



Draft Mountain Goat Management Plan / Environmental Impact Statement



2017

UNITED STATES DEPARTMENT OF THE INTERIOR – NATIONAL PARK SERVICE
MOUNTAIN GOAT MANAGEMENT PLAN / ENVIRONMENTAL IMPACT STATEMENT

Lead Agency: National Park Service, US Department of the Interior

Cooperating Agencies: USDA Forest Service, Washington Department of Fish and Wildlife

This *Draft Mountain Goat Management Plan / Environmental Impact Statement* (plan/EIS) for Olympic National Park (the park) evaluates the impacts of a range of alternatives for managing exotic mountain goats on the Olympic Peninsula in a manner that reduces impacts on park resources while reducing potential public safety issues associated with the presence of mountain goats. Upon conclusion of the plan/EIS and decision-making process, the alternative selected for implementation will become the mountain goat management plan, which will specifically address the issue of mountain goats within the park and in areas of the adjacent Olympic National Forest. The National Park Service (NPS) (at Olympic National Park) worked in cooperation with the Washington Department of Fish and Wildlife (WDFW), and the United States Department of Agriculture (USDA) Forest Service (Olympic, Mt. Baker-Snoqualmie, and Okanogan-Wenatchee National Forests) to prepare this plan/EIS.

This plan/EIS evaluates the impacts of the no-action alternative (alternative A) and three action alternatives (alternatives B, C, and D). Alternative A would involve full implementation of the 2011 *Mountain Goat Action Plan* including management of individual mountain goats in visitor use areas according to a continuum of mountain goat-human interactions. Specific management could range from hazing to lethal removal of hazardous mountain goats. Alternative B would focus exclusively on the capture of mountain goats within the park and on adjacent Olympic National Forest lands followed by transfer of ownership to the WDFW and release on National Forest System (NFS) lands at Mt. Baker-Snoqualmie and Okanogan-Wenatchee National Forests (North Cascades national forests). Translocation would be conducted at the discretion of WDFW to NFS lands in the North Cascades where mountain goats are native and supplementation of the existing population would further mountain goat conservation efforts (e.g., improve genetic diversity and enhance demographic vigor to depleted populations). Alternative C would use lethal removal to significantly reduce or eliminate mountain goats from the park and adjacent Olympic National Forest lands. Alternative D (preferred alternative) would use a combination of capture and translocation and lethal removal to reduce or eliminate mountain goats from the park and adjacent Olympic National Forest lands. Capture and translocation would take place wherever safe and feasible. Once a point of diminishing returns for capture operations is reached, management would continue using lethal removal activities. This plan/EIS analyzes impacts of these alternatives in detail for both the Olympic Peninsula area and NFS lands within the two national forest units located in the North Cascades Mountains that could receive mountain goats.

The review period for this plan/EIS will end 60 days after publication of the US Environmental Protection Agency Notice of Availability in the Federal Register. During the 60-day comment period, comments will be accepted electronically through the NPS Planning, Environment, and Public Comment (PEPC) website at <http://parkplanning.nps.gov/olyngoat> and in hard copy format delivered by the US Postal Service or other mail delivery service or hand-delivered to the address below. Written comments will also be accepted during public meetings on the plan/EIS. Comments will not be accepted by fax, email, or in any format other than those specified above. Bulk comments in any format (hard copy or electronic) submitted on behalf of others will not be accepted.

For further information, visit <http://parkplanning.nps.gov/olyngoat> or contact:

Olympic National Park
Mountain Goat Management Plan/EIS
600 East Park Avenue
Port Angeles, WA 98362-6798

Decision-Making Process

After reviewing and analyzing comments on the draft plan/EIS, the NPS will prepare a final plan/EIS and then issue a Record of Decision (ROD) that selects an alternative for implementation. In the event that an alternative is selected that involves removing goats (either via live capture or lethal means) from Olympic National Forest and/or translocating mountain goats to North Cascades national forests, the USDA Forest Service would have to authorize these actions on NFS lands, which could include issuing temporary closures around staging areas, capture sites, and lethal removal areas as needed, per 36 CFR 261 Subpart B, "Prohibitions in Areas Designated by Order." Therefore,

the responsible officials for the USDA Forest Service will decide through their own records of decision whether to authorize the following actions on their respective forests:

- The responsible official for the Olympic National Forest will decide whether to authorize the NPS to use helicopters to remove mountain goats from wilderness areas in the Olympic National Forest and transport them to staging areas; and whether to authorize temporary closures associated with the NPS capture operations, and at staging areas used by the WDFW.
- The responsible officials for the Mt. Baker-Snoqualmie and Okanogan-Wenatchee National Forests will decide whether to authorize the WDFW to establish temporary closures for staging and release sites and to release mountain goats with helicopters in the wilderness areas on their respective forests.

USDA Forest Service Objection Process

Actions proposed on NFS lands under this plan/EIS constitute activities that implement land management plans for the USDA Forest Service and are subject to the agency's pre-decisional objection process at 36 CFR 218 Subparts A and B. The objection process occurs prior to the Forest Service making a final decision (signing a ROD) and will include circulation of the final EIS and draft decision document (ROD). Legal notices to initiate the objection period will be published in the newspapers of record for the three national forests following publication of the Notice of Availability of the final EIS; objections will be submitted to the respective forests at that time.

The opportunity to provide comments to establish eligibility to object under 36 CFR 218 ends when the public comment period on this draft plan/EIS ends, as discussed above. Only those individuals who submit timely and specific written comments (36 CFR 218.2) regarding the proposed project or activity during the public comment period are eligible to file an objection (36 CFR 218.24(b)(6)). It is the responsibility of all individuals and organizations to ensure that their comments are received in a timely manner. For issues to be raised in objections, they must be based on previously submitted, specific, written comments regarding the proposed project or activity and must be attributed to the objector. For objection eligibility, each individual or representative from each entity submitting timely and specific written comments regarding the proposed project or activity must either sign the comments or verify identity upon request (36 CFR 218.24(b)(8)).

National Park Service
US Department of the Interior

Olympic National Park
Washington



DRAFT MOUNTAIN GOAT MANAGEMENT PLAN / ENVIRONMENTAL IMPACT STATEMENT

2017

Executive Summary



EXECUTIVE SUMMARY

This *Mountain Goat Management Plan / Environmental Impact Statement* (plan/EIS) analyzes the impacts that could result from a continuation of current management of an exotic mountain goat population on the Olympic Peninsula (the no-action alternative) by the National Park Service (NPS) and United States Department of Agriculture (USDA) Forest Service, as well as the impacts that could result from three action alternatives. The plan/EIS describes the reasons the NPS is taking action at this time and evaluates a range of alternatives for the management of exotic mountain goats on the Olympic Peninsula, as well as the associated actions proposed by the Washington Department of Fish & Wildlife (WDFW) to translocate mountain goats to National Forest System (NFS) lands in the North Cascade Mountains should an alternative involving translocation be implemented. Two separate project areas are being evaluated in this plan/EIS: (1) areas of Olympic National Park and Olympic National Forest, where exotic mountain goats could be reduced, which comprise the area referred to as the Olympic Peninsula; and (2) areas in the Mt. Baker-Snoqualmie National Forest and Okanogan-Wenatchee National Forest where mountain goats could be translocated, which comprise the area referred to as the North Cascades national forests.

PURPOSE OF TAKING ACTION

The purpose in taking action is to allow the NPS to reduce or eliminate impacts on park resources from exotic mountain goats, while reducing potential public safety issues associated with the presence of mountain goats in the park.

NEED FOR ACTION

Mountain goats are not native to the Olympic Peninsula. They were introduced to the Olympic Mountains prior to the establishment of the national park, and have since colonized the entire range, with the majority of the population residing within the park (Noss et al. 2000). The original need to manage this exotic species was an ecological concern related to the impacts that mountain goats impose on natural resources at the park, particularly sensitive vegetation communities (NPS 1995; Houston, Schreiner, and Moorhead 1994). New concerns were raised in 2010 when a visitor was fatally gored by a mountain goat while hiking on a park trail. Mountain goats have a high affinity for salts and natural sources of salt occur within their native range. There are no natural sources of salt in the Olympic Mountains, and mountain goats have learned to seek salts from humans. In areas with high levels of visitor use within the park and national forest, mountain goats have become conditioned to the extent that they are a nuisance and may be hazardous to visitors. The Olympic National Park *Mountain Goat Action Plan*, included as appendix A, addresses mountain goat behavior and seeks to minimize the potential for hazardous mountain goat-human encounters. This action plan focuses on the management of individual mountain goats that have been identified as potentially hazardous (appendix A). Additional planning and compliance is needed to address overall management of the mountain goat population on the Olympic Peninsula.

There is also a need to remove mountain goats from adjacent lands in the Olympic National Forest because mountain goats in these areas are part of a population that moves between the Olympic National Forest and Olympic National Park. As in the national park, mountain goats cause soil erosion, impact native plant communities, and occupy habitat for native species in the national forest. As a result of these concerns, a plan/EIS is needed to address the impacts of exotic mountain goats in the park and in the adjacent Olympic National Forest, which would include the interference with natural processes, native species, natural habitats, and impacts on visitor use and safety.

OBJECTIVES IN TAKING ACTION

Objectives are “more specific statements of purpose that provide additional bases for comparing the effectiveness of alternatives in achieving the desired outcomes of the action” and represent a refinement of the purpose of this plan/EIS. All alternatives selected for detailed analysis must meet all objectives to a large degree and resolve the purpose of and need for action. The following objectives relate to the management of mountain goats on the Olympic Peninsula:

- Develop a scientifically based method for the management of exotic mountain goat populations in an extensive mountainous wilderness area.
- Reduce or eliminate impacts on sensitive environments and unique natural resources from mountain goats in the park and in Olympic National Forest.
- Reduce or eliminate the potential for visitor safety issues associated with mountain goats in the park.
- Further public understanding of the Olympic high elevation ecosystems and native species and the ecology and conservation of mountain goats in their native range.
- Protect the International Biosphere Reserve and World Heritage Site designations of Olympic National Park and preserve the integrity of these designations.
- Protect the wilderness character of designated park wilderness and wilderness in Olympic National Forest.
- Work cooperatively with co-managers of mountain goats or habitats in Washington State (USDA Forest Service, WDFW, and tribes).
- Support the wildlife management objectives of cooperating agencies and tribes, to the extent practicable, with respect to mountain goats.
- Provide opportunities to reestablish or augment sustainable native mountain goat populations in suitable mountain goat habitat on NFS lands in the North Cascades national forests.

ISSUES RELATING TO THE PROJECT

Issues associated with mountain goats on the Olympic Peninsula are primarily related to visitor safety and the unique vegetation of the Olympic Mountains. Because many of the areas inhabited by mountain goats are popular destinations for park and national forest visitors, both in the frontcountry (e.g., Hurricane Ridge) and backcountry (e.g., Glacier Meadows), there is high potential for mountain goat-human interactions. Most notable are areas where mountain goats are habituated to human presence and have become conditioned to seeking salts and other minerals from humans. Mountain goats can be a nuisance along trails and around wilderness campsites where they persistently seek salt and minerals from human urine, packs, and sweat on clothing. They often paw and dig areas on the ground where hikers have urinated or disposed of cooking wastewater. The nature of mountain goat-human interactions can vary widely, such as humans observing mountain goats from several hundred meters away across a ridge, mountain goats approaching visitors, hazing events and hazardous interactions such as the October 2010 fatality.

Through herbivory and wallowing behaviors, mountain goats have directly and indirectly affected the vegetation in the Olympic Mountains. Changes in the relative abundance of plant species have been observed as a result of mountain goat herbivory; this has altered competitive interactions among plant species. Wallowing by mountain goats has impacted plant species as a result of soil disturbance and

subsequent creation of mineral substrates for colonization by disturbance-oriented plant species. As the mountain goat population on the Olympic Peninsula increased prior to live capture operations in the 1980s, changes in vegetation were substantial, and the status of rare plant populations became a concern.

ISSUES AND IMPACT TOPICS

The issues described above form the basis for identifying impact topics that can be used to organize the analysis of effects of mountain goats and the management actions being considered. Table ES-1 details the impact topics that are discussed and analyzed in the plan/EIS.

