Caspian Tern Deterrence at Reclamation's Columbia Basin Project Facilities

2023 Final Report to Bureau of Reclamation

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

720 O'Leary St. NW
Olympia, Washington 98502
(360) 753-9884

19 December 2023

Background:

In 2012, approximately 475 Caspian tern (*Hydroprogne caspia,* hereafter tern or CATE) breeding pairs were observed on Goose Island and were estimated to be consuming between 180,000 to 200,000 juvenile salmon per year (2014, USACE). The Bureau of Reclamation (Reclamation) has since implemented a dissuasion program to reduce or eliminate CATE nesting success on Goose Island and throughout the Potholes Reservoir, features of the Columbia Basin Project, under the Inland Avian Predation Management Plan (IAPMP; 2014, USACE). In 2020, U.S. Department of Agriculture Wildlife Services (USDA-WS) began assisting Reclamation with the implementation of CATE dissuasion efforts in the Potholes Reservoir for the protection of ESA listed salmonids in the Columbia River Basin.

Passive Dissuasion Efforts:

The polyurethane rope and caution tape flagging system used during the 2020 season required nearly weekly maintenance. In 2021, flagging was updated from polyurethane rope to stainless steel cables and vinyl flagging (Figure 1), reducing maintenance after high-wind events. In 2022, USDA-WS began tracking flagging maintenance. In 2023, heavier gauge cables and wire clips were deployed on high wind surfaces (Figure 2), resulting in only one day in 2023 with maintenance actions reported. Although the flagging approach was approved through coordination with the U.S. Fish and Wildlife Service, these updates reduce litter and reduce disturbance to nesting gulls from flagging maintenance compared to the previous systems.

FIGURE 1. EASTERN ASPECT OF MAIN ISLAND ROCKS OF THE UPGRADED PASSIVE DISSUASION SYSTEM CONSTRUCTED BY USDA-WS IN 2022.

FIGURE 2. HEAVIER GAUGE CABLE AND NEW FLAG ATTACHMENT.

In 2022, USDA-WS incorporated a coyote effigy to enhance CATE dissuasion and its use was continued in 2023. The effigy remained effective in 2023, as CATE did not attempt to nest in proximity to the coyote effigy, but it did not deter geese or gulls (Figure 3) as had been expected based on prior experiences. The coyote effigy was stolen in 2023; once a replacement was procured, it was deployed in the region of Goose Island where CATE nesting was most concentrated.

FIGURE 3. PHOTO SHOWING THAT THE COYOTE EFFIGY DID NOT NEGATIVELY IMPACT GULLS, AS EVIDENCED BY THE NUMEROUS GULL TRACKS SURROUNDING THE EFFIGY.

Where CATE attempted to nest, additional temporary flagging was deployed to disrupt those attempts (Figure 4). In areas with existing flagging, additional polyurethane rope or cable was added to existing anchors and flags were added to the lines. In areas where no existing flagging was deployed, silt fence or PVC pipes were driven into the sand with rebar to support additional rope/cable and flags. In some cases, CATE started nesting on the periphery of existing flagging, necessitating additional temporary flagging. In other situations, lowering water levels exposed new nesting areas; once CATE nesting was observed, additional temporary flagging was deployed.

FIGURE 4. AERIAL DELINEATION AND TEMPORARY FLAGGING ADDITIONS FOR 2023, GOOSE ISLAND, POTHOLES RESERVOIR.

Best Management Practice Change:

At the beginning of the season, USDA delayed removing CATE eggs for up to 14 days. At Reclamation's request, a mid-season change was made to take eggs upon nest discovery. Best Management Practices documents will be updated prior to the 2024 breeding season as this change will continue in 2024.

Potholes Reservoir Survey Results:

All survey data was collected using ArcGIS Survey 123. Goose Island was surveyed via boat, and by foot to account for areas not visible by boat. The foot surveys were conducted once a week from the highest point of the Goose Islands (Main Island Rocks region). Boat surveys

were conducted by circling the island and stopping from varying vantage points to conduct counts. The other islands within Potholes Reservoir were also surveyed by boat.

USDA-WS made 54 visits to Goose Island and other regions of the Potholes Reservoir during the period from April 3 through August 24, 2023. USDA-WS dispersed 430 CATE over the season (compared to 395 CATE in 2022); 211 were at Goose Island and 219 were at surrounding areas within Potholes Reservoir. The highest single-day counts of CATE were 82 at Goose Island and 102 at Deer Island. In 2023, USDA-WS observed the latest CATE arrival, breeding start date, and last nest removal compared to previous years (Table 1).

TABLE 1 NOTABLE CATE BREEDING SEASON MILESTONES DATES, 2020-2023.

Activity	2020	2021	2022	2023
First CATE Observed	13 April	05 April	15 April	24 April
First CATE Harassment	13 April	28 April	27 April	26 April
First Breeding CATE Observed	17 April	20 April	02 May	11 May
First CATE Egg Removal	28 April	28 April	09 June	23 May
Last CATE Nest Removal	09 July	26 May	12 July	31 July

USDA-WS surveyed 22 islands for tern activity during the 2023 breeding season and observed tern activity on Goose Island, Dove Island, Deer Island, Zigzag Island, and Campsite Beach (Figure 5; see also Figure 7). More of these islands emerged as Potholes Reservoir water levels decreased later into the CATE breeding season, which is generally from April through August. Table 2 shows the number of survey days in which CATE were observed on each of the locations that had observed tern activity. Nesting attempts were not observed on other islands except for Campsite Beach, which was not flagged (due to public access). Therefore, temporary flagging was not deployed off Goose Island.

TABLE 2 LOCATIONS WITH TERN ACTIVITY OBSERVED AND THE NUMBER OF DAYS CATE WERE OBSERVED.

Location Name	Days Tern Activity was Observed
Goose	29
Campsite Beach	10
Dove	5
Deer	2
Zigzag	1

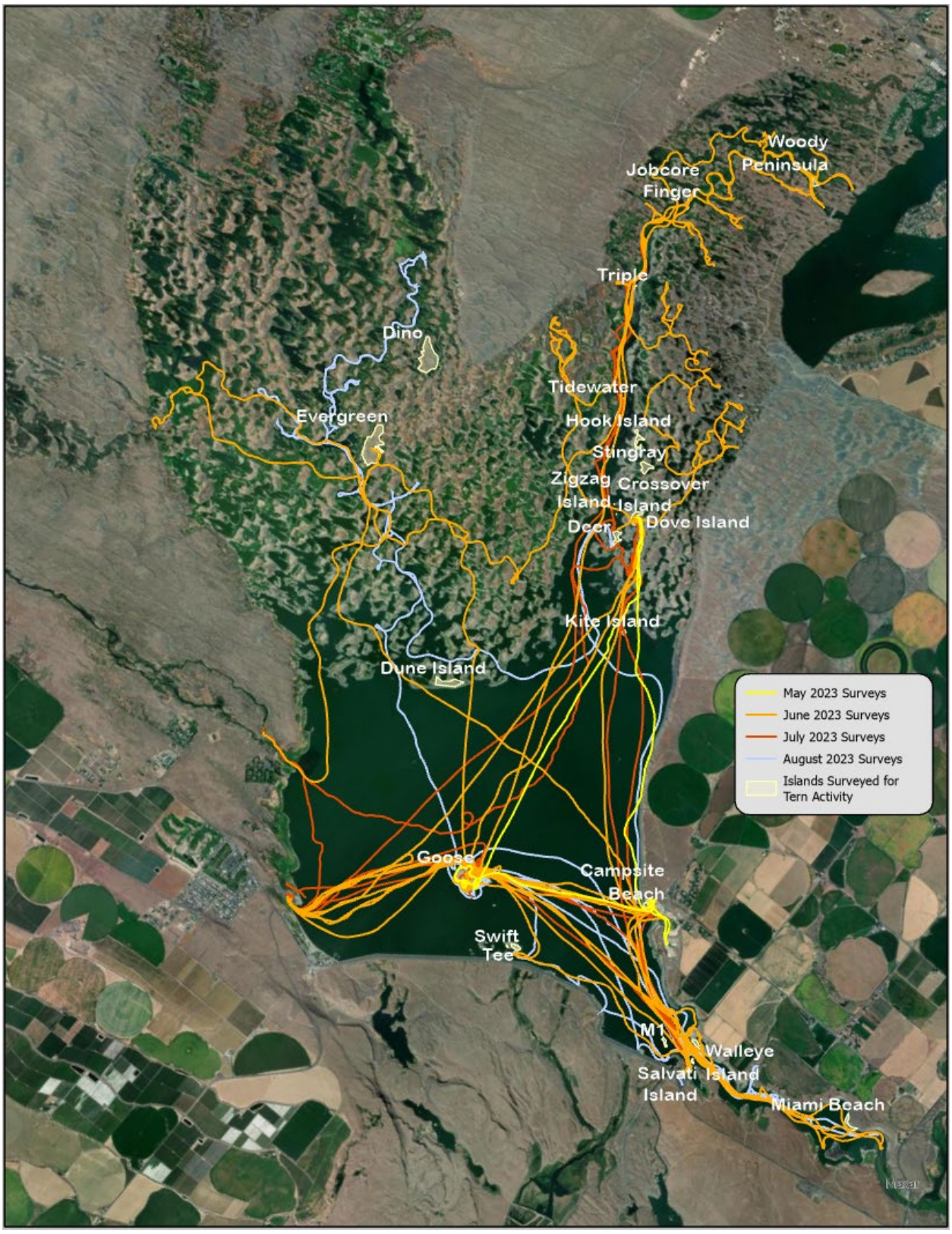

FIGURE 5. POTHOLES RESERVOIR ISLANDS SURVEYED FOR TERN ACTIVITY IN 2023. THE FIGURE SHOWS ALL SURVEY TRACKS OCCURRING FOR A GIVEN SURVEY MONTH.

CATE observations throughout Potholes Reservoir remained consistently under 50 birds until July 12, when an influx of birds to the reservoir was observed (Figure 6).

USDA-WS documented the lake water level recorded via the Reclamation Hydromet website during each survey. April 2023 had higher water levels than the past 3 years, but June-July water levels were below the 4-year average (Figure 7). The highest count of nests was on Goose Island on June 14 (n=11; Figure 7). An islands nest count is considered the minimum number of active breeding CATE pairs. Therefore, when breeding CATE were present, between 2 and 11 (average 5) CATE nesting pairs were observed intermittently attempting to nest on Goose Island; the assumption is that each reported attempt was likely a different nesting pair over the course of the breeding season.

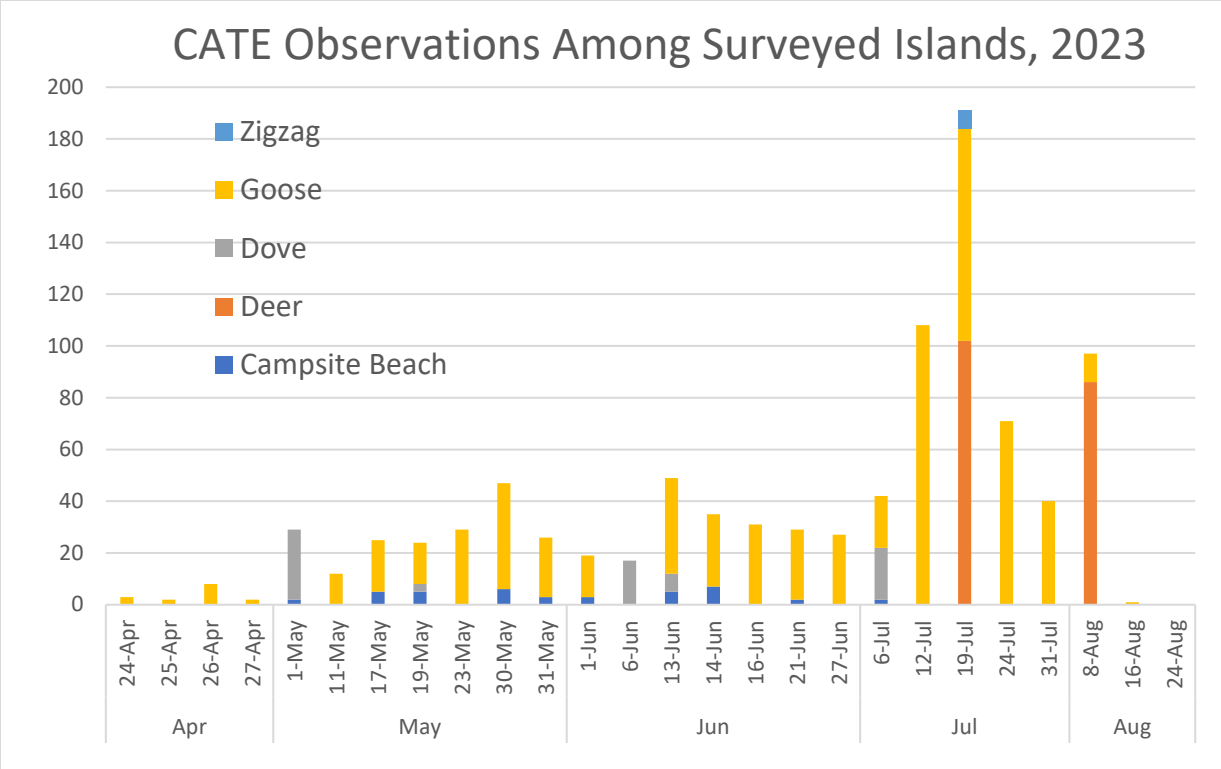

FIGURE 6. CATE OBSERVED DURING ISLAND SURVEYS IN 2023, POTHOLES RESERVOIR.

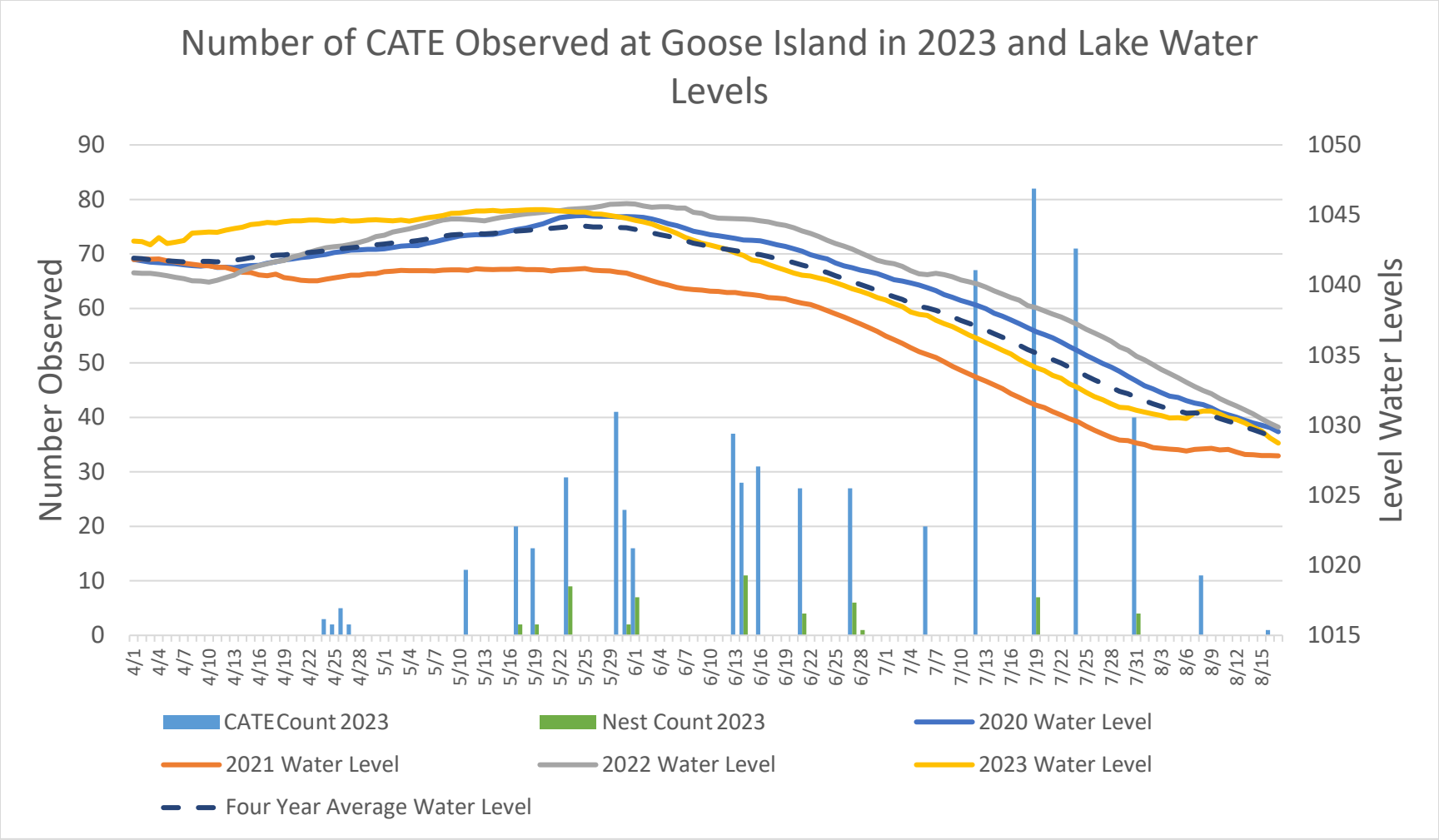

FIGