

APPENDIX D: MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES

To ensure protection of the park's fundamental resources and values, the following best management practices would be implemented under all action alternatives. These best management practices are grounded in National Park Service (NPS) *Management Policies 2006*, and they are intended to provide a practical approach to everyday management of Glacier Bay National Park and Preserve's resources. These best practices and mitigation measures are intended to avoid or minimize potential adverse impacts from implementing the management actions proposed in this plan.

GENERAL CONSTRUCTION MEASURES

- Locate equipment/materials staging and stockpiling areas in previously disturbed sites, away from visitor use areas to the extent possible, to minimize the amount of ground disturbance and visual intrusion. All staging and stockpiling areas would be returned to preconstruction conditions and/or revegetated following construction. Parking areas for construction vehicles would be limited to these staging areas, existing roads, and identified previously disturbed areas.
- Identify and fence construction zones with construction fencing, silt fencing, or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications, and workers would be instructed to avoid conducting activities, including materials staging and storage, beyond the construction zone as defined by construction zone fencing.

WILDERNESS CHARACTER

The proposed Point Gustavus Route, which passes through designated Wilderness, would follow the forest-beach interface and would require no (or very minimal) signage for visitor wayfinding. This hike route is primitive in nature to align with the wilderness character and incorporates minor site amendments using natural elements (wood, stone) to the minimum extent required to enable visitors to cross streams and areas of tidal inundation and protect sensitive resources from impacts because of foot traffic. Any designed infrastructure such as bridges and boardwalks would be avoided if at all possible and, if deemed necessary, would be the minimum required for the administration of the area in compliance with the Wilderness Act and ANILCA.

Infrastructure that is necessary to protect wetlands, such as boardwalks, are considered installations under the Wilderness Act. Before boardwalks would be installed, a minimum requirements analysis (16 U.S.C.1133(c)) would be conducted.

Mooring buoys would be removed during the winter to protect character of adjacent wilderness and cultural resources (viewshed from the tribal house).

CULTURAL RESOURCES

The National Park Service would preserve and protect, to the greatest extent possible, resources that reflect human occupation and historical events associated with the Bartlett Cove area of Glacier Bay National Park and Preserve. Specific mitigating measures include the following:

- To appropriately preserve and protect national register-listed or eligible historic structures and associated cultural landscape features; all stabilization, preservation, or restoration efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995) and the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (1996).
- Park staff would continue to develop inventories for and oversee research regarding archeological, historic, and ethnographic resources to better understand and manage the resources, including cultural landscapes. Park staff would conduct any needed archeological or other resource-specific surveys, National Register of Historic Places evaluations and identify recommended treatments. The results of these efforts would be incorporated into comprehensive planning and resource assessments, as well as site-specific planning, mitigation, and environmental analysis.
- All projects with the potential for ground disturbance would undergo site-specific planning and compliance procedures. For archeological resources, construction projects and designed facilities would occur in previously disturbed or existing developed areas. Adverse impacts to archeological resources would be avoided to the extent possible in accordance with *The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*.
- Known archeological sites would be routinely monitored to assess and document the effects of natural processes and human activities on the resources. Archeological resources would be left undisturbed and preserved in a stable condition to prevent degradation and loss of research values unless intervention could be justified based on compelling research, interpretation, site protection, or park development needs. Recovered archeological materials and associated records would be treated in accordance with *NPS Management Policies 2006*, *NPS Museum Handbook*, and 36 CFR Part 79.
- As appropriate, archeological surveys or monitoring would precede any ground disturbance. Significant archeological resources would be avoided to the greatest extent possible during construction. If such resources could not be avoided, an appropriate mitigation strategy (e.g., the excavation, recordation, and mapping of cultural remains prior to disturbance to ensure that important archeological data is recovered and documented) would be developed in consultation with the Alaska State Historic Preservation Office, associated Alaska Native tribal representatives, and other concerned parties as necessary.
- If, during construction, previously unknown archeological resources were discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented. If the resources could not be preserved in situ, an appropriate mitigation strategy would be developed. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed. If non-Indian human

remains were discovered, standard reporting procedures to notify appropriate authorities would be followed, as would all applicable federal, state, and local laws.

