FINDING OF NO SIGNIFICANT IMPACT

Proposed Relocation and Improvements to the Hurricane Ridge Weather Station

Olympic National Park,
Clallam County, Washington
March 2009

This finding of no significant impact (FONSI) and the environmental assessment (EA) constitutes the record of the environmental impact analysis and decision-making process for this research project. The National Park Service (NPS) in conjunction with the Northwest Weather and Avalanche Center (NWAC) will implement alternative B, the management preferred alternative as described in the Olympic National Park EA, the installation of a new weather station at Hurricane Ridge, in Olympic National Park.

PURPOSE AND NEED FOR FEDERAL ACTION

The purpose of the weather station is to provide specialized mountain weather and avalanche forecasts to allow for safe park operation, winter travel, and recreation at the Hurricane Ridge area of Olympic National Park. Through the site at Hurricane Ridge, NWAC monitors weather, snow cover, and forecasts avalanche conditions to prevent avalanche fatalities and to minimize transportation disruptions to the greatest extent possible.

As currently configured, the Hurricane Ridge Weather Station is composed of a variety of sensors located on a 25-foot-high tower attached to the generator building (measuring heated precipitation, air temperature, relative humidity) and on a 80-foot- tall radio tower immediately adjacent to and just west of the generator building (measuring wind speed, direction, and snow depth). Although in its current configuration the system provides reliable and relatively representative data on wind speed and direction, precipitation and snow depth data obtained from the system is unreliable, unrealistic and not representative of local snow or rain received at this location. Also, owing to wind effects, the temperature/humidity sensor and radiation shield located on the main radio tower may fill with snow during winter storms. This may result in both incorrect temperature and relative humidity data as well as time lagged temperature values (air temperature changes must infiltrate the blocked temperature shield to be correctly measured). For this reason, the NPS and NWAC wish to install a new weather station to meet the following objectives:

1. Eliminate or reduce inaccuracies in precipitation and snow depth data from automated NWAC weather stations at Hurricane Ridge to provide accurate snow and precipitation measurements.
2. Provide emergency managers, meteorologists and avalanche forecasters with real-time climate data to better predict timing and extent of flood, winter storm and avalanche events.
3. Promote visitor and staff safety, and help create better river, weather, and avalanche forecasts for Olympic National Park.

NWAC is administered by the U.S. Forest Service, but it is cooperatively funded by a variety of federal, state, and private agencies, including the Washington State Department of

Transportation, Washington State Parks and Recreation Commission, National Weather Service, Pacific Northwest Ski Areas Association, Friends of the Avalanche Center, the NPS, and others.

NWAC promotes safety by helping reduce the impacts of avalanches and adverse mountain weather on recreation, industry and transportation in Washington and northern Oregon through data collection, mountain weather and avalanche forecasting and education. The program provides detailed weather and avalanche forecasts for all the Washington Cascades and Olympics, and northern Oregon Cascades and manages the most comprehensive real-time mountain weather data network in the U.S.

RANGE OF ALTERNATIVES CONSIDERED

The environmental assessment analyzed two alternatives: relocate Hurricane Ridge Weather Station to the existing snow stake site (management preferred alternative) and the no action alternative (alternative A). There are no changes based on public comments or other agency consultations.

To identify the management preferred alternative, the interdisciplinary planning team evaluated each alternative based on the ability to meet the project requirements and the potential impacts on the environment ("Chapter 4: Environmental Consequences"). Alternative B is the only alternative that fully meets all of the plan objectives. Therefore alternative B was identified as the management preferred alternative.

SELECTED ALTERNATIVE

The preferred alternative, alternative B: Relocate Hurricane Ridge Weather Station to Existing Snow Stake Site is the selected alternative.

Under this alternative, a portion of the Hurricane Ridge Weather Station (wind speed and direction) will remain at its existing location, and the precipitation, snow depth, temperature and relative humidity measurement devices will be moved to the location of the existing snow stake. The Hurricane Ridge snow stake site is the location for the manual snow depth pole and has been the location for Hurricane Ridge snow depth measurements for the past 20 years. The site is located about 100 yards to the west of the existing tower and generator building, about 30 yards west of the Cirque Rim Trail that crosses the Ridge in a north-south direction, and west of the Hurricane Ridge Lodge. Inspection of snow drift activity at this location indicates that the site is much less windy than the existing site.

