**Weather**

During the week of 5/20-5/26, the weather was generally overcast with periods of rain, but was sunny by the end of the week. Total precipitation for the week was 0.44 inches and average wind speed was 11 knots, with maximum gusts of 38 knots on 5/20. The average temperature for the week was 55°F with a maximum of 68°F and a minimum of 45°F.

**Caspian Terns**

A drone flight to obtain aerial photography of the tern colony was conducted on 5/22 this week. The count of Caspian terns from the photo mosaic taken during this flight was 4,279 individuals, which was similar to the ground-based estimate from the previous week (4,400 individuals). This week’s photo count represents a significant decline from the previous count of Caspian terns on-colony from a photo mosaic taken on 5/9 (5,194 individuals).

Despite frequent flushes of the nesting Caspian terns on-colony, terns continued to exhibit nesting behaviors on the one-acre colony area, with frequent observations of nest scraping, copulation, territorial disputes, and mate feedings throughout this week. Caspian terns continued to copulate and lay eggs throughout the colony area, yet these eggs were quickly depredated by western/glaucous-winged gulls during flushes of the tern colony. Only 1-egg clutches were observed in tern nests on-colony this week. Tern nests with eggs continued to be concentrated in the central and northern edge portions of the eastern half of the colony area. During one flush of the tern colony caused by an adult bald eagle on 5/22, at least 20 tern eggs were depredated by western/glaucous-winged gulls. Caspian terns nesting on the westernmost portion of the one-acre colony area continued to flush more frequently than terns nesting in the central and eastern portions of the colony.

By the end of the week (5/26) only an estimated 247 tern nests with eggs remained on the main colony, which is a decline from last week’s estimate (540 nests with eggs). The number of tern nests containing eggs was estimated based on the assumption that the 20 study plots on the colony, each measuring 6 m x 6 m, are representative of the colony as a whole. The decline in the number of tern nests with eggs at this stage of the nesting season, when normally the number of tern nests with eggs is increasing, suggests that the tern colony may fail to hatch any eggs laid during this first nesting attempt.

Due to the unexpectedly high levels of bald eagle pressure on the Caspian tern colony so far this breeding season, we reviewed Columbia River discharge rates into the upper estuary so far this season. In previous years the magnitude of bald eagle disturbance to the Caspian tern colony on East Sand Island has been positively correlated with river discharge in May and June. Data were downloaded from the U.S. Geological Survey website (<http://waterdata.usgs.gov>) for river km 86 (site number 14246900). River discharge rates for the current breeding season so far are similar to the 10-year average for river discharge at this site, and discharge levels are considerably lower than levels observed at this time in both 2017 and 2018. River discharge in 2017 was exceptionally high early in the tern nesting season, and the tern colony failed to raise any young to fledging in that year.

Salmonids remained the main prey type in the Caspian tern diet again this week, comprising 49.7% of observed bill-loads, followed by surfperch (19.3%) and clupeids (12%). Gull kleptoparasitism pressure on Caspian terns returning to the colony with fish in their bills was similar to the previous week; 35.3% of terns with bill-load fish were chased by gulls this week. We continued to observe adult bald eagles chasing Caspian terns with bill-load fish multiple times during each visit to the island this week, and adult bald eagles were repeatedly observed kleptoparasitizing fish from adult Caspian terns.

**Pelicans**

Although a boat-based brown pelican survey was not conducted this week, approximately 300-400 brown pelicans have been roosting on the south beach near the Caspian tern colony and on the edge of the upland grassy area just east of the tern colony. No adult brown pelicans in breeding plumage were observed this week, and pre-nesting and nesting behaviors by brown pelicans have not been observed on East Sand Island so far this season.

A total of 13 American white pelicans were observed loafing on the north beach of East Sand Island on 5/22; the majority of these pelicans were in breeding plumage.

**Gulls**

Attendance by large numbers of ring-billed gulls at their breeding colony located on the upper section of the northeast beach on East Sand Island was consistent with the previous week, and individuals continue to sit tight on nests. A count will be conducted from oblique aerial photography taken during an aerial survey, scheduled for this coming week. An adult bald eagle was observed causing major disturbances to the ring-billed gull colony on 5/23 while chasing ring-billed gulls and swooping over the area of the gull colony multiple times.

Western/glaucous-winged gulls continued to occupy nesting territories over much of the island, including on the eastern part of the prepared one-acre tern colony area. There were at least 40 active gull nests in the eastern part of the tern colony area this week. This part of the one-acre tern colony was used by nesting gulls last year, and not by Caspian terns. The high count of western/glaucous-winged gulls present on the tern colony was 114 individuals this week. There are no longer any pairs of western/glaucous-winged gulls defending territories completely surrounded by nesting Caspian terns. At four western/glaucous-winged gull nests that are observable from the observation blinds adults were incubating 2-3 eggs on 5/26. Western/glaucous-winged gulls continued to depredate Caspian tern eggs on-colony throughout the week, especially during flushes of the tern colony caused by bald eagles.

**Predators**

Bald eagle pressure on the Caspian tern colony this week was similar to the previous week, with a total of 26 major disturbances to the tern colony observed this week (compared to 27 the previous week). The majority of these disturbances were observed on 5/22, 5/25, and 5/26, with seven bald eagle flushes observed on both 5/22 and 5/25, and 10 observed on 5/26. The majority of these disturbances were caused by adult bald eagles chasing and kleptoparasitizing fish from Caspian terns. Three adult and one subadult bald eagle were consistently observed around the eastern end of the island during the week. On 5/25, seven bald eagles (five adults and two subadults) were observed chasing each other over the north beach, and they were each attempting to steal a fish that had been kleptoparasitized from a Caspian tern.

On 5/22, a Caspian tern head was found between the northwest blind and the tunnel entrance. Two Caspian tern wings were observed on the northern edge of the colony, between the northwest and central blinds. A disturbance to the western section of the tern colony was detected by the Spypoint Link-S camera during the night of 5/21 at around 22:50, indicating that a great horned owl killed the adult Caspian tern on-colony at that time.

One ring-billed gull wing was observed on the eastern tip of the island on 5/25, near the high tide line, and was likely depredated by an avian predator.

On 5/26, one Caspian tern wing was found on the northeast beach, near the ring-billed gull colony, and apparently it was depredated by an avian predator. Another Caspian tern carcass was found on the northeast beach, near the western/glaucous-winged gull colony. There were no signs of any depredation, and the individual was presumed to have died of natural causes. White feathers and bald eagle tracks were observed around a small stump on the northeast beach, but no carcass was found.

Mink tracks were observed on 5/25, leading from the north beach to the south beach west of the Caspian tern colony. Potential mink scat was found at the north entrance to the tunnel leading to the central blind on 5/23 and on 5/26. We have not detected any disturbances to the Caspian tern colony that were likely caused by a mammalian predator so far this season.