- To minimize visual and auditory intrusions on cultural resources from modern development, the National Park Service would use screening or sensitive designs that would be compatible with historic resources and cultural landscapes and not intrude on ethnographic resources. If adverse impacts could not be avoided, impacts would be mitigated through a consultation process with all interested parties. Mooring buoys would be removed in the winter to protect viewsheds from the Huna Tribal House at that time of year.
- The National Park Service would consult with associated Alaska Native tribal representatives to develop and accomplish park programs in a way that respects the beliefs, traditions, and other cultural values of the tribes who have ancestral ties to park lands. The National Park Service recognizes the past and present connections of associated tribes with park lands and that potential resources, places, and traces of tribal use are important parts of the cultural environment to be preserved, protected, and interpreted as appropriate.
- The park would encourage visitors through the park's interpretive programs to respect and leave undisturbed any inadvertently encountered archeological and historical resources.
- The park would cooperate with partners, park neighbors, and other stakeholders to establish and enforce measures to prevent and reduce human impacts, such as vandalism and looting, on cultural resources.
- Prior to implementing proposed actions, the National Park Service will conduct Section 106 reviews (see "*Appendix A: National Historic Preservation Act, Section 106 Considerations and Next Steps*").

VISITOR USE AND EXPERIENCE

Mitigation measures for all land and water-based visitors, could include, but are not limited to:

- Phase construction, temporary closures, noise abatement, visual screening, providing information to visitors on the purpose and need for construction, and directional signage to help visitors avoid construction activities.
- Increase messaging to visitors regarding safe wildlife viewing practices and direct visitors to the best opportunities to view wildlife and find quiet areas where enjoying bird song and the natural sound environment is possible.
- Increase NPS presence including law enforcement if wildlife viewing incidents increase in frequency at specific locations.
- Continue to offer and provide relevant information to visitors arriving in the frontcountry. This messaging could be expanded to include:
 - Appropriate trail etiquette and leave-no-trace principles when visiting the park including frontcountry areas;
 - Being a good neighbor for campgrounds to ensure visitors still have a positive visitor experience that aligns with desired conditions; and

- Important information on human-wildlife interactions, including, but not limited to, topics such as safe food storage and traveling with pets.
 - Information to vessel operators on sensitive marine ecosystems.
- Partner with other companies, groups, entities, and access providers to connect with visitors before arriving at Bartlett Cove with relevant park information such as safety and orientation information (i.e., maps, leave-no-trace principles, etc.).
- Development and long-term operations of new and existing facilities would include dark sky-friendly lighting and other measures to protect the unique experience that Bartlett Cove offers visitors.
- Implement timely and accurate communication with visitors regarding programs, services, sites, and permitted activities via new releases, visitor contacts, web and social media, as well as signage.
- Pursue alternative and active transportation options to reduce vehicle traffic and noise for visitors and staff including to and within the park (e.g., electric vehicles, shuttle, non-tonal back-up alarms).
- Schedule construction, maintenance, and recurring vegetation management to occur outside the core visitor season—essentially the period when the Glacier Bay Lodge is open—Memorial Day to Labor Day.
- Operating plans for concessions would be revisited annually by NPS staff with concessioners to ensure desired conditions are maintained. Monitoring of the indicators and thresholds could result in changes to the timing, group size, and authorized areas for commercial tour operators in the Bartlett Cove area (*see appendix C*). For example, the park would review and revise requirements for the heavy use areas within the operation plan and communicate this with contract holders. Future prospectus development would include similar considerations and are also subject to change for locations and amounts of use to maintain high-quality visitor experiences. If changes were necessary, the park would consider the financial impact of any proposed change.

VEGETATION

Mitigation actions would occur prior to, during, and/or after construction to minimize immediate and long-term impacts to vegetation. These actions would vary by specific project, depending upon the extent of construction and the types of species and habitat affected. Before ground disturbance or vegetation management could occur, qualified biologists would conduct studies to determine if rare, threatened, or endangered state or federally listed plant species were present to avoid disturbance and ensure appropriate locations and design of facilities. If present, park staff would first determine if protection zones or modifications to the planned facility location could be used to avoid disturbance of rare plants and would then implement those measures during construction. If disturbance could not be avoided, a botanist would transplant the plant to another area with similar habitat.

