

PIPING PLOVER/RUFA RED KNOT SURVEY PROTOCOL FOR NDDOT PROJECTS



Photo Credit: Greg Schonert

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I. Introduction

As part of Section 7 Endangered Species Act (ESA) compliance, a survey by a qualified biologist (see next section) for one or more of the following species is required: piping plover (*Charadrius melodus*) and rufa red knot (*Calidris canutus rufa*). If the survey is required for the Missouri River system (including Lake Sakakawea or Lake Oahe), alkali lakes, or other designated critical habitat; then both the piping plover and rufa red knot should be surveyed.

II. Surveyor Qualifications

A qualified biologist is required to have a four-year Bachelor of Science degree in wildlife management, biology/zoology, or closely related natural resources degree from an accredited university and must have knowledge of piping plover and rufa red knot biology, behavior, and preferred habitat. They must be able to identify these species by call and sight, identify suitable habitat and be familiar with survey methodology. A permit from USFWS is not required to remotely survey for these species; however, to not disturb or harass individuals, pairs, or broods, caution must be used in order not to violate the endangered species act.

III. Survey Equipment

- Good quality binoculars - (10x) magnification recommended
- Spotting scope with tripod, with at least (40x) magnification recommended
- Camera
- GPS handheld unit (recommended - preferably Trimble units)- used to buffer a survey area
- Bird Identification manual (recommended)
- Boat/Canoe/Kayak – Not required, but certain situations may require use
- Maps with aerial imagery including survey area and any known nesting data included
- Survey forms (Appendix A).

IV. Piping Plover Biology

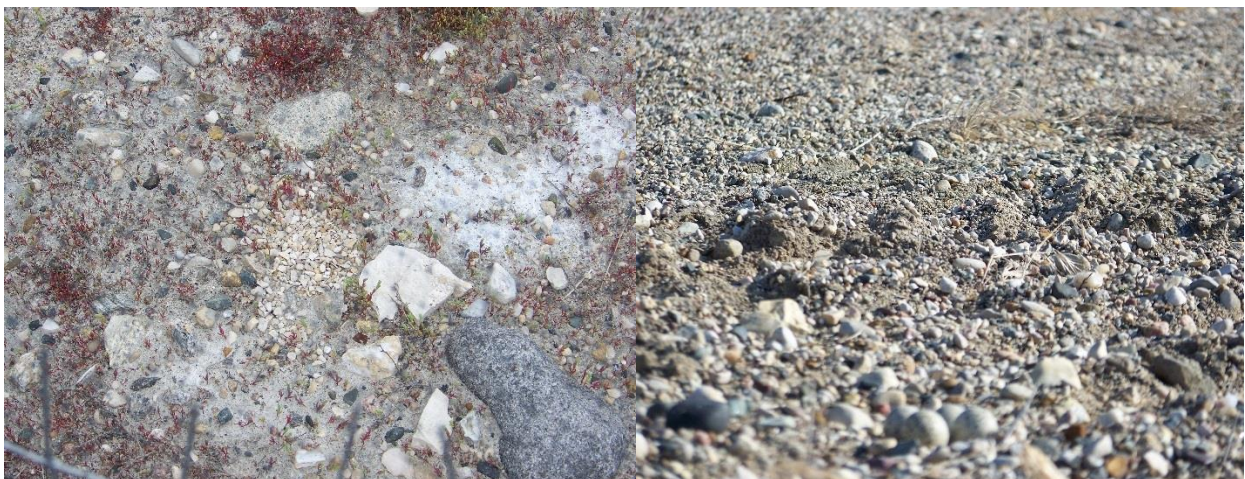
The Northern Great Plains populations of piping plovers breed in North Dakota; in which critical habitat has also been designated for the species. Piping plovers make their nests on open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands, and on beaches, sand bars, and dredged material islands of major river systems. Most natural lakes used by plovers in North Dakota are alkaline in nature and have salt-encrusted, white beaches. Such alkali lakes probably are selected due to their sparse vegetation. Beaches used by piping plovers generally are 10-40 yards wide. Beach/shore width as well as abundance and distribution of vegetation are important factors that affect piping plover habitat selection and reproductive success (USFWS 1988). See Examples 1 and 3 for representative photos.