TABLE ES-1. SUMMARY OF IMPACT TOPICS

Impact Topic	Reason for Analysis
Mountain Goats	<p>On the Olympic Peninsula, any proposed management of mountain goats in this plan/EIS would have direct impacts on mountain goats.</p> <p>For the North Cascades national forests, impacts on mountain goats are analyzed as part of the wildlife topic. Any proposed management activities would have only beneficial impacts on mountain goats.</p>
Wilderness Character	<p>The congressionally designated Daniel J. Evans Wilderness was established in 1988 and comprises about 95% of the park. Adjacent to the park on Olympic National Forest are five wilderness areas. The NPS and USDA Forest Service are responsible for preserving wilderness character, defined by the 1964 <i>Wilderness Act</i> as "...the combination of biophysical, experiential, and symbolic ideals that distinguish wilderness from other lands."</p> <p>On the Olympic Peninsula, the presence of exotic mountain goats in wilderness, and their impacts on native species from grazing and wallowing results in adverse impacts on the natural quality of designated wilderness in Olympic National Park and Olympic National Forest. Additionally, any proposed management activities, such as the use of aircraft and firearms to remove mountain goats, could result in impacts on the untrammeled, undeveloped, and opportunities for solitude or primitive and unconfined recreational qualities of wilderness character.</p> <p>For the North Cascades national forests, impacts on wilderness character are also analyzed because proposed management activities, in particular the use of aircraft to translocate mountain goats, could impact the untrammeled and undeveloped qualities of wilderness character.</p>
Wildlife and Wildlife Habitat, Including Special-Status Species	<p>The Olympic Peninsula is home to a variety of native fish, birds, and other wildlife throughout its diverse habitats, including several endemic species due to its isolated biogeographic history. Similarly, the North Cascades national forests are home to an abundant and diverse assemblage of native fauna.</p> <p>On the Olympic Peninsula, mountain goats represent a source of competition that impacts certain native wildlife species and their habitat. Wildlife could be impacted by mountain goat management activities including hazing, aversive conditioning, capture, and lethal removal actions, the use of staging areas and associated site preparation, and aircraft or vehicular traffic.</p> <p>For the North Cascades national forests, impacts on wildlife are also analyzed because proposed management activities to translocate mountain goats would have the potential to impact wildlife, including sensitive and management indicator species.</p>

Impact Topic	Reason for Analysis
Vegetation, Including Special-Status Plant Species	<p>Mountain goats occupy high-elevation alpine and subalpine vegetation communities at or above treeline. The summer range of mountain goats is composed primarily of subalpine meadows, fragile alpine herbaceous communities, and sparsely vegetated scree and rock slopes. Mountain goats damage vegetation and destabilize soils through herbivory, trampling, and wallowing behaviors.</p> <p>On the Olympic Peninsula, the removal of mountain goats would reduce adverse impacts on native vegetation.</p> <p>For the North Cascades national forests, impacts on vegetation are also analyzed because translocation activities could result in the removal of vegetation at staging areas and the disturbance of vegetation at mountain goat release sites.</p>
Threatened or Endangered Species	<p>Several species that are federally listed under the <i>Endangered Species Act</i> (ESA), or their designated critical habitat, could be impacted by proposed mountain goat management activities, such as the use of aircraft or firearms.</p> <p>On the Olympic Peninsula, two species that could be impacted are the northern spotted owl and marbled murrelet, both listed as threatened.</p> <p>For the North Cascades national forests, impacts on threatened or endangered species are also analyzed because proposed management activities associated with staging areas and release sites, such as the use of aircraft, could impact six threatened or endangered species. These species includes the northern spotted owl (threatened), marbled murrelet (threatened), grizzly bear (threatened), Canada lynx (threatened), gray wolf (endangered), and wolverine (candidate).</p>
Acoustic Environment	<p>The natural soundscape in the Olympic Mountains is a special resource to park and national forest visitors. The park is one of the best examples of a natural soundscape found anywhere in the national park system and includes natural sounds that are part of the biological or physical resources of the park.</p> <p>On the Olympic Peninsula, any proposed mountain goat management activities, specifically the use of aircraft and firearms, would result in noise that could in turn impact visitors, wildlife, and wilderness character within the park and national forest.</p> <p>For the North Cascades national forests, although the proposed translocation of mountain goats would have similar impacts on the acoustic environment, those impacts are addressed within the context of the analysis of impacts on wildlife, wilderness character, and visitor use and experience.</p>
Soils	<p>Mountain goats cause soil disturbance and erosion by wallowing, trailing, and trampling.</p> <p>On the Olympic Peninsula, alpine and subalpine soils tend to be shallow, poorly developed, and fragile, making them sensitive to disturbance. Any proposed management that would reduce or eliminate mountain goats from areas with sensitive soils would result in beneficial impacts on soils.</p> <p>For the North Cascades national forests, impacts on soils are not analyzed because the translocation of mountain goats to their native range will not contribute adverse impacts on soils.</p>
Archeological Resources	<p>Mountain goat wallowing behavior has the potential to degrade or destroy archeological resources in the park and in national forests.</p> <p>On the Olympic Peninsula, only about one percent of the park has been systematically inventoried for archeological resources, although results from this work indicate that there are thousands of archeological sites within the project area. Mountain goat wallowing has had an adverse effect on both documented and undocumented archeological resources in the Olympic Mountains.</p> <p>For the North Cascades national forests, impacts on archeological resources are not analyzed because there are no known cultural, historic, or archeological resources within the project area that would be disturbed as a result of actions related to mountain goat restoration.</p>

Impact Topic	Reason for Analysis
Visitor Use and Experience	<p>Potential activities associated with the management of mountain goats, specifically the use of aircraft and firearms, would generate intermittent loud noises that could disrupt visitor activities and enjoyment of natural soundscapes. Proposed management activities could result in the temporary closure of areas.</p> <p>On the Olympic Peninsula, visitors to the park and adjacent national forest have indicated that the presence of habituated mountain goats deters them from hiking on trails, while other visitors have indicated that the presence of mountain goats in the Olympic Mountains enhances the visitor experience. The reduction or elimination of mountain goats could reduce recreational mountain goat hunting opportunities in the national forest.</p> <p>For the North Cascades national forests, impacts on visitor use and experience are also analyzed because future visitors would observe mountain goats more frequently and hunting opportunity would be increased due to increased mountain goat populations.</p>
Visitor and Employee and Safety	<p>The presence of mountain goats in the park and in the national forest can present threats to visitor and employee safety.</p> <p>On the Olympic Peninsula, many of the areas that mountain goats inhabit are hiking and camping destinations for visitors and thus, there is potential for mountain goat-human interactions. There have been attacks by mountain goats, although attacks are rare. Interactions between mountain goats and humans can range from neutral, to nuisance, to hazardous.</p> <p>For the North Cascades national forests, impacts on visitor and employee safety are also analyzed because translocated mountain goats would inhabit areas that are also popular destinations for national forest visitors, thus increasing the potential for interactions between mountain goats and humans.</p>

ALTERNATIVES CONSIDERED

The alternatives considered include a required “no-action” alternative and three action alternatives that were developed by the interagency planning team, which included federal and state agencies, and through feedback received during the public scoping process. The three action alternatives analyzed in this plan/EIS meet, to a large degree, the management objectives and address the purpose of and need for action. The alternatives are briefly described below.

Alternative A: No Action

Under the no-action alternative, options for the management of mountain goats on the Olympic Peninsula would be limited to those actions outlined in the park’s *Mountain Goat Action Plan* (appendix A), which are focused on preventing unacceptable mountain goat behavior. Management would be set up according to a continuum of mountain goat-human interactions and the appropriate park response to each. Common management activities under alternative A would include foot patrols, evaluation of mountain goat-human interactions, possible area closures, and use of nuisance animal control tools, including hazing and up to lethal removal. The frequency of management activities under alternative A would vary depending on the level of mountain goat-human interaction observed at a given time. The long-term duration of management activities would continue indefinitely, and may increase in frequency and intensity, because the mountain goat population within the park and national forest would continue to increase.

Elements Common to All Action Alternatives (Alternatives B, C, and D)

The action alternatives described below (alternatives B, C, and D) include several management elements that would be used to reach the goal of substantially reducing or eliminating mountain goats on the

Olympic Peninsula. Some elements are common to all three action alternatives and include the use of helicopters for access and transporting mountain goats, area closures for safety, and various interpretive tools to provide information and education to the public under an enhanced public outreach program. These are described in more detail below.

Interpretive Tools. Under all action alternatives, park and national forest staff would provide information and educational opportunities to the public through interpretive programs and visitor interactions regarding the management of mountain goats on the Olympic Peninsula. Public outreach would be enhanced to increase the public's awareness of the current mountain goat situation, and detailed information would be provided regarding impending mountain goat management activities or areas of potential closures in the park and national forest.

Helicopters. Under all action alternatives, helicopter operations would take place during two separate 2-week management periods in a given year: once in mid- to late July, and the second in late August to mid-September. Helicopters would be used for both capture and translocation, and lethal removal, operating up to a maximum of 12 days during each period, and a maximum of 8 hours per day. Flight paths would be determined by weather (clouds and winds), but in general, helicopters would take the most efficient routes between staging areas and mountain goat habitat.

Area Closures. Under all action alternatives, there would potentially be temporary area closures within both the park and national forest during management activities, which include capture and translocation and lethal removal operations. In general, trails and campgrounds would remain open to the public in both backcountry and frontcountry areas as long as management personnel determine it is safe to do so. As applicable for each alternative, closures would include areas near ongoing management activities and immediately surrounding staging areas. There would be no parkwide or forest-wide closures, and no area closures would be permanent.

Staging Areas. Under all action alternatives, staging areas would be required for mobilization of staff and equipment during management activities. The use of helicopters to access remote areas of the park and national forest would require a safe and accessible space for taking off, landing, and refueling. Five staging areas have been identified, with three sites in the northern part of the park and two sites on Olympic National Forest lands, beyond the southeastern boundary of the park.

Baiting. It is likely that salt blocks could be placed in remote areas of the park and national forest to attract mountain goats to suitable areas for carrying out management activities. Baiting areas would either be located away from public use areas or closed to public access to minimize mountain goat-human conflicts.

Lethal Removal. Under all action alternatives, there would be the potential for lethal removal of mountain goats. The timing and duration of lethal removal would vary dramatically for each action alternative. Lethal removal would be used as the only approach for mountain goat management under alternative C, but would be a secondary management approach under alternative D. Shotguns and high-powered rifles would be used for lethal removal actions. Ammunition would be non-toxic. Personnel involved, which could include NPS or other federal personnel, state personnel, or trained volunteers, would have the appropriate skills and proficiencies in the use of firearms to maximize public safety, including experience in the use of firearms for the removal of wildlife. Any lethal action would be completed as humanely as possible. Under all alternatives, mountain goats that sustain life-threatening injury during management activities would be dispatched as quickly as possible to minimize suffering.

Animal Welfare Tools and Considerations. The NPS would strive to use the most humane techniques possible for animal capture, transport, and handling to maximize individual animal welfare and health.

Translocation activities would be conducted in accordance with established WDFW translocation protocols; and when conducting lethal removal using firearms, consideration would be given to the choice of firearm and shot placement to ensure the humaneness of the action.

Research and Monitoring. Under all alternatives, research and monitoring activities would take place opportunistically based on available funding. Possible research and monitoring efforts could involve management efficacy analysis and mountain goat population studies. Mountain goat population surveys would be conducted in a manner similar to the no-action alternative.

Carcass Handling and Disposal. Under all action alternatives, mountain goat carcasses resulting from management activities could be left in the field, but relocated away from trails, campsites, or where visible from areas with high visitor use. If feasible, mountain goats that have been killed could be donated for processing and human consumption. Carcasses could be provided to the Skokomish Indian Tribe or other willing recipients who may wish to obtain hides and horns.

Alternative B: Capture and Translocation

Under alternative B, mountain goats would be captured within the park and in the adjacent Olympic National Forest, followed by transfer of ownership to WDFW and translocation to areas of the Mt. Baker-Snoqualmie and Okanogan-Wenatchee National Forests (North Cascades national forests), where mountain goats are native and augmentation of the existing populations would further mountain goat conservation. Mountain goats would be captured over the course of up to 3 to 5 years, with most activity in years 1 and 2. Capture operations would occur during two 2-week management periods per year: once in mid- to late July, and once in late August to mid-September. Captured mountain goats would be transported by helicopter to one of five staging areas for transfer to WDFW. WDFW would then translocate mountain goats in crates to the North Cascades national forests.

