufficient weather window to accommodate the duration of flight operations. Verify conditions prior to departure. Ensure pilot and aircraft are OAS carded prior to takeoff. Maintain flight following with park dispatch or ARCC, as appropriate. Make sure pilot is aware of any gear loaded into the aircraft so that they can manage weight distribution. Carry the "10 essentials of survival".
Field Activities-Aerial Surveys	Exposure to environment	Hypothermia, hyperthermia, Giardia, Dehydration, Sunburn,	Wear adequate outerwear for the conditions. Effective rain gear and insulating layers are critical. Be prepared for conditions to change during operations by dressing in layers. Bring plenty of water and avoid drinking directly from water bodies without filtration or treatment. Use sunscreen as needed, particularly at high elevations.

Appendix SOP 1 – A: Specific Safety Links

National

[NPS Reference Manual 50B](#)

[NPS Travel and Driving Policy](#)

Alaska Region

[ARCC Standard Operating Procedures](#)

[AKR Bear Safety Training Policy](#)

Glacier Bay National Park and Preserve

[GLBA Aviation Management Plan](#)

[Glacier Bay Backcountry Communications Plan](#)

[Glacier Bay Boating Policy](#)

Appendix SOP1–B: Example of a Project Aviation Safety Plan (PASP)

PROJECT AVIATION SAFETY PLAN

Project Name and Date: SEAN Sea Otter Monitoring 2018 - GLBA

APPROVALS

Prepared By: Jamie Womble

Wildlife Biologist/Project Leader

Reviewed By: Scott Gende & Mike Bower

Supervisors

Reviewed By: Jake Ohlson

GLBA Aviation Manager

Supervision:

Project Manager: Jamie Womble (Wildlife Biologist-NPS, Juneau) 907-364-1577 (office), 907-957-1563(cell)

Supervisor: Scott Gende (Senior Science Advisor, Juneau) 907-364-2622; Mike Bower (SEAN Program Manager) 907-364-2621

Aviation Safety Manager: Jake Ohlson (GLBA Safety Officer) 907-697-2602

Project Name:

SEAN Sea Otter Monitoring

Objectives & Justification:

Sea otters were selected as a vital sign by the SEAN Monitoring Program in 2015, with the primary objectives of monitoring the spatial distribution and abundance of sea otters in Glacier Bay to assess patterns of population colonization and expansion while providing reliable information that can be used to inform management decisions that may affect sea otters or the nearshore ecosystem.

Specific monitoring objectives include:

- (1) monitor the abundance and spatial distribution of sea otters in Glacier Bay;
- (2) utilize a dynamic spatio-temporal model and flexible statistical framework that can account for multiple sources of uncertainty and accommodate multiple data types; refine model using survey results as a primary means to advance ecological learning;
- (3) implement optimal dynamic survey designs to increase sampling efficiency to maximize program sustainability, increase safety, and improve the precision of parameter estimates;
- (4) provide reliable quantitative information regarding the spatial distribution and abundance of sea otters to assess the status of sea otters in Glacier Bay, inform Alaska-wide stock assessments by USFWS, and inform decisions regarding management actions that may have the potential to impact sea otters;
- (5) reduce risk associated with aerial surveys by reducing flight time and implementing aerial photographic techniques;
- (6) create a permanent record of digital photographs that allows for independent verification of data and can be used to quantify habitat covariates; and
- (7) develop a platform and survey design that is capable of being extended to unmanned aerial systems (UASs).

Project Dates: This project will take place at in Glacier Bay, Alaska, between May – August annually. Exact dates of surveys will be dependent on weather and aviation resources.

Location of Operations: The survey area is located in Glacier Bay, Alaska. All aerial surveys will begin and end at the Juneau International Airport. Crew is aware that most of the flights for this project will take place in mountainous terrain where visibility is imperative. All surveys are transect-based and will cover the areas in the following figures (Figure 1-3). Each set of transects (Figure 1-3) can be completed in ~4 hours of flying time including transit time to and from Juneau.