Plovers arrive on the breeding grounds during mid-March through mid-May and remain for 3 to 4 months per year. In North Dakota they are typically present between April 15 and August 15. Courtship behavior includes aerial flights, digging of several nest scrapes and a ritualized stone-tossing behavior

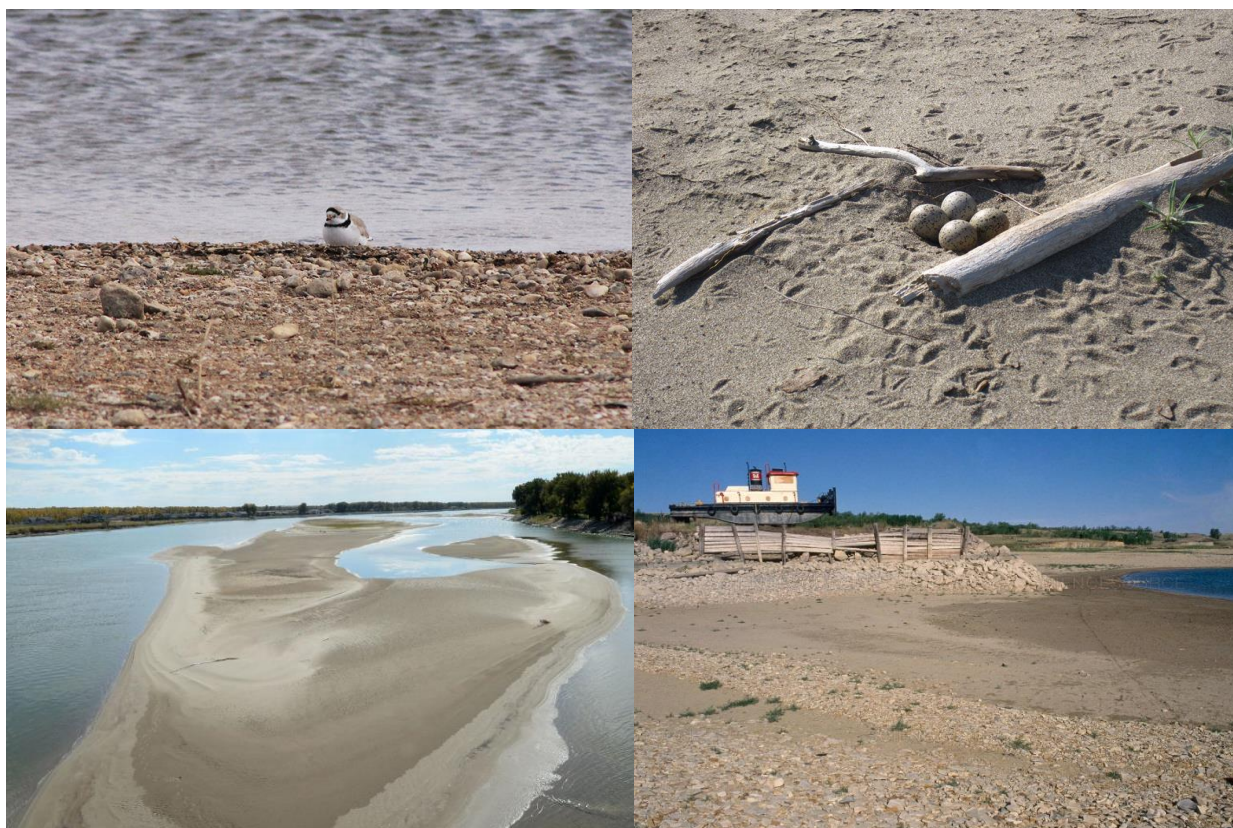
(USFWS 1988). Territories are actively defended by both adults. Egg laying generally begins in the second or third week in May, although the species may re-nest depending on local conditions. They lay 3 to 4 eggs in shallow depressions lined with pebbles and shell fragments. The eggs and nests camouflage very well with the environment. See Example 2 for representative photos.



Example 1. Representative photos of piping plover habitat in alkali lake settings. Note that although plovers prefer open areas, plovers do tolerate some vegetative growth and will nest in these types of areas. Other shorebirds are often present. Photo credits: Greg Schonert



Example 2. Nest locations and eggs of piping plovers blend in extremely well with the surrounding environment. Photo credits: Greg Schonert



Example 3. Representative photos of typical nesting substrate and high-quality habitat examples on the Missouri River and Lake Sakakawea. Photo credits: USACE (top two), Will Kincaid (bottom left), David R. Frazier (bottom right).

