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Final Environmental Impact Statement for the Land Management Plan

Appendix G: Climate Change Adaptation Strategies

Nez Perce-Clearwater National Forests



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Final Environmental Impact Statement for 2023 Land Management Plan for the Nez Perce-Clearwater National Forests

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Abstract: This Final Environmental Impact Statement documents the analysis of the Preferred Alternative and four additional action alternatives developed for programmatic management of the four million acres of National Forest system lands administered by the Nez Perce-Clearwater National Forests. The purpose is to provide land management direction for the Nez Perce-Clearwater National Forests, combining the 1987 Nez Perce National Forests Land Management Plan and the 1987 Clearwater National Forest Land Management Plan into one plan for the Nez Perce-Clearwater National Forests, now managed as one administrative unit.

Contents

Examples of Nez Perce-Clearwater Land Management Plan Climate Change Adaptation Strategies.....	1
Introduction	1
Water and Aquatic Resources.....	1
Key Ecosystem Component: Watershed, Aquatic, Wetland, and Riparian	2
Terrestrial Vegetation and Wildlife.....	4
Key Ecosystem Component: Forest Vegetation and Ecosystem Processes.....	5
Key Ecosystem Component: Special Botanical Species.....	5
Key Ecosystem Component: Whitebark Pine Communities and Associated Wildlife.....	6
Key Ecosystem Component: Ponderosa Pine Communities and Associated Wildlife	6
Key Ecosystem Component: Hardwood Communities and Associated Wildlife	6
Key Ecosystem Component: Old Growth Forest.....	7
Key Ecosystem Component: All Forest Communities	7
Key Ecosystem Component: Rangelands	7
Sustainable Recreation	7
Key Ecosystem Component: Recreational Use and Seasonality	8
Knowledge Gaps	9
Key Ecosystem Component: All Ecological, Social, and Economic Ecosystem Components	9
Literature Cited.....	9

Examples of Nez Perce-Clearwater Land Management Plan Climate Change Adaptation Strategies

Introduction

The climate in the northern Rocky Mountains has changed in the past and will continue to change in the future. Climate influences the ecosystem services obtained from forests and grasslands. Consideration of how climate may change in the future in the context of resource management was incorporated into the development of the Nez Perce-Clearwater Land Management Plan. Plan direction includes strategies to help address the uncertainties associated with a changing climate and its potential impacts on ecosystems.

Strategies included in the Land Management Plan focus on promoting resilience to change, creating resistance to change, and enabling forests to respond to change (Millar et al. 2007). Resilience to change is the degree to which the ecosystem can recover from disturbances without a major shift in composition or function. Resilient forests accommodate change and have the ability to quickly recover and regain normal function in the face of climate change and potential stressors, such as drought and changes in disturbance processes. Resistance to change is the ability of the ecosystem to withstand disturbances without significant loss of structure or function, thereby remaining unchanged. This approach manipulates the physical environment to forestall impacts and protects highly valued resources in the face of climate change and potential changes in ecosystem disturbances and processes. Response to change is the ability of the ecosystem to respond adaptively as changes accrue rather than resisting it. Practices such as actively shifting species to new areas and promoting connected landscapes can help aquatic and terrestrial species adapt to climate change.

The Northern Rockies Adaptation Partnership publication by Halofsky et al. (2018a, b) is the main source of information on possible strategies and approaches to respond to climate change. Initiated in 2013, this science-management partnership consists of multiple agencies, organizations, and stakeholders who worked together over a period of two years to identify issues relevant to resource management in the Northern Rocky Mountains and to find practical solutions that can make ecosystems adaptable to the effects of a changing climate.

The 2012 Planning Rule specifies that land management plans must include plan components, including standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity, taking into account...stressors, such as climate change (219.8 (a)(1)(iv)).

The following sections provide examples of potential climate change adaptation strategies for aquatic and riparian resources, terrestrial vegetation and wildlife resources, and sustainable recreation and how plan components from the Land Management Plan support those strategies. These example strategies and associated plan components are not meant to be all inclusive. Other plan components in the Land Management Plan support resilience, resistance, and adaptation strategies. Knowledge gaps are also addressed, emphasizing the need for adaptive management and a monitoring strategy.

Water and Aquatic Resources

Primary adaptation strategies to address changing hydrology in the Northern Rockies (Halofsky et al. 2018a, b) include restoring the function of watersheds, connecting floodplains, reducing drainage

efficiency, maximizing valley storage, and reducing hazardous fuels. Resilience and adaptation tactics include adding wood to streams, restoring beaver populations, modifying livestock management, and reducing surface fuels and forest stand densities. Primary strategies for infrastructure include increasing the resilience of stream crossings, culverts, and bridges to higher peak flows and facilitating response to higher peak flows by reducing the road system and disconnecting roads from streams. Adaptation tactics include updating geospatial databases for infrastructure and drainage components, installing higher capacity culverts, and decommissioning roads or converting them to alternative uses.

Primary strategies to address climate change threats to cold water fish species (Halofsky et al. 2018a) include maintaining or restoring functionality of channels and floodplains to retain water, hence cooling the water, and buffering against future changes; decreasing fragmentation of stream networks so aquatic organisms can reach similar habitats; and developing wildfire use plans that address sediment inputs and road failures. Adaptation tactics include using multiscale analysis to develop integrated actions for vegetation and hydrology, protecting groundwater and springs, restoring riparian areas and beaver populations to maintain summer baseflows, reconnecting and increasing off-channel habitat and refugia, identifying and improving stream crossings that impede fish movement, decreasing road connectivity, and revegetating burned areas to store sediment and maintain channel geomorphology. Removing nonnative fish species and reducing their access to cold water habitat reduces competition with native fish species. The following are specific examples of forest plan components from the Land Management Plan that support potential climate adaptation strategies outlined in *Climate Change Vulnerability and Adaptation in the Northern Rocky Mountains* (Halofsky et al. 2018a).

Key Ecosystem Component: Watershed, Aquatic, Wetland, and Riparian

Species and indicator addressed: all aquatic and riparian species; watershed function

Climate adaptation strategies:

Build resilience to changing climate, higher peak flows, and higher variability: All alternatives include this strategy to some degree. In the No Action Alternative, PACFISH and INFISH direction applies. In the Action Alternatives, the plan components associated with watershed (WTR) and riparian management zones (RMZ) address this strategy to a greater extent, specifically plan components FW-DC-WTR-01, FW-DC-WTR-07, FW-DC-WTR-08, FW-DC-WTR-11, FW-DC-RMZ-02, FW-GDL-WTR-03, FW-STD-RMZ-07, FW-GDL-ARINF-08, FW-GDL-ARREC-01, FW-GDL-ARREC-02, FW-OBJ-WTR-02, and FW-OBJ-RMZ-01. The strategy is addressed by maintaining the capability of floodplains and riparian areas.

Build resilience to higher stream peak flows: All alternatives include this strategy to some degree. In the No Action Alternative, PACFISH and INFISH direction applies. In the Action Alternatives, the plan components FW-DC-ARINF-01, FW-STD-ARINF-04, FW-GDL-ARINF-05, FW-OBJ-WTR-02, FW-OBJ-CWN-02, FW-OBJ-ARREC-01, FW-OBJ-INF-02, and FW-OBJ-INF-01 address this strategy to a greater extent. The strategy is addressed by modifying infrastructure where possible; for example, increasing culvert size, improving road drainage, and relocating vulnerable campgrounds or road segments.

Respond to climate-induced occurrence of disturbances, such as drought and flooding: All alternatives include this strategy to some degree. In the No Action Alternative, PACFISH and INFISH direction applies and wetlands are encompassed by riparian habitat conservation areas. In the Action Alternatives, wetlands are encompassed in riparian management zones, with specific plan components, such as FW-

DC-WTR-02, FW-DC-WTR-08, FW-DC-WTR-09, FW-DC-RMZ-01, FW-DC-RMZ-02, FW-GDL-ARINF-08, and FW-OBJ-RMZ-01. The strategy is addressed by increasing water storage by recognizing the important ecological role of beavers and wetlands.

Reduce erosion potential to protect water quality: All alternatives address this strategy based on adherence to the Healthy Forest Restoration Act. The Action Alternatives contain additional plan components, such as all forestlands (FOR) desired conditions related to forest densities, FW-DC-FIRE-01, FW-OBJ-FIRE-01, FW-OBJ-FIRE-02, FW-OBJ-FIRE-03, FW-GDL-FIRE-01, FW-DC-MWTR-01, FW-STD-MWTR-01, FW-STD-WTR-02, FW-GDL-RMZ-02, FW-GDL-RMZ-06, FW-GDL-RMZ-07, FW-DC-ARINF-01, FW-STD-ARINF-03, FW-GDL-ARINF-01, FW-GDL-ARINF-03, FW-GDL-ARINF-04, FW-GDL-ARREC-03, FW-GDL-ARREC-04, FW-GDL-ARREC-05, FW-GDL-ARREC-06, FW-OBJ-INF-01, FW-OBJ-INF-02, FW-OBJ-CWN-02, FW-OBJ-REC-01, and FW-OBJ-REC-02. The strategy is addressed by reducing forest densities and fuel loadings in dry forest types to maintain low-to-mixed severity natural fire regimes reducing the risk of high-severity fire; using road and trail best management practices that reduce erosion; storm proofing roads; and prioritizing municipal water supplies.

Increase stream flows and moderate changes in instream flows: All alternatives incorporate this strategy based on the application of project-level best management practices. In the No Action Alternative, PACFISH and INFISH direction applies. The Action Alternatives include plan components FW-DC-WTR-07, FW-DC-WTR-08, FW-GDL-WTR-03, FW-STD-ARLND-03, and FW-STD-ARLND-04. The strategy is addressed through managing authorizations and building of hydroelectric facilities and water developments, managing and monitoring drafting of water from streams, and securing and utilizing water rights for instream flows.

Increase habitat resilience for cold-water aquatic organisms by restoring structure and function of streams: All alternatives incorporate this strategy based on the application of project-level best management practices (FW-STD-WTR-02). In the No Action Alternative, PACFISH and INFISH direction applies. Most plan components for water and aquatic resources (WTR), riparian management zones (RMZ), and conservation watershed networks (CWN) included in the Action Alternatives address this strategy, as well as plan components FW-DC-ARINF-01, FW-STD-ARINF-06, FW-GDL-ARINF-11, FW-OBJ-WTR-02, FW-OBJ-WTR-03, FW-OBJ-WTR-04, FW-OBJ-INF-01, and FW-OBJ-RMZ-01. The strategy is addressed through restoring natural channel and floodplain form and function; restoring aquatic organism passage structures through design and placement of appropriate structures; maintaining functional stream channel morphology; restoring riparian areas to increase hydrologic function and retain cold water; reintroducing beaver; and removing or relocating roads adjacent to riparian areas, channels, and floodplains where they inhibit complexity.

Provide opportunities for native fish to move and find suitable stream temperatures: All alternatives incorporate this strategy based on the application of project-level best management practices (FW-STD-WTR-02). In the No Action Alternative, PACFISH and INFISH direction applies. The Action Alternatives include plan components FW-DC-WTR-01, FW-DC-WTR-02, FW-DC-WTR-08, FW-DC-WTR-10, FW-DC-WTR-11, FW-DC-WTR-12, FW-OBJ-WTR-02, FW-OBJ-WTR-03, FW-OBJ-WTR-04, FW-DC-CWN-01, FW-DC-CWN-02, FW-DC-CWN-03, FW-STD-ARINF-07, FW-STD-ARLND-03, FW-OBJ-RMZ-01, FW-DC-ARINF-01, FW-STD-ARINF-06, FW-GDL-ARINF-11, and FW-OBJ-INF-01. The strategy is addressed through increasing the patch size of favorable habitat to enhance viable populations and allow migratory life histories; modifying or removing barriers to increase connectivity between areas of cold-water habitat; and identifying and mapping where groundwater inputs provide cold water.

Increase resilience to fire-related disturbance: All alternatives incorporate this strategy based on the application of project-level best management practices (FW-STD-WTR-02). In the No Action Alternative, PACFISH and INFISH direction applies. The Action Alternatives include plan components FW-DC-FIRE-01, FW-OBJ-FIRE-01, FW-OBJ-FIRE-02, FW-OBJ-FIRE-03, FW-GDL-FIRE-01, FW-STD-RMZ-06, FW-STD-ARINF-07, FW-GDL-RMZ-06, FW-GDL-RMZ-07, FW-DC-ARINF-01, FW-GDL-ARINF-01, FW-GDL-ARINF-03, FW-GDL-ARINF-04, FW-OBJ-INF-01, and FW-OBJ-CWN-02. The strategy is addressed through implementing fuel treatments, such as thinning or prescribed burning to reduce wildfire severity and size; disconnecting roads from stream networks to reduce erosion and sediment delivery to streams; and installing erosion control structures following wildfires.

Terrestrial Vegetation and Wildlife

Most strategies for conserving native tree, shrub, and grassland systems in Halofsky et al. (2018a) focus on increasing resilience to chronic low soil moisture, especially extreme drought and low snowpack, and to more frequent and extensive ecological disturbance, such as wildfire, insects, and nonnative species. These strategies generally include managing landscapes to reduce the severity and patch size of disturbances, encouraging fire to play a more natural role, and protecting refugia where fire-sensitive species can persist. Increasing species, genetic, and landscape diversity, such as spatial pattern and structure, is an important “hedge your bets” strategy that will reduce the risk of major forest loss. Adaptation tactics include using silvicultural prescriptions, especially stand density management and fuels treatments to reduce fuel continuity; reducing populations of nonnative species; potentially using multiple genotypes in reforestation; and revising grazing policies and practices. Rare and disjunct species and communities, such as whitebark pine and quaking aspen, require adaptation strategies and tactics focused on encouraging regeneration, preventing damage from disturbance, and establishing refugia.

Adaptation strategies for wildlife in Halofsky et al. (2018a, b) focus on maintaining adequate habitat and healthy wildlife populations and increasing knowledge of the needs and climate sensitivities of species. Connectivity is an important conservation strategy for most species in the Northern Rockies. Maintaining healthy American beaver populations will provide riparian habitat structure and foraging opportunities for multiple species. Quaking aspen habitat, which is also important for several species, can be enhanced by allowing wildfire, protecting aspen from grazing, and reducing conifer encroachment. Restoration of more open stands of Ponderosa pine and mixed-conifer forest through reduction of stand densities will benefit species, such as fisher and the flammulated owl. Excluding fire and reducing nonnative species will maintain sagebrush habitats that are required by several bird and mammal species.

Adaptation strategies for rangeland vegetation in Halofsky et al. (2018a, b) focus on increasing resilience of rangeland ecosystems, primarily through control and prevention of invasion by nonnative species. Ecologically based management of nonnative plants focuses on strategies to repair damaged ecological processes that facilitate invasion and seeding of desired native species can be done where seed availability and dispersal of these species are low. Proactive management to prevent establishment of nonnative species is also critical, including tactics such as early detection-rapid response, weed-free policies, education of employees and the public, and collaboration among multiple agencies to control weeds. Livestock grazing can also be managed through the development of site-specific indicators that inform livestock movement guides and allow for maintenance and enhancement of plant health.

The following are specific examples of forest plan components from the Land Management Plan that support potential climate adaptation strategies outlined in *Climate Change Vulnerability and Adaptation in the Northern Rocky Mountains* to help sustain terrestrial species and communities.

Key Ecosystem Component: Forest Vegetation and Ecosystem Processes

Species addressed: all animal and plant species and communities

Climate adaptation strategies:

Maintain and enhance species and structural diversity at multiple scales; protect forests from severe and uncharacteristic disturbances; and reduce impacts of existing stressors, such as insects and disease and invasive species: The No Action Alternative addresses this strategy to some degree through forestwide direction in the 1987 Forest Plans. The Action Alternatives address this strategy in more detail in plan components for terrestrial ecosystems (TE); forestlands (FOR); meadows, grasslands, and shrublands (GS); fire (FIRE); invasive species (INV); and wildlife (WL). The strategy is addressed by developing desired conditions that are based on estimated natural range of variation and anticipated influence of climate changes on vegetation composition and structures; promoting retention and development of large and very large trees of species resilient or resistant to disturbance; promoting site-adapted species; promoting diversity of species at the stand level and landscape level; focusing on species best adapted to potential changes in climate and disturbances, such as drought, increased fire frequency and severity, and increased insect populations; promoting diversity of forest structures at the landscape level; protecting old-growth forest and promoting its development; promoting restoration of native species that have been diminished due to human influences, such as exotic disease, land conversion, and fire suppression; promoting diversity of forest densities and reducing densities where appropriate using a variety of tools and maintaining the reduced forest densities over time.

Maintain and create areas where ecological processes are generally allowed to function with minimal human influence: All alternatives address this strategy through land allocations and associated forest plan direction. The strategy is addressed by developing forest plan direction to provide a range of areas that have different management intensities and potential human influences—some areas may serve as “baselines” for understanding how ecological systems function and respond, such as current and recommended wilderness areas, and other areas provide more opportunity for active and adaptive management approaches to gain understanding of potential ways to address impacts of climate changes on the ecosystem.

Key Ecosystem Component: Special Botanical Species

Species addressed: species of conservation concern in wetland and meadow guilds, such as Buxbaum's sedge, crested shield-fern, Douglas clover, and sticky goldenweed.

Climate adaptation strategies:

Maintain particular species or community types of concern and high vulnerability: In the No Action Alternative, PACFISH and INFISH direction applies for activities within riparian habitat conservation areas. The Action Alternatives include plan components FW-DC-TE-01, FW-DC-TE-02, FW-DC-TE-03, FW-DC-TE-04, FW-DC-TE-05, FW-GDL-TE-01, FW-DC-GS-04, FW-DC-WTR-02, FW-DC-WTR-03, FW-DC-WTR-08, FW-DC-RMZ-01, MA2-DC-RNA-01, and GA-DC-SIA-01. The strategy is addressed by designating special areas that feature special and unique botanical features, allowing for natural hydrologic processes to occur.

Key Ecosystem Component: Whitebark Pine Communities and Associated Wildlife

Species addressed: whitebark pine, Clark's nutcracker, and grizzly bear

Climate adaptation strategies:

Maintain particular species or community types of concern and high vulnerability: The No Action Alternative does not address this strategy explicitly. The Action Alternatives include plan components FW-DC-FOR-09, FW-DC-FOR-10, MA1 and MA2-DC-FOR-09, MA3-DC-FOR-07, MA3-DC-FOR-08, MA3-OBJ-FOR-04, MA2-OBJ-FOR-01, MA2-OBJ-FOR-02, MA3-STD-FOR-01, MA3-GDL-FOR-02, and MA3-GDL-FOR-03. The strategy is addressed by focusing restoration efforts on sites where viable populations of whitebark pine are most likely to succeed; supporting an active restoration program that includes the collection of seed, pollen, and scion for the tree improvement program; planting of blister rust resistance seedlings; thinning in whitebark pine stands to reduce competition of other conifer species; using fire to promote regeneration of whitebark pine; and protecting identified mature trees that are contributing to the restoration program, such as cone collection trees, from loss due to fire or other stressors.

Key Ecosystem Component: Ponderosa Pine Communities and Associated Wildlife

Species addressed: Ponderosa pine and flammulated owl

Climate adaptation strategies:

Maintain particular species or community types of concern and high vulnerability: The No Action Alternative does not address this strategy explicitly. The Action Alternatives include plan components FW-DC-FOR-02, FW-DC-FOR-03, FW-DC-FOR-04, MA3-OBJ-FOR-01, MA2-OBJ-FOR-01, MA2-OBJ-FOR-02, MA3-STD-FOR-01, MA2 and MA3-GDL-FOR-02, MA2 and MA3-GDL-FOR-03, and plan components specific to the Lower Salmon River Geographic Area, GA-DC-SR-01 and GA-DC-SR-03. The strategy is addressed by retaining mature and older Ponderosa pine; reducing competition from Douglas-fir; reducing forest density; monitoring establishment, survival, and development of Ponderosa pine age class distribution; and retaining very large trees and snags.

Key Ecosystem Component: Hardwood Communities and Associated Wildlife

Species addressed: aspen, black cottonwood, and cavity-nesting and deciduous-nesting birds

Climate adaptation strategies:

Maintain particular species or community types of concern and high vulnerability: The No Action Alternative does not address this strategy explicitly. The Action Alternatives include plan components FW-DC-FOR-01 and FW-OBJ-FOR-01. The strategy is addressed by removing conifers around aspen at multiple scales using multiple tools, including utilizing prescribed fire, cutting, protecting from livestock grazing, and prioritizing areas where aspen currently exists at lower than historic levels.

Key Ecosystem Component: Old Growth Forest

Species addressed: all conifer species

Climate adaptation strategies:

Maintain particular species or community types of concern and high vulnerability: The No Action Alternative includes old growth and snag standards. The 1987 Clearwater and Nez Perce Forest Plans specify maintaining ten percent of the Forest in old growth habitat, with five percent of each timber compartment as old growth. The No Action Alternative and all Action Alternatives rely on Green et al. (2011) for the definition of old growth. The Action Alternatives include plan components MA2 and MA3-DC-FOR-10, MA3-STD-FOR-01, MA2 and MA3-GDL-FOR-02, MA2 and MA3-GDL-FOR-03, and MA2 and MA3-GDL-FOR-04 to maintain or improve old growth conditions. The strategy is addressed by maintaining or creating structure in mesic old-growth conifer forest and developing redundancy across landscape to buffer against future fire or drought mortality.

Key Ecosystem Component: All Forest Communities

Species addressed: all tree species and many wildlife species, including wide-ranging species, such as wolverine, Canada lynx, grizzly bear, and gray wolf

Climate adaptation strategies:

Maintain multiple levels of connectivity, including daily, seasonal, and dispersal range shifts: All alternatives include guidance from the Northern Rockies Lynx Management Direction (NRMLD) document. The Action Alternatives also include plan components FW-GL-TE-01, FW-GL-WL-02, FW-DC-WTR-02, FW-DC-WL-03, FW-DC-WL-09, FW-GDL-WL-01, MA2-DC-RWILD-03, and MA2-DC-IRA-03. The strategy is also evaluated through the USDA Forest Service Northern Region Broad Scale Monitoring Strategy.

Key Ecosystem Component: Rangelands

Species addressed: meadow and grassland plant species

Climate adaptation strategies:

Increase proactive management actions to prevent invasive species and maintain intact ecosystems and increase resilience and resistance of native ecosystems: For all alternatives, the Nez Perce-Clearwater actively participates in cooperative weed management areas, which are used to determine weed treatment priorities, projects, budgets, and annual programs. The No Action Alternative provides direction on mapping and treatment of noxious weeds. The Action Alternatives include plan components FW-GL-INV-01, FW-DC-INV-01, FW-OBJ-INV-01, FW-GDL-INV-03, FW-OBJ-GS-01, FW-GDL-ARGR-01, and all desired condition plan components related to meadows, grasslands, and shrublands (FW-DC-GS-01 to 08). The strategy is addressed by promoting the occurrence and growth of native species and employing preventative measures to reduce the spread and introduction of invasive species.

Sustainable Recreation

Climate change may impact the timing and types of recreation occurring on the Nez Perce-Clearwater and throughout the Northern Rockies (Halofsky et al. 2018a, b). A warmer climate will generally improve

opportunities for warm weather activities, such as hiking, camping, and sightseeing because it will create a longer time during which these activities are possible, especially in the spring and fall shoulder seasons. However, it will reduce opportunities for snow-based, winter activities, such as downhill skiing, cross-country skiing, and snowmobiling because snowpack is expected to decline significantly in the future. Recreationists will probably seek more water-based activities in lakes and rivers as refuge from hotter summer weather. Higher temperatures may have both positive and negative effects on wildlife-based activities, for example hunting, fishing, and birding and gathering of forest products (for example, berries, mushrooms), depending on how target habitats and species are affected.

Recreationists are expected to be highly adaptable to a warmer climate by shifting to different activities and different locations, behavior that is already observed from year to year (Halofsky et al. 2018a, b). For example, downhill skiers may switch to ski areas that have more reliable snow, cross-country skiers will travel to higher elevations, and larger ski areas on Federal lands may expand to multi-season operation. Water-based recreationists may adapt to climate change by choosing different sites that are less susceptible to changes in water levels. Hunters may need to adapt by altering the timing and location of hunts. Federal management of recreation is currently not very flexible with respect to altered temporal and spatial patterns of recreation.

Key Ecosystem Component: Recreational Use and Seasonality

Climate adaptation strategies:

Transition to address shorter average winter recreation seasons and changing use patterns: Ice—and snow—based recreation is highly sensitive to variations in temperature and the amount and timing of precipitation as snow. Recreationists are expected to be highly adaptable to a warmer climate by shifting to different activities and different locations, behavior that is already observed from year to year. For example, as snowpack is expected to decline, cross-country skiers and snowmobile users may travel to higher elevations. The Action Alternatives include plan components FW-DC-REC-01, FW-DC-REC-02, FW-DC-REC-04, FW-DC-REC-05, and FW-DC-REC-06 that provide for long-term sustainable recreation under changing conditions. The strategy could be addressed by maintaining current infrastructure and expanding facilities in areas where concentrated use increases and posting signs and providing safety education to make the public aware of increased risk of avalanches.

Increase management flexibility and facilitate transitions to meet user demand and expectation: The seasonality of whitewater rafting could shift with increasing temperatures and shifts in the timing of peak stream flows. Water-based recreationists may adapt to climate change by choosing different sites that are less susceptible to changes in water levels. The Action Alternatives also include plan components FW-DC-REC-03, FW-DC-REC-04, FW-DC-REC-05, and FW-DC-REC-06 that provide for long-term sustainable recreation under changing conditions. The strategy could be addressed by varying the permit season to adapt to changes in peakflow and duration and maintaining current infrastructure and expanding facilities in areas where concentrated use increases.

Manage recreation sites to mitigate risks to public safety and infrastructure and to continue to provide recreation opportunities: Increases in flooding, fire, and other natural disturbances will cause damage to infrastructure. The Action Alternatives also include plan components FW-DC-INF-01, FW-DC-REC-02, FW-OBJ-CWN-02, FW-OBJ-INF-01, FW-OBJ-INF-02, FW-OBJ-INF-03, and FW-DC-FIRE-03 that provide for long-term sustainable recreation under changing conditions and promote safety and maintenance of infrastructure. The strategy could be addressed by actions, such as adjusting the timing of actions such as road and trail closures, food storage orders, and special use permits; maintaining current infrastructure; storm proofing system roads; and cutting hazard trees.

Knowledge Gaps

Key Ecosystem Component: All Ecological, Social, and Economic Ecosystem Components

Climate adaptation strategies:

Incorporate increased knowledge and new science related to climate change and species responses: All alternatives would include this strategy based on participation in the Northern Region Adaptation Partnership (NRAP). The strategy would be addressed by developing an adaptive management and monitoring strategy for all resources with a monitoring program that recognizes that 1) climate change is slow, especially in comparison to the planning period of 15 years, and 2) the future is uncertain and new science and information might lead to changes in the Nez Perce-Clearwater's approaches. The Forest Service is an active partner in the Northern Region Adaptation Partnership, a collaborative effort with the goal of increasing climate change awareness, assessing vulnerability, and developing science-based adaptation strategies to reduce adverse effects of climate change.

Build partnerships to include all lands: All alternatives would include this strategy because the Forest Service is an active partner with other resource managers and organizations across the Nez Perce-Clearwater and adjacent lands. The Action Alternatives specifically include goals that speak to working with partners and using an all lands management strategy, such as FW-GL-FIRE-02, FW-GL-WTR-02, FW-GL-CWN-01, FW-GL-CWN-02, FW-GL-REC-02.

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