In order to complete a relocation of precipitation, snow depth, temperature and relative humidity measurements; a new 30-foot high tower will be placed at this site. The tower will require installation of a 2- by 2- by 2-foot concrete base (poured on location). There will be no lights on the tower. Buried AC power will be extended to the site from the generator building along with one 6-pair shielded telemetry cable. These will be buried in a 2-foot-wide by 1½-foot-deep trench through an opening in the forest to the existing trail. This involves trenching the cable through a small patch of meadow approximately 130 feet from the existing generator building to the trail north of the existing site. Then, an approximately 150-foot-long trench will extend parallel to the

trail to the selected site; and, approximately 60 to 75 feet will be trenched in the meadow corridor leading to the relocation site. A backhoe or small trencher and hand tools will be used to accomplish this work.

A phone line and telemetry line will be installed adjacent to the power line trench. Communication devices will transmit wind speed and direction information from the radio tower sensors and junction box to the new site via a shielded multi-conductor telemetry cable. The datalogger will be moved from the generator building to the new tower, and will be housed in a 12- by 18-inch white box in the new tower.

Construction of the new tower will involve the use of a small backhoe or trencher for utility line placement. Hand tools will be used to dig the hole for the tower foundation. A small concrete mixer will be used. A truck may be used on the existing trail to deliver supplies and tower parts to the generator building, and then they will be either hand carried or wheeled to the site using a wheelbarrow.

Annual Site Maintenance
Maintenance visits would continue to occur once or twice a year and take approximately 2 hours per visit. One vehicle would be parked at the Hurricane Ridge parking lot, and one or two NWAC staff members walk to the site. Equipment used for the maintenance of the weather station includes small hand tools, such as wrenches and screwdrivers. Extensive maintenance is needed only if the tower is damaged by high winds or snowpack.

Additional long-term maintenance may require trimming, pruning or removing invading trees in order to keep the proposed installation site open. This will prevent unusual snow loading and thus provide more accurate and consistent data collection. All work will be conducted under consultation with the park's vegetation specialist.

During the first few years of installation, manual measurements of snow depth and snow water equivalent might be taken to ensure that all instruments are calibrated and recording accurate data.

In the long-term, if riming or snowpack causes deformation of the tower, then it may need to be replaced.

OTHER ALTERNATIVE CONSIDERED AND ANALYZED

In addition to the selected alternative, the EA considered a no action alternative.

Under the no action alternative, the existing NWAC site would continue to operate in its current location, co-located on the NPS radio tower and on the generator building at Hurricane Ridge. A variety of sensors would be located on either the 25-foot tower attached to the generator building (heated precipitation, air temperature, relative humidity) or on the main 80- foot- tall radio tower immediately adjacent to and just west of the generator building (wind speed and direction, snow depth).

Maintenance visits would continue to occur once or twice a year and take approximately 2 hours per visit. One vehicle would be parked at the Hurricane Ridge parking lot, and one or two NWAC staff members walk to the site. Equipment used for the maintenance of the weather station includes small hand tools, such as wrenches and screwdrivers. Extensive maintenance is needed only if the towers are damaged by high winds or snowpack.

ALTERNATIVES CONSIDERED BUT REJECTED

The park and NWAC considered several alternatives for this project and conducted a detailed evaluation to determine the most feasible alternatives. In addition, several alternative locations were considered during the planning phase of this project; alternative locations were rejected because they did not meet the project purpose and objectives. Table 1 describes locations and the reasons for their dismissal.