Capture and translocation under alternative B would most likely involve approximately 50% of the 725 mountain goats projected to occupy the Olympic Mountains by 2018. However, the number of mountain goats captured and translocated could be more or less, depending on capture success and the ability of WDFW to receive and translocate mountain goats. Following the 5-year initial management period, maintenance activities would consist of periodic capture and translocation efforts focused in areas of high visitor use, or areas experiencing high levels of resource damage, in order to reduce impacts by the remnant mountain goat population and to keep the mountain goat population at a reduced level.

Alternative C: Lethal Removal

Under alternative C, lethal removal using shotguns or high-powered rifles would be used to reduce or eliminate mountain goats from the park and adjacent Olympic National Forest. Mountain goats would not be translocated under this alternative. Specific management activities for the lethal removal of mountain goats would include helicopter- and ground-based use of firearms. Park staff and other approved personnel, including trained volunteers, would access areas on foot that are accessible, but in more remote areas, a helicopter would be used for lethal removal activities. Following lethal removal, mountain goat carcasses would remain on the landscape but would be moved from areas of high visitor use.

Initial lethal removal actions would involve removing as many mountain goats as possible from the Olympic Peninsula. It is expected that approximately 90% of the projected 2018 mountain goat population, or approximately 625 to 675 mountain goats, could be removed during the initial management phase and whose carcasses would be left on the landscape. Maintenance activities under alternative C would involve opportunistic ground- and helicopter-based lethal removal throughout the summer and fall seasons as personnel, funding, weather, and accessibility of targeted mountain goats allow. Maintenance

activities would be prioritized in proximity to areas of high visitor use and areas experiencing high levels of resource damage.

The timing and duration of the initial management phase under alternative C would be 3 to 5 years, with most activity occurring in years 1 to 3. Lethal removals would be conducted only if necessary in years 4 and 5. Helicopter-based operations would occur within the same 2-week management periods as described for alternative B, and ground-based lethal removal would take place opportunistically at any time during the year as needed.

Alternative D: Combination of Capture and Translocation and Lethal Removal (Preferred Alternative)

Under alternative D, initial management would involve the capture and translocation of as many mountain goats as possible, similar to alternative B, followed by a switch to lethal removal, similar to alternative C. Initial management activities under alternative D could last 3 to 5 years, with most of the activity in years 1 to 4. Some lethal removal could occur as early as the second capture bout in year 1, but only for those mountain goats that are determined to be uncatchable. The timing and duration of capture and translocation operations within a year would be the same 2-week management periods as described for alternative B. Translocation operations under alternative D would be identical to those described for alternative B.

Similar to alternative C, it is anticipated that initial management under alternative D would remove approximately 90% of the mountain goat population, or approximately 625 to 675 mountain goats, and carcasses of those mountain goats that are lethally removed would be left on the landscape. It is anticipated that the success rate for capturing mountain goats would diminish over time and management would likely switch to almost exclusively lethal removal during year 3 or year 4 of the initial management, but could begin as early as year 2. By year 5, most mountain goats encountered would be lethally removed.

ENVIRONMENTAL CONSEQUENCES

This document evaluates the impacts that would result from the proposed mountain goat management alternatives. The analysis used methods and assumptions that follow Council on Environmental Quality (CEQ) and US Department of the Interior regulations and guidance found in the 2015 NPS National Environmental Policy Act (NEPA) Handbook. A summary of the environmental consequences is provided below for each alternative, and a full analysis for each impact topic is evaluated in chapter 4.

Alternative A: No Action

Olympic Peninsula

Impacts under the no-action alternative would occur from potential management activities and from the continued presence of exotic mountain goats on the Olympic Peninsula. The management activities under this alternative would seek to address undesirable mountain goat-human interactions and thus, would occur infrequently and be of short duration, over an indefinite period. Direct, short-term, adverse impacts to wilderness character; wildlife and wildlife habitat, including special-status species; threatened or endangered species; acoustic environment; and visitor use and experience could result from hazing activities and associated human presence, although greater impacts would occur on the rare occasion that required mountain goat capture or lethal removal. However, impacts would be minimal for most affected resources because any disturbance or changes would be of limited duration and intensity. Under the no-

action alternative, impacts would occur over an indefinite period from the continued presence and growth of the mountain goat population, including from mountain goat-human interactions and due to mountain goat behaviors such as browsing, grazing, wallowing, trailing, and trampling. Although there would be some beneficial impacts on visitor use and experience from continued wildlife viewing opportunity, the increasing presence of mountain goats would continue to threaten visitor safety. In comparison to the action alternatives, the continued habitat degradation, alteration of forage resources, and soil disturbance due to the no-action alternative would have greater long-term, adverse impacts on the natural quality of wilderness character; wildlife and wildlife habitat, including special-status species; threatened or endangered species; soils; and archeological resources. The continued abundance of mountain goats would also likely have substantial adverse impacts on vegetation, including special-status plant species, through herbivory, trampling, and soil disturbance, which affects the relative abundance of plant species, alters interspecific competition, and degrades habitat for sensitive subalpine and alpine plant communities. As the mountain goat population continues to grow under the no-action alternative, these adverse impacts would expand geographically and in intensity.

North Cascades National Forests

Alternative A would have no impacts in the North Cascades national forests.

Alternative B: Capture and Translocation

Olympic Peninsula

During the first 3 to 5 years of initial management under alternative B, temporary adverse impacts would affect most resources analyzed due to capture and translocation activities, and associated preparation and use of staging areas. These impacts would occur intermittently each year during the two 2-week management periods. Management activities, including the use of aircraft, vehicles, and other equipment would produce direct, adverse impacts on the acoustic environment. In turn, the noise associated with these activities would have direct, periodic adverse impacts on the following resources: mountain goats; wilderness character; wildlife and wildlife habitat, including special-status species; threatened or endangered species; visitor use and experience; and visitor and employee safety. Increased human presence under alternative B, as well as handling of mountain goats, would further disturb mountain goats; wilderness character; wildlife and wildlife habitat, including special-status species; vegetation, including special-status plant species; and threatened or endangered species. Restrictions on public access or area closures during mountain goat capture and translocation activities, although temporary and localized, would adversely impact wilderness character and visitor use and experience. Most of these direct impacts would be temporary and intermittent, therefore the overall impact would be minimal; however, there would be substantial impacts on wilderness character from the noise associated with helicopter use at staging areas. These adverse impacts would progressively diminish in duration and intensity, as the need for management activities declines as the mountain goat population is decreased.

Maintenance activities under alternative B would have the same adverse, direct impacts as described for the initial management phase, although they would only occur periodically every few years. The capture and removal of mountain goats would have an adverse effect on the local mountain goat population because it would result in a large decrease in numbers, although mountain goats would remain in certain areas and be likely to rebound after initial management activities cease. However, assuming that maintenance activities are able to keep the mountain goat population at a lower level, alternative B would result in beneficial impacts on most resources, including substantial benefits to wildlife and wildlife habitat, including special-status species; vegetation, including special-status plant species; and soils due to reduced pressure on these resources by mountain goats. These beneficial impacts would continue for an extended duration. Adverse effects of the remaining mountain goat population from browsing, grazing,

wallowing, trailing, and trampling would continue indefinitely in certain areas of the Olympic Mountains, impacting the natural quality of wilderness character; wildlife and wildlife habitat, including special-status species; threatened or endangered species; soils; and archeological resources. Thus, the implementation of alternative B would produce fewer beneficial impacts on natural resources than alternatives C or D because those alternatives would eliminate a much larger number of mountain goats. The removal of mountain goats would have no long-term impact on the acoustic environment. Likewise, adverse impacts on visitor use and experience, and visitor and employee safety would continue under alternative B due to potential human interactions with any remaining mountain goats. For the visitor whose experience is enhanced by the ability to view mountain goats, minimal adverse impacts would result because although the mountain goat population would be reduced, there would still be a population present to view.

North Cascades National Forests

The translocation of mountain goats to the North Cascades national forests would have short-term, direct adverse impacts on all resources analyzed, although long-term, beneficial impacts are believed to outweigh those more immediate impacts. As on the Olympic Peninsula, the primary source of direct impacts would be from helicopter use, human presence, and other activities associated with preparing and using staging areas and release sites. There would be short-term, adverse impacts on the untrammelled and undeveloped qualities of wilderness character, as well as opportunities for solitude within wilderness areas. Impacts on wildlife, including special-status species, would include their displacement or disturbance, which could adversely affect the survival of some individuals; however, these effects would be limited in area and duration during management actions. Likewise, for several federally threatened or endangered species, including grizzly bear, Canada lynx, gray wolf, and wolverine an effects determination was made that proposed actions *may affect, but would not likely adversely affect* their survival and recovery. However, an effects determination was made that proposed translocation activities are *likely to adversely affect* the northern spotted owl and marbled murrelet because unknown nesting individuals near staging sites could be disturbed by helicopters and other human activity. Furthermore, adverse impacts on vegetation would occur during preparation of staging areas and release sites, but these effects would be limited to small areas and vegetation would recover following management activities. There would also be some short-term, adverse effects on visitor use and experience in the North Cascades national forests due to noise and sight of helicopters, as well as temporary closures of a few roads and trails. Lastly, adverse impacts on visitor and employee safety would occur due to risks associated with staging and release activities and increased future potential for human-mountain goat interactions.

Augmenting the mountain goat populations in the North Cascades national forests would have lasting beneficial effects on the viability of this Regional Forester Sensitive wildlife species through increased genetic diversity and enhanced demographic vigor to depleted populations. The natural quality of wilderness would be improved over the long term as a result of the mountain goat relocation as this would move these ecosystems toward their historical ecological condition. For other wildlife species and vegetation resources, management activities are unlikely to have any indirect or long-term, adverse impacts. The increased abundance of mountain goats would produce beneficial, lasting impacts on visitor use and experience due to increased opportunity to view native wildlife and possibly increased mountain goat hunting opportunity in the future from the translocation of mountain goats.

Alternative C: Lethal Removal

Olympic Peninsula

During the first 3 to 5 years of initial management under alternative C, temporary adverse impacts would affect most resources analyzed due to lethal removal actions, and associated preparation and use of

staging areas. These direct impacts would occur intermittently each year during the two 2-week management periods. The preparation and use of staging areas would result in adverse impacts on the same resources as described above under alternative B. Unlike alternative B, the duration of these impacts would be less frequent, and less intense because fewer helicopter flights to and from staging areas would be required because mountain goats would not be captured and translocated. Also, the impacts under alternative C would occur over a relatively shorter time frame because lethal removal would be a more efficient method to remove mountain goats. Adverse impacts on mountain goats on the Olympic Peninsula would be more substantial than under alternative B because of the number that would be lethally removed. Also, the use of firearms for lethal removal activities would produce additional noise and disturbance, which would further impact mountain goats; wilderness character; wildlife and wildlife habitat, including special-status species; vegetation, including special-status plant species; threatened or endangered species; visitor use and experience; and visitor and employee safety. The impacts from potential public access restrictions or area closures would be similar as under alternative B. Lastly, the presence of a large number of mountain goat carcasses on the landscape would have short-term benefits on scavenging wildlife, but would adversely impact the untrammelled quality of wilderness character. Overall, similar to alternative B, most direct adverse impacts of management activities under alternative C would be temporary and intermittent, and would diminish as increasing numbers of mountain goats are lethally removed. Maintenance activities under alternative C would have the same adverse, direct impacts as describe above for the initial management phase. However, such impacts would be more intermittent and less intense than those under alternative B because a much smaller number of mountain goats are expected to remain on the Olympic Peninsula after initial management.

After completion of management activities under alternative C, there would be long-term, beneficial impacts on most resources due to reduced impacts from exotic mountain goats. This alternative would also produce those benefits more quickly and to a larger degree than under alternative B. Some of the beneficial impacts would be substantial, including those to soils; wildlife and wildlife habitat, including special-status species; archeological resources; and visitor use and experience. One exception is that the lethal removal of mountain goats from the park would have a significant and permanent adverse impact on mountain goats on the Olympic Peninsula. These impacts would likely continue indefinitely because any mountain goats remaining on the landscape would be too few for the population to rebound. Beneficial impacts on visitor use and experience would result from the reduced potential for visitors to encounter mountain goats or to be inconvenienced by area closures related to the presence of conditioned or aggressive mountain goats. There would also be long-term, adverse impacts on visitor use and experience for those visitors that value seeing mountain goats in the Olympic Mountains.

North Cascades National Forests

Alternative C would have no impacts in the North Cascades national forests.