The project will comply with the Alaska Region Invasive Plant Management Plan Environmental Assessment and FONSI (NPS 2010):

- Equipment used in ground-disturbing operations will be cleaned of soil, mud, and debris and inspected by park personnel before it enters parks.
- Fill materials including gravel, crushed rock, topsoil, and stockpiled project materials will be acquired from sources identified as free of invasive plants.
- Equipment operators will avoid working in or moving equipment through infested areas. When this is not possible, equipment will be cleaned before leaving the area.
- Ground-disturbing projects will be monitored for invasive species for five years after project completion. *See the EA Restoration section (2.5.5) for post-project revegetation measures to minimize colonization success.*

Additionally, during all construction activities, best practices for invasive plants management would be employed, including:

- Minimize new soil disturbance, and select previously-disturbed areas for associated construction staging and stockpiling.
- Prior to necessary earthwork, carefully salvage topsoil and native vegetation from the construction footprint and store in another location; at that location stockpile the soil in a minimum-surface-area pile, and cover to prevent weed establishment; bed/care for the salvaged vegetation in mulch in such a way as to maximize survival.
- During construction, fence or clearly mark and enforce disturbance zones to prevent disturbances to vegetation outside construction limits.
- Ensure project personnel make daily checks of clothing, footwear, and equipment to ensure no exotic plant seeds and no off-site soil is transported to the work site.
- Thoroughly pressure-wash equipment offsite to ensure all equipment and machinery are clean and weed-free before being brought into the park and secondarily the project area.
- Consider covering all haul trucks bringing materials from outside the park to prevent seed transport and dust deposition.
- Obtain all fill, rock, topsoil, or other earth materials from certified weed-free sites.

Immediately upon completion of construction activities, the following measures would be implemented to maximize the effectiveness of vegetation restoration efforts:

- Reapply the previously-salvaged topsoil onto disturbed surfaces. Immediately transplant the previously-salvaged native vegetation into the topsoil, and care for it in such a way as to maximize survival. Aim to revegetate to restore the natural spacing, abundance, and diversity of native plant species as closely as possible.
- Monitor for and control/eradicate invasive species within disturbed areas.
- Use weed-free erosion-control blankets and waddles to reduce erosion and encourage establishment of native seedlings.
- Monitor the restored area to ensure that revegetation is successful, plantings are maintained, and unsuccessful plant materials are replaced.

As feasible, areas used by visitors such as new trails and social gathering places would be monitored for signs of native vegetation disturbance and for the presence of exotic plants. The park would use a variety of mitigation tools such as public education, erosion control, and barriers to control visitor use impacts on sensitive vegetation if impacts persist.

Finally, managers will consider dynamic vegetation contexts during design, construction, and maintenance (isostatic rebound, succession, etc.). Vegetation-related activities in cultural landscapes will be managed according to treatment and preservation maintenance plans that define objectives (historic asset protection, historic viewshed preservation, forest health and age diversity, windthrow and hazard tree risk, firewise considerations, etc.).

FISH AND WILDLIFE

Mitigation actions would occur prior to, during, and after construction to minimize immediate and long-term impacts to fish and wildlife. These actions would vary by specific project, depending on the extent of construction, its location, and the types of species and habitat affected. The National Park Service is already taking some actions to reduce wildlife-visitor conflicts within the Park. Additional mitigation actions specific to wildlife and fish would include the following, as appropriate.

Mitigation measures to reduce impacts to fish and wildlife could include, but are not limited to:

- Conduct surveys prior to vegetation removal (including hazard tree removal) to ensure that species of concern are not present. Work would not be conducted during nesting times (April 15 to July 1) or migration periods if the project site harbors wildlife that could be adversely impacted by construction.
- In trail design, consider alignment and design to reduce potential impacts to wildlife movement and ground nests. Trails would be placed to minimize the need for elevated boardwalks that may impede wildlife movement. Where feasible, boardwalks would be designed with railing gaps for the safe passage of large mammals.
- Monitor the natural soundscape and implement mitigation measures and best management practices identified under ‘Soundscapes’ to reduce adverse impacts to wildlife from acoustic disturbances.
- Continue to engage in activities outlined in the 2013 Glacier Bay Bear Management Plan. The plan outlines several activities that the park will engage in to reduce bear-human conflict including control of human food and attractants, enforcement of food and trash storage violations, visitor education, staff training, and use of deterrents such as bear pepper spray.
- Collect recreational fishing harvest data for the Bartlett River. If substantial changes in angler harvest and associated catch rates were observed, park staff would implement strategies to reduce recreational fishing pressure on fish populations, such as reducing daily bag limits, limiting gear types, or implementing temporary spatial or temporal closures.
- Continue to educate visitors about where they may encounter nesting birds, nest identification, nesting bird behavior, and appropriate responses (such as moving elsewhere) to encroachment upon nest sites or nesting behavior. If changes in nesting

success and survivorship because of trampling or disturbance were observed, park staff would implement strategies to reduce human impacts on bird populations, such as increasing signage, restricting off-trail travel, or implementing temporary spatial or temporal closures.

- Incorporate design features for the mooring facility that eliminate bottom chain scouring and minimize the contact footprint with the seabed and reduce impacts to wildlife living along the seafloor.
- Monitor the mooring facility for marine mammal entanglement. If marine mammal entanglement were observed, park staff would implement strategies to reduce risk of entanglement, such as changing the number or spacing of moorings, using mooring systems with different properties, or experimenting with devices to alert whales to the presence of an obstacle.

WETLANDS

Mitigation measures would be applied to protect wetland resources. Once an alternative has been selected, a survey would be performed to certify wetlands within the project area and to identify locations of wetlands and open water habitat more accurately. Wetlands would be delineated by qualified NPS staff or certified wetland specialists and marked before any construction starts. All pathway construction facilities would be sited to avoid wetlands, or if that were not feasible, to otherwise comply with EO 11990, the Clean Water Act, and Director's Order #77-1. Additional mitigation measures would include the following, as appropriate:

- Employ standard avoidance, minimization, and mitigation strategies.
- Avoid wetlands during construction, using bridge crossings or retaining walls wherever possible. Increased caution would be exercised to protect these resources from damage caused by construction equipment, erosion, siltation, and other activities with the potential to affect wetlands. Measures would be taken to keep construction materials from escaping work areas, especially near streams or natural drainages.
- Use elevated boardwalks over wetland sections where it is not feasible to avoid the wetland or apply feasible mitigation measures. Boardwalks along shorelines would be placed on helical piers or other elevated structures that can be periodically shifted toward the water to maintain the shoreline experience as isostatic rebound occurs.
- Design footbridges in such a way as to completely span the channel and associated wetland habitat (i.e., no pilings, fill, or other support structures in the wetland/stream habitat). If footbridges could not be designed in such a way as to avoid wetlands, then additional compliance (e.g., a Wetland Statement of Findings) would be done to assess impacts to wetlands and ensure no net loss of wetland area.

SOUNDSCAPES

Mitigation measures to protect soundscapes would include the following, as appropriate:

- Install and use next-generation broadband back-up alarms on park and construction contractor machinery to increase safety while minimizing human and wildlife disturbance and the effects on soundscape.

- Consider alternative and active transportation models that would reduce vehicular traffic and/or associated noise.
- Create interpretive materials that instill a culture of awareness of and respect for the value of natural soundscapes.
- Enforce existing noise ordinances (36 CFR §2.12). 36 CFR §2.12 is a federal regulation related to audio disturbances and prohibits noise that "... exceeds a noise level of 60 decibels measured on the A-weighted scale at 50 feet..."
- Work with boat operators to manage use of generators when at the dock or in Bartlett Cove. For commercial vessels (under contract or CUA), use of generators may be managed through their operating agreements.
- Advise visitors and park staff about the growing impact of loud vehicles, motors, and other unnecessary noise disturbances (e.g., radios).
- Implement standard noise abatement measures during construction and maintenance activities. Standard noise abatement measures may include the following elements: a schedule that minimizes impacts on adjacent noise-sensitive users; the use of best available noise control techniques wherever feasible; the use of quieter impact tools when feasible; the use of hand tools when feasible; the placement of stationary noise sources as far from sensitive uses as possible; and the use of noise-muffling, shielding, or fencing. Functioning mufflers would be installed and maintained on all motorized equipment. Engine idling would be reduced or eliminated.