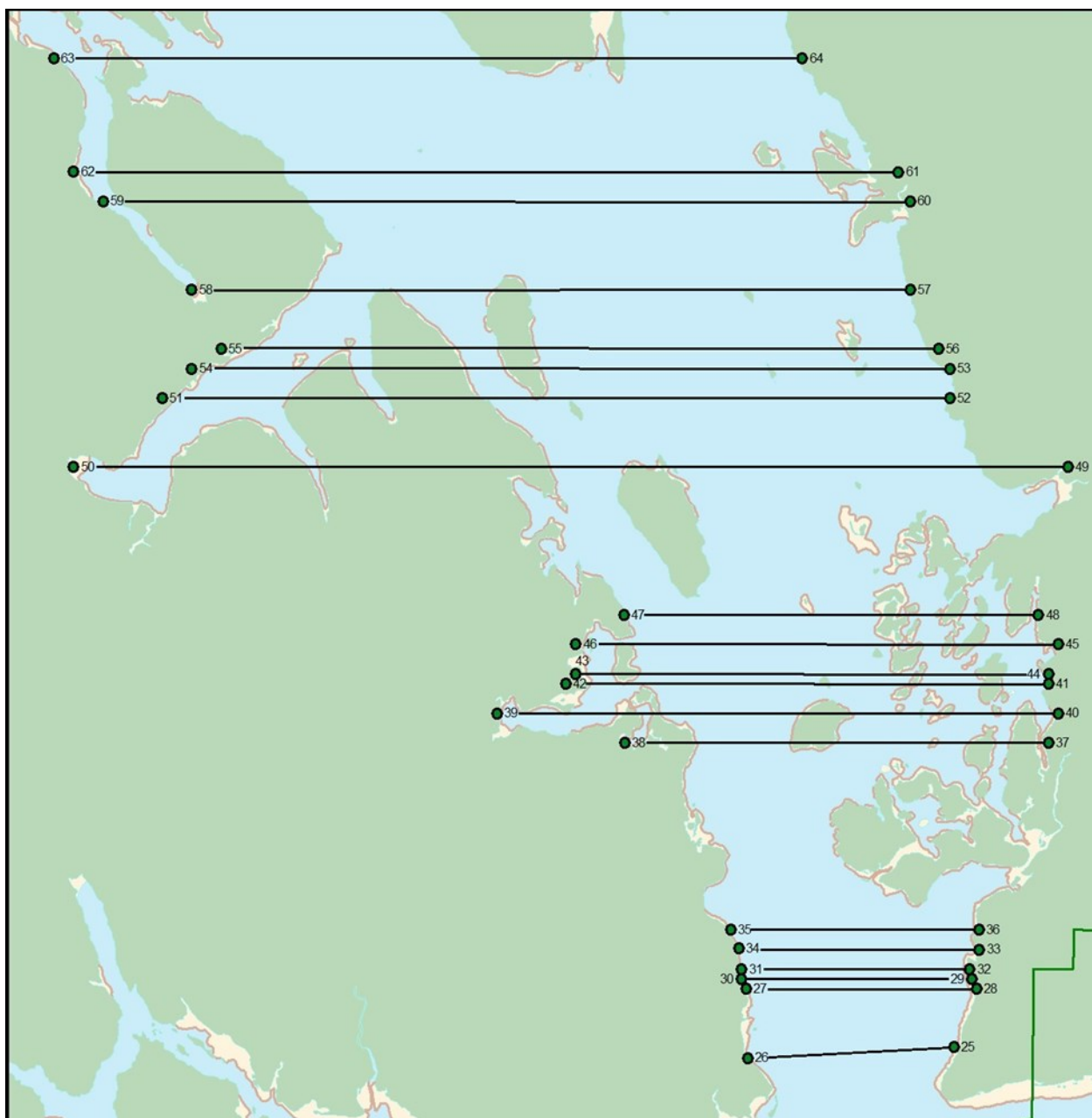


Figure 1.1. Examples of locations of randomly selected transects.

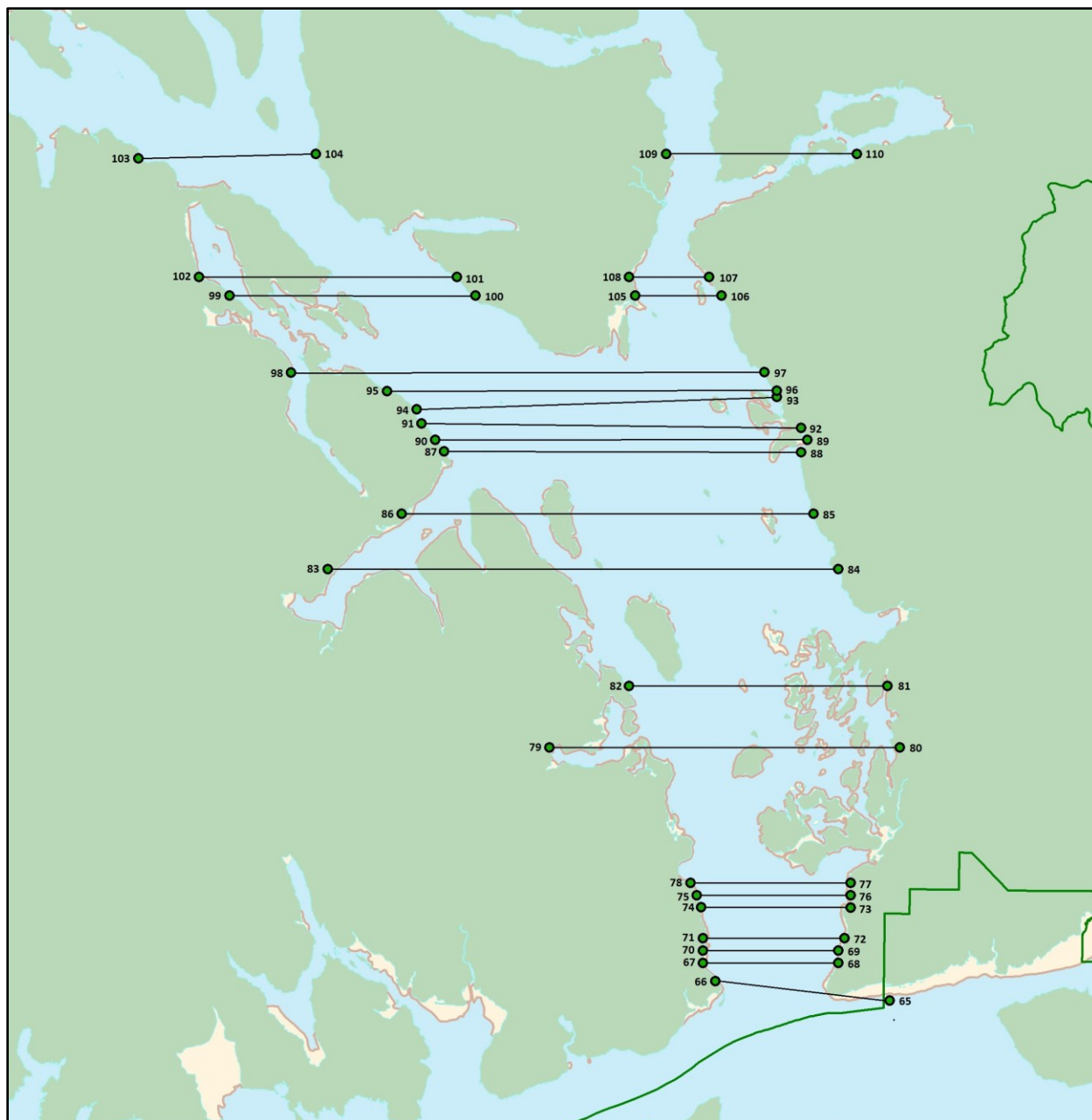


Figure 1.2. Examples of locations of 20 optimal transects

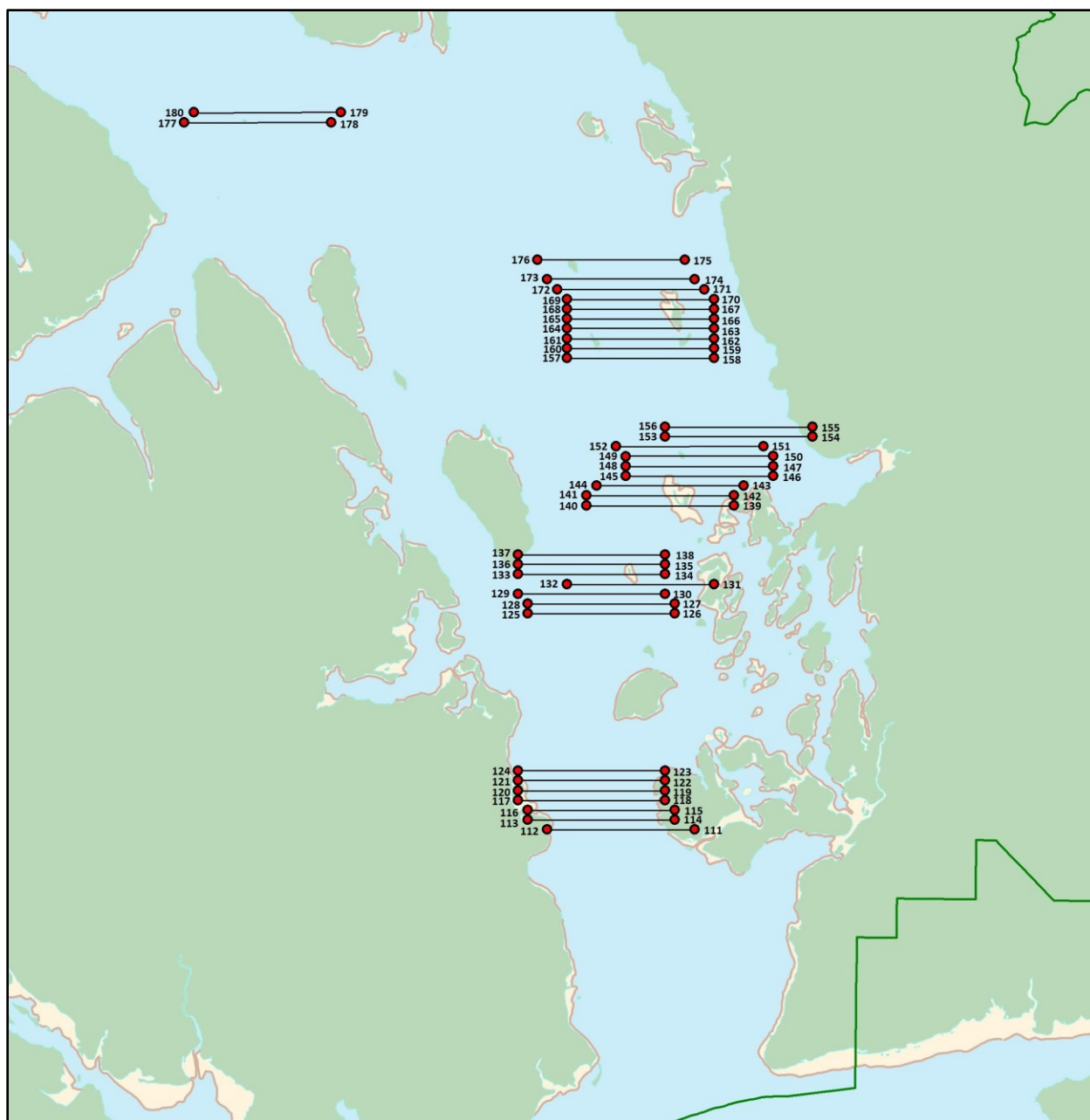


Figure 1.3. Example of flight path for sampling areas with highest predicted sea otter abundance.

Projected Cost of Aviation Resources:

Projected annual flight costs for aerial surveys of sea otters are \$15,000-\$17,000/year.

Account code for all trips:

PPAKAKIMDO

PPMRSNR1N.AM0001

PX.XIMD01801.00.1

Aircraft:

Company	Ward Air
Address	Juneau, Alaska
Phone number	907-789-9150
Pilot name	Dennis Lozier
Aircraft type	Beaver on Floats
Aircraft colors	Blue and Red
Tail number	N62353507AE
Tracking	AFF
Billee code	53817X1

Aerial Hazard Analysis: We will have daily safety discussions to go over potential risks for the flights being conducted each day and we will do a survey go/no-go assessment prior to each take-off.

Protective Clothing, Equipment, and Survival Gear: Personal protective equipment includes bright orange personal flotation device (worn at all times), Leatherman tool, knife, firestarter, lighter, whistle, pocket flares, C-strobe light, signal mirror, handheld GPS (Garmin 76CSX), water, and compass. In addition, Womble carries a sleeping bag, emergency rations, energy bars, bivouac sack, sleeping pad, dry bag, small first aid kit, and survival suit in addition to the survival gear that is already carried on board the plane by the pilot. Non-synthetic flame-resistant clothing is also worn. Crew will also have a PLB (ACR) and an InReach two way device.

Procedures for Flight Consent: A GO/NO-GO form for Vendor Fixed wing or Helicopter flights is required for all projects prior to commencement, in accordance with the GLBA Aviation Management Plans. A GAR model should be completed each morning before the flight mission proceeds.

Load Calculations and Weight-and-Balance: The pilot is responsible for the accurate completion of load calculations, weight and balance, and to insure that the aircraft is operated within its performance capabilities for the areas being used at all times. Trained aviation personnel shall ensure that aircraft scheduled are capable of performing the mission(s).

Communications/ Flight Following Specifics: Flight crews will file flight plans with the ARCC each day. Each aircraft will have a functioning Automatic Flight Following system in operation, and if/when in flight will check in with ARCC at least once per hour via park radio, satellite phone, or cell phone. Flight manager will make sure Spidertracks (if vendor) equipment is turned on prior to the flight. In the event that AFF fails, 15 minute check-ins will be initiated. If any aircraft's location is unknown for 30 minutes beyond the hourly requirement, the mishap response plan will be initiated by contacting ARCC and declaring that an aircraft is overdue. Communication with ARCC will be through the park radio system, satellite phone, cell phone or land line.

Satellite Phone Numbers and VHF

Communication between aircraft will occur on VHF 122.9. Flight following with ARCC will be done with satellite phones. Iridium phones will be recharged each evening and at least two extra batteries will be carried with each phone.

Iridium Dialing Procedure:

1. **Landline to Satellite Phone:** 011+ Satellite Phone Number, or dial 1-480-768-2500, then dial sat phone number when prompted.
2. **Satellite Phone to Satellite Phone:** 00+ Satellite Phone Number
3. **Satellite Phone to US Landline:** 001+Area Code+Number

Emergency Procedure: Emergency procedures for overdue and missing aircraft will follow the Aviation Mishap Response Plan for the appropriate park. Prior to the survey, the pilot and observer will discuss scenarios of overdue and missing aircraft to ensure that everyone is familiar with procedures and contacts. The current Aviation Mishap Response Plans for each park have been reviewed by project participants, and current emergency contacts have been incorporated in this PASP.

Denali Dispatch (open 24/7): 907-683-9555

Hazardous Materials:

No Hazardous Materials are being transported.

Participants:

NPS Personnel	Dates	Safety Skills	Aviation Training
Jamie Womble	All surveys	Operational leadership; Supervisor Training	All Aviation training for crewmembers and supervisors
Louise Taylor-Thomas	All surveys	Operational leadership; Safety Committee Representative	All aviation training for crew members

Emergency Plan for Evacuation

The Emergency Plan for Evacuation and the Hazard Analysis and mitigation plan has been borrowed and modified from the Glacier Bay Resource Management Fisheries Aviation Plan.

Non-life-threatening

NPS vessel or local air carrier vender to retrieve personnel. Aircraft landing on scene would have appropriate landing gear based on access constraints.

Life-threatening

USCG and/ or NPS vessel or local carrier to extract/retrieve/transport personnel and make all appropriate notifications based on established EMS procedures, in accordance with the NPS AK Aviation Mishap Plan.

Fatality

NPS staff would protect the scene (similar to crime scene), notify State Troopers, protect the public from injury, and protect the wreckage from further damage or disturbance.

Fueling Plan, Locations/Facilities

All flights originate and terminate in Juneau, thus all aircraft fueling takes place in Juneau. All flights originate with 4.5 hours of fuel on board. Area fueling facilities also exist at the Gustavus airport.