Male and female piping plovers are involved in the care of young, taking turns incubating the eggs (which hatch within 30 days), as well as feed the young (until about 30 days after hatching). Plovers depart for the wintering grounds from mid-July through late October. Piping plovers feed on exposed wet sandy beaches/shorelines; intertidal ocean beach; wrack lines; wash-over passes; mud-, sand-, and algal flats; and shorelines of streams, ephemeral ponds, lagoons, and salt marshes by probing for invertebrates at or just below the surface (USFWS 2015d). They use beaches adjacent to foraging areas for roosting and preening. Home range of piping plovers during the breeding season is usually limited to the wetland, lakeshore, or section of beach on which the nest is located.

V. Rufa Red Knot Biology

The rufa red knot is a medium-sized bulky shorebird about 9 to 11 inches in length, with a short straight black bill. The red knot is easily recognized during the breeding season by its distinctive red plumage. The face, prominent stripe above the eye, breast, and upper belly are a rich rufous-red to a brick or salmon red, sometimes with a few scattered light feathers mixed in (USFWS 2014c). The feathers of the lower belly and under the tail are whitish with dark flecks. Upperparts are dark brown with white and rufous feather edges, outer primary feathers are dark brown to black (Harrington 2001; Davis 1983). See Example 4 for representative photo.

The rufa red knot does not nest in North Dakota but sometimes migrates through the state in mid-May on their way to breeding grounds, and again in mid-September to October on their way to their

wintering grounds. Observations of rufa red knots are rare in North Dakota but both alkaline and freshwater lakes have been used in North Dakota during migration. The species has also been observed in the Missouri River System as well as sewage lagoons and large permanent freshwater wetlands. The rufa red knot is considered a rare migrant in North Dakota and there are no stopover sites consistently used by the species within the state (Dyke, et al. 2015).



Example 4. Rufa red knots migrate through North Dakota during the spring and/or fall migration periods. They are often observed with other species of shorebirds during migration. They utilize the same types of habitats as piping plovers for stopover sites to rest and feed on their way to their breeding grounds in the Tundra. Photo Credit: Nebraska Game and Fish.

VI. Habitat Survey Methods

The summer nesting season for piping plovers occurs between April 15 and August 15; however, the peak of nesting occurs during mid-May through late July. A buffer extends 0.5-mile around the designated critical habitat where surveys should occur; however, due to fluctuating water levels, the actual boundary of critical habitat may be different than what is portrayed on a map. To help ensure adequate coverage of a survey area, a 0.5-mile buffer can be placed on the project footprint, which is typically the grading limits. GPS units with the buffer loaded will help ensure that all potential habitat within the survey area is covered.

Consulting with the USFWS and USACE (for USACE managed property) prior to the survey is also recommended to request any known historical nesting locations that may be within the survey area. This will help focus survey efforts on areas where there has been documented nesting. Nesting data is particularly abundant for the Missouri River System and is maintained by the USACE. The North Dakota

Ecological Services Field Office may have access to data obtained by various refuges in the state that conduct piping plover monitoring. Referring to historic aerial imagery is also recommended to look for historical areas which may provide the best habitat within a survey area based on water levels at the time the surveys need to be conducted.

An initial survey should occur 7 days prior to the beginning of construction activities to identify suitable habitat (e.g., generally unvegetated, relatively wide shorelines, islands, or sandbars that have sandy or gravelly substrates that may be interspersed with silt, sand, gravel). Surveys should be focused on areas closest to construction activities that are within the line of sight of construction equipment, personnel, and staging areas/borrow and waste sites. Areas that are within 0.5-mile but are obstructed visually from construction activities should be given a lower priority for surveys as it is less likely species would be exposed to anthropogenic effects including noise and visual disturbances.

The likelihood of plovers or rufa red knots occurring near a project depends on the availability of suitable habitat. During high water years, little to no suitable habitat may be present for these species. Conversely, in low water years, suitable habitat may be in great abundance.

For the initial survey, determining the suitability of potential habitat is necessary before construction commences, and will determine if daily surveys are needed. The goal is to identify any potential nesting habitat within a 0.5-mile of all construction activities associated with the project. Document habitat conditions within the survey area, as well as any visual barriers that may be present between potential habitat and work areas (e.g., topography, tree cover, etc.). These surveys should be completed by walking near all potential habitat within 0.5-mile of the project. Representative photos should be taken to document habitat conditions at the time of survey. Record bird species observed. Use attached survey form in Appendix A to document each survey.

The surveys should be sent to NDDOT ETS biologist, contractor, and project engineer. If the habitat surveys are being conducted when the species may also be present, care must be taken not to disturb any piping plovers or red knots while documenting habitat conditions. If there are any observations of the species during habitat surveys, cease the survey, document the location and behavior of the bird(s) and notify the project engineer, FHWA, NDDOT ETS biologist, USFWS, and USACE (if applicable) as soon as possible. Contact information is provided at the end of this document.

Discretion from the biologist conducting surveys should be used when determining if there is suitable nesting habitat within the survey areas. Prior to conducting surveys, familiarize yourself with habitat requirements of piping plovers. Use your best judgement to confirm whether there is suitable habitat for the species including nesting and foraging areas. If there are questions on whether suitable habitat is present, take multiple photographs and coordinate with the NDDOT ETS biologist.

A. Habitat Surveys for Missouri River system (including Lake Oahe and Lake Sakakawea)

If no suitable habitat is identified during the initial field visit, conduct a weekly survey to identify any new habitat that may be revealed from receding water levels, or to confirm habitat has been inundated which may occur with the June rise. Each survey should be documented, and habitat conditions should be recorded along with representative photographs and species observations. End habitat surveys July 15th if no suitable nesting habitat has been identified as it is extremely unlikely nests would be established after this date if suitable habitat becomes available.

B. Habitat Surveys for Designated Critical Habitat (other than Missouri River system)

If no suitable habitat is found during the initial field visit, surveys may cease as it is not anticipated that water levels would drop enough to allow for suitable nesting habitat to be revealed. Use your best judgement in making this determination. If habitat is marginal, it can still be used by plovers, especially during high water years. Document the survey areas with photographs and take notes of why or why not habitat is suitable. If the body of water is completely inundated at the start of nesting season, it is highly unlikely to recede enough for plovers to initiate a nest on these waters.

C. If Suitable Habitat Identified on Missouri River (including reservoirs) or alkali lakes:

If suitable habitat is found for either the Missouri River system, other designated critical habitat, or other known nesting areas and construction will take place within 0.5-mile of the habitat, conduct two (2) surveys daily. See survey methods in next section. Care must be used to not disturb these species while conducting surveys.

- Conduct the first survey for 2 hours, beginning 30 minutes before sunrise. Complete this survey before starting construction activities that day. From a good vantage point, use binoculars or spotting scope to survey for a minimum of 20 minutes in each viewing area.
- Conduct a second survey for 1 hour beginning after work has stopped for that day. Stop construction activities early enough to allow for the survey to be completed no later than 30 minutes after sunset.
- Nest establishment is not anticipated to occur past July 15; however, if active nests are present, adults and young may remain in the area until August 15. If no nests, an individual, or pairs of birds have been detected by July 15, construction may resume July 16.
- In cases of inclement weather, or other delays in construction activities, daily surveys do not need to be completed.

If nests, an individual, or pairs of birds are detected, notify the project engineer who will then stop construction activities within 0.5-mile of the sighting and will contact USFWS, FHWA, and NDDOT ETS Division to determine the appropriate actions (e.g., avoid timing restrictions or implement mitigation measures such as installing visual screening, etc.) Construction will not resume until daily surveys show that the birds have vacated the area, mitigation measures determined by the contacted agencies have been installed, or August 16 has been reached. See methodology section below for situations where it may not be necessary to halt construction in the event of an observation.

VII. Species Survey Methodology

The purpose of these surveys is to determine species presence without disturbance at a given location within habitat identified during initial surveys. The intent is not to determine nest sites, number of eggs, chicks, etc. The USFWS requires that persons involved in piping plover research apply for a Section 10 sub-permit through the local Ecological Services office in the state of proposed work for that type of work. These permits are issued with stipulations to avoid harm or harassment by restricting time spent at nest sites, number of visits to nests, handling of eggs or chicks, banding or nest marking.

Biologists conducting the surveys must have knowledge of piping plover and rufa red knot biology, behavior, and preferred habitat. They must be able to identify these species by call and sight, identify suitable habitat, and be familiar with this survey methodology. There are brief descriptions of biology, behavior, and preferred habitat within this document for reference; however, for more details refer to the recovery plans for these species and other publications for more in-depth information.

Remote surveys can be conducted on these species without causing harm or harassment to them, and this is the method surveys shall be conducted for NDDOT projects. Spotting scopes can be used to find incubating adults from up to 400m away (approximately 0.25-mile away or more depending on quality of optics and environmental conditions), particularly in the morning when cool air temperatures minimize heat distortion in the scope of view-field (Murphy *et al.*, 1999). Low light angles also accent the silhouette and distinguishing plumage features of plovers. (Murphy *et al.*, 1999). Elevated vantage points such as hilltops are helpful. In some situations, it may be possible to view from a vehicle or step ladder (with a dark blanket or camouflage netting cover) (Murphy *et al.*, 1999). Although this is specific to plovers, it also applies to rufa red knots as well.

Observations from a small boat 30-50 m offshore is a specialized form of remote observation and can be effective for detecting the species (Murphy *et al.*, 1999). When using small boats, surveyors should stay at least 30 m from shore, row and move quietly, and not disembark or stand in the boat when within 100 m of beaches (Murphy *et al.*, 1999). Use of small boats or canoes may be helpful in some situations and will be dependent on the project. Care must be used when using small watercraft for surveys. Personal flotation devices should be worn, and weather must be followed closely.

When conducting surveys, an adequate distance must be maintained to avoid disturbing the species. If behavioral cues such as plovers dashing from nests, furtive running with head lowered or head pumping accompanied with alarm notes, or broken wing displays are observed; back off immediately and discontinue the survey as there is a high probability a nest is nearby, or a territory has been set up by a pair. These behaviors are likely to only occur when in proximity, which should not happen while utilizing remote observation techniques for surveying. Note that these behaviors can also be observed remotely if there is a predator or other intruder (another bird species, human, etc.) in the area or other source of disturbance. Discretion should be used by the biologist when these situations occur. If it seems the species is being disturbed for any reason, it is best to back off for the day.

Courtship flights, in which the male plover loops through the air while consistently peeping and often swooping very close to the ground near the female, indicates breeding behavior and the site should be deemed occupied by the species and pair bonding and nest territory has been established. Nest scrapes are simple shallow depressions in sand and are often lined with small pebbles. If the female approaches the male while he is digging or sitting in a scrape, he will stand over the scrape and fan out his tail and may initiate dancing. These are breeding behaviors and can be witnessed using remote observation. If these behaviors are observed, consider the general area occupied by the species.

Once it has been established that there is a presence of a nesting or territorial pair of plovers, surveys can cease for the day. The project engineer should be notified immediately, and the engineer should notify the NDDOT, FHWA, USFWS, and USACE (if applicable) as soon as possible. Construction should not resume until coordination with the appropriate agencies has occurred. If the surveys occur outside of normal business hours such as on a holiday or weekend, construction should cease until agencies can be contacted.

Rufa red knots may be observed in similar habitats as piping plovers; however, they do not nest in North Dakota. If the species is observed within 0.6-mile of the project; document the behavior and location of the species. Discretion should be used by the biologist on whether the project engineer needs to halt construction after a rufa red knot observation. Since the species does not nest in North Dakota, there are ample areas for the species to utilize as stopover habitat and disturbance to the species because of construction should not rise to the level of “take”. Unless the species is going to potentially physically harmed by construction activities (e.g., sighting is directly adjacent to construction activities, flying through construction equipment between wetlands, etc.), it is probably not necessary to halt construction for the day. If there is any doubt, it is best to halt construction until the bird(s) have left the area. Appropriate agencies should still be notified in the event a rufa red knot is observed.

Similar to habitat evaluations for the rufa red knot, discretion should be used by the biologist that is in the field conducting daily surveys when a piping plover is observed. For example, if a plover is spotted within a survey area, but is not displaying nesting or territorial behavior, it could be a non-breeding adult, or an individual foraging. Plovers generally stay in the vicinity of a nesting territory. Depending on the situation, notifying the project engineer to cease construction may or not be necessary. If surveys are occurring during the peak of nesting season and a plover is observed, there is a high potential a nest is nearby. If there is any doubt to whether nesting is occurring where the species was observed, the project engineer should be notified immediately, construction should halt for the day, and agencies should be contacted. The following day, surveys should resume to investigate further.

The intent is not to stop construction in situations where it is not anticipated nesting has occurred or is not expected to occur (e.g., only one individual is observed and behavior indicates the species is resting or foraging and moves on after some time), **AND** the individual(s) are not anticipated to be disturbed physically by construction. Consideration should be taken to ensure in whatever situation, if one of these species is observed, that construction would not disturb the species to the point where it is harassed or harmed. If the biologist discerns that a piping plover has initiated a territory or nest, construction must cease in all situations until the appropriate agencies have been contacted to determine whether construction may proceed with or without additional measures to reduce potential effects to the species.

If the biologist discerns that an individual piping plover or rufa red knot is not likely to stay in the area or be affected by construction activities, the observation should be noted, and notes should be taken on the behavior of the species and reasoning why disturbance is not anticipated from construction activities. Examples are the species is at an adequate distance from construction activities and perhaps shielded by topography or vegetative cover, existing disturbances in the area, or the species was observed and left the area after some time and did not return.

Remember to document each survey using the form in Appendix A and send to project engineer, contractor, and ETS biologist. This is important to ensure environmental commitments have been adhered to. If there are any questions on the survey methodology, contact the ETS biologist.

VIII. Agency Contact Information

Below is contact information for agencies that should be notified in the event a species is observed, or if there are specific questions or inquiries to a respective agency. Please note that these numbers may not always be current, so before conducting surveys, ensure contact information is up to date.

NDDOT Biologist: 701-328-2592

FHWA ND Division: 701-250-4204

USFWS Ecological Services Office: 701-250-4481

USACE Garrison-Riverdale Office: 701-654-7411

IX. Literature Cited

Davis, T.H. 1983. 1, Loons to sandpipers. Pages 372-375 In J. Farrand, ed. The Audubon Society master guide to birding, Knopf, New York.

Dyke, Steve R., Sandra K. Johnson, and Patrick T. Isakson. 2015. North Dakota State Wildlife Action Plan. North Dakota Game and Fish Department, Bismarck, ND

Harrington, B.A. 2001. Red knot (*Calidris canutus*). In A. Poole, and F. Gill, eds. The birds of North America, No. 563, The Birds of North America, Inc., Philadelphia, PA.

Murphy, R. K., B.G. Root, P.M. Mayer, J.P. Goosen, and K.A. Smith. 1999. A draft protocol for assessing piping plover reproductive success on Great Plains alkali lakes. Pages 90-107 in Proceedings, piping plovers and least terns of the Great Plains and nearby. South Dakota State University, Brookings.
Citations

USFWS. 1988. Great Lakes and Northern Great Plains Piping Plover Recovery Plan. U.S. Fish and Wildlife Service; Twin Cities, Minnesota.

USFWS. 2014c. Rufa Red Knot Background Information and Threats Assessment. Docket No. FWS-R5-ES-2013-0097; RIN AY17.

USFWS. 2015d. All About Piping Plovers. Accessed on June 26, 2015 at <http://www.fws.gov/plover/facts.html>

APPENDIX A

SURVEY FORM

NDDOT Piping Plover, Rufa Red Knot Survey Form

Surveyor(s):

Date:

Time:

Weather Conditions:

Temp:

Wind:

Describe Habitat Conditions (substrate, vegetative cover, visual obstructions, distance between construction and habitat, approx. habitat size/width, etc.)

Is Suitable Nesting Habitat Present?

Water Level Fluctuations (expected to rise, fall, or remain constant):

Notes (species observed, photo log information, etc.)

DAILY SPECIES SURVEYS—Only complete this section if daily surveys are necessary. Conduct the first survey for 2 hours, beginning 30 minutes before sunrise. Complete this survey before construction commences for that day. Conduct a second survey for 1 hour beginning after work has stopped for that day. Construction activities must stop early enough to allow for the survey to be completed no later than 30 minutes after sunset. Refer to survey protocol for more information. Daily surveys should end July 15 if no nesting pairs are discovered.

Morning Survey Timeframe:

Evening Survey Timeframe:

Describe Surveys (species observed, methods, bird behavior, likelihood of nesting occurring, photo log, etc.)

Were PIPL/RURK Observed?

If yes, were nesting/territorial observations documented?

Actions Taken: (e.g. was project engineer notified immediately and were appropriate agencies notified ASAP, was construction halted for the day, were additional measures required if requested by appropriate agencies, etc.):

ADDITIONAL NOTES: