



1 **PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM**
2 **2017 Central Platte River Tern and Plover Monitoring and Research Protocol**
3

4 **INTRODUCTION**

5 During 2010, the Platte River Recovery Implementation Program (PRRIP or Program) revised the
6 Program’s interior least tern (tern) and piping plover (plover) Monitoring Protocol entitled ‘Monitoring
7 the Abundance, Distribution, Reproductive Success, and Reproductive Habitat Parameters of Interior
8 Least Terns and Piping Plovers on the Central Platte River’ (2010 Monitoring Protocol) primarily to: 1)
9 increase the timeframe for conducting tern and plover surveys at all sites from 15 May – 15 July to 1 May
10 – 1 August; 2) increase the frequency of surveys at potential nesting areas; 3) clarify or further define
11 terms within the original Monitoring Protocol; and 4) allow for on-site collection of habitat parameters
12 believed to influence reproductive success of terns and plovers within Program Associated Habitats (2011
13 Monitoring Protocol). In 2009 the Program retained U.S. Geological Survey - Northern Prairie Wildlife
14 Research Center (USGS) to implement a 2-year Foraging Habits study that concluded in 2010. The
15 Program retained the USGS from 2010-2016 to continue to implement inside and outside monitoring and
16 to band tern and plover adults and chicks at managed and unmanaged sites within the Program Associated
17 Habitat area (2015 Monitoring Protocol).

18 Activities proposed for 2017–2019 include the collection of data outlined in the Program’s 2017
19 Monitoring Protocol as well as to re-sight band combinations from within tern and plover nesting colonies
20 where approved by the land owner/manager. Data collected at nesting sites during 2017–2019 will be
21 utilized to determine effects and relationships that relate back to priority hypotheses outlined in the
22 Program’s Adaptive Management Plan (AMP), the two management strategies identified in the AMP, and
23 overall AMP implementation. Information obtained through band re-sighting efforts will allow us to
24 obtain better estimates of chick survival and overall reproductive success of these species and will allow
25 us to discern how the species interact with riverine and sandpit habitats. Band re-sighting will also serve
26 as an essential tool in providing long-term information such as site fidelity (within Program Associated
27 Habitats as well as across multiple river systems), recruitment, fledgling and adult survival, and seasonal
28 as well as annual movement patterns. Since terns and plovers are banded within several river systems, we
29 can gather information at both a local and regional scale which could result in better demographic
30 population models, a better understanding of how central Platte River terns and plovers contribute to the
31 overall population recovery goals, and additional guidance for future efforts to recover the species.

32 **DESIGN CONSIDERATIONS AND SPECIFICATIONS**

33 **Area of Interest**

34 The area of interest consists of the Platte River beginning at the junction of U.S. Highway 283 and
35 Interstate 80 near Lexington, Nebraska, and extending eastward to Chapman, Nebraska. This includes
36 approximately 90 miles of the Platte River and sandpits within 3.5 miles of the main channel or within 2
37 miles of a side channel if the side channel extends beyond 3.5 miles of the main channel.

38 **Survey Design**

39 The design consists of two main components: 1) semi-monthly river surveys and 2) semi-monthly sandpit
40 surveys. Each sandpit and constructed, managed, or naturally existing river island designated as suitable
41 habitat will be monitored for tern and plover adults, nests, broods, and fledglings from outside the nesting
42 area as described in the methods section below. Least tern or piping plover nests or chicks observed
43 during any survey will be monitored twice/week from outside the nesting area to evaluate their status.
44 Nesting adults will also be monitored from within the nesting colony via blinds, spotting scopes,
45 binoculars, cameras, and trail cameras placed near nests as to obtain as much band re-sighting data as
46 possible. Data collected will be used to make informed judgments regarding trends in least tern and
47 piping plover reproductive parameters associated with Program effects on habitat.
48



PRRIP – Protocol

49 *Semi-monthly River Surveys*

50 Airboat surveys of the entire 90-mile study area between Lexington and Chapman, Nebraska will be
51 conducted on or about 1 and 15 May, June, and July and 1 August as outlined in the Program’s
52 Monitoring Protocol. Nebraska Public Power District personnel (NPPD; i.e., Jim Jenniges) will survey
53 potential nesting habitat between the Lexington Bridge and the J-2 Return (i.e., Lexington Island).
54 Program staff and technicians will survey the Platte River between the J-2 Return and the Chapman
55 Bridge. If nesting occurs on a river island between the Alda and Chapman Bridges, Program staff and
56 technicians will monitor nests and broods as outlined below.

57 *Semi-monthly Sandpit Surveys*

58 All sandpits that have areas of bare sand (<25% vegetative cover) greater than 1.5 acres, and for which
59 access can be gained, will be surveyed for active tern and plover colonies on or about 1 and 15 May, June,
60 and July and 1 August. NPPD (i.e., Jim Jenniges) will conduct outside surveys at the Lexington, Johnson,
61 and Blue Hole Sandpits. Program staff and technicians will conduct outside surveys at all Program owned
62 or managed sites and additional sites where nesting occurs and access can be gained. Central Platte
63 Natural Resources District (CPNRD; i.e., Mark Czaplewski) will conduct outside surveys at all remaining
64 sandpits located between the Alda and Chapman Platte River Bridges. Program staff and technicians will
65 perform inside monitoring and band re-sighting at all sights where nesting occurs and access can be
66 obtained.

67 **METHODS**

68 **Field Techniques**

69 Standard field methods will be used during each visit to a nesting area and information such as: date; time
70 of day (arrival and departure); weather conditions; number of adults, nests, chicks, and fledglings present;
71 and other species of wildlife present in area will be recorded.

72 *Outside Survey/Monitoring*

73 Outside surveys will be performed using binoculars and/or spotting scopes at a distance great enough to
74 not cause disturbance to nesting birds (usually >165 ft, but closer or farther as terrain dictates) and for at
75 least 1/2 hour. Observations will be conducted from multiple locations to provide as complete of coverage
76 of the site as possible. Observers will scan the area using binoculars and/or a spotting scope at least five
77 times and will record the number and/or status of adults, nests, chicks, and fledglings observed as well as
78 any other pertinent information.

79 *Nest and Brood Monitoring*

80 To confirm their status, active nests and broods will be monitored twice per week as outlined above. We
81 will monitor nests/chicks until they become inactive either through success (hatch/fledge) or failure. The
82 fate of each nest and brood, including an estimate of the number of hatched eggs and fledged chicks will
83 be documented. An estimate of the number of successfully fledged chicks will be based on age and date
84 chicks were last observed or will be directly counted if chicks are observed flying from natal areas. When
85 possible, band combinations will be collected from previously marked birds to more accurately ascertain
86 which nests chicks and/or broods were generated from. Each site will be monitored twice a week until
87 nests and chicks are no longer observed at the natal area.

88 *Inside Monitoring/Band Re-sighting*

89 Nesting and brood-rearing adults will also be monitored from within the nesting colony using blinds,
90 spotting scopes, binoculars, cameras, and via trail cameras placed near nests as to obtain as much band re-
91 sighting data as possible. Surveys within each nesting colony will be limited so that individual adults are
92 not kept off their nest or away from their brood for >20 minutes (unless further restricted by the
93 Program’s State or Federal permit). To reduce stress and mortality to eggs and chicks, all within-site
94 monitoring efforts will be conducted when wind speeds are <25mph and sand is not blowing around, it is
95 not precipitating, and the temperature is >40°F (4°C) and <90°F (32°C).



96 **HABITAT MEASUREMENTS**

97 **On-site Data Collection**

98 When a new nest is observed, we will document the presence of adults tending each nest, document
99 management activities applied to the nest (elevating, caging, etc), collect a GPS location of the nest, and
100 mark nests with a numbered nest marker. Numbered nest markers (e.g., paint stir-stick) will be place 10
101 feet north of each nest, at a maximum height of 6 inches, to allow observers to easily locate and identify
102 nests during subsequent visits.

103 **Off-site Data Collection/Recording**

104 We will document site-level management activities (pre-emergent herbicide, predator fence, disking, etc)
105 applied to each suitable nesting site in the study area. We will use a GIS to delineate the waterline and
106 mark predator perches so that these distance measures can be determined off-site using a GIS. We will
107 also use LiDAR data collected annually to determine the elevation of each nest above the waterline. A
108 GIS will also be used to measure the distance to the nearest conspecific and other species' nest located at
109 each site, active channel width at suitable riverine nesting sites (width at 1,200cfs including land), and
110 pond size at sandpit sites.

111 **Biological, Reproductive, and Habitat Definitions**

112 Nest – A scrape in the sand, usually lined with pebbles, with eggs in it. Scrapes without eggs and
113 randomly deposited non-incubated eggs(s) outside of a nest bowl will not be considered nests.

114 Nest Initiation – A nest is initiated when it is constructed and at least one egg is laid.

115 Total Nests Initiated – Total number of nests initiated whether successful or not. This total includes first
116 nesting attempts as well as re-nesting attempts.

117 Incubation Period – The incubation period for interior least terns and piping plovers will be considered to
118 be 21 and 28 days, respectively, from when the adult begins to incubate the eggs.

119 Successful Nest – A nest is successful when at least one egg hatches.

120 Nest Management – Management activities applied specifically to nests (i.e., exclosures).

121 Nest Bowl – Nest cup (depression) including a 3-inch buffer area around the cup.

122 Nest Furniture – Any non-living object present within the diameter of the nest bowl such as driftwood,
123 large cobble, boulder, bivalve, bone, etc.

124 Vegetative Cover – Percent canopy cover within a 1-yd² area around the nest (<1%, 1-5%, 5-10%, 10-
125 20%, >20%)

126 Vegetation Height – Maximum height of all vegetation in a 1-yd² area centered on the nest

127 Distance to Water – Distance from each nest to the nearest water line measured with using a GIS

128 Distance to Predator Perch – Distance to nearest predator perch ≥10 feet tall (i.e., tree, power-line pole,
129 etc.) measured off-site using a GIS.

130 Distance to Live Vegetation – Measured distance in inches from the center of a nest to living or current
131 year vegetation within a 1-yd² area of the nest.

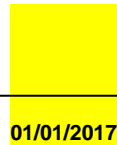
132 Nearest Bank (riverine) – Distance, across water at flows of 1,200cfs, from each nest to the nearest bank
133 measured off-site using a GIS.

134 Nest Elevation – Difference between the elevation of each nest and the water surface obtained off-site
135 using a GIS and LiDAR data.



PRRIP – Protocol

- 136 Nesting colony – Area encompassed by multiple nests within which disturbance to one nest results in a
137 disturbance reaction by adults of other nests. In cases where only a single nest is present, the nest will
138 serve as the “colony” for habitat measurements.
- 139 Colony Centroid – Average Northing and Easting GPS measure for all nests within a single colony.
- 140 Site – A group of river islands within close proximity of each other and managed as a group or sandpit
141 island habitat surrounded by common water.
- 142 Site Management – Management activities applied to the colony site (i.e. predator fencing, predator
143 trapping, herbicide application, disking, mowing, etc.).
- 144 Brood – 1 or more chicks that hatched from a single nest.
- 145 Brood-rearing Period – The brood-rearing period for interior least terns and piping plovers will be
146 considered to be 21 or 28 days post-hatch, respectively, unless more conclusive evidence of fledging is
147 documented.
- 148 Fledge – An interior least tern or piping plover chick will be considered fledged when it is 21 or 28 days
149 old, respectively, when it is covered in unsheathed feathers, has a black eye stripe (interior least terns),
150 and has a short tail, or when sustained flight is observed.
- 151 Successful Brood – Interior least tern or piping plover brood with ≥ 1 chick that fledges or survives 21 or
152 28 days after hatching, respectively.
- 153 Number of Pairs – Number of pairs will be estimated using the Program’s Breeding Pair Estimator (BPE;
154 Baasch et al. 2015).
- 155 Bare Sand – River island or sandpit site with <20% vegetative cover.
- 156 Bare Sand Area – Total area with <25% vegetative cover at the colony site.
- 157 % Bare Sand Area – Percent of the nesting area classified as bare sand (<25%, 25-50%, 50-75%, >75%)
- 158 Active Channel (riverine) – Channels carrying water at minimum flows of 1,200 cfs.
- 159 Channel Width (riverine) – Width of entire open-channel, including land, measured from the center of
160 river islands in a direction perpendicular to river flow.
- 161 Wetted Channel Widths (riverine) – Wetted width of the channel on each side of the nesting area
162 measured with a laser-range finder or a GIS.
- 163 Pond Size (sandpit) – Size of pond adjacent to sandpit sites. This parameter will be measured using a GIS.
- 164 Adjacent Land Use – Land use classification within 200 feet of river island or sandpit sites.
- 165 Site-specific water flow – We will obtain maximum, minimum, and average daily discharge (ft³/sec) as
166 well as observation-period specific discharge data at 4 locations from the “USGS Real-Time Water Data
167 for Nebraska” website including Overton (USGS gage 06768000), Cottonwood Ranch near Overton
168 (USGS gage 06768035), Kearney (USGS gage 06770200), and Grand Island, Nebraska (USGS gage
169 06770500). We will use the location of each river island site with respect to the nearest upstream and
170 downstream USGS gage to extrapolate flow data collected at the nearest upstream USGS gage of the site
171 to determine site- and observation-period-specific flow at the time habitat characteristics are measured.
- 172 Available or Suitable Nesting Habitat – Nesting habitat will be classified as “available” or “suitable” if it
173 is a river island or sandpit site with nesting interior least tern or piping plover adults, or if it fits the
174 following minimum habitat criteria as defined by the Program:



175 **Riverine Habitat**

- 176 • At least 50% water within a one quarter-mile river reach
- 177 • Within the same one quarter-mile reach of river, at least 1.5 acres of sand, 1.5 feet above 1,200
- 178 cfs reference stage in minimum channel width of 400 feet
- 179 • Minimum buffer of island edge to bank of 50 feet
- 180 • Bare sand (i.e., less than 25% vegetative cover); existing vegetation less than 1.5 m in height
- 181 • Edge of island at least 200 feet from any vegetation 1.5 m or higher above the top elevation of
- 182 the nesting island/bar

183 **Sandpit Habitat**

- 184 • Sandpits within Program associated habitats along the river
- 185 • Per site, at least 1.5 acres of bare sand (i.e., less than 25% vegetative cover)
- 186 • Edge of bare sand at least 200 feet from any vegetation 1.5 m or higher