Alternative D: Combination of Capture and Translocation and Lethal Removal (Preferred Alternative)

Olympic Peninsula

Impacts associated with management of mountain goats under alternative D would include a combination of the impacts described under alternatives B and C. As described above for those alternatives, the initial management phase of mountain goat management activities would result in temporary adverse impacts on most resources from both capture and translocation operations and lethal removal actions. The preparation and use of staging areas would result in adverse impacts from aircraft, vehicle, and other equipment noise; direct disturbance from human activity; safety issues; and temporary limitations on public access in some

areas. The impacts associated with lethal removal activities would include disturbance from aircraft and firearm noise and the presence and disturbance of ground crews and would be concentrated during the final 2 years of initial management. The potential for adverse impacts would decrease substantially after management changes from capture and translocation to lethal removal activities, because lethal removal activities would require less helicopter flight time and fewer human resources. The resources affected include mountain goats; wilderness character, including opportunities for solitude and unconfined recreation; wildlife and wildlife habitat, including special-status species; vegetation, including special status plant species; threatened or endangered species; acoustic environment; visitor use and experience; and visitor and employee safety. Most of the adverse impacts would be temporary, intermittent, and minimal.

As described for alternative C, alternative D would result in long-term, beneficial impacts on most resources, including substantial beneficial impacts on the natural quality of wilderness, wildlife and wildlife habitat, including special-status species; vegetation, including special-status plant species; archeological resources; and soils, as a result of the removal of the majority of adverse impacts on these resources by mountain goats. The beneficial impacts would likely continue indefinitely because any mountain goats remaining on the landscape would be too few for the population to rebound. Long-term, beneficial impacts on visitor use and experience would result from the reduced potential for visitors to encounter mountain goats or to be inconvenienced by area closures related to the presence of conditioned or aggressive mountain goats. There would also be long-term, adverse impacts on visitor use and experience for those visitors that value seeing mountain goats in the Olympic Mountains.

North Cascades National Forests

Alternative D would have the same impacts in the North Cascades national forests as alternative B.

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Acronyms

ACETA	Aerial Capture, Eradication and Tagging of Animals
AGL	above ground level
APHIS	Animal & Plant Health Inspection Service
CEQ	Council on Environmental Quality
dBA	A-weighted decibel
ESA	<i>Endangered Species Act</i>
NEPA	<i>National Environmental Policy Act</i>
NFS	National Forest System
NPS	National Park Service
PEPC plan/EIS	NPS Planning, Environment, and Public Comment Website Mountain Goat Management Plan / Environmental Impact Statement
ROD	record of decision
SHPO	State Historic Preservation Office
USDA	US Department of Agriculture
USFWS	US Fish and Wildlife Service
WDFW	Washington Department of Fish & Wildlife

Chapter 1:
Purpose of and Need for Action



CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

INTRODUCTION

This *Mountain Goat Management Plan / Environmental Impact Statement* (plan/EIS) for Olympic National Park (the park) analyzes the impacts that could result from a continuation of current management of an exotic mountain goat population on the Olympic Peninsula (the no-action alternative), as well as the impacts that could result from three action alternatives.

This chapter describes the reasons the National Park Service (NPS) is taking action at this time to evaluate a range of alternatives for the management of exotic mountain goats in the park, and the subsequent actions by the Washington Department of Fish & Wildlife (WDFW) on National Forest System (NFS) lands in the North Cascades national forests. Two separate project areas are being evaluated in this plan/EIS: (1) areas of Olympic National Park and Olympic National Forest where exotic mountain goats could be reduced, which comprise the area referred to as the Olympic Peninsula; and (2) areas in the Mt. Baker-Snoqualmie National Forest and Okanogan-Wenatchee National Forest where mountain goats could be translocated, which comprise the area referred to as the North Cascades national forests.

This plan/EIS analyzes the impacts that could result from the no-action alternative and three action alternatives that involve lethal removal and/or translocation of nonnative mountain goats from the Olympic Peninsula.

PURPOSE OF TAKING ACTION

The purpose in taking action is to allow the NPS to reduce or eliminate impacts on park resources from exotic mountain goats (*Oreamnos americanus*), while reducing potential public safety issues associated with the presence of mountain goats in the park.

NEED FOR ACTION

Mountain goats are not native to the Olympic Peninsula. They were introduced to the Olympic Mountains prior to the establishment of the national park, and have since colonized the entire range, with the majority of the population residing within the park (Noss et al. 2000). The original need to manage this exotic species was an ecological concern related to the impacts that mountain goats impose on natural resources at the park, particularly sensitive vegetation communities (NPS 1995; Houston, Schreiner, and Moorhead 1994). New concerns were raised in 2010 when a visitor was fatally gored by a mountain goat while hiking on a park trail. Mountain goats have a high affinity for salts and natural sources of salt occur within their native range. There are no natural sources of salt in the Olympic Mountains, and mountain goats have learned to seek salts from humans. In areas with high levels of visitor use within the park and national forest, mountain goats have become conditioned to the extent that they are a nuisance and may be hazardous to visitors. The Olympic National Park *Mountain Goat Action Plan*, included as appendix A, addresses mountain goat behavior and seeks to minimize the potential for hazardous mountain goat-human encounters. This action plan focuses on the management of individual mountain goats that have been identified as potentially hazardous (appendix A). Additional planning and compliance is needed to address overall management of the mountain goat population on the Olympic Peninsula.

There is also a need to remove mountain goats from adjacent lands in the Olympic National Forest because mountain goats in these areas are part of a population that moves between the Olympic National Forest and Olympic National Park. As in the national park, mountain goats cause soil erosion, impact

native plant communities, and occupy habitat for native species in the national forest. As a result of these concerns, a plan/EIS is needed to address the impacts of exotic mountain goats in the park and in the adjacent Olympic National Forest, which would include the interference with natural processes, native species, natural habitats, and impacts on visitor use and safety.

OBJECTIVES IN TAKING ACTION

Objectives are “more specific statements of purpose that provide additional bases for comparing the effectiveness of alternatives in achieving the desired outcomes of the action” (NPS 2015e). Objectives presented below represent a refinement of the purpose of this plan/EIS and are focused primarily on objectives for Olympic National Park, although these would help meet the purpose and need for the Olympic National Forest areas that are adversely affected by mountain goats. All alternatives selected for detailed analysis must meet all objectives to a large degree and resolve the purpose of and need for action. Objectives for managing exotic mountain goats must be grounded in the enabling legislation, purpose, significance, and mission goals of the park, and must be compatible with the direction and guidance provided in the strategic plan, natural resources management plan, master plan, or other management guidance for the park. Any plan the park and cooperating agencies develop must be consistent with the laws, policies, and regulations that guide the NPS. The following objectives relate to the management of exotic mountain goats on the Olympic Peninsula:

- Develop a scientifically based method for the management of exotic mountain goat populations in an extensive mountainous wilderness area.
- Reduce or eliminate impacts on sensitive environments and unique natural resources from mountain goats in the park and in Olympic National Forest.
- Reduce or eliminate the potential for visitor safety issues associated with mountain goats in the park.
- Further public understanding of the Olympic high-elevation ecosystems and native species, and the ecology and conservation of mountain goats in their native range.
- Protect the International Biosphere Reserve and World Heritage Site designations of Olympic National Park and preserve the integrity of these designations.
- Protect the wilderness character of designated park wilderness and wilderness in Olympic National Forest.
- Work cooperatively with co-managers of mountain goats or habitats in Washington State (US Department of Agriculture (USDA) Forest Service, WDFW, and tribes).
- Support the wildlife management objectives of cooperating agencies and tribes, to the extent practicable, with respect to mountain goats.
- Provide opportunities to reestablish or augment sustainable native mountain goat populations in suitable mountain goat habitat on NFS lands in the North Cascades national forests.

MOUNTAIN GOATS ON THE OLYMPIC PENINSULA

Mountain goats are a native species in the State of Washington but are not native on the Olympic Peninsula. Approximately 12 mountain goats were introduced to the Olympic Peninsula near Lake Crescent from 1925 to 1929, prior to establishment of the national park. By the early 1980s, the mountain goat population in the park had grown to more than 1,000 individuals, with mountain goats distributed in

high-elevation habitats throughout the Olympic Peninsula (Houston, Moorhead, and Olson 1986). The highest density population was on Klahhane Ridge and included more than 200 mountain goats. The park implemented a series of live capture operations from 1981 to 1989, translocating 407 mountain goats to other mountain ranges throughout several western states (Houston et al. 1991). An additional 119 mountain goats were legally harvested during sport hunting seasons outside the park and 3 known mountain goats were illegally harvested in the park between 1983 and 1997. A second survey, conducted in July 1990 following the cessation of the NPS capture and translocation program, produced an estimate of 389 goats (Jenkins et al. 2012). Live capture operations were halted in 1990 for several reasons, including employee safety, animal safety, and changing Department of the Interior rules concerning helicopter landing techniques (NPS 1995). Subsequent surveys were conducted in 1994, 1997, and 2004, during a period in which no mountain goats were removed from the Olympic Mountains (Jenkins et al. 2012). A survey conducted in 2011 revealed that the population started increasing sometime between 2004 and 2011. Most recently, a 2016 survey revealed that the population has continued to increase to an estimated 625 mountain goats, with an 8% average annual rate of increase from 2004 to 2016. At this growth rate, there could be approximately 725 mountain goats on the Olympic Peninsula by 2018 (Jenkins et al. 2016).

Following the 2010 visitor fatality, the NPS developed the 2011 *Mountain Goat Action Plan* (appendix A) to provide guidance for addressing mountain goat behavior issues and minimizing the potential for hazardous encounters between mountain goats and humans. In 2015, a continuum for classifying and responding to mountain goat-human interactions was developed during a “Managing Animal Behavior” workshop attended by the Olympic National Park biologists (appendix B). Potential management actions identified in the continuum range from tracking mountain goat behavior to lethal removal of conditioned and aggressive mountain goats and are described in detail in appendixes A and B.

COOPERATING AGENCIES AND THE DECISION-MAKING PROCESS

The NPS is the lead agency for this planning process, whereas the USDA Forest Service and WDFW are participating as cooperating agencies. Management of mountain goats in Washington State is the primary responsibility of WDFW, but the USDA Forest Service is responsible for managing the vast majority of their habitat outside of Olympic National Park on both the Olympic Peninsula and in the North Cascades national forests (see FS 1991, FSM 2600). The NPS has jurisdiction over actions on NPS lands; however, NPS must also consider the impacts of its actions on other agencies’ lands. The USDA Forest Service has jurisdiction over the Olympic National Forest lands and must provide NPS and WDFW with permission to engage in certain proposed mountain goat management activities on its lands. The USDA Forest Service also manages lands in the North Cascades national forests, where WDFW proposes to translocate mountain goats depending on the alternative ultimately selected in this plan/EIS.

After reviewing and analyzing comments on the draft plan/EIS, the NPS will prepare a final plan/EIS and then issue a record of decision (ROD) that selects an alternative for implementation. In the event that an alternative is selected that involves removing goats (either via live capture or lethal means) from Olympic National Forest and/or translocating mountain goats to North Cascades national forests, the USDA Forest Service would have to authorize these actions on NFS lands, which could include issuing temporary closures around staging areas, capture sites, and lethal removal areas as needed, per 36 CFR 261 Subpart B. Therefore, the responsible officials for the USDA Forest Service will decide through their own records of decision whether to authorize the following actions in their respective forests:

- The responsible official for the Olympic National Forest will decide whether to authorize the NPS to use helicopters to remove mountain goats from wilderness areas in the Olympic National Forest and transport them to staging areas; and whether to authorize temporary closures associated with the NPS capture operations, and at staging areas used by the WDFW.

- The responsible officials for the Mt. Baker-Snoqualmie and Okanogan-Wenatchee National Forests will decide whether to authorize the WDFW to establish temporary closures for staging and release sites and to release mountain goats with helicopters in the wilderness areas in their respective forests.

IMPACTS ASSOCIATED WITH MOUNTAIN GOATS AT OLYMPIC NATIONAL PARK

Issues associated with mountain goats at the park are primarily related to visitor safety and the unique vegetation at the park. Because many of the areas inhabited by mountain goats are popular destinations for park visitors, both in the frontcountry (e.g., Hurricane Ridge) and backcountry (e.g., Royal Basin), there is a high potential for mountain goat-human interactions within the park. Most notable are areas where mountain goats are habituated to human presence and have become conditioned to seeking salts and other minerals from humans. Mountain goats can be a nuisance along trails and around wilderness campsites where they persistently seek salt and minerals from human urine, packs, and sweat on clothing. They often paw and dig areas on the ground where hikers have urinated or disposed of cooking wastewater. The nature of mountain goat-human interactions in the park can vary widely, such as humans observing mountain goats from several hundred meters away across a ridge, mountain goats approaching visitors, and hazardous interactions such as the October 2010 fatality (appendix A).

Issues associated with mountain goats at the park are primarily related to visitor safety and the unique vegetation at the park.

Through their herbivory and wallowing behaviors, exotic mountain goats have directly and indirectly affected the vegetation within the park. Changes in the relative abundance of plant species have been observed as a result of mountain goat herbivory; this has altered competitive interactions among plant species. Wallowing by mountain goats has impacted plant species within the park as a result of soil disturbance and subsequent creation of mineral substrates for colonization by disturbance-oriented plant species. As the mountain goat population in the park increased prior to live capture operations in the 1980s, changes in vegetation were substantial, and the status of rare plant populations became a concern (Houston, Schreiner, and Moorhead 1994).



Mountain goat wallow site

NPS MANAGEMENT POLICIES REGARDING REMOVAL OF EXOTIC SPECIES

Section 4.4.4.2 of *NPS Management Policies 2006* states that “all exotic plant and animal species that are not maintained to meet an identified park purpose will be managed—up to and including eradication—if (1) control is prudent and feasible, and (2) the exotic species: interferes with natural processes and the perpetuation of natural features, native species or natural habitats; or disrupts the genetic integrity of native species; or disrupts the accurate presentation of a cultural landscape; or damages cultural resources; or significantly hampers the management of park or adjacent lands; or poses a public health hazard as

advised by the U.S. Public Health Service (which includes the Centers for Disease Control and the NPS public health program); or creates a hazard to public safety.”

PARK BACKGROUND

Olympic National Park protects 922,651 acres of three distinct ecosystems, including rugged glacier-capped mountains, wild Pacific coast, and vast stands of old-growth and temperate rain forest. The park encompasses one of the largest wilderness areas in the contiguous United States; 95% (876,447 acres) of the park is designated as wilderness, offering visitors a chance to experience the diversity of the park in its natural and pristine state. The 3,500 miles of rivers and streams in the park are home to 29 species of native freshwater fish and support 70 unique stocks of Pacific salmon and steelhead. The park includes habitat for more than 1,100 species of native plants, 300 species of birds, and 65 species of mammals. The isolated peninsula has at least 24 endemic taxa that are not found anywhere else on earth (NPS 2008a, 2010). The maintenance or restoration of these native plants and animals is given priority over exotic species in the park, according to NPS *Management Policies 2006* (NPS 2006).

Throughout the diverse landscape of the park is an array of cultural and historic sites. Historic sites within the park document 10,000 years of human occupation, with 650 archeological sites. Local communities are closely and directly linked to the park in culture, heritage, and tradition, and provide important historical information and meaning to the landscape (NPS 2008a, 2010b).

Occupying the central core of the Olympic Peninsula, with a narrow strip along the Pacific coast, the park is the primary travel destination of the peninsula. More than five million people live within a 3- to 5-hour drive of the park in the region stretching from Vancouver, British Columbia, south to Seattle, Washington, and Portland, Oregon. The park is surrounded by a network of land and marine areas managed by state and federal agencies, tribes, and private interests. Among these entities are eight federally recognized tribes that have traditional association with the Olympic Peninsula. These tribes include the Lower Elwha Klallam Tribe, Jamestown S’Klallam Tribe, Port Gamble S’Klallam Tribe, Skokomish Indian Tribe, Quinault Indian Nation, Hoh Tribe, Quileute Nation, and Makah Tribe. Federally owned lands surrounding the park make up the Olympic National Forest, which consists of portions of land on all sides of the park and includes several designated wilderness areas (NPS 2008a, 2010).

Olympic National Park Enabling Legislation

The enabling legislation of Olympic National Park (Act of June 29, 1938, 52 Stat. 1241) states that the park is “set apart as a public park for the benefit and enjoyment of the people” (NPS 2008a).

Purpose and Significance of Olympic National Park

As stated in the 2017 *Olympic National Park Foundation Document* (NPS 2017c), “According to House Report 2247, April 28, 1938, the purpose of Olympic National Park is to preserve for the benefit, use, and enjoyment of the people, a large wilderness park containing the finest sample of primeval forest of Sitka spruce, western hemlock, Douglas fir, and western red cedar in the entire United States; to provide suitable winter range and permanent protection for the herds of native Roosevelt elk and other wildlife indigenous to the area; to conserve and render available to the people, for recreational use, this outstanding mountainous country, containing numerous glaciers and perpetual snow fields, and a portion of the surrounding verdant forests together with a narrow strip along the beautiful Washington coast.”

Within the national park system, statements of significance describe distinctive natural, cultural, and recreational resources and values that are the factual rationale for national recognition of the site. According to the 2017 *Olympic National Park Foundation Document* (NPS 2017c), the significance of the park includes the following:

- Olympic National Park protects several distinctly different and relatively pristine ecosystems that provide both ecological and scenic diversity to the Olympic Peninsula, ranging from wild Pacific coast and islands to densely forested lowlands to the glacier-crowned Olympic Mountains. Views of the mountain range define the landscape for great distances in all directions, and the rugged beauty of the coastline and verdant grandeur of the rainforest have inspired people for generations.
- The ecosystems protected within Olympic National Park contain a unique array of habitats and life forms, resulting from thousands of years of geographic isolation, along with extreme gradients of elevation, temperature, and precipitation. There are many animals and plants on the Olympic Peninsula that exist nowhere else in the world. The park is key to maintaining the populations of these taxa.
- Olympic National Park contains some of the last remaining undisturbed, contiguous aquatic habitat throughout the range of several west coast fish species. The park protects 12 major river basins, more than 3,500 miles of rivers and streams, more than 300 high mountain lakes, and 2 large lowland lakes. As a consequence, the park is entrusted with the stewardship of numerous unique stocks of Pacific salmonids and other native freshwater fish species. Salmon are a keystone species of the park's forest and aquatic ecosystems and are deeply woven into the cultural fabric of the Pacific Northwest.
- One of the largest wilderness areas in the contiguous United States is designated within Olympic National Park. By today's wilderness quality scale, the Daniel J. Evans Wilderness is superb. Few, if any NPS areas in the contiguous United States can approach or surpass the Daniel J. Evans Wilderness in terms of its near-pristine nature, grandeur, immensity, or variety of resources, which include glacier-covered mountains, subalpine lakes and meadows, extensive river valleys, old-growth coniferous forests, and the tremendously diverse wild Pacific coastline. The wilderness character of these lands is of inestimable value and among the most precious of the region's resources.
- Olympic National Park contains the finest remaining stands of old-growth temperate coniferous forest in the contiguous United States, including one of the finest remaining examples of temperate rainforest in the United States. These extensive forests of ancient and immense trees provide important habitat for complex communities of plants and animals, including a number of imperiled species.
- The Olympic rocky intertidal community is considered to be one of the most complex and diverse shoreline communities in the United States. Olympic National Park includes about 1,400 square miles of the intertidal, island, and shoreline habitat, and contributes to a large protected landscape of coastal and ocean habitats, including approximately 64 miles of shoreline, 52 of which borders designated wilderness.
- Olympic National Park is home to the largest population of Roosevelt elk in its natural environment in the world. Decades of protection from human harvest and habitat manipulation have sustained not only high densities of elk, but also preserved the natural composition, social structure, and dynamics of this unique western forestland sub-species of elk.

- Olympic National Park manages a variety of cultural resources, from ancient village sites to historic structures, which retain local, regional, or national significance. Eight federally recognized tribes (the Lower Elwha Klallam Tribe, Jamestown S’Klallam Tribe, Port Gamble S’Klallam Tribe, Skokomish Indian Tribe, Quinault Indian Nation, Hoh Tribe, Quileute Nation, and Makah Tribe) have, since time immemorial, sustained strong ties to the Olympic Peninsula and what is now the park. Hundreds of archeological and ethnographic sites attest to approximately 12,000 years of continuous use and connection to the park landscape. Park resources continue to provide material, spiritual, and cultural sustenance to contemporary descendants as they have for millennia.
- Olympic National Park serves as a recreational “backyard” for millions of people in the Puget Sound region and Olympic Peninsula region, in addition to attracting recreation visitors from across the nation and world.

The attributes of the park have led to multiple international designations. In 1976, the park was designated an International Biosphere Reserve in the Man and the Biosphere Program by the United Nations Educational, Scientific, and Cultural Organization. This identifies the park as an internationally significant ecosystem within one of the world’s major biogeographical provinces. The park is valued for the study of biological evolution and natural processes that are largely free of human disturbance. The park serves as a global benchmark of ecological health against which effects of human activities in similar environments can be compared. The park was recognized for its scientific values because it contains superb examples of temperate rain forests and is a large protected ecosystem. International recognition came to the park again in 1981 when it was declared a World Heritage Site by the World Heritage Convention, joining a system of natural and cultural properties that are considered irreplaceable treasures of outstanding universal value. Few areas in the United States are designated as both an International Biosphere Reserve and World Heritage Site (NPS 2008a).

- The park protects the primeval character of one of the largest wilderness areas in the contiguous United States.
- The park protects some of the finest remaining stands of old-growth temperate rain forest in the United States. These forests of ancient and immense trees provide habitat for dozens of smaller plants and animals, including important habitat for a number of threatened species.
- The park protects the largest population of Roosevelt elk in its natural environment in the world. Decades of protection from human harvest and habitat manipulation have sustained not only high densities of elk, but also preserved the natural composition, social structure, and dynamics of this unique coastal form of elk as found nowhere else.
- The park protects important cultural resources, with regional and national significance, including more than 650 archeological sites, hundreds of ethnographic sites, 31 cultural landscapes, and 16 historic districts. Within the park boundary, there are 121 historic structures on the List of Classified Structures.

PROJECT AREAS EVALUATED FOR IMPACTS

Olympic Peninsula

The project area includes Olympic National Park and Olympic National Forest on the Olympic Peninsula, focused in high-elevation mountain goat habitat (figure 1). Mountain goat habitat on the Olympic Peninsula comprises approximately 149,000 acres of high-elevation alpine and subalpine lands that are free of glacial ice and above 4,675 feet in elevation (Jenkins et al. 2011a, 2016). Mountain goat habitat outside of the park occurs primarily in adjoining wilderness areas in Olympic National Forest, as well as some non-wilderness areas on NFS lands.

Management activities proposed in this plan/EIS would also occur in some areas at lower elevations that are used by mountain goats as winter range, where opportunistic management activities could occur any time during the year. Additionally, there are several proposed staging areas for actions associated with mountain goat management in both Olympic National Park and Olympic National Forest (described in detail in chapter 2). As a result, the discussion of the affected environment and potential effects is limited to those resources that may be affected by proposed activities in mountain goat habitat and surrounding staging area locations.

Management actions proposed in this plan/EIS would be focused primarily in areas of the park and forest that are above 4,675 feet in elevation.

North Cascades National Forests

Two action alternatives in this plan/EIS propose translocating mountain goats to the North Cascades national forests, which include the Mt. Baker-Snoqualmie National Forest and Okanogan-Wenatchee National Forest (figure 2). Nine sites are proposed where mountain goats could be released in the Mt. Baker-Snoqualmie National Forest; two release sites are proposed in the Okanogan-Wenatchee National Forest (one site in the Methow Valley Ranger District and one in the Cle Elum Ranger District); and one release site is proposed on land owned by Seattle Public Utilities. These sites are characterized by high elevations and are within areas currently or historically occupied by mountain goats. As on the Olympic Peninsula, the North Cascades national forests also include potential staging areas where mountain goats could be received and prepared for transport via helicopter to identified release sites. Thus, the affected environment and analysis of potential effects of proposed actions includes the resources that could be affected within and surrounding mountain goat staging areas and release sites. The areas where mountain goats would be released also include several wilderness areas.

ISSUES AND IMPACT TOPICS

Issues describe the relationship between actions and environmental, social, or economic resources. Issues are usually concerns or problems that may occur if current management continues or if new management is implemented. These issues may describe concerns or obstacles to achieving the purpose of the plan/EIS. Issues may be questions, concerns, or other relationships, including beneficial ones (NPS 2015e).

