

CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	NEON Relocatable – Paradise Valley
Proposed Implementation Date:	July 2015
Proponent:	National Ecological Observatory Network
Location:	The project would be located on State Common School Trust Land Section 16-T6S-R8E, and University of Montana Income Trust Land Sections 22-T5S-R8E and N2 32-T4S-R9E.
County:	Park

I. TYPE AND PURPOSE OF ACTION

A meteorological tower that is 26 feet tall would be built and used to mount sensors that measure a key suite of atmospheric variables. An instrument hut (IH) would be built near the tower to house gas analyzers and other equipment. The hut would also contain communications and control hardware that transmits data back to the National Ecological Observatory Network (NEON) central repository. The tower and associated infrastructure would be constructed with minimal disturbance. Additional structures would include open cell paver footpath, a small boardwalk between the tower and instrument hut, approximately 4950' of trenched utilities, a soil array, fencing, and a parking area measuring 40' by 40'. The total area of ground disturbance would be approximately 0.29 acres at the proposed location. The duration of the proposed project would be up to 10 years.

The tower and associated infrastructure would be dismantled and the site would be fully rehabilitated at the end of the project. Please refer to Appendix C for additional details on the proposed design.

NEON plans to link the ecological causes and consequences of change, multiple ecological processes would be observed (www.neoninc.org):

- Remote sensing would measure structure and biogeochemical properties of vegetation,
- The tower and other automated sensors would measure components of the atmosphere (e.g. precipitation, temperature, radiation) and soil (e.g. respiration, soil moisture) and measure how the whole ecosystem breathes in terms of carbon, water and energy,
- Field crews associated with the Terrestrial Observation System (TOS) would collect data and samples to characterize organisms and biogeochemistry.

The TOS would collect data on biogeochemical cycles, infectious diseases, and a suite of focal taxa to characterize local patterns, dynamics, and linkages in terrestrial ecosystems. The selected taxa are designed to be widespread, capture a wide range of turnover time, and diverse evolution histories. Specifically, at the scale of the site, the TOS would collocate observations of:

- Plant biodiversity
- Plant biomass, leaf area, and chemical composition
- Plant phenology
- Bird composition and abundance
- Ground beetles abundance and diversity
- Mosquitos phenology, abundance, and pathogens
- Small mammal abundance, demography, and pathogens
- Tick-borne diseases
- Soil microbe abundance, diversity, and function collected via coring or digging soil pits
- Soils biogeochemistry collected via coring or digging soil pits

TOS protocols are designed to provide standardized data across the observatory, linkages among TOS protocols and between TOS and other NEON project areas, and where possible, complement other continental

scale sampling efforts (e.g. Breeding Bird Survey, Forest Inventory Analysis). Please refer to Appendix D for location of the areas that are proposed for observations. Minor ground disturbing activities would take place in the form of soil coring or soil pits.

Additional Airborne Observation Platform (AOP) activities would include:

1. During operations, NEON would survey the permitted area on an annual basis. The flight season would generally extend from March until October. Airborne spectroscopy, and discrete and waveform LiDAR would be used to quantify plant species type and function, and vegetation structure and heterogeneity at the scale of individual shrubs and larger plants. Color photography (25 cm resolution) would retrieve fine-scale information on land use, roads, impervious surfaces, and built structures.
2. The AOP is aircraft-mounted and operated instrumentation and would not result in any ground impacts. Flyovers would occur once a year. Flight paths have been established and would be reviewed and coordinated with local air traffic control prior to any flights. The AOP would deploy supporting field equipment (canvas tarps, GPS base station and sun photometer) at a single location designated for the duration of the campaign (equipment to be deployed and packed up each day).

The proposed NEON Relocatable Tower in Paradise Valley and associated sampling activities would collect pertinent environmental data that would provide key, basic data to support local land use, adaptive management, conservation, preservation and policymaking as well as a core scientific understanding of the Greater Yellowstone Ecosystem.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project. List number of individuals contacted, number of responses received, and newspapers in which notices were placed and for how long. Briefly summarize issues received from the public.

NEON Planning Stages:

Design 2007. Letter of Support, S. Thomas Olliff, Chief Yellowstone Center for Resources, NPS, DOI

Design 2008. Request For Information was conducted January 2008. Overall science themes, engagement, concepts, locations, sites and logistics provided. Eighteen responses received.

Planning 2008. Initial Site visits. B. Maxwell, T. McDermitt, K. Suding (Montana State U), K. Vohis (District Ranger Yellowstone NPS, DOI), M. Reynolds (Technologies Service Supervisor, Yellowstone NPS, DOI), D. Barnett (Colorado State U), G. Starr, R. Sponseller (U Alabama),

Planning 2009. A. Hansen, D. Madsen, R. Renkin, L. Mazzu (Yellowstone NPS, DOI), Discussed the scientific integration among all the sites, and benefit to community resources.

Planning 2011. Meeting with University Officials confirming overall Domain science rationale, Attendees; A. Hanson, P. Stoy (Montana State U), D. Tazik (Project Scientist, NEON), H. Loescher (Team Lead, NEON), L. Wright (NEON Permitting), H. Luo (NEON Staff Scientist), and other members of the University, Foundation and Museum.

Planning 2012 (ongoing). NEON Urban Ecology Technical Working Group (TWG). C. Polsky (Clark U), D. Pataki (U Utah, National Science Foundation), N. Grimm (Arizona State U), P. Groffman (Cary Inst. Ecosystem Studies), S. Grimmond (King's College London).

Planning 2013. DNRC Forester C. Barone and NEON representative Liz Wright conducted a field review in July 2013.

Planning 2014. Eight individual scoping notices were sent in December 2014. One response was received.

Planning 2014. (June) Site visit and confirmation of ecological design, and regional relevance, as part of the Mountain Research and Education Institute meeting, Chico Hot Springs, MT; J Dennis (Chief Scientist NPS, DOI), D. Hallac (Division Chief, Yellowstone NPS, DOI), A. McKee (U Montana), B. Crabtree (U Montana, Yellowstone Ecological Research Center)

Other contacts:

DNRC Bozeman Unit Manager C. Campbell
DNRC Archaeologist P. Rennie
USFWS Field Supervisor Jodi Bush
Montana Natural Heritage Program
Montana Fisheries Information System
MT Fish Wildlife and Parks – Licenses and Permits

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

Examples: cost-share agreement with U.S. Forest Service, 124 Permit, 3A Authorization, Air Quality Major Open Burning Permit.

Other permits the NEON activities would require include: scientific collections permit from the Montana Department of Fish, Wildlife & Parks. Section 7 consultation would be made with the USFWS for Rare, Threatened and Endangered species.

A Right-Of-Way easement from the State of Montana would be required for Park Electric for the installation of an underground electrical line.

3. ALTERNATIVE DEVELOPMENT:

Describe alternatives considered and, if applicable, provide brief description of how the alternatives were developed. List alternatives that were considered but eliminated from further analysis and why.

The two options are:

- 1) No Action Alternative: Proposed project would not be implemented and no ecological, climate change or land management data would be collected. Current management actions would be maintained.
- 2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

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| <ul style="list-style-type: none">• <i>RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.</i>• <i>Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.</i>• <i>Enter "NONE" if no impacts are identified or the resource is not present.</i> |
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4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify direct, indirect, and cumulative effects to soils.

- 1) No Action Alternative: Proposed project would not be implemented and no ecological data would be collected. Current management actions would be maintained.

Present condition; vegetation is generally native with some short grasses. Although some grazing does exist, soils are stable and somewhat compacted. If this alternative was selected resources would not be affected. Future conditions; no measurable changes other than naturally occurring changes.

- 2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection.

The Project Area is mapped as Soil Map Unit 321B, Beaverell, stony-Attwen complex, with zero to four percent slopes. (USDA-NRCS 2014).

The soils along the access path conform to the published NRCS descriptions. Soil textures in the field classified as stony with little sandy loam in the upper two inches.

At the proposed tower location, construction would disturb soils as a result of clearing and grading to place tower pad IH and parking area, installation of fencing around tower, and trenching to transfer electric power from portals. The total area of disturbed soils would be approximately 0.29 acres at the proposed location. There would be the potential for erosion and sedimentation to occur prior to covering or re-vegetating disturbed areas. None of the soils that would be disturbed are highly prone to erosion. NEON would implement appropriate BMPs, as described in Section 2.2.2 of the NEON Environmental Assessment, to minimize the potential for soil erosion and indirect impacts to surface waters from transport of eroded materials into nearby waterbodies.

Upon completion of NEON activities at the site or loss of funding, all infrastructure features would be removed including the tower, tower pad, the instrument hut, instrument hut foundation, parking area, and utility conduit (from tower infrastructure to parking area). Care would be taken to minimize ground disturbance during removal activities. Any materials removed during these processes would be reused, recycled, or properly disposed of. Disturbed ground would be stabilized with biodegradable materials and re-vegetated with species native to the area and appropriate for site-specific conditions and in coordination with the site host. Compacted soils would be loosened and scarified, then seeded and/or planted. If needed, topsoil appropriate for the area would be brought in and spread over the loosened soil prior to re-vegetation activities.

No direct or indirect impacts to geology would be expected. There would be no potential for interaction with other projects and no cumulative impacts to geologic resources would occur.

Short-term minor direct impacts to soils would be expected as a result of construction and site closure. Any indirect impacts to soils would be negligible. NEON has strict reduced impact requirements that are closely managed. Any direct impacts to soils during operation of NEON would be negligible and no indirect soil impacts would result from operation of NEON infrastructure. Because all impacts would be limited to the NEON footprint, there would be no potential for interaction with other projects and no cumulative impacts to soils would result. BMPs would be used to minimize the potential for erosion. At site closure, pre-construction site conditions would be restored to the extent practicable.

Soil sampling for the TOS would result in negligible direct disturbance of soils throughout the operation of NEON. Future impacts are expected to be negligible.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify direct, indirect, and cumulative effects to water resources.

1) No Action Alternative: Proposed project would not be implemented and no ecological data would be collected. Current management actions would be maintained.

The Yellowstone River flows through the corner of Section 22 and Sixmile Creek and spring flow through Section 16. The Yellowstone River and is of good quality, classified as pristine. Leachate from mine spoils and tailings can result in increased levels of trace elements in streams and groundwater within the Yellowstone River basin. Natural trace elements are introduced from leaching of soils with high concentrations of selenium. Geothermal areas can contribute elevated levels of arsenic to waters. Due to the presence of uranium-bearing rocks, elevated levels of radon may occur in waters (USGS, 2009d). If this alternative was selected the resources would not be further impacted. Future conditions; no measurable changes other than naturally occurring changes.

2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection

Construction would be completed in approximately 6 months with a crew of up to 10 workers plus oversight personnel from NEON. All work would be completed during the day and equipment and materials would be brought in via the existing access road. At any proposed NEON location, the amount of disturbance would be

small, approximately 0.29 acres. Any indirect impacts would be temporary and negligible and the potential for impacts to water quality from construction would end following the stabilization and re-vegetation of disturbed soils.

Upon completion of NEON activities at the site or loss of funding, all infrastructure features would be removed including the tower, tower pad, the instrument hut, instrument hut foundation, parking area, and utility conduit (from tower infrastructure to parking area). Disturbed ground would be stabilized with biodegradable materials and re-vegetated with species native to the area and appropriate for site-specific conditions and in coordination with the site host.

Appropriate BMPs, as discussed in Section 2.2.2 of the NEON Environmental Assessment, would be implemented to minimize the potential for indirect impacts to water quality as a result of erosion and sedimentation from disturbed soils. A similar potential for temporary direct and indirect impacts to water quality would be expected at the time of site closure.

Additional cumulative impacts could result from NEON activities and cattle grazing, in the form of erosion, vegetation and land degradation. Groundwater degradation would not result.

There would be no potential for direct impacts to water quality during construction of NEON infrastructure. Negligible short-term indirect impacts to water quality could occur from stormwater runoff during construction. Because any impacts would be localized, there would be no potential for cumulative impacts to occur. No future impact water resources are anticipated during operations.

6. AIR QUALITY:

What pollutants or particulate would be produced (i.e. particulate matter from road use or harvesting, slash pile burning, prescribed burning, etc)? Identify the Airshed and Impact Zone (if any) according to the Montana/Idaho Airshed Group. Identify direct, indirect, and cumulative effects to air quality.

1) No Action Alternative: Proposed project would not be implemented and no ecological data would be collected. Current management actions would be maintained.

Current; ambient air quality is generally good and is designated as in attainment for criteria pollutants (USEPA, 2009b). If this alternative was selected good ambient air quality would be maintained. Future conditions; no measurable changes other than naturally occurring.

2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection

Construction of the proposed infrastructure would have short-term, negligible impacts on air quality. The amount of ground disturbance is estimated around 0.29 acres at the proposed location and no large earthmoving equipment would be used. Appropriate BMPs, as discussed in Section 2.2.2 of the NEON Environmental Assessment, would be implemented during construction to reduce or eliminate fugitive dust emissions.

Construction would be completed in approximately 6 months by a crew of up to 10 contractors plus oversight personnel from NEON. Workers would travel to the sites in carpools or vanpools to minimize the amount of vehicle emissions. Vehicle emissions during construction would be a minor temporary impact on local air quality.

A comparable potential for short-term air quality impacts would result at the end of the NEON projects. Similar equipment would be used to remove NEON infrastructure and implement site restoration activities. Any impacts at site closure would likely be negligible.

During operations, a maximum of 25 scientists and technicians would be onsite daily for a 6-week period during maximum sampling efforts. During other times, it is expected that an average of three people would visit each site twice per week. Scientists and technicians would carpool or vanpool to the sites and vehicle trips associated with implementation of the proposed NEON activities would not cause substantial changes in air quality from the baseline conditions.

Short-term negligible direct and indirect impacts to air quality would occur during construction of NEON infrastructure. There would be negligible long-term direct impacts to air quality from use of vehicles during the operation of NEON infrastructure. Because emissions associated with NEON projects would be intermittent and small, no cumulative impacts to air quality would be expected. Future impacts; the NEON project during operations would not contribute to regional haze or air quality degradation and would not impact visibility.

7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify direct, indirect, and cumulative effects to vegetation.

- 1) No Action Alternative: Proposed project would not be implemented and no ecological data would be collected. Current management actions would be maintained.

Present conditions; Paradise Valley, is a nearly treeless valley of the Yellowstone River. Trees are typically confined to the banks of the Yellowstone River and riparian areas along smaller streams. Paradise Valley vegetation is dominated by grasses and forbs. (WWF, 2009).

The ecological system of the project area can be classified as sagebrush steppe and montane grassland. Flora and fauna descriptions below are taken from the online Montana Field Guide (2013). Shrub species often include Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), silver sagebrush (*Artemisia cana* ssp. *viscidula*), subalpine big sagebrush (*Artemisia tridentata* ssp. *spiciformis*), greasewood (*Sarcobatus vermiculatus*), saltbush (*Atriplex* species), rubber rabbitbrush (*Ericameria nauseosa*), green rabbitbrush (*Chrysothamnus viscidiflorus*), and antelope bitterbrush (*Purshia tridentata*) (Montana Field Guide 2013). Grass species often include Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Western wheatgrass (*Pascopyrum smithii*), and Indian ricegrass (*Achnatherum hymenoides*) (Montana Field Guide 2013). Future conditions; no measurable changes other than naturally occurring changes.

- 2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection

The ecosystem is mainly Northern Rocky Mountain Lower Montane-Foothill-Valley Grassland and Rocky Mountain Subalpine-Montane Mesic Meadow. Due to grazing, the soil is compacted, and the grasses are sparse and short. Vegetation cover at this site is ~80-90% The canopy height for grassland is ~ 0.2-0.3 m. No trees or shrubs are located on or near the site. The vegetation onsite consists of only herbaceous plants forbs and grasses with open stony ground intermixed.

A vegetation survey was completed by NEON environmental contactor, Kleinfelder (Appendix E). The Montana Heritage Program and United States Fish and Wildlife Service's database was reviewed during the vegetation survey mentioned previously to determine the potential absence or presence of sensitive plants in or adjacent to the proposed project site. In this database for Park County, MT the following sensitive species were listed; Whitebark pine (Candidate).

This survey mentioned above determined that minimal impacts to the plant community would occur from the planned construction at the proposed project site. No sensitive, threatened, or endangered plant species were observed within the proposed project area. No sensitive plants were observed during the pedestrian survey where potential sampling would occur.

Minor clearing of vegetation would occur during construction to prepare for tower pad IH and parking area. Construction of fencing would result in a long-term negligible impact to vegetation. There also would be minor clearing of vegetation to place trenches for extension of utility lines. Vegetation in areas cleared for tower and associated infrastructure would be lost for the duration of the NEON project. Areas disturbed for trenching could be stabilized or allowed to naturally re-vegetate. Upon completion of NEON activities at the site or loss of funding, all infrastructure features would be removed including the tower, tower pad, the instrument hut, instrument hut foundation, parking area, and utility conduit (from tower infrastructure to parking area).

The spread of noxious weeds is a serious concern in this region. Areas disturbed through trenching or other construction activities would be stabilized and seeded with native vegetation in accord with respective land

management agency BMPs. Where overhead utility lines are extended, there could be limited removal of trees along the route. Because of the need to keep the utility lines clear of vegetation, these areas would remain free of trees until the end of the NEON project. Utilities would be buried. Noxious weeds would be monitored annually and a weed plan with mitigations would be developed and implemented should introduced noxious weeds be discovered.

Loss of vegetative cover due to physical disturbance in Section 22-T5S-R8E would be ~0.3 acres. Grazing land put out of production in Section 22-T5S-R8E due to physical disturbance, installation of facility and protective fencing would be approximately 0.5 acres. Loss of animal unit months (AUM) and forage productivity would be minimal.

There would be minor long-term impacts to vegetation and plant communities at tower pad IH and parking area and negligible short-term impacts to vegetation and plant communities along utility lines. Because impacts would be localized, there would be no potential for interaction with other projects and no cumulative impacts to vegetation or other ecological resources are anticipated. Future impacts would be minor during operations and would include; clip harvesting of plant material, leaf litter collection and soil cores or pits.

8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify direct, indirect, and cumulative effects to fish and wildlife.

- 1) No Action Alternative: Proposed project would not be implemented and no ecological data would be collected. Current management actions would be maintained.

Present conditions; Paradise Valley is located in a nearly treeless valley along the Yellowstone River, animal species and habitats in this ecological system are varied. Common large mammal species include coyote (*Canis latrans*), elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), and pronghorn (*Antilocapra americana*) (Montana Field Guide 2013). Small mammals include various shrews (*Sorex* species), voles (*Microtus* species), rabbits and cottontails (*Lepus* and *Sylvilagus* species), mice (numerous species), squirrels (*Urocyon* species), and bats (numerous species). Reptile species are primarily limited to snakes with some lizards also present (Montana Field Guide 2013). Bird species in the project area range from birds of prey such as eagles, hawks, and owls to smaller birds such as doves and sparrows (Montana Field Guide 2013). Habitats are present that support the above species and are detailed in section 7. Future conditions; no measurable changes other than naturally occurring changes.

- 2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection

Construction occurring during the nesting season may require clearance surveys to prevent disruption of nesting birds within the project area. The proposed infrastructure installation at the Relocatable site would include actions such as temporary surface disturbance, operating small equipment, and localized increase of human activity and noise that could affect wildlife and their habitat within and/or adjacent to the tower site. Potential impacts to wildlife resources are temporary and would be mitigated by standard best management practices. After construction is complete terrestrial and avian impacts would be minimal.

The tower at the Relocatable site would pose a minimal risk to common birds and flying mammals. Collisions with the tower would be unlikely and any impacts would likely be negligible from a population standpoint. This potential risk to birds and flying mammals would be eliminated at site closure. The tower would be a self-supporting structure and would not have guy wires, therefore a lower risk of collision with birds and flying mammals due to the lack of guy wires.

During construction activities, there would be the potential to disturb and displace wildlife. However, construction would be completed in approximately 6 months with a crew of up to 10 workers plus oversight personnel from NEON. All work would be completed during the day. No large equipment would be used during construction and materials would be brought in by hand. The proposed site has adequate habitat surrounding the proposed location, which could provide refuge during construction. Any construction near nesting, breeding, or rearing areas would be timed to avoid sensitive periods to the extent practicable. No disruption of wildlife breeding is likely.

Fencing around towers would prevent large terrestrial wildlife from entering the immediate tower area. The fenced areas would be small and no impact to wildlife populations would be expected.

Construction would result in the temporary loss of approximately .29 acres of potential wildlife habitat at the Paradise Valley proposed location. There is abundant suitable habitat in the surrounding areas and any impacts and habitat loss to birds and small mammals would be negligible.

Small mammal trapping would be conducted by the TOS and would follow established protocols and regulations for animal handling to minimize incidental trap mortality. Trap grids would be moved among the TOS to minimize the potential for predators to learn trap patterns. Appropriate permits for trapping would be obtained from the Montana Fish, Wildlife, and Parks prior to any small mammal trapping. A site-specific animal welfare plan would be prepared and implemented prior to conducting small mammal trapping at any location. There would be a long-term loss of habitat at tower IH and parking area, but the area of lost habitat would be negligible relative to the total habitat available in the proposed project area. Overall impacts to wildlife would be negligible.

Wildlife species react to fixed-wing aircraft overflights, with the type and magnitude of response varying among species and with the specific conditions of the overflight. The response is thought to be a result of both visual and auditory stimuli (Ward, 1984). Animals may startle at the noise of the plane, but no energy-consuming flight response would be expected due to the lack of visual stimuli and the relatively low volume and constant nature of the noise.

Noise from the atmospheric sampling equipment pumps also could impact wildlife. The constant nature of the noise could result in long-term displacement of some animals. Other animals would adjust to the constant noise and resume use of the area around instrumentation. Any impacts to wildlife would likely be long-term and minor at the proposed tower.

Negligible indirect impacts to wildlife would result from loss of habitat. No population-level impacts would be expected and there would be no potential for cumulative impacts from the NEON activities at Paradise Valley. Future negative impacts are not expected.

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify direct, indirect, and cumulative effects to these species and their habitat.

1) No Action Alternative: Proposed project would not be implemented and no ecological data would be collected. Current management actions would be maintained.

Current conditions; some unique, endangered, fragile or limited environmental resources do or have potential to exist. Resource include; sensitive large mammals, birds and their habitat. If this alternative was selected the resources would not be affected. Future conditions; no measurable changes other than naturally occurring changes.

2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection

There is the potential to disturb sensitive terrestrial wildlife of the area during construction activities. The proposed construction site is surrounded by habitat occupied by these species. It is expected that any sensitive wildlife species disturbed by construction activity would relocate a short distance to suitable habitat nearby. Upon completion of construction, any displaced sensitive species would be expected to return to their former use patterns.

Occasional Grizzly Bear use of the Paradise Valley area of the Yellowstone River Basin does occur. The project area is located within identified occupied and spring habitat but preferred habitat for grizzly bear is generally only found in river and stream riparian areas. Adverse direct, indirect and cumulative impacts to Grizzly Bear's as a result of this project are expected to be minimal.

No known denning or rendezvous sites for Gray Wolf occur within 1 mile of the project area. However, wolves may occasionally use the project area and occasional sightings have been noted in the area. Minimal risk of direct, indirect or cumulative effects that would result in harm to wolves would be anticipated under either of the alternatives considered.

Suitable lynx habitat is not present but Lynx could occasionally use the proposed project area. Habitats high in coarse woody debris that are preferred for denning, and large acreages of dense conifer regeneration at high elevations that are preferred for foraging are not represented in the project area. Lynx habitat is marginal due to man-made fragmentation, the high level of native grassland habitat types; and to the lack of highly desirable habitat conditions for lynx and their primary prey, snowshoe hares. Minimal risk of direct, indirect or cumulative impacts to lynx is expected as a result of this project.

The proposed project area falls within the range of wolverines. The DNRC is not aware of any specific observations of wolverines associated with the proposed project area; however, periodic or transient use of the proposed project area could occur. High elevation areas with persistent snow late into the spring do not occur in the project area. Activities associated with this proposal are expected to have minimal effect on wolverines.

No Bald Eagle nests were observed on the State parcels but feeding areas, roosting areas or suitable nesting habitat do occur on or within one mile of the proposed project area. No effects to Bald Eagles associated with this project are anticipated.

Sagebrush semi-desert habitats suitable for use by Sage Grouse do occur within one mile of the project area but no leks, lek areas or core areas have been identified within one mile of the project area. Any effects to habitat or disturbance-related effects would be expected to be minimal and preferred sagebrush habitat would not be altered. Impacts to Sage Grouse are not anticipated.

A plant species of concern, Wedge-leaf Saltbush, has been observed in Sections 22-T5S-R8E and 16-T6S-R8E associated with riparian areas. Impacts to Wedge-leaf Saltbush are not anticipated.

Some suitable habitat does occur for the Sprague's Pipit within the proposed project area.

Negligible indirect impacts to wildlife would result from loss of habitat. No population-level impacts would be expected and there would be no potential for cumulative impacts. As mentioned previously, construction occurring during the nesting season would require clearance surveys to prevent disruption of nesting birds within the project area. The proposed infrastructure installation at the Relocatable tower would include actions such as temporary surface disturbance, operating small equipment, and localized increase of human activity and noise that could affect wildlife and their habitat within and/or adjacent to the core site. Potential impacts to wildlife resources are temporary and would be mitigated by standard best management practices. After construction is complete terrestrial and avian impacts would be minimal.

The watersheds within the project area are known to support cold-water fisheries including Yellowstone Cutthroat Trout. Direct, indirect or cumulative impacts to the fisheries resources within these watersheds as a result of implementing the proposed actions are expected to be negligible. Future impacts to fisheries are not expected.

10. HISTORICAL AND ARCHAEOLOGICAL SITES:

Identify and determine direct, indirect, and cumulative effects to historical, archaeological or paleontological resources.

- 1) No Action Alternative: Proposed project would be suspended and no ecological data would be collected. Current management actions would be maintained.

Present conditions; some historical and archaeological resources exist. Three isolated occurrences were documented during an inventory in 2013 for Section 22-T5S-R8E. The isolated occurrences consist of six individual features likely consisting of an old section marker boundary, a prehistoric tested cobble and associated flake, and a historic bottle fragment. If this alternative was selected the resources would not be affected. Future conditions; no measurable changes other than naturally occurring.

An archeological survey for Sections 16-T6S-R8E and 32-T4S-R9E for Terrestrial Observations is currently in progress and the report will be available in July 2015. Numerous drive trails with rock cairn features have been identified within Section 16-T6S-R8E. NEON would be required to protect all rock cairn features and leave them in an undisturbed condition.

- 2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection

HDR conducted a cultural resources inventory for Section 22-T5S-R8E of the NEON's Paradise Valley Site, Park County, Montana in 2013. The project area is an irregularly shaped parcel and associated access road. The inventory identified and evaluated cultural resources in the project area that may be impacted by the proposed construction of an ecological monitoring tower, instrument hut, installation of an array of soil monitoring sensors, and distributed terrestrial sampling throughout the project area.

In total, 48 acres were surveyed in Section 22-T5S-R8E. Three isolated occurrences were documented during the inventory. The isolated occurrences consist of six individual features likely consisting of an old section marker boundary, a prehistoric tested cobble and associated flake, and a historic bottle fragment. Isolated occurrences are not considered for listing on the NRHP. Since no historic properties would be impacted by the proposed undertaking, no further cultural resource management actions are recommended. This inventory and report is available, if requested.