Hazard analysis/Mitigation

- The hazards associated with this project include the possibility of a power failure in a single engine aircraft, resulting in a water landing or ditching, and/or crash landing. The flight path lies in close proximity to a variety of relatively high (2,000-3,000 ft.) coastal topography, glaciers, and ice fields.
- The possibility of poor visibility, pilot disorientation, and erroneous navigation exists especially under inclement weather (*i.e.*, fog or heavy rain) conditions; however, aerial survey flights are not conducted during inclement weather as inclement weather precludes the possibility of this type of survey. Impact with or engine failure over such terrain features could lead to an uncontrolled or crash landing and/or a fatal outcome for survey participants.
- The Juneau, Gustavus, and Excursion Inlet portion of the survey route lies within an area of relatively heavy aircraft traffic. The possibility of a midair collision is increased when operating in these areas. In addition, flight-seeing traffic is often encountered in Johns Hopkins Inlet and occasionally in McBride Inlet during surveys which increase the probability of a midair collision.

Risk mitigation

- Survey participants and managers are required to have all mandatory aviation training including water Ditching and Survival (A-312) course including in-the-water pool exercises
- Survey participants will follow established protocols to evaluate weather and flying conditions before each flight including: on-line weather checks for Icy Strait, Lynn Canal, Cape Spencer Webcam and a visual check of weather conditions. Flight minimums needed to accomplish surveys are as follows:
-1,500 ft., 2 mile visibility

- 20 knot wind limit
- No night flying
- No IFR (flights operated under instrument flight rules)

- Each survey participant has the freedom, responsibility, and the obligation to postpone or cancel the flight at any time if safety concerns arise.
- NPS survey participants are required to wear blaze orange life vests (containing emergency survival gear) that can be inflated in the event of a water landing, ditching or crash landing. Moreover, no synthetic clothing is worn to prevent or mitigate burns during flashover.
- Because survey flights are scheduled when considerable on-the-water vessel activity occurs, the necessity of protection from hypothermia is at least somewhat mitigated. Surveyors can opt to wear an aviation dry suit (i.e., Mustang MSF750 Constant Wear Aviation Dry Suit).
- All flights must remain above 500' AGL.
- Additional (redundant) flight following occurs with the use filing flight plans with FAA and NPS and using Spider Tracks automated flight following and Spot tracking devices. In addition, each surveyor is required to carry an satellite phone, NPS radio, VHF and conduct at least 30 min. location reporting or immediate reporting whenever any deviation from the flight plan occurs.

Appendices:

We have attempted to accommodate each individual park's aviation hazard analysis tools by doing the following worksheets:

Hazard Analysis/Mitigation Section (Rubric or Chart): GLBA

METHOD		YES	NO
1.	Is there an alternative method that would accomplish the mission more safely and/or efficiently (including accomplishment by ground methods)? <i>Explanation here: This project has gone through a minimum requirement/minimum tool analysis for all parks and sites and fixed-winged access is the preferred option. Future development of Unmanned aerial systems will be important for reducing risk and increasing safety.</i>		X
2.	Is the method selected approved and do detailed instructions for safe accomplishment exist? <i>Explanation here: Yes, all personnel have the minimum requirements to undertake the tasks on this mission safely.</i>	X	
3.	Have adequate flight following and communications methods been established? <i>Explanation here: Yes, we will follow the ARCC and regional aviation safety plan documents including RM60 and all policies particular to safe aircraft operations in AKRO and GLBA.</i>	X	

MEDIUM			
1.	Can factors of terrain, altitude, temperature, or weather that could adversely affect the mission's success be mitigated? <i>Explanation here: We will do a go/no go analysis before every flight and postpone the mission if conditions are unsafe.</i>	X	
2.	Will the mission be conducted at low (below 500' AGL) altitudes -can the same objective be achieved by flying at a higher altitude AGL other than below 500' AGL? <i>Explanation here: There will be minimal low level flying only during take-off and landing.</i>		X
3.	If low-level flight, have all known aerial hazards been identified during the planning process and are they known to all participants? <i>Explanation here: All known aerial hazards will be discussed prior to mission</i>	X	

4.	If there is a potential for an airspace conflict (military, media, or sightseeing aircraft), have mitigating measures been taken?	X	
	<i>Explanation here: Current aeronautical info has been reviewed, standardized reporting points and communication frequencies will be discussed at each location. There will be scenic tour operations in GLBA and high-density traffic around the Juneau International airport.</i>		
5.	Have adequate landing areas been identified and/or improved to minimum requirements?	X	
	<i>Explanation here: Yes, we have landed at these locations in the past and all are acceptable.</i>		
PERSONNEL			
1.	Are the pilots properly carded for the mission to be conducted?	X	
	<i>Explanation here: Yes, all pilots have been carded for this specific mission.</i>		
2.	Will the flight be conducted within the Pilot flight time/duty day requirements and limitations?	X	
	<i>Explanation here:</i>		
3.	Have the minimum number of personnel necessary to accomplish the mission safely been assigned, and do they meet personnel qualifications and experience requirements?	X	
	<i>Explanation here:</i>		
4.	Will adequate personnel (flight and ground) and pilot briefings be conducted prior to the flight?	X	
	<i>Explanation here: We will do a full briefing the day of the mission with all involved.</i>		
5.	Are users aware that the pilot-in-command has final authority over any operations conducted involving the aircraft or its occupants?	X	
	<i>Explanation here:</i>		

MACHINE			
1.	Is the aircraft capable of performing the mission in the environment (altitude, temperature, terrain, weather) where the operation will be conducted?	X	
	<i>Explanation here:</i>		
2.	Is the aircraft properly carded for the intended mission?	X	
	<i>Explanation here:</i>		

Review/Approvals

I reviewed the contents of the Special Use Flight Plan and Risk Analysis and find that it conforms to existing policies.

Prepared by: Jamie N. Womble, Wildlife Biologist, NPS Date: _____

Project Leader

Reviewed by: Scott M. Gende, Coastal Ecologist, NPS Date: _____

Supervisor

Reviewed by: Mike Bower, SEAN Program Manager Date: _____

Reviewed by: Jake Ohlson, GLBA Safety Officer Date: _____

Approved by: _____

Date: _____

AVIATION Mishap Notification

Notification- Don't delay notification if someone is not available. Accident notification will be by calling 1-888-4MISHAP (DOI and USFS 24 hour accident hotline) and providing the information on OAS 77/FS 5700-28 (included).

Aviation Emergency Notification List:

Name/Position	Location	Work	Cell
AMD- Flt. Coord. Center	Anchorage	907-271-3935	
Paul Anderson Regional Aviation Manager	Anchorage	907-644-3419	907-365-9180
Chris Pergiel Supervisor, Ranger Services	Anchorage	907-644-3406	907-382-0431
Joel Hard Assoc. Regional Director	Anchorage	907-644-3506	
Bert Frost Regional Director	Anchorage	907-644-3510	

OVERDUE AIRCRAFT

An aircraft is considered "overdue" when it fails to arrive within 30-minutes past the estimated time of arrival (ETA) and cannot be located.

MISSING AIRCRAFT

An aircraft is considered "missing" when it has been reported to the FAA as being "overdue" and the FAA has completed an administrative search for the aircraft without success. The aircraft is **OFFICIALLY** missing when the fuel duration, as reported on the request for flight following, or as reported on the FAA Flight Plan, has been exceeded and the aircraft location is unknown.

Time	Action	Contact and Phone	Time
Immediately at missed check-in/ETA	Attempt to contact aircraft by radio or phone. Contact destination agency airbase or airport. Gather info required for Accident Report.	Iridium phone onboard #N62353 _____ is: _____. This number will vary from year to year.	
15 minutes past check-in or ETA	Contact originating or enroute agency dispatch . Contact originating or enroute agency airbase . Contact originating or enroute airports . Notify Park's Hub Aviation Manager - see AK Contacts *Contact local FAA flight service station if unable to reach park or dispatch.	Contact in this order, all 907 area code: work & (after hours numbers): AKRO Aviation Mgr: Jeff Babcock , 907-644-3407, cell 907-3263 GLBA Safety Officer: Jacob Ohlson, 907-697-2602 Chief GLBA Ranger: Albert Faria, 907-697-2621, cell 907-317-6213 GLBA Superintendent: Philip Hooge , 907-697-2616, cell 907-230-7243	
30 minutes past ETA*	Contact Vendor home base. Contact FAA Flight Service Station Contact AMD (in Alaska)	1-800-WX BRIEF or 907-271-5936 907-271-3935 24 hours	
Anytime the fuel duration is exceeded or if an aircraft is missing and an accident is suspected	Submit data from the Aircraft Accident Checklist to: FAA / Lockheed-Martin Flight Service Station and request an Alert Notice (ALNOT) NBC-AM /USFS Aviation Safety Manager Local Aviation Manager	1 800 992-7433 (800 WX BRIEF) 1 888 464-7427 (888-4MISHAP)	

Appendix SOP3–C: Example of a Green, Amber, Red (GAR) Risk Assessment

GAR Model

Green, Amber, Red (GAR) Model –CAKN Climate/Stream Work All parks. **Score: 23 GREEN-Low Risk.**

The GAR model is used during planning to identify risk and present mitigation recommendations to the Park Aviation Manager. A GAR will also be done each day in the field prior to flights.

Calculating Risk

National Park Service Operational/Mission Risk Assessment (GAR)

Green (0-35) (Low Risk)	Amber (36-60) (Caution)	Red (61-80) (High Risk)
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Category	Description	Risk (0-10)	Mitigation(s)
Supervision	Presence, accessibility and effectiveness of leadership for all teams and personnel. Clear chain of command. Superintendent, Park Aviation Manager (PAM), Supervisor. The Superintendent has clearly stated policies for all flights, employees are held accountable for deviations, the PAM and Supervisor are directly involved in the decision to conduct the flight under the current condition.	2	This is a small team with supervision on site (project mgr.). The team will follow all appropriate policy for the flights as stated in the PASP. A copy of the plan will be distributed to aviation mgr. prior to flight for review. The crew has appropriate aviation training to complete the mission, but the risks involved in aviation still exist.
Planning	Current and relevant standards and policies, team trained in accordance with same. Adequate mission planning time. Required equipment and associated training is provided. Briefs/debriefs planned, team input solicited.	2	Planning done well in advance of trip. All required training complete before mission begins. Small team familiar with operations and expectations. Pilot will need to be briefed prior to mission.
Contingency Resources	Formal agreements in place with participating cooperators. Planning accomplished with cooperators. Shared communications plan and frequencies. Weather reporting: Real time and pilot reports. Aircraft and equipment appropriate for the mission? Yes. Is the required PPE available and being used? Yes.	3	Emergency procedures clearly stated in PASP with resource phone numbers. Communication plan with comm. center, aviation mgr., and supervisors. This work is in a remote area and may not be readily available in case of an emergency.
Communication	Infrastructure: radio communications possible throughout area of operations. Availability of alternate communications. Interpersonal communications on team considered. Communication plan established and rehearsed.	3	Each aircraft will have a satellite phone with spare batteries. Observers will check in with ARCC upon take-offs, landings and every hour in flight. All aircraft will have AFF.

Team Selection	Level of individual training and experience. Park Aviation Manager, Supervisor, Pilot/Crewmembers. All positions meet the minimum training requirements and have a working knowledge of policy and procedures. The mission is well within the comfort zone of the pilot based on demonstrated experience, knowledge, and training	3	The teams are well chosen for their field experience and capability. The pilot is a vendor pilot is familiar with the project/area. Pre-flight briefing will mitigate any concerns of the field crew. The field crew will be responsible for making sure the pilot and aircraft operate within NPS policy.
Team Fitness	Level of overall physical fitness of team. Level of crew rest/fatigue and overall morale. Team members with major life events and distractions.	2	Field crew works together often and can assess fitness and fatigue of each other on a daily basis. Field crew will ensure that the pilot is well rested and capable of mission each day and entire crew will do a daily risk assessment.
Environment	The operating environment presents significant hazards that cannot be mitigated, including weather, winds, mountainous terrain, and remote operations.	6	Team will maintain awareness of environmental factors; weather; and other aspects of field work, but risk will still exist.
Task Complexity	Task complexity is moderate. The aviation component has the highest risk but is straightforward - point-to-point transport of crew and gear in remote, mountainous environment. The landing zones are unimproved.	2	Field crew is familiar with flight paths and most landing areas. All cargo will be internal, mitigating the risk of external loads.
TOTAL		23	

Mitigations should be considered for any category rated higher than 5.

Overall Mission risk:

Green (1-35)	Amber (36-60)	Red (61-80)
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