This plan/EIS uses “impact topics” as headings to indicate which resources or values would be affected by each issue. One section addresses impact topics and actions proposed to remove mountain goats from the Olympic Peninsula. A separate section addresses issues and impacts that could occur in the North Cascades national forests if mountain goats are translocated there. The existing condition of the resources and values of these two areas are described in “Chapter 3: Affected Environment.” “Chapter 4: Environmental Consequences” provides a more detailed analysis of each impact topic presented below.

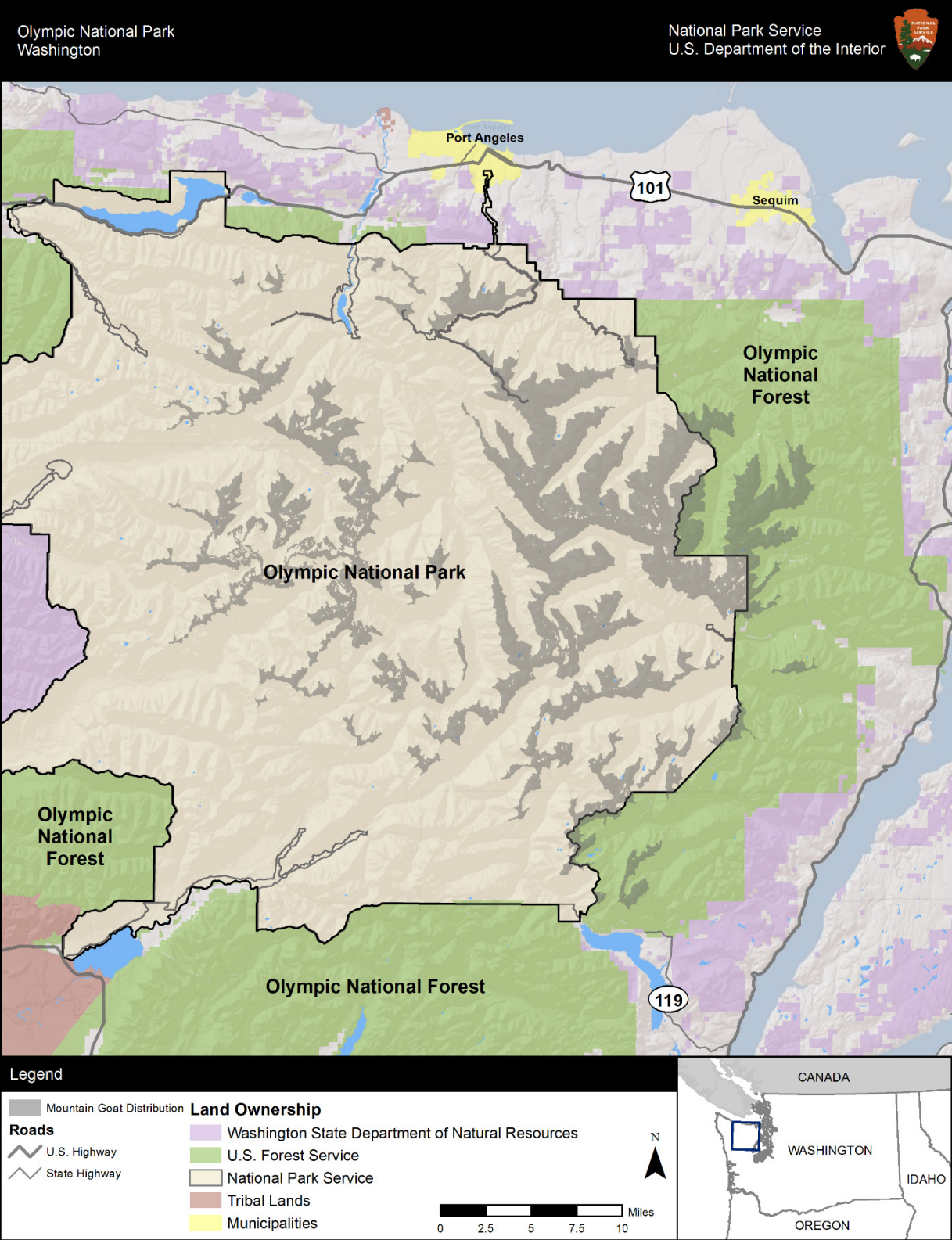


FIGURE 1. PROJECT AREA ON THE OLYMPIC PENINSULA

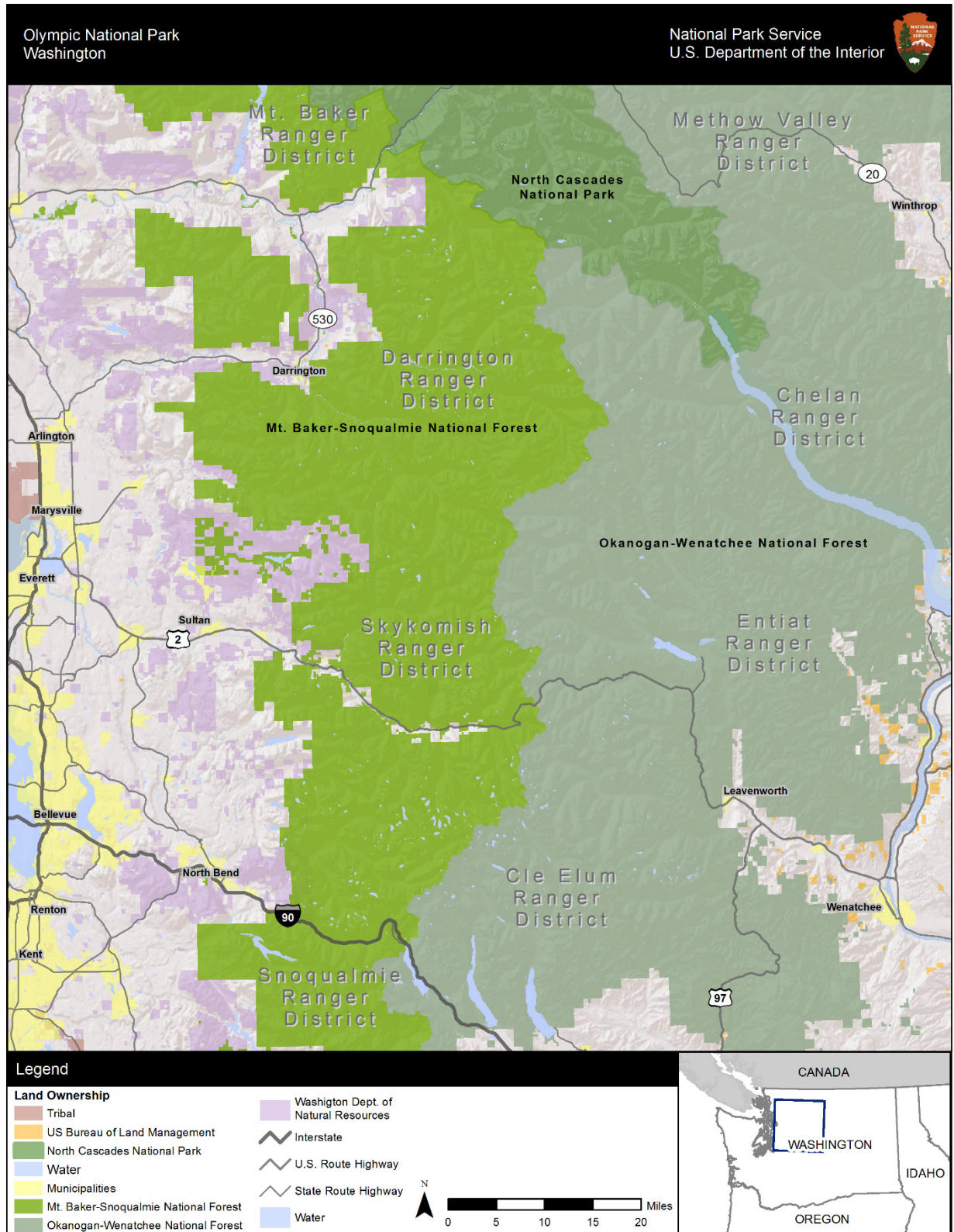


FIGURE 2. PROJECT AREA IN THE NORTH CASCADES NATIONAL FORESTS

Issues and Impact Topics – Olympic Peninsula

Mountain Goats

As noted above in the section “Mountain Goats on the Olympic Peninsula,” the 12 mountain goats introduced to the Olympic Peninsula grew to a population of more than 1,000 mountain goats. Although the goat population significantly declined to approximately 300 goats following the removals conducted in the 1980s, and was stable at that lower number for over a decade, the mountain goat population in the Olympic Mountains was observed to begin increasing after 2004 at an average annual rate of 8% (Jenkins et al. 2016).

Introduced exotic species often disrupt established ecosystem processes and pose management problems for national parks. In this situation, mountain goats have modified vegetation within the Olympic Mountains, affecting endemic plants (NPS 1995). According to NPS *Management Policies 2006* (NPS 2006), the NPS is required to prevent the introduction of exotic species and to remove, when possible, or otherwise contain individuals or populations of these species that have already become established in parks. Likewise, the USDA Forest Service National Strategic Framework for Invasive Species Management provides a consistent, agency-wide approach to the prevention, detection, and control of invasive species (USDA 2013). Based on the following issue statement, this impact topic is carried forward for detailed analysis.

Issue Statement. Any action to manage exotic mountain goats in the park and adjacent Olympic National Forest will have a clear and direct impact on the Olympic Peninsula mountain goat population.

Wilderness Character

The congressionally designated Daniel J. Evans Wilderness (formerly the Olympic Wilderness) was established in 1988 and comprises about 95% of the park. In Olympic National Forest, five wilderness areas were designated by the 1984 *Washington State Wilderness Act*, including the Buckhorn Wilderness (44,258 acres), Colonel Bob Wilderness (11,961 acres), Mount Skokomish Wilderness (13,015 acres), The Brothers Wilderness (16,682 acres), and Wonder Mountain Wilderness (2,349 acres) (FS 1990). The NPS and USDA Forest Service are responsible for preserving wilderness character, defined by the 1964 *Wilderness Act* as “...the combination of biophysical, experiential, and symbolic ideals that distinguish wilderness from other lands.” Based on the following issue statements, this impact topic is carried forward for detailed analysis.

Issue Statement. The presence of mountain goats, an exotic species, in wilderness, and the impacts on sensitive alpine and subalpine plant communities from grazing and wallowing disturbance result in adverse impacts on the natural quality of designated wilderness in Olympic National Park and Olympic National Forest.

Issue Statement. Proposed activities associated with the management of mountain goats within the park and adjacent national forest, such as the use of aircraft, firearms, and area closures to remove mountain goats, could result in impacts on the untrammeled, natural, undeveloped, and solitude or primitive and unconfined recreational qualities of wilderness character.

Wildlife and Wildlife Habitat, Including Special-Status Species

Wildlife populations in the park and national forest have been largely shaped by geographic isolation of the Olympic Peninsula, which has produced high levels of endemism. This biogeography has also prevented several species that occur in similar habitat on nearby mountain ranges from inhabiting the

Olympic Mountains, including mountain goats (Houston, Schreiner, and Moorhead 1994). From dense, mixed-conifer forests, to the subalpine meadows and rock slopes, the Olympic Peninsula is home to a variety of fish, birds, and other wildlife throughout these diverse habitats. This variety includes several endemic species (found nowhere else). The project area also contains habitat for a variety of species that are not federally listed, but have been designated as special-status species by the state or USDA Forest Service. For example, the Olympic pocket gopher (*Thomomys mazama melanops*) and the Olympic marmot (*Marmota olympus*) (USDA Forest Service sensitive species) occur within mountain goat habitat and it is possible that their habitat is indirectly impacted by mountain goat herbivory, trampling, and wallowing behaviors (NPS 1995). Based on the following issue statements, this impact topic is carried forward for detailed analysis.

Issue Statement. Proposed management activities associated with the use of staging areas for the management of mountain goats (including site preparation and any aircraft or vehicular traffic to and from sites), would have the potential to impact wildlife and wildlife habitat, including special-status species.

Issue Statement. Proposed management activities associated with management of mountain goats on the Olympic Peninsula (including actions associated with hazing, aversive conditioning, capture, and lethal removal), such as the use of aircraft or firearms, would have the potential to impact wildlife and wildlife habitat, including special-status species.

Vegetation, Including Special-Status Plant Species

Vegetation on the Olympic Peninsula is extremely diverse due to the elevational and climatic variety. Mountain goats occupy high-elevation alpine and subalpine vegetation communities. Within the summer range of mountain goats, vegetation communities range from subalpine meadows and herbaceous communities to scree and rock areas with little vegetation. In these areas, substrate stability and soil moisture are the primary factors in determining community distribution. The project area also contains habitat for a variety of species that are not federally listed, but have been designated as special-status species by the state or USDA Forest Service. Olympic Mountain milkvetch (*Astragalus australis* var. *olympicus*), a state imperiled and endemic species, occurs in mountain goat habitat. Other special-status vegetation species with the potential to be impacted by mountain goats or mountain goat management include triangular-lobed moonwort (*Botrychium ascendens*), tall bugbane (*Cimicifuga elata*), great polemonium (*Polemonium carneum*), and cut-leaf synthyris (*Synthyris pinnatifida* var. *lanuginose*). Additionally, of 33 taxa of rare or endemic plants known to occur in the summer range of mountain goats, four endemic species are grazed by mountain goats and it is reasonable to expect that mountain goats, as generalist herbivores, would also eat other rare or endemic plant species (NPS 1995). Based on the following issue statements, this impact topic is carried forward for detailed analysis.

Issue Statement. Mountain goats damage and kill vegetation within sensitive alpine and subalpine communities through herbivory, trampling, and wallowing behaviors. Any management of mountain goats that would reduce or eliminate them from areas with sensitive alpine and subalpine vegetative communities would remove a large source of adverse impacts on these resources.

Issue Statement. Management activities could result in the removal of small trees and brush at staging areas.

Threatened or Endangered Species

Wildlife species listed as threatened or endangered under the federal *Endangered Species Act* (ESA) with the potential to be impacted by mountain goat management activities include the northern spotted owl

(*Strix occidentalis caurina*) (listed as threatened under ESA) and marbled murrelet (*Brachyramphus marmoratus*) (listed as threatened under ESA). Although unlikely, management activities proposed by this plan/EIS could impact these two federally listed species. Based on the following issue statement, this impact topic is carried forward for detailed analysis.

Issue Statement. Proposed activities associated with the management of mountain goats on the Olympic Peninsula, such as the use of aircraft or firearms, would have the potential to impact threatened or endangered species, or designated critical habitat, during management activities.

Acoustic Environment

The natural soundscape (i.e., natural quiet) in park wilderness is a special resource to park visitors. The park is one of the best examples of a natural soundscape found anywhere in the national park system and includes natural sounds that are part of the biological or physical resources of the park (NPS 2008a). Based on the following issue statement, this impact topic is carried forward for detailed analysis.

Issue Statement. Potential activities associated with the management of mountain goats, specifically the use of aircraft and firearms, would result in noise that would be temporary and limited in duration but could in turn impact visitors, wildlife, and wilderness character within the park and adjacent national forest.

Soils

Alpine and subalpine soils in the Olympic Mountains are young and poorly developed, making them sensitive to disturbance. Mountain goats change soil erosion by wallowing, trailing, and trampling. Wallowing removes soil surface layers resulting in reduced water-holding capacity, reduced nutrients available for vegetation, increased soil aeration, and increased surface temperature. The soil disturbance from mountain goat wallowing provides less stability for plant regeneration. These changes to the soil can cause major shifts in plant community composition around wallow edges (NPS 1995). Based on the following issue statement, this impact topic is carried forward for detailed analysis.

Issue Statement. Mountain goats cause soil disturbance and erosion, which can impact soil integrity as well as the associated vegetative communities. Any management of mountain goats that would reduce or eliminate them from areas with sensitive soils would result in beneficial impacts on soils in the Olympic Mountains.

Archeological Resources

Mountain goat wallowing has the potential to degrade or destroy archeological resources in the park. Only one percent of the park has been surveyed for archeological resources. Mountain goat wallowing behavior has had an adverse impact on both documented and undocumented archeological resources and has resulted in previously unknown archeological resources being unearthed within the park (Conca pers. comm. 2015a). Based on the following issue statement, this impact topic is carried forward for detailed analysis.

Issue Statement. Mountain goat wallowing behavior has the potential to degrade or destroy archeological resources on the Olympic Peninsula.

Visitor Use and Experience

Because many of the areas that mountain goats inhabit are popular destinations for visitors to the Olympic Mountains, both in the frontcountry (e.g., Hurricane Ridge) and backcountry (e.g., Royal Basin), there is a high potential for interactions between mountain goats and humans (appendix A).

Hunting of mountain goats is prohibited within Olympic National Park, but is permitted in adjacent Olympic National Forest. This includes sport hunting as well as hunting by local tribal members. The mountain goat population crosses jurisdictional boundaries of the park and the national forest, limiting hunting opportunities, because the majority of mountain goats reside in the park. Based on the following issue statements, this impact topic is carried forward for detailed analysis.

Issue Statement. Visitors have indicated that the presence of habituated mountain goats deters them from hiking on trails within the park and adjacent national forest. Other visitors have indicated that the presence of mountain goats enhances the visitor experience. In addition, proposed mountain goat management activities could result in the temporary closure of areas or the use of helicopters that could disrupt visitor activities.

Issue Statement. Management activities proposed to reduce or eliminate mountain goats on the Olympic Peninsula could result in a reduced or eliminated mountain goat population within Olympic National Forest, substantially reducing or eliminating the potential for mountain goat hunting and thereby impacting recreational hunting opportunities.

Issue Statement. Management activities associated with the management of mountain goats, specifically the use of aircraft and firearms, would generate intermittent loud noises that could disrupt visitor enjoyment of natural soundscapes within the Olympic Mountains.

Visitor and Employee Safety

Habituated and salt-conditioned mountain goats interact with the public in many areas of the park and adjacent Olympic National Forest. These mountain goat-human interactions can range from neutral, to nuisance, to hazardous. Although attacks by mountain goats are rare, in 2010 a visitor was fatally gored by a mountain goat while hiking on a park trail. In Olympic National Forest in 1999, a similar incident occurred near Mt. Ellinor when a man was also gored in the thigh. In all reports of mountain goat-caused human injuries, the encounters were with large, mature male mountain goats in areas where there was a history of habituation and salt conditioning.

Because many of the areas that mountain goats inhabit are popular destinations for park visitors, there is a high potential for mountain goat-human interactions within the park and adjacent Olympic National Forest. Most notable are areas where mountain goats that are habituated to human presence have also become conditioned to seeking salts from humans. There are also safety issues that need to be addressed in the use of helicopters in steep alpine terrain. Based on the following issue statements, this impact topic is carried forward for detailed analysis.

Issue Statement. The presence of habituated and salt-conditioned mountain goats on the Olympic Peninsula can present threats to visitor and employee safety.

Issue Statement. Management operations associated with the capture or lethal removal of mountain goats may involve the use of helicopters within steep, uneven terrain, which could present a threat to visitor and employee safety.

Issues and Impact Topics – North Cascades National Forests

Wilderness Character

There are numerous designated wilderness areas in the North Cascades national forests, including the Glacier Peak Wilderness, Alpine Lakes Wilderness, and Henry M. Jackson Wilderness. Within these congressionally designated wilderness areas, the USDA Forest Service is responsible for preserving wilderness character, defined by the 1964 *Wilderness Act* as "...the combination of biophysical, experiential, and symbolic ideals that distinguish wilderness from other lands." The definition of wilderness found in section 2(c) of the 1964 *Wilderness Act* identifies four qualities of wilderness character that unify all wilderness areas regardless of size, location, or any other feature. These four qualities are natural, untrammeled, undeveloped, and providing opportunities for solitude or primitive and unconfined recreation. A fifth quality, "other features of value," is often added to these four because wilderness may preserve other features that are of scientific, educational, scenic, or historical value. Based on the following issue statement, this impact topic is carried forward for detailed analysis.

Issue Statement. Potential activities associated with the translocation of mountain goats to the North Cascades national forests, including the use of aircraft to transfer mountain goats from staging areas to release sites, could result in impacts on wilderness character.

Wildlife, Including Sensitive and Management Indicator Species

The North Cascades national forests are home to a diversity of plant and animal species, which includes approximately 75 species of mammals and 200 species of birds that either pass through or use the region for a breeding area (NPS 2016a). To maintain these species, the USDA Forest Service has policies for developing and implementing conservation strategies for sensitive species (Regional Forester Sensitive, Management Indicator, and Survey and Manage). Sensitive species may require special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for federal listing (FS 2011). Based on the following issue statement, this impact topic is carried forward for detailed analysis.

Issue Statement. Management activities associated with the use of staging areas and release sites for the translocation of mountain goats (including site preparation and any aircraft or vehicular traffic to and from sites), would have the potential to impact wildlife, including sensitive and management indicator species.

Vegetation

Dominant vegetation zones include the western hemlock (*Tsuga heterophylla*), Pacific silver fir (*Abies amabilis*), mountain hemlock (*Tsuga mertensiana*), and subalpine fir (*Abies lasiocarpa*) zones. Much of the project area is within the alpine zone, and covered by glaciers. No Regional Forester Sensitive plants are expected to be affected.

Issue Statement. Translocation activities would require removal of small trees at staging areas and could result in the crushing of vegetation at landing locations.

Threatened or Endangered Species

Federally listed threatened or endangered wildlife species with the potential to have habitat overlapping with mountain goats or to be impacted by mountain goat management activities include northern spotted owl (*Strix occidentalis caurina*) (listed as threatened under ESA), marbled murrelet (*Brachyramphus*

marmoratus) (listed as threatened under ESA), grizzly bear (*Ursus arctos horribilis*) (listed as threatened under ESA), Canada lynx (*Lynx canadensis*) (listed as threatened under ESA), gray wolf (*Canis lupus*) (listed as endangered in the western two-thirds of Washington under ESA), and wolverine (*Gulo gulo luscus*) (listed as proposed threatened). No threatened or endangered plants or fish in the North Cascades national forest area would be affected by mountain goat management activities. Based on the following issue statement, this impact topic is carried forward for detailed analysis.

Issue Statement. Management activities associated with the use of staging areas and release sites for the translocation of mountain goats, such as the use of aircraft, would have the potential to impact threatened or endangered species, or designated critical habitat.

Visitor Use and Experience

Because staging and release areas involved in mountain goat release activities in the North Cascades national forests overlap with areas used by the public, there is potential for impacts on visitor use and experience. Based on the following issue statements, this impact topic is carried forward for detailed analysis.

Issue Statement. Management activities associated with the use of staging areas and release sites for the translocation of mountain goats could result in impacts on visitor use and experience due to temporary trail, trailhead, and road closures, as well as the sight and sound of helicopters near areas of high recreational visitor use.

Issue Statement. The translocation of mountain goats to the North Cascades national forests could benefit visitor use and experience by providing an increased opportunity to view native wildlife and possibly increase mountain goat hunting opportunities in the future.

Visitor and Employee Safety

Because areas that mountain goats inhabit are also destinations open to visitors, there is a potential for mountain goat-human interactions in the North Cascades national forests. Based on the following issue statements, this impact topic is carried forward for detailed analysis.

Issue Statement. The translocation of habituated or salt-conditioned mountain goats to the North Cascades national forests, and their future population growth, could present a threat to visitor and employee safety.

Issue Statement. Management operations associated with the translocation of mountain goats may involve the use of helicopters within steep, uneven terrain, which could present a threat to visitor and employee safety.

Issues Eliminated from Further Consideration – Olympic Peninsula

In addition to the issues and impact topics described above that have been identified for further analysis in this plan/EIS, several others were raised during internal, agency, and public scoping. Using the same considerations for determining issues carried forward for detailed analysis, the interdisciplinary team analyzed these issues and determined they did not warrant more detailed discussion. The following impact topics and issues were therefore removed from detailed consideration in the Olympic Peninsula sections of this plan/EIS.

Streaked Horned Lark, Yellow-billed Cuckoo, Taylor's Checkerspot, Whitebark Pine, and Threatened or Endangered Fish

According to the US Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System website, three additional federally listed wildlife species and one candidate plant species have the potential to occur in the project area on the Olympic Peninsula. These species are the streaked horned lark (*Eremophila alpestris strigata*) (listed as threatened under ESA), yellow-billed cuckoo (listed as threatened under ESA), Taylor's checkerspot butterfly (*Euphydryas editha taylori*) (listed as endangered under ESA), and whitebark pine (*Pinus albicalus*) (listed as a candidate species for the ESA). However, these species use habitats that would not be affected by proposed actions in this plan/EIS, or have never been documented as occurring in Olympic National Park or Olympic National Forest. Because management activities associated with this plan/EIS would not impact them, these four species are not carried forward for detailed analysis. No threatened or endangered fish on the Olympic Peninsula would be affected by proposed mountain goat management activities.

Water Quality and Hydrologic Resources

Although there is the potential for low levels of sedimentation due to erosion resulting from mountain goat wallowing behavior, these impacts are more closely related to the destruction of alpine soils than to water quality and hydrologic resources. As a result, this topic was dismissed from detailed analysis.

Air Quality, Greenhouse Gas Emissions, and Climate Change

Although management actions may result in emissions of criteria pollutants pursuant to the *Clean Air Act* and greenhouse gases due to the use of aircraft and other vehicles, contributions would be extremely low and would result in impacts on air quality and greenhouse gas emissions that would be below de minimus levels. As a result, air quality and greenhouse gas emissions were dismissed from detailed analysis.

The effects of climate change can result in increased stress to natural systems. A large and varied number of potential climate change impacts are anticipated within the Pacific Northwest, including decreased mountain snowpack, earlier snowmelt, potential extinction of local populations, loss of biological diversity, and many others (CIG 2015). Although climate change could impact the resources discussed in this plan/EIS, the alternatives are not expected to have an impact on climate change. For example, the management activities proposed to capture mountain goats would result in fossil fuel consumption from helicopters and trucks, but the greenhouse gas emissions associated with these activities would be negligible because of the limited number of flights that would be anticipated. As a result, climate change was dismissed from detailed analysis.

Unique Ecosystems, International Biosphere Reserve, World Heritage Sites

Park attributes have led to multiple international designations, including the park being named an International Biosphere Reserve in 1976 and being declared a World Heritage Site in 1981. These designations label the park as an area to be valued for study of biological evolution and natural processes that are largely free of human disturbance and as a natural and cultural property that represents an irreplaceable treasure of outstanding universal value. Few areas in the United States are designated as both an International Biosphere Reserve and World Heritage Site (NPS 2008a).

The park is recognized for ecosystem diversity that includes glacier-clad peaks, extensive alpine and subalpine meadows, and extensive old growth forests, which include one of the best examples of intact and protected temperate rainforests in the Pacific Northwest. Multiple major rivers systems offer some of the best habitats for anadromous fish species in the country (UNESCO 2015a).

According to the United Nations Educational, Scientific, and Cultural Organization, the primary danger to the integrity of the park's unique attributes is the presence of mountain goats. As a result of the isolation of the park, mountain goats never naturally dispersed to the Olympic Mountains and their introduction "may be causing significant changes in the natural ecosystem. The mountain goats have reduced plant cover, increased erosion, and shifted plant-community dominant species toward more resistant or less palatable species" (UNESCO 2015b).

Because threats to unique ecosystems and related designations are primarily concerning impacts on vegetation, soils, and wildlife, potential impacts on the park's special designations are addressed through analysis of these resources. Additionally, because action alternatives associated with this plan/EIS would reduce or eliminate mountain goats, an exotic species, from the natural ecosystem, these designations would not be negatively impacted. As a result, this topic was dismissed from detailed analysis.

Socioeconomic Resources

Although the State of Washington and the local tribes have a mountain goat hunting season on the Olympic Peninsula, and management of mountain goats on the Olympic Peninsula may result in a decreased huntable population outside of the park, this activity does not generate significant income and would therefore have no impact on socioeconomic resources in the area surrounding the park. Additionally, there is no tourism industry associated with mountain goats on the Olympic Peninsula. As a result, this topic was dismissed from detailed analysis.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations." A minority population exists within an affected area when either the minority population exceeds 50%, or the minority population is meaningfully greater than the minority population of the general population (CEQ 1997).

Minority populations on the Olympic Peninsula are largely made up of native tribal communities that participate in native forest harvest practices. As discussed for socioeconomic resources, the State of Washington and the local tribes have a mountain goat hunting season on the Olympic Peninsula, and management of mountain goats within the park may result in a decreased huntable population outside the park. However, although minority populations are present on tribal lands surrounding the park, tribal hunting activities do not generate significant income or subsistence and would therefore not disproportionately impact low-income or minority populations in the area surrounding the park. As a result, environmental justice was dismissed from detailed analysis.

Cultural Landscapes

A cultural landscape is "a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions" (NPS 1998). Three of the four cultural landscapes within the park are located within designated wilderness areas. However, none of these cultural landscapes is in the project area for this plan/EIS and would not be impacted by the management of mountain goats. As a result, the cultural landscapes topic was dismissed from detailed analysis.

Historic Structures

Historic structures are defined as “material assemblies that extend the limits of human capability” (NPS 1998). Simply, this means a constructed work, usually immovable by nature or design, consciously created to serve some human activity. Historic structures within the project area include the Dodger Point Lookout, the Snowdome Research Facility, and two shelters in Glacier Meadows. However, these resources would not be impacted by the management of mountain goats. As a result, the historic structures topic was dismissed from detailed analysis.

Ethnographic Resources

Ethnographic resources are any “site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence or other significance in the cultural system of a group traditionally associated with it” (NPS 1998). Ethnographic resources are a component of “Other Features of Value” considered in the definition of wilderness character. Ethnographic resources within the project area include beargrass and Alaska yellow cedar. However, the potential for adverse impacts on these resources from the management of mountain goats (presence of removal crews on the ground) would be very small and impacts from the removal of mountain goats would be beneficial over the long term. As a result, the ethnographic resources topic was dismissed from detailed analysis.

Exotic Plant Species

There are more than 300 exotic plant species within the Olympic Mountains. Many exotic plant species are found in disturbed areas of the frontcountry near roads. Exotic plant species are typically found at lower elevations not associated with mountain goat habitat, and generally would not be expected to successfully establish in alpine environments. If areas of exotic plant infestation were detected at staging areas, these areas would be avoided or approved mitigation measures would be applied. As a result, no impacts related to the spread of exotic species would be expected under any of the alternatives. This topic was therefore dismissed from analysis as a component of impacts on vegetation.

Impacts on Soils and Visitor Safety at Staging Areas

Staging areas would be located in previously disturbed areas with paved, graveled, or vegetated surfaces. Site preparation could be necessary to facilitate operations at some staging areas, which are in previously disturbed habitats, resulting in no measurable impacts on soils. As a result, staging areas were dismissed from analysis as a component of impacts on soils.

All staging areas have been selected in part on the basis of the ability of NPS, WDFW, and USDA Forest Service to control access, and all would be temporarily closed to the public while mountain goat management activities are taking place at the site. Thus, no opportunities for injury or other adverse visitor safety impacts on visitors would be expected to result from activities at staging areas. As a result, staging areas were dismissed from analysis as a component of impacts on visitor safety.

Impacts on Soils from Management Actions

Management actions would not permanently disturb soils or change soil profiles. Soils would be traversed and helicopters would touch down in some locations, but these actions would only cause slight, temporary disturbance to soils. Therefore, impacts on soils from management actions were dismissed from detailed analysis.

Issues Eliminated from Further Consideration – North Cascades National Forests

Issues and impact topics related to translocating mountain goats into North Cascades national forests area were analyzed by the USDA Forest Service. For some issues, it was determined that there would be no impacts or very limited impacts; therefore, these issues do not warrant more detailed discussion. The following issues and impact topics were therefore removed from detailed consideration in the North Cascades national forests section of this plan/EIS.

Water Resources

Mountain goat restoration activities would not be expected to involve the direct use of or activity in any water resources, including wetlands and floodplains. Given the anticipated nature, scope, and scale of restoration activities, potential impacts could be avoided through mitigation measures such as keeping equipment and personnel out of riparian areas and wetlands. The nine aquatic conservation strategy objectives have been considered and are found in appendix C. No impacts on water resources or water quality of those features are expected as a result of the implementation of mountain goat restoration activities; therefore, this topic was dismissed from further consideration.

Air Quality

The North Cascades national forests lie in the path of prevailing westerly winds blowing from rapidly growing urban-industrial and agricultural areas in the Puget Sound region. Pollutants such as particulate matter, ozone, acid deposition, mercury, and pesticides have been detected across the surrounding region. Some of the activities associated with mountain goat translocation activities would require fossil fuel consumption, such as the use of vehicles and helicopters to carry out prescribed management activities. However, the increase in emissions from these activities would be minimal over the short term, resulting in only negligible impacts on regional air quality relative to existing conditions, and these activities would be consistent with the *Clean Air Act*. This topic was therefore dismissed from further consideration.

Geology and Soils

Mountain goat translocation activities in the North Cascades national forests would not be expected to result in any direct ground disturbance. Although mountain goats are known to disturb soils, they are native to the North Cascades and currently inhabit these areas; therefore, any soil disturbance from additional mountain goats would be a natural and expected component of their native ecosystem. Given the anticipated nature, scope, and scale of mountain goat restoration activities, no impacts on geology or soil resources are anticipated; therefore, this topic was dismissed from further consideration.

Cultural and Historical Resources

There are no known cultural, historic, or archaeological resources within the project area that would be disturbed as a result of actions related to mountain goat restoration (Alford pers. comm. 2016). Because there would be no direct or indirect effects on cultural or archeological resources resulting from mountain goat release activities in the North Cascades national forests, this impact topic was dismissed from further consideration.

Visual Resources

Mountain goat restoration activities would not be expected to have any direct or indirect impacts on visual resources. Any visual impacts that may result from the presence of vehicles, equipment, and personnel during the implementation of mountain goat restoration activities are analyzed within the context of the impacts on visitor use and experience or wilderness character, as applicable. Therefore, this topic was dismissed from further consideration.

Climate Change and Greenhouse Gas Emissions

The reasons for dismissing climate change and greenhouse gas emissions are the same as stated above for the Olympic Peninsula.

Acoustic Environment

If mountain goats are translocated to the North Cascades national forests, the noise from the use of aircraft, particularly in designated wilderness areas, or other vehicles outside of wilderness areas could adversely affect wildlife, wilderness character, and visitor use and experience. The soundscape is expected to have intermittent and temporary impacts; however, these noise impacts are addressed within the context of the analysis of impacts on wildlife, wilderness character, and visitor use and experience; therefore, this topic was dismissed from consideration as a separate impact topic.

Exotic Species

The reasons for dismissing exotic species as an impact topic are the same as stated above for the Olympic Peninsula.

Environmental Justice

The reasons for dismissing environmental justice as an impact topic are the same as stated above for the Olympic Peninsula.

Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by congress in 1968 (Public Law 90-542; 16 United States Code (USC) 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. Rivers are classified as wild, scenic, or recreational.

The Skagit Wild and Scenic River is designated as a Recreational and Scenic River to conserve its outstandingly remarkable fisheries, wildlife, and scenic values. Temporary use of an area, referred to as the Green Mountain Pasture staging area, would not affect the scenic quality of the Skagit River because the staging area is not visible from the edge of the wild and scenic river. The use of this staging area to receive and transfer mountain goats would be temporary, therefore would not adversely affect the scenic quality nor any of the other outstandingly remarkable values of the river.

The Snowking Meadow release site is near the Illabot Creek Wild and Scenic River. Augmenting existing native mountain goat populations in the wild and scenic river corridor by adding additional mountain goats to suitable habitat would not affect the existing wild or recreational values of Illabot Creek. Although the mountain goats would be placed within the designated recreational and wild corridor, there

would be no adverse impacts on the free flow, water quality, or outstandingly remarkable values of the Illabot Creek.

For these reasons, this was dismissed for consideration as a separate impact topic.

Prime Farmland, Park Land, or Range Land

There is no prime farmland, park land, or range land within the project area and no impact on these areas is expected.

Research Natural Areas

The Mount Stillaguamish release site is located just outside of the Perry Creek Research Natural Area. The Twin Peak translocation patch includes almost all of the 2,300-acre Research Natural Area. Perry Creek Research Natural Area was established to represent a mosaic of forest, valley bottom, aquatic, and subalpine communities including its diverse and rich assemblage of fern species. The Pacific Northwest Research Station Director has reviewed this project for consistency and concurs with the proposed translocation (FS Pacific Northwest Research Station 2016), therefore, this was dismissed for consideration as a separate impact topic.