An archeological survey for Sections 16-T6S-R8E and 32-T4S-R9E for Terrestrial Observations is currently in progress and the full report will be available in July 2015. Numerous drive trails with rock cairn features have been identified within Section 16-T6S-R8E. NEON would be required to protect all rock cairn features and leave them in an undisturbed condition.

No cumulative effects to cultural resources would result from this project. No future impacts to historic and archaeological sites.

11. AESTHETICS:

Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify direct, indirect, and cumulative effects to aesthetics.

- 1) No Action Alternative: Proposed project would be suspended and no ecological data would be collected. Current management actions would be maintained.

Current conditions; minimal structures exist at the location currently, largely used for grazing. If this alternative was selected the resources would not be affected. No future impacts.

- 2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection

Minor noise would be generated during tower construction. Wildlife in immediate construction areas would be exposed to the elevated noise and would be expected to relocate from the construction area, but would likely resume normal activity following construction. Any construction-related noise impacts would be temporary and minor.

During operations noise would be minimal to non-existent. The pumps for atmospheric sampling equipment on the instrumentation would operate continuously. Typically, these pumps produce noise of approximately 65 dBA. Noise impacts to residents near proposed tower would be long-term and minor. The nearest residence is ~0.5 miles away. 60 dBA is normal conversation and noise impact from pumps would be negligible.

Visibility of the tower would present an aesthetic impact. The tower would potentially be visible by the surrounding community and vehicles traveling on Highway 89, this is a direct effect. The tower could be painted to help blend with surroundings. There would be no cumulative effects on aesthetics as a result of the Tower or associated sampling. Minor future aesthetic impacts.

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify direct, indirect, and cumulative effects to environmental resources.

- 1) No Action Alternative: Proposed project would not be implemented and no ecological data would be collected. Current management actions would be maintained.

N/A

- 2) Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection

NONE

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

The National Science Foundation completed an Environmental Assessment in November 2009 to assess the environmental impact of NEON as whole. The proposed sites in the Greater Yellowstone Ecosystem were included.

This Assessment is referenced several times in this checklist and is available for download at:

http://www.nsf.gov/bio/outreach/final_neon_ea_addendum_a_combined.pdf

A Vegetation survey to identify potential sensitive and endangered species as well as state of the plant communities was completed by NEON contractor Kleinfelder in July, 2014, please refer to Appendix E for this survey. HDR conducted a cultural resources inventory of the NEON's Paradise Valley Site in Park County in October, 2013 and an additional survey for the Terrestrial Observations was completed in June 2015 by Mead and Hunt. These surveys can be found in appendix F and G.

The SE4NE4 of Section 32-T4S-R9E is currently proposed for the DNRC land banking program and is in the early stages of MEPA review.

IV. IMPACTS ON THE HUMAN POPULATION
<ul style="list-style-type: none">• <i>RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.</i>• <i>Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.</i>• <i>Enter "NONE" if no impacts are identified or the resource is not present.</i>

14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

There are some risks involved for NEON employees and contractors during the construction and operations of the Tower. NEON has strict Environmental Health and Safety protocols and would be responsible to ensure safety of NEON employees and contractors. Each site would have an individual Environmental Health and

Safety (EHS) plan that would provide safety contacts and concerns including; potential hazards, weather, fire, security, emergencies, conflicts with wildlife, etc.

There are also concerns with security of the tower and members of the community or wildlife climbing the structure. Security measures including fencing or gates would be installed to prevent and minimize this to maximum extent possible.

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:

Identify how the project would add to or alter these activities.

NONE.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

Estimate the number of jobs the project would create, move or eliminate. Identify direct, indirect, and cumulative effects to the employment market.

The NEON project in Montana (which NEON calls Domain 12) would create several permanent scientific data collection positions and seasonal positions as well. Economic development could increase as a result of the potential for future grants and additional research. No employment would be moved or eliminated, no cumulative effects anticipated.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

Estimate tax revenue the project would create or eliminate. Identify direct, indirect, and cumulative effects to taxes and revenue.

Due to the relatively small size of the project, there would be no measurable direct, indirect, or cumulative impact from this proposed action on tax revenues.

18. DEMAND FOR GOVERNMENT SERVICES:

Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify direct, indirect, and cumulative effects of this and other projects on government services

There would be no measurable direct, indirect, or cumulative impacts related to demand for government services due to the small size of the project, the short-term impacts to traffic and the small possibility of a few people temporarily relocating to the area.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

None.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify direct, indirect, and cumulative effects to recreational and wilderness activities.

Persons having legal access to the parcels and possessing a valid state lands recreational use license or FWP conservation license may conduct various recreational activities on the parcels. The proposed project would not affect the existing access or recreational quality of the general public.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

Estimate population changes and additional housing the project would require. Identify direct, indirect, and cumulative effects to population and housing.

There would be no measurable direct, indirect, or cumulative impacts related to population and housing due to the relatively small size of the project.

22. SOCIAL STRUCTURES AND MORES:

Identify potential disruption of native or traditional lifestyles or communities.

NONE

23. CULTURAL UNIQUENESS AND DIVERSITY:

How would the action affect any unique quality of the area?

Construction of the tower and associated equipment would have minimal impact on the community. Tower visibility and NEON personnel accessing the site to collect data could be of concern to adjacent landowners and the general public.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify direct, indirect, and cumulative economic and social effects likely to occur as a result of the proposed action.

The estimated return to the trust would be \$15,000.00 (\$1,500.00 per year @ 10 years). This estimate is intended for comparison of alternatives, not as an absolute estimate of return.

The tower or associated infrastructure is not anticipated to impact any economic activities in the area.

EA Checklist Prepared By:	Name: Sarah Eastin	Date: June 9, 2015
	Title: Environmental Permitting Specialist	

V. FINDING

25. ALTERNATIVE SELECTED:

Action Alternative: Construct tower/instrument facility with infrastructure and implement data collection.

WITH THESE MEASURES TO MITIGATE POTENTIAL IMPACTS:

- 1) All construction equipment would be power washed and inspected prior to being brought on site.
- 2) Limit equipment operations to periods when soils are dry, frozen or snow covered to minimize soil compaction, rutting and vegetative disturbance.
- 3) Install adequate road drainage to control erosion concurrent with activities and construction. Provide effective sediment filtration along drainage features.
- 4) Compliance with Best Management Practices (BMP's), Streamside Management Zone (SMZ) laws, the Montana Stream Protection Act, Working in Bear Habitat brochure and applicable DNRC Administrative Rules.
- 5) Litter receptacles and portable toilets would be supplied, emptied, maintained, and removed by the Licensee.

- 6) Vehicle access would be limited to existing roads and designated trails as directed by the Department representative. All other access would be by foot.
- 7) Access path to monitoring facility in Section 22-T5S-R8E from parking area would utilize an open cell paver.
- 8) Any sensitive sites and features described in the Cultural Resource Surveys would be protected and left in an undisturbed condition.
- 9) Construction and disturbed areas would be rehabilitated and grass seeded with an authorized seed mix as directed and approved by the Department representative.
- 10) Licensee shall contact the Bozeman Unit prior to activities to determine what mitigations are necessary to minimize fire concerns. All Stage I and Stage II Restrictions would be followed. The mitigations may include mowing of the area at main instrument facility, an ATV equipped with a water tank and pump, or closure of area.
- 11) Contact Department representative should any threatened or endangered species be encountered within the State ownerships.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

I have determined that none of the anticipated environmental impacts outlined in the EA are significant according to the criteria outlined in *ARM 36.2.524*. I find that no impacts are regarded as severe, enduring, geographically widespread, or frequent. Further, I find that the quantity and quality of various resources, including any that may be considered unique or fragile, will not be adversely affected to a significant degree. I find no precedent for future actions that would cause significant impacts, and I find no conflict with local, State, or Federal laws, requirements, or formal plans. In summary, I find that the identified adverse impacts will be avoided, controlled, or mitigated by the design of the project to the extent that the impacts are not significant.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

EIS
 More Detailed EA
 No Further Analysis

EA Checklist Approved By:	Name: Craig Campbell Title: Bozeman Unit Manager
Signature:	
Date:	6/15/2015

List of Appendices

Appendix A - Tower Location in proximity to the local community

Appendix B - NEON Relocatable Tower Location

Appendix C - Tower 60% Design

Appendix D - Parcels of State owned land that would be used for Terrestrial Observations