Table 1. Locations Considered and Dismissed

Considered Location	Primary Reason for Dismissal
Hurricane Ridge Well House	This location has AC power and is partially protected from winds by tree cover, however, the local topography includes a steeply sloped creek drainage which is likely to produce some channeling of winds (especially from the south), and the steep side slopes do not allow for accurate or representative snow depth measurements. Also, the same tree cover that allows for partial wind sheltering is high enough and close enough to the well house that snowfall accumulating on tree boughs may impact precipitation measurements during warming events. There is no communication capability at this location (no phone line) and the ridge to the east that lies in between this site and the current ridge weather system would make radio communication either problematic or impossible. In addition, archeological resources were found at this location during initial surveys. Hence this location does not meet all of the project objectives.
Hurricane Ridge Lodge	The Lodge meets the requirements for AC power and communication; however, the Lodge is located in an extremely windy location with major snow drifts. Also, the Lodge provides spectacular views of the Olympic Mountains that the park wants to preserve. A tower would interfere with those views. Therefore, this location does not meet all of the project objectives.
Top of Poma Lift	This location is in a previously disturbed area, however, power and phones were not available nearby, and the site was not sheltered or level. Therefore, the location does not meet the project objectives.

There were several preliminary options considered for getting power to proposed weather station site:

1. Trench through trees
2. Skirt around meadow on south side (visitor center side)
3. Trench to existing trail north of existing site and follow trail to new location

The straight line west from the generator house (existing tower) to the snow stake was thick with trees and downed logs. A path would have to be cut through the trees and trees removed to accomplish the trenching. Trenching though this area would cause an unacceptable amount of damage by removing the trees, and damage to the tree roots from trenching, and it would be too difficult to trench through this area. Therefore, this option was ruled out.

Trenching from the generator building through the meadow on the south side of the project area would create a visual disturbance and disturb native plants in the fragile meadow area. In addition, the trench would still have to go through an area of dense trees and downed logs, creating damage. Even with mitigation and the restoration of the meadow area, these fragile resources can take years to recover. Therefore, because this option would cause unacceptable impacts, it was not considered further in the analysis.

Trenching along the trail location would be possible for a portion of the project work, however, due to several larger sub-alpine fir trees located along the trail that would have to be removed for this alternative, the trenching was not able to follow the trail for the entire length. The trenching will follow a portion of the trail and then will cut across the meadow corridor leading to the selected relocation site, as described under the selected alternative.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

According to the Council on Environmental Quality (CEQ) guidelines, the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in Section 101 of the National Environmental Policy Act (NEPA), which considers:

1. fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assuring for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. preserving important historic, cultural and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
5. achieving a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA, section 101).

The NPS is required to identify the environmentally preferred alternative in its NEPA documents for public review and comment. Further guidance from the CEQ states that the environmentally preferred alternative means "the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves and enhances historic, cultural and natural processes" (CEQ 1981).

The no action alternative (alternative A) would keep the weather station and tower in place at its existing location. All facilities currently located at the generator building would remain. In alternative B, the existing facilities at the generator building would remain (tower and building) and an additional tower and utility corridor would be constructed in the Hurricane Ridge area. This would add another human-made structure to the area. Both alternatives result in an adverse effect to the natural environment of Hurricane Ridge, but alternative A would have no additional effect on the biological and physical environment; therefore it is identified as the environmentally preferred alternative. However, alternative B would establish an additional weather station in the park, which would allow for better understanding of the natural environment and processes, and would provide a safer environment for visitors and park staff through improved avalanche forecasting. Even though alternative A is the environmentally preferred alternative, it does not meet plan objectives and therefore is not the management preferred alternative.

WHY THE SELECTED ALTERNATIVE WILL NOT HAVE A SIGNIFICANT EFFECT ON THE HUMAN ENVIRONMENT

The following summary reviews impact considerations and highlights key safeguards of implementing the selected alternative. Mitigation measures will be employed to minimize these impacts during and after completion of the proposed project. The EA documents full consideration of all factors supporting the determination of non-significance.

Soils

The selected alternative will involve excavation and manipulation of small areas of soil for the installation of the tower and the underground utility line. The total area of soil disturbance for the utility corridor will be 656 sq. ft. (0.01 acres). Mitigation, including preserving the top soil and revegetation, will minimize this disturbance. Approximately 4 sq. ft. of additional disturbance will be permanent surface disturbance associated with the placement of the 2- by 2- by 2-foot concrete base for the tower. There will be little potential for soil erosion associated with the disturbance because the site is flat and the majority of the disturbed area will be replaced with concrete or revegetated using salvaged vegetation and soils from disturbed sites. The selected alternative will result in direct, localized, long-term negligible adverse impact to soil resources in the project area.

Vegetation

The selected alternative will involve the permanent removal of a small area of native grasses and forbs for the installation of the concrete foundation. It will also result in the removal of vegetation, including small trees, for the utility trenching, but this effect will be temporary as mitigation will be used to restore this area. The total area of temporary vegetation disturbance for the placement of the utility corridor will be 656 sq. ft. This will include removal of

approximately 85 seedling and sapling subalpine fir (less than 20" tall), and one 7 foot high subalpine fir. An additional 4 sq. ft. of vegetation will be disturbed permanently and replaced with the concrete base for the new tower. As young trees invade the installation site during the lifetime of the monitoring station, periodic trimming, pruning or removing saplings will be necessary to keep the tower site open. This will prevent unusual snow loading and thus provide more accurate and consistent data collection. All work will be conducted as advised by the park's vegetation specialist. Overall, the placement of the utility corridor and tower will result in negligible adverse effects to vegetation.

Wildlife

The installation of the NWAC weather station under alternative B will disturb small areas of soil and vegetation which may provide food or cover for birds, amphibians and small mammals. Wildlife may avoid the area temporarily during construction activities. However, the loss of habitat will be minimal, as total affected area will be very small when compared with the amount of similar habitat in the immediate project area. Although the new weather station will be located adjacent to deer trails, it will not block or deter travel of deer or other mammals.

Radio and other communications towers have the potential to adversely impact some wildlife species including birds and bats. Fatalities can result from collisions to the towers; however, most of the bird and bat deaths have occurred from collisions to higher, lighted towers. Since this tower would be at or below tree level, and will not be lighted, the potential for bird and bat deaths due to collisions is very low. Overall, the installations will have a local, long-term negligible impact on wildlife resources.

Cultural Resources

The selected action will involve excavation and manipulation of small areas for the installation of the instruments. The total area of soil disturbance will be 660 sq. ft. Approximately 656 sq. ft. will be surface disturbance (1 ½ feet deep) associated with the utility trenching. The additional 4 sq. ft. of disturbance will be excavation associated with concrete foundations for the new tower.

Archeological surveys within the project area revealed a low density of precontact artifacts in the area proposed for construction of the utility corridor and tower.

Visual Resources

Visual resources are measured as the potential impact on scenery from the perspective of a park visitor. The expectation of a visitor in the Hurricane Ridge area is to have views of facilities such as the visitor center, roads, and trails, and also of distant pristine landscapes generally free of human influences.

The new tower site is somewhat sheltered by trees. The tower will be approximately the same height as the perimeter trees in the project site, and it will be surrounded on three sides by trees. There is a small clearing that could be visible to visitors using the Cirque Rim Trail if visitors happen to glance in that direction. These views will be somewhat obscured by non-reflective paint on the tower. The likelihood of visitors seeing the tower from distant trails or park areas is very low since it would not be higher than the surrounding trees.

Visitor Experience
Current snow conditions, weather and avalanche forecasts are of high importance to many park visitors. Climate stations providing real-time data on the web are routinely accessed by park visitors inquiring about the conditions they might find in the backcountry. Initial scoping of this project found a public interest in real-time climate data from this site. This group of people might, therefore, experience a direct, long-term, minor beneficial impact to their visitor experience if this project were completed.

In contrast, some visitors seeking a pristine park experience might happen upon or view the proposed tower site. Since the project area is in a developed area with existing facilities and it is not likely to be noticeable by most park visitors, this would likely result in negligible to minor, temporary adverse effects to the visitor experience.

Safety and Park Operations
Accurate real-time climate and snowpack data from the Hurricane Ridge area will increase the accuracy of avalanche forecasting, and will result in a moderate beneficial impact to employee and visitor safety and park operations at Olympic National Park.

BASIS FOR DECISION

The preferred alternative is the selected course of action. The project could be implemented without any major adverse impacts to vegetation, wildlife, soils, wilderness values, cultural resources, visual resources, visitor experience, and park and safety operations.

There were no highly controversial effects identified during either the preparation of the environmental assessment or the public review period, and the impact analysis has not been highly debated. The nature of this project is such that it does not involve highly uncertain, unique, or unknown risks. The available information on which to base this decision is adequate.

The selected actions are not directly related to any larger proposal. The project does not establish a precedent or constrain any future considerations of use in the area. The NPS followed required compliance processes to ensure that this project does not violate any federal, state, or local environmental protections laws or requirements.

MITIGATION MEASURES
Mitigation measures have been incorporated into the selected alternative to avoid or reduce impacts as part of the proposed project. All mitigation measures are summarized in Table 2.

Table 2. Mitigation Measure

Resource Topic	Mitigation Measure	Responsible Party
Soils and Vegetation	To minimize impacts to vegetation and decrease the overall footprint of the installation, all instruments will be installed in as tight an arrangement as possible, while allowing adequate spacing so that installations do not intercept or interfere with snow deposition. Native vegetation will be carefully salvaged by revegetation experts and placed in holding areas during installation of the utility line. The top 6 to 8 inches of soil will be removed to preserve the seed base and top layer of ground cover. These soils will be placed onto clean tarps and stored until backfilled into trenches. Salvaged vegetation will be restored to all areas except at the concrete base of the tower. All equipment, tools, boots, clothes and packs will be cleaned to ensure that no exotic species are transported to the site. Any fill used will be from the local area and free of exotic seed sources.	NPS Project Coordinator and Park Vegetation Specialist
Visitor Experience, Visual Resources	Potential impacts to visitor experience and visual resources were mitigated with careful selection of the installation site. The chosen site is surrounded by trees and is situated mostly out of sight. All equipment will be painted in green or brown tones to provide additional camouflage. During installation and maintenance of the facility, "leave no trace" practices will be used.	NPS Project Coordinator

Cultural Resources	Archeological resources in the project area will be further tested and evaluated by conducting archeological surveys prior to construction, and monitoring will occur during construction. If significant archeological materials are found, then instrument locations will be moved or data recovery (archeological excavation and documentation) will occur. Park archeologists will be on site before and during the installation.	NPS Project Coordinator and Park Archeologist

NON-IMPAIRMENT OF PARK RESOURCES

Impairment is an impact that, in the professional judgment of the responsible manager, will cause permanent and/or major harm to the integrity of park resources or values, including opportunities that otherwise will be present for the enjoyment of those resources values.

The implementation of the preferred alternative will result in no more than minor adverse impacts to soil resources, wildlife, wilderness resources, archeological resources, visual resources, and soundscapes in and around the project area. Mitigation implemented during and after project implementation will reduce impacts to vegetation, wildlife, soils, visual resources, cultural resources, visitor experience, and safety and park operations.

The NPS has determined that implementation of the selected action will not constitute an impairment to ONP resources and values. This conclusion is based on a thorough analysis of the environmental impacts described in the EA, public comments received, relevant studies, and professional judgment of the decision-makers guided by direction in NPS *Management Policies 2006.*

UNACCEPTABLE IMPACTS

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the NPS applies a standard that offers greater assurance that impairment will not occur. The NPS does this by avoiding impacts that it determines to be unacceptable. These are impacts that fall short of impairment, but are still not acceptable within a particular park's environment. The NPS has determined that the selected alternative will not result in unacceptable impacts to ONP resources. This conclusion is based on a thorough analysis of the environmental impacts described in the EA, public comments received, relevant studies, and professional judgment of the decision-makers guided by direction in NPS *Management Policies 2006.*

PUBLIC ENGAGEMENT AND AGENCY COORDINATION

Public Scoping

A scoping letter and news release initiating public scoping and describing the project was issued on July 28, 2008. A press release was sent to approximately 50 media outlets, interested groups, public officials, agencies, and other individuals on the park's mailing list. Comments were solicited during a public scoping period that originally ended August 25, 2008, but was extended until September 10 because the original news release was not published in the local newspaper in a timely manner. Five responses were received, four from individuals and one from an interest group. Comments received were generally in support of the project. Commenters expressed concern about the impacts the weather station would have on park visitors, visual resources including night sky, vegetation, wildlife and wildlife habitat, and nearby wilderness areas. There was interest in the park carefully choosing an appropriate site which would minimize the footprint on the land and would be hidden from public view and wilderness users. Individuals also desired direct benefits from the weather station such as improved safety and access due to more accurate avalanche forecasting.

A media notice for public scoping was published by the *Peninsula Daily News* on August 28, 2008.

Public Review of the EA

The EA was released for public review on January 8, 2009. A press release was sent to approximately 50 media outlets. Approximately 50 printed versions of the EA were sent to individuals, park neighbors, organizations, area tribes, local news media, area libraries, and agencies on the park's mailing list. Notification of the EA was sent to an additional 80 individuals on the park's mailing list. An electronic version of the EA was further available to the public through a posting on the NPS Planning, Environment and Public Comment (PEPC) website and linked to the park's public website. In addition, printed copies of the EA were available at several area libraries, including the North Olympic Library System libraries in Port Angeles and Forks; and the Timberland Regional Libraries in Aberdeen, Shelton, and Hoquiam.

A media notice about the opportunity to review the EA was published by the *Peninsula Daily News* on January 9, 2009. The public review and comment period for the EA was open until February 9, 2009. The park received four comments during the public review period for the EA; one from an individual, and three from interest groups. Each comment was considered and reviewed by park staff.

All four comments were in support of the project and agreed to the importance of accurate weather data on Hurricane Ridge. One commenter was concerned about the existence of a long-term monitoring plan for climate variability and change within the park. They suggested that the data from the Hurricane Ridge weather station could provide long-term benchmark reference measurements.

Another commenter suggested that one way to eliminate ground disturbance in the project area would be by burying the transmission line directly under the tread surface of the Cirque Rim Trail, rather than parallel to the trail. As stated previously, the park did look into the alternative of following the trail corridor, and could follow a portion of the trail shoulder for the utility corridor. However, the Cirque Rim Trail is a paved trail and the additional expense of cutting the trail with an asphalt cutter, and repaving it made this option infeasible at this time.

The commenters did not provide any additional, new, or substantive information that would require revising the EA for additional public review or that would change the determination of effects.

Consultation and Coordination

A letter was sent to the Lower Elwha Klallam Tribal Chair on September 20, 2007 formally inviting the tribe to comment on the proposed actions and providing them with an opportunity to express specific concerns. The Tribe did not respond with written comments, but did state informally in communications with the park tribal liaison that they had no concerns with the project.

A letter was sent to the State Archeologist/Department of Archaeology and Historic Preservation (SHPO) on September 20, 2007. The SHPO had no concerns with the project but requested in their response letter (dated January 13, 2009) that the survey and monitoring report results be forwarded once completed.

No other permits or consultations are required for this project.

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CONCLUSION

Based on the conservation planning and environmental impact analysis documented in the EA, with due consideration of the nature of the public comments and consultations with tribes and other agencies, and given the capability of the mitigation measures to avoid, reduce, or eliminate impacts, the NPS has determined that selected actions do not constitute a federal action that normally requires preparation of an environmental impact statement (EIS). The selected actions will not have a significant effect on the quality of the human environment or the park's cultural resources, or natural resources, and are not likely to adversely affect threatened or endangered species.

There are no unmitigated adverse impacts on public safety, sites, or districts listed in, or eligible for listing in, the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, cumulative effects or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law. Based on the foregoing, it has been determined that an EIS will not be prepared and the selected actions may be implemented as soon as practicable.

Recommended:

Karen Gustin
Superintendent, Olympic National Park

3/2/09
Date

Approved:

Jonathan B. Jarvis
Regional Director, Pacific West Region

3/9/09
Date