

Documenting interior least tern and piping plover nest predation events on managed off-channel nesting sites protocol.

Interior least tern (*Sternula antillarum*) and piping plover (*Charadrius melodus*) migrate to the Platte River Valley to nest on off-channel nesting habitat (sand and gravel mines) along the central Platte River during late April to mid-August. Along the central Platte River, nest and brood failures have been attributed to several factors including predation, weather, and abandonment. Predation is thought to be a persistent factor in reducing nest and brood success of these breeding populations. Prevention of predation by terrestrial predators is an important objective for increasing productivity of interior least terns and piping plovers. As such, permanent electrified fences are in place on the entrance of each off-channel nesting area and non-electrified panel wings are positioned on the ends of the electrified fence and extend 2–3 meters into the water. However, predation is still a commonly documented cause for reducing productivity at off-channel nesting sites.

Mammalian and avian predation are hypothesized to be significant factors in limiting avian reproductive success and have become a focus of management practices for interior least terns and piping plovers. However, predation events are difficult to discern as many predators either do not leave a sign of their presence, the sign is inconclusive, or sign of predation simply goes undetected. A precursor to successful management of these threatened and endangered species is identifying predation events when they occur and documenting predator species that are responsible. Predator species type, however, is truly unknown because it is difficult to determine specific causes of nest and chick failure when the events are not seen firsthand. To date, predator signs left in the sand at nests has been the primary source for determining predator identity. However, several predators such as mustelids and snakes and many avian species are identified as “clean” predators as they may leave no signs of their presence at the nest.

In 2017 and 2018 we conducted a study on predator presence at interior least tern and piping plover off-channel nesting sites near the central Platte River in Nebraska. We found avian predators (bald eagles, great horned owls, etc.) to be the most prevalent (65.5%) during the study period. Mammalian predators (fox, coyote, raccoon, etc.) were also captured on camera 33.3% of the time and unidentified species were documented 1.2% of the time. Determining whether avian or terrestrial predation occurs more often is vital because avian predation is more complex and difficult to manage than terrestrial predation.

Occasionally, several nests have been known to fail around the same timeframe and when nests were successful the chicks only survived for a short period of time. Off-channel nesting sites were chosen for this study to learn about causes of nest and young brood failures due to past productivity issues. In order to determine possible causes for nest and brood failures while chicks are young and still in the nest bowl, whether it be from weather, abandonment, or predation we will place cameras on both species' nests at a few PRRIP sites to gather information about which species is most vulnerable to predation and which predators are responsible for nest and chick losses. The objective of this study is to investigate predator presence and predation events that occur at interior least tern and piping plover nests on off-channel nesting sites.

Although the previous study was successful in capturing predators on camera, no evidence of predation was captured. Therefore, we will focus on individual nests within several sites to document species responsible for predation events. Bushnell and Moultrie trail cameras will be

used in this study and will be attached to 2-ft posts and avian bird spikes that will be placed on the top of the camera and posts to prevent them from being used as a predator perch. Cameras will be placed 1 foot off the ground and approximately 10 feet from nests to capture predator presence at each nest. We will also record and compare the abundance of mammalian predators present at each site based on the number of predators caught by USDA-APHIS trappers and predators caught on nest cameras. These abundance estimates will be used to compare to the number of predators caught on the nest cameras to show any possible correlations between presence and nest and chick losses. Results from this study will help to identify which types of predators are present at nests and to determine if additional management techniques need to be implemented to help prevent future predation events.