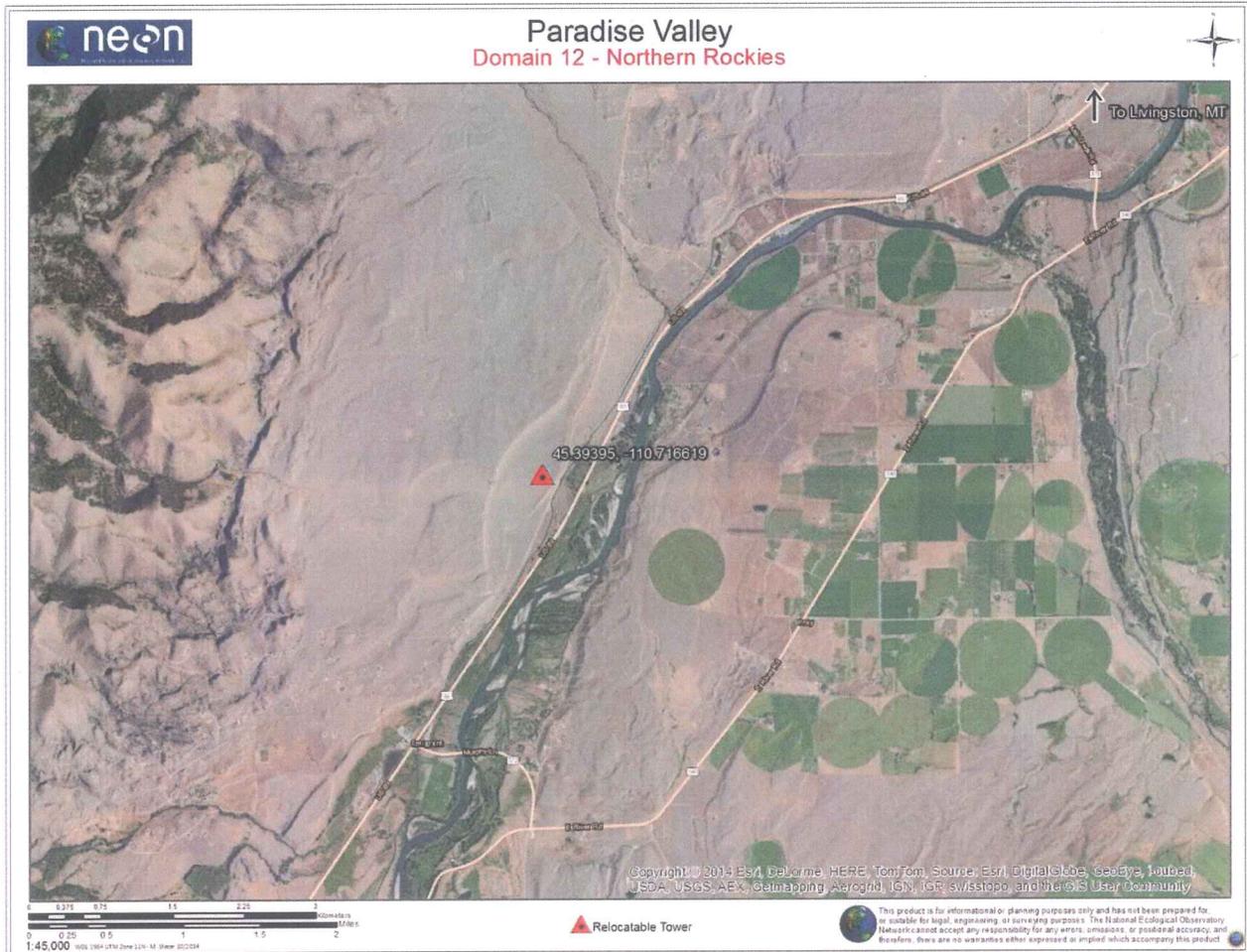
Appendix E - NEON Vegetation Survey

Appendix H – CLO Checklist For Endangered, Threatened and Sensitive Species



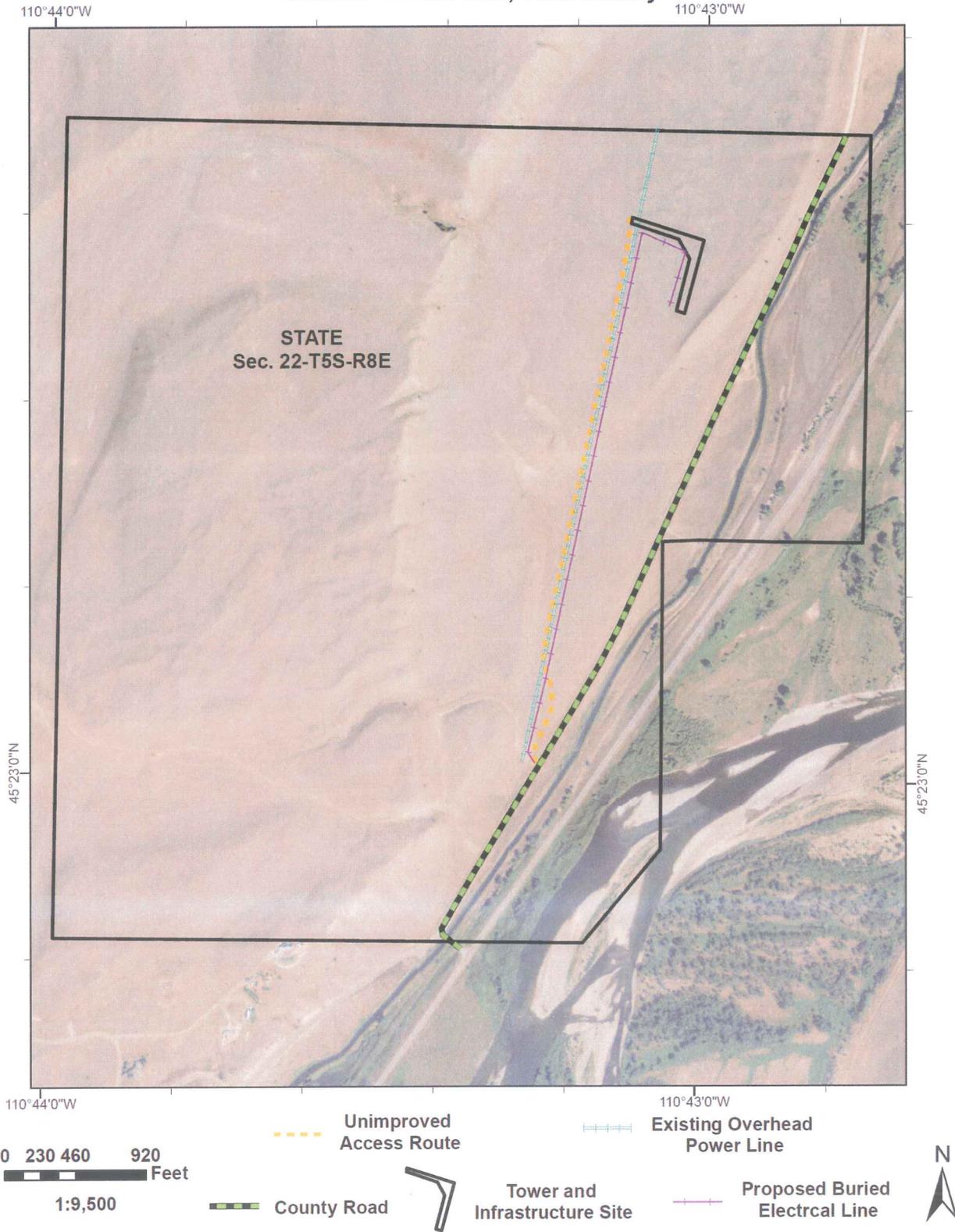

GENERAL LOCATION MAP
 120,000 20,000' 0 20,000' 40,000'
 1:250,000

Appendix A

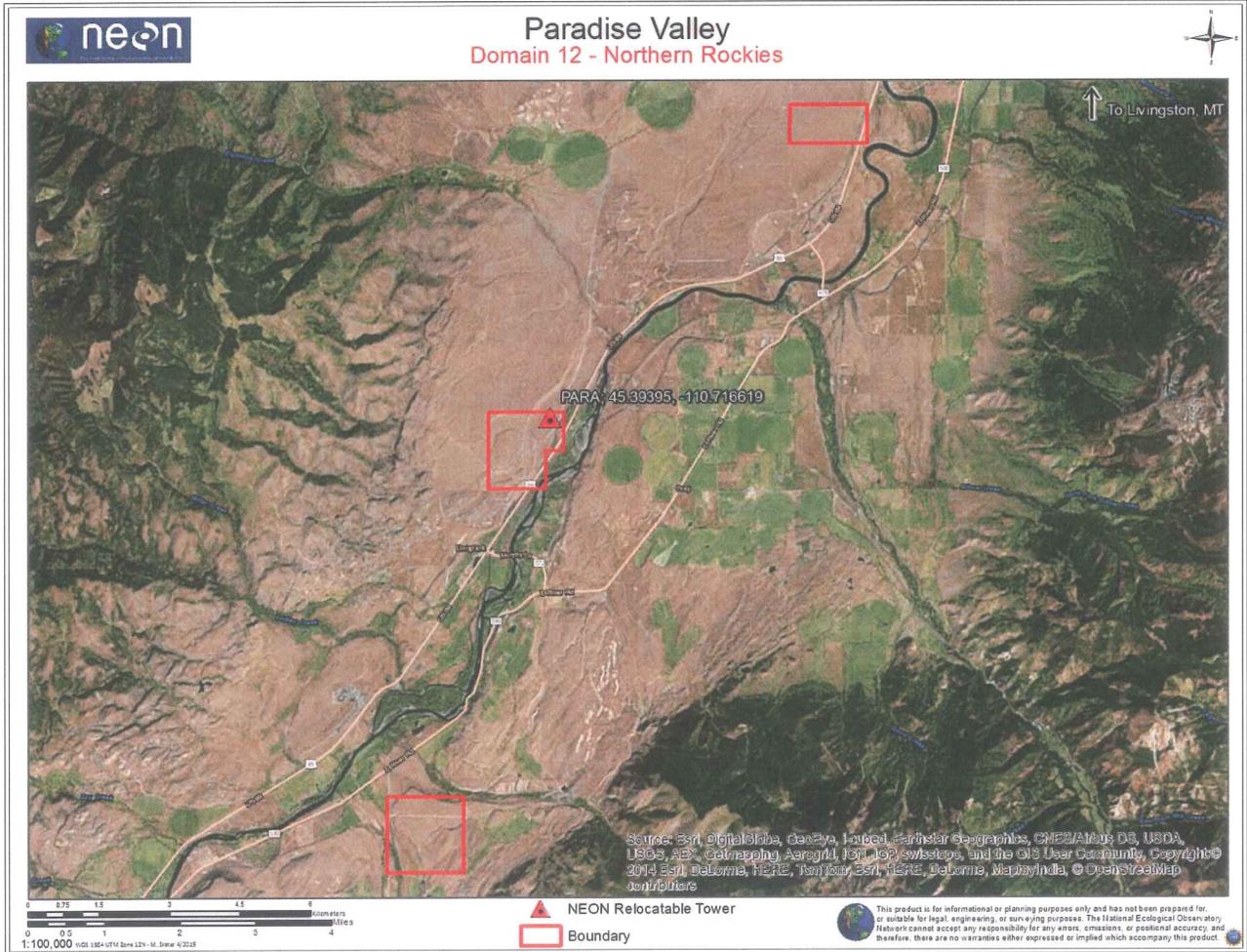


Appendix B

APPENDIX B
NEON Tower and Infrastructure Site
Section 22-T5S-R8E, Park County

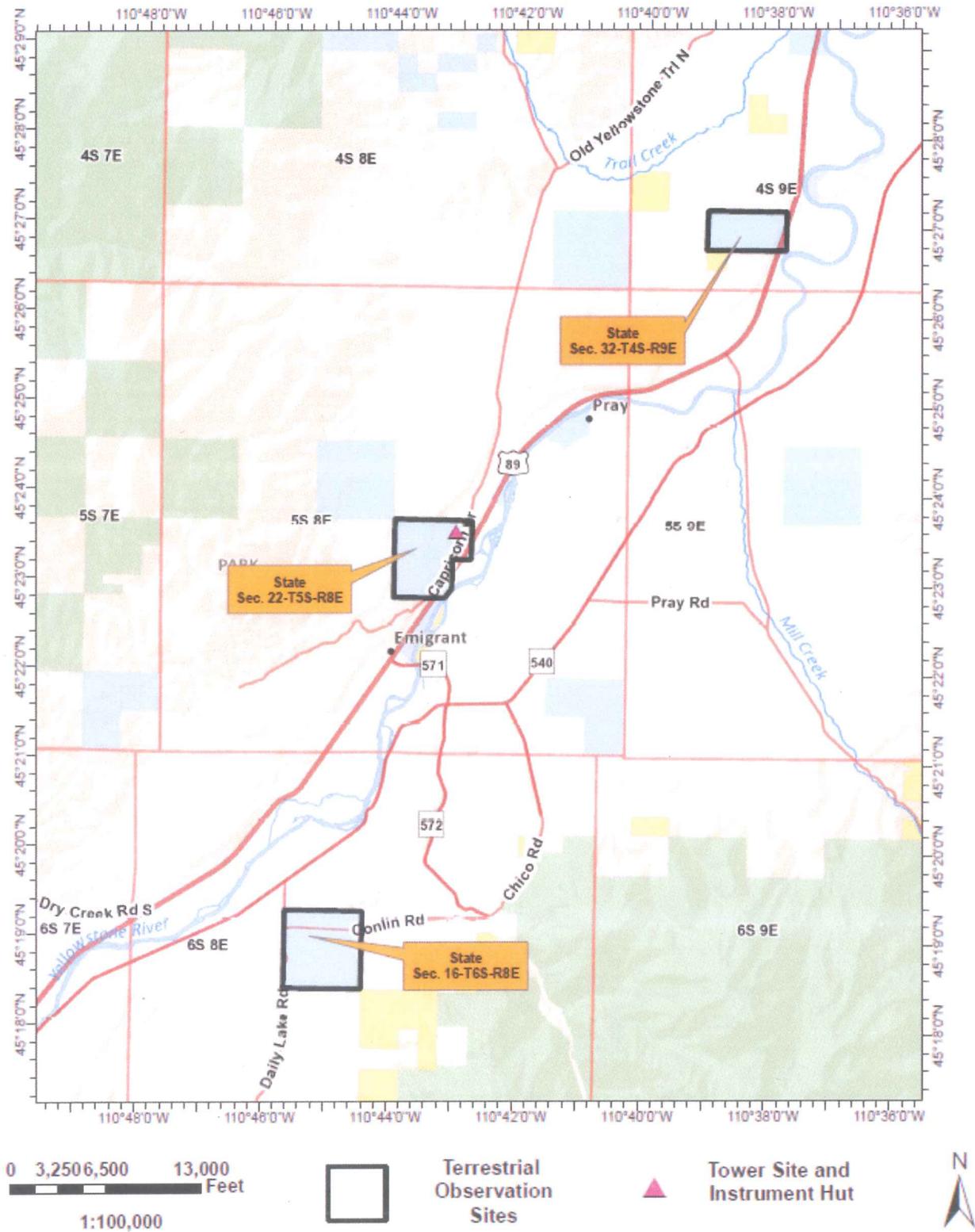


Appendix B



Appendix D

APPENDIX D
NEON Terrestrial Observation Sites
Sections 32-T4S-R9E, 22-T5S-R8E and 16-T6S-R8E, Park County



Appendix D

APPENDIX E Vegetation Survey

July 28, 2014
Kleinfelder Project No.: 118301.40

John Oppenheim
NEON, Inc.
1685 38th Street, Suite 100
Boulder, CO 80302

SUBJECT: Results of the Vegetation Survey
For the NEON Domain 12 Northern Rockies Relocatable Tower 2 Paradise
Valley,
Livingston, Montana

Dear Mr. Oppenheim:

Kleinfelder is pleased to submit our findings of the pre-construction vegetation survey for the NEON Domain 12 Northern Rockies Relocatable Tower 2 (RT2) site, located near Livingston, Montana in an area called Paradise Valley. The vegetation survey was completed for the RT2 and related infrastructure including the boardwalk, instrument hut, and soil array (**Figure 1**). The purpose of the vegetation survey was to identify existing vegetation conditions and to identify potential sensitive plants that may be located in or adjacent to the RT2 project site. Please refer below for a detailed summary of the findings.

BACKGROUND

The proposed Project is currently located on private rangeland within Park County, Montana. The proposed NEON facility at Paradise Valley is comprised of the following main components: boardwalk, re-locatable tower, instrument hut and a soil array. The access path originates from Old Yellowstone Trail which is accessed from Montana State Highway 89.

The Project Area is mapped as Soil Map Unit 321B, Beaverell, stony-Attwen complex, with zero to four percent slopes. (USDA-NRCS 2014).

SCOPE OF WORK

Kleinfelder's scope of work included conducting a pre-construction vegetation survey for the proposed RT2 site. The survey effort was to include a pedestrian survey within the proposed project site to determine the vegetation composition and the presence or absence of any sensitive plants that may be located within or near the project site.

Specific information that was researched included; property ownership, on-site topographic characteristics, population biology data, condition of site, landscape structure of surrounding lands, general habitat data and federal and state databases.

SITE VISIT AND METHODOLOGY

Qualified Kleinfelder biologist, Louis Bridges PhD visited the Project Area on June 25, 2014, to conduct the vegetation survey. The Kleinfelder representative arrived on site at approximately 9:30 AM Mountain Daylight Time (MDT). No NEON or property representative was present during the survey. NEON provided two percent layout drawings with GPS points identified for the instrument hut, tower, 1st soil array, and boardwalk orientation.

Structure locations were located in the field utilizing the GPS information (**Figure 1**). The tower and soil array terminus were utilized as reference points for establishing a baseline. The Project Area was assessed and four 100-foot vegetation transects were established in areas representative of the ground cover and species composition of the Project Area.

Figure 2 contains a photographic record with representative photos taken at the site. Plant species and wildlife species (or signs of wildlife species) within the Project Area were documented.

FINDINGS

The soils along the access path conform to the published NRCS descriptions. Soil textures in the field classified as stony with little sandy loam in the upper two inches.

There is existing infrastructure adjacent to the Project Area. A powerline is adjacent to the site access path. Cattle were actively grazing on the site.

No trees or shrubs are located on or near the site. The vegetation onsite consists of only herbaceous plants forbs and grasses with open stony ground intermixed.

The Montana Heritage Program and United States Fish and Wildlife Service's databases were reviewed to determine the potential absence or presence of sensitive plants in or adjacent to the proposed project site. No sensitive plants were observed during the pedestrian survey.

Table 1 summarizes the plant species documented during the survey.

**TABLE 1
PLANT SPECIES DOCUMENTED WITHIN THE PROJECT AREA**

COMMON NAME	SCIENTIFIC NAME
Trees	
None	
Forbs	
Nine leaf desert parsley	<i>Lomatium triternatum</i>
Western salsify*	<i>Tragopogon dubius</i>
Red-stemmed saxifrage	<i>Saxifraga lyallii</i>
Fringed sage	<i>Artemisia frigida</i>
Oxeye daisy*	<i>Leucanthemum vulgare</i>
Wooley groundsel	<i>Senecio canus</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Sulfur buckwheat	<i>Eriogonum umbellatum</i>
Graminoids	
Timothy	<i>Phleum pratense</i>
Needle-and-thread grass	<i>Stipa comata</i>
Lichens and Mosses	
Roadside rockmoss	<i>Racomitrium canescens</i>
Lichen	<i>Cladonia spp.</i>

*Weed species

There are many ways that have been used to classify vegetation. Some are based on vegetation physiognomy, vegetation structure, or environmental factors. Some of these approaches are useful at very broad scales. However, for work at fine scales, floristic approaches to vegetation, i.e. those based on the species composition of the plant communities, are essential.

The Braun-Blanquet Cover Classes approach was utilized to delineate the vegetation strata of the project site. This cover class approach implies that plant community types are conceived as units recognized by their total floristic composition. Among the species that make up the floristic composition of a community, some are better indicators of a given community than others. The approach seeks to use those species whose ecological relationships make them most effective indicators.

TABLE 2
SUMMARIZES THE VEGETATION STRATA OBSERVED AS CLASSIFIED BY THE
BRAUN-BLANQUET COVER CLASSES (BONHAM 1989)

COVER CLASS				
TRANSECT	EMERGENT TREE	TREE CANOPY	TREE SUB-CANOPY	HERBACEOUS
1	-	-	-	4
2	-	-	-	4
3	-	-	-	4
4	-	-	-	4

Cover is as follows: "+" = <1%, "1" = 1-5%, "2" = 6-25%, "3" = 26-50%, "4" = 51-75%, "5" = >75%.

CONCLUSIONS

Based upon the vegetation survey, Kleinfelder concludes that minimal impacts to the plant community will occur from the planned construction at the Domain 12 Paradise Valley site. No sensitive, threatened, or endangered plant species were observed within the proposed project area. Construction occurring during the nesting season may require clearance surveys to prevent disruption of nesting birds within the project area.

LIMITATIONS

This work was performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Kleinfelder's profession practicing in the same locality, under similar conditions and at the date the services are provided. Our conclusions, opinions, and recommendations are based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no other representation, guarantee, or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

This report may be used only by the Client and the registered design professional in responsible charge and only for the purposes stated for this specific engagement within a reasonable time from its issuance, but in no event later than two years from the date of the report.

The work performed was based on project information provided by Client. If Client does not retain Kleinfelder to review any plans and specifications, including any revisions or modifications to the plans and specifications, Kleinfelder assumes no responsibility for the suitability of our recommendations. In addition, if there are any changes in the field to the plans and

specifications, Client must obtain written approval from Kleinfelder's scientist that such changes do not affect our recommendations. Failure to do so will vitiate Kleinfelder's recommendations.

Recommendations contained in this report are based on interpretation of publically available databases, the status of field conditions as reported by the Client, and our present knowledge of the proposed construction. It is possible that soil and hydrological conditions could vary from the time of site visits. The conditions observed during the site visit represent a snapshot view of environmental conditions present at the time of the visit and do not represent the full range of climate, vegetation, and soil that complex Utah environments experience over the course of a full growing season. If vegetation, soil, or hydrological conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that Kleinfelder is notified immediately so that we may reevaluate the recommendations of this report. If the scope of the proposed construction changes from that described in this report, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed, and the conclusions of this report are modified or approved in writing by Kleinfelder.

CLOSING

We appreciate the opportunity to submit these findings and look forward to working with you on future projects. If you have any questions or need additional information, please contact Louis Bridges at (303) 901-9317.

Sincerely,

KLEINFELDER



Louis J. Bridges, Ph.D.
Principal Professional
Environmental Planning & Permitting

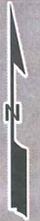


Stephen Caruana
Technical Practice Leader
Environmental Planning & Permitting

Enclosures: Figure 1 D12 Paradise Valley Site
Figure 2: Photologs

REFERENCES

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Soil Horizon




Legend

 1st Soil Plot	 Tower	 Boardwalk
 Instrument Hut	 Transformer	 Transect
 Soil Horizon	 Survey Boundary	

0 100 200 400 Feet
 1 inch = 200 feet

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



PROJECT NO.	118301
DRAWN:	7/25/2014
DRAWN BY:	J. Weber
CHECKED BY:	L. Bridges
FILE NAME:	D12_RT2_ParadiseValley.mxd

Aerial Imagery

Domain 12 Northern Rockies
 RT2 - Paradise Valley
 Site Layout

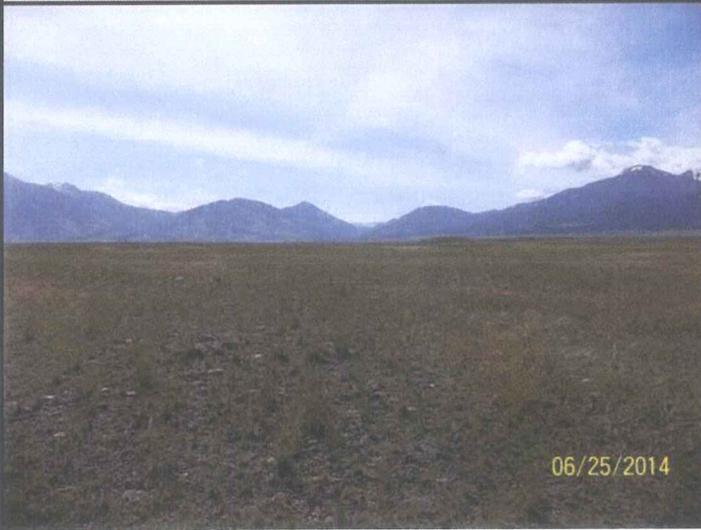
FIGURE
1



A. Boardwalk 1 ground cover.



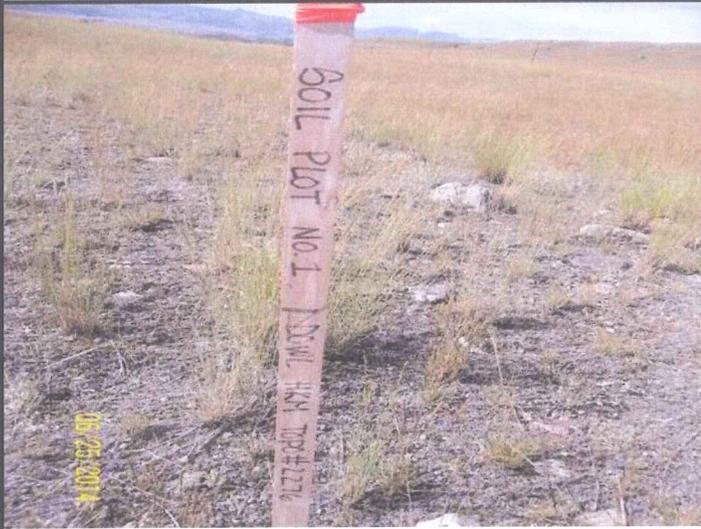
B. Boardwalk 1 looking north.



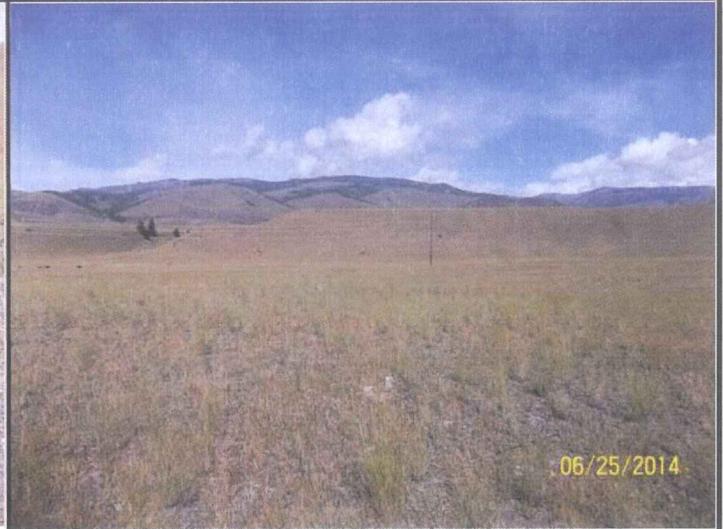
C. Boardwalk 2 looking east.



D. Instrument Hut stake.



E. Soil Plot 1 stake.



F. Boardwalk 5 (Soil Plot 5) looking west.



SITE PHOTOGRAPHS
NEON D12 Relocatable Tower 2 (RT2)
Paradise Valley, Montana

PN# 118301.2014 D12 Paradise Valley

Figure 2

APPENDIX H

NEON LAND USE LICENSE CHECKLIST FOR ENDANGERED, THREATENED AND SENSITIVE SPECIES CENTRAL LAND OFFICE

Prepared by Chuck Barone

April 28, 2015

Threatened and Endangered Species	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
<p>Canada Lynx (<i>Lynx canadensis</i>) Habitat: dense spruce/fir forest supporting snowshoe hares.</p>	<p>[N] The proposed project is located in dry grassland habitats not typically preferred by lynx. Habitats high in coarse woody debris that are preferred for denning, and large acreages (>50 acres) of dense conifer regeneration at high elevations that are preferred for foraging are not present in the project area. The predominant cover types within the project area do not contain high horizontal cover comprised of subalpine and spruce bows. Considering the limited presence of several habitat attributes within the project area that are known to be important for lynx and snowshoe hares (e.g. dense overstory canopy, dense shrubs and downed logs), habitat in this area is likely suited at best as travel habitat or matrix habitat that would facilitate movement, linkage, and provide habitat for secondary prey species. Preferred lynx habitat is not present within the proposed project area due to the lack of highly desirable habitat conditions for lynx and their primary prey, snowshoe hares. Adverse direct, indirect or cumulative impacts to lynx as a result of this project are expected to be negligible.</p>
<p>Grizzly Bear (<i>Ursus arctos</i>) Habitat: recovery areas, security from human activity</p>	<p>[Y] The proposed project area lies outside of any grizzly bear recovery area. The nearest recovery area is the Yellowstone Grizzly Bear Recovery Zone (USFWS 1993) situated ~2.5 miles south of Section 16-T6S-R8. Riparian areas adjacent to the Yellowstone River corridor in Sections 32-T4S-R9E and 22-T5S-R8E have been identified as potential grizzly bear spring habitat. The surrounding foothills above the main river valley have been identified as potential grizzly bear denning habitat. Grizzly bear use of the upper Yellowstone Valley does occur and the project area is located in what is considered occupied habitat (Interagency Occupied Habitat Map, September 2002). The project sites are comprised of dry grassland types not typically preferred by bears. Riparian habitats preferred by bears do occur along the adjacent Yellowstone River corridor and within the State sections. A smaller creek in Section 16-T6S-R8E also supports some level of hiding cover habitat. Human access levels are presently moderate to high due to the adjacent private lands, residential structures and public access within the</p>

	Yellowstone River corridor and project area. No new road would be constructed. In association with activities, food storage measures would also be required and firearms restrictions would be applied. Potential for any measurable increases in bear-human conflicts following project activities are not expected. Due to the scope, scale, nature and location of the proposed project, activities associated with this proposal are not expected to affect grizzly bears. Adverse direct, indirect and cumulative impacts to grizzly bears as a result of this project are expected to be minimal.
Wolverine (<i>Gulo gulo</i>) Habitat: High elevation cirque basins and zones with persistent snow in late spring	[N] The proposed project area falls within the range of wolverines. The DNRC is not aware of any specific observations of wolverines associated with the proposed project area; however, periodic or transient use of the proposed project area could occur. High elevation areas with persistent snow late into the spring do not occur in the project area. Due to the scope, scale, nature, and location of the proposed project, activities associated with this proposal are expected to have minimal effect on wolverines.

DNRC Sensitive Species	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
Bald Eagle (<i>Haliaeetus leucocephalus</i>) Habitat: late-successional forest <1 mile from open water	[N] Bald Eagles have been documented within the area that encompasses the proposed project area (MNHP/FWP Montana Field Guide 2014 and MNHP 2015). No Bald Eagle nests were observed on the State parcels. Feeding areas, roosting areas or suitable nesting habitat do occur on or within one mile of the proposed project area. Due to the scope, scale, nature and location of this proposed project, no direct, indirect or cumulative effects to Bald Eagles associated with this project are anticipated.
Black-Backed Woodpecker (<i>Picoides arcticus</i>) Habitat: Habitat: mature to old burned forest	[N] Black-backed woodpeckers have been documented within the area that encompasses the proposed project area (MNHP/FWP Montana Field Guide 2014 and MNHP 2015). Forested stands are negligible within the proposed project area. Trees are not presently experiencing noticeable insect activity and no recent burns (≤ 5 years old) have occurred within the State tracts or adjoining sections. Regionally insect activity is abundant at the landscape scale and not likely to be limiting for black-backed woodpeckers. Due to the scope, scale, nature and location of this proposed project, no direct, indirect or cumulative effects to black-backed woodpeckers would be expected to occur.

<p>Black-tailed Prairie Dog (<i>Cynomys ludovicianus</i>) Habitat: Prairie, shortgrass prairie, badlands</p>	<p>[N] Black-tailed prairie dogs have not been documented in the project area or surrounding area (MNHP/FWP Montana Field 2014 and MNHP 2015). No grassland habitat suitable for use by black-tailed prairie dogs occurs in or near the project area. No direct, indirect or cumulative effects to prairie dogs would be anticipated under the alternatives considered.</p>
<p>Flammulated Owl (<i>Otus flammeolus</i>) Habitat: late-successional ponderosa pine and Doug.-fir forest</p>	<p>[N] Flammulated Owls have not been documented within the area that encompasses the proposed project area (MNHP/FWP Montana Field 2014 and MNHP 2015). The parcels involved in the proposed project do not maintain the forest habitat types preferred by Flammulated Owls. No direct, indirect or cumulative effects to Flammulated Owls would be anticipated under the alternatives considered.</p>
<p>Gray Wolf (<i>Canis lupus</i>) Habitat: ample big game pops., security from human activity</p>	<p>[N] The proposed project area falls within the Greater Yellowstone Experimental Area for gray wolves. Several packs reside in the vicinity of the project area but no known denning or rendezvous sites occur within 1 mile of the project area. However, wolves may occasionally use the project area and occasional sightings have been noted in the area. Minimal risk of direct, indirect or cumulative effects that would result in harm to wolves would be anticipated under the alternatives considered. If wolves or an active den site were detected in the immediate area, operations would cease, and a DNRC biologist would be consulted. Appropriate mitigations would be developed and applied prior to resuming activities.</p>
<p>Greater Sage-grouse (<i>Centrocercus urophasianus</i>) Habitat: sagebrush semi-desert</p>	<p>[N] Sage Grouse have been documented in the area that encompasses the proposed project area (MNHP/FWP Montana Field Guide 2014 and MNHP 2015). Sagebrush semi-desert habitats suitable for use by Sage Grouse do occur within one mile of the project area but no leks, lek areas or core areas have been identified within one mile of the project area. Should sage grouse be present in the vicinity of the project area, any effects to habitat or disturbance-related effects would be expected to be minimal and preferred sagebrush habitat would not be altered. Impacts to Sage Grouse are not anticipated.</p>
<p>Harlequin Duck (<i>Histrionicus histrionicus</i>) Habitat: white-water streams, boulder and cobble substrates</p>	<p>[N] Harlequin ducks have been documented within the Yellowstone River corridor adjacent to the proposed project area (MNHP/FWP Montana Field Guide 2014 and MNHP 2015). High gradient streams suitable for use by harlequins do occur within the project area. Due to the scope, scale, nature and location of this proposed project, no impacts to Harlequin Ducks would be expected to occur as a result of this project.</p>

<p>Mountain Plover (<i>Charadrius montanus</i>) Habitat: short-grass prairie, alkaline flats, prairie dog towns</p>	<p>[N] Mountain Plovers have not been documented within the area that encompasses the proposed project area (MNHP/FWP Montana Field Guide 2014 and MNHP 2015). No short-grass prairie or prairie dog towns occur on, or within one mile of the proposed project area. No impacts to Mountain Plovers are expected as a result of this project.</p>
<p>Northern Bog Lemming (<i>Synaptomys borealis</i>) Habitat: sphagnum meadows, bogs, fens with thick moss mats</p>	<p>[N] No sphagnum meadows, bogs or fens occur within or near the project area, and the project area occurs outside of the known distribution of northern bog lemmings in Montana (MNHP/FWP Montana Field Guide 2014 and MNHP 2015). No direct, indirect or cumulative effects to bog lemmings would be anticipated for the alternatives considered.</p>
<p>Peregrine Falcon (<i>Falco peregrinus</i>) Habitat: cliff features near open foraging areas and/or wetlands</p>	<p>[N] Peregrine Falcons have been documented within the area that encompasses the proposed project area (MNHP/FWP Montana Field Guide 2014 and MNHP 2015). No cliff features but suitable foraging areas do occur within 0.75 miles of the State parcels. No known nest sites occur within or near the project area. No direct, indirect or cumulative effects to peregrine falcons would be anticipated for the alternatives considered.</p>
<p>Pileated Woodpecker (<i>Dryocopus pileatus</i>) Habitat: late-successional ponderosa pine and larch-fir forest</p>	<p>[N] Pileated Woodpeckers have not been documented within the area that encompasses the proposed project area (MNHP/FWP Montana Field Guide 2014 and MNHP 2015). The project area occurs outside of the normal distribution of pileated woodpeckers in Montana. No direct, indirect or cumulative effects to pileated woodpeckers would be anticipated for the alternatives considered.</p>
<p>Townsend's Big-Eared Bat (<i>Plecotus townsendii</i>) Habitat: caves, caverns, old mines</p>	<p>[N] No known caves, caverns, or old mines suitable for use by bats occur within 1 mile of the project area. No direct, indirect or cumulative effects to Townsend's big-eared bats would be anticipated for the alternatives considered.</p>

*Montana National Heritage Program/ FWP Montana Field Guide 2014. National Heritage Tracker 2015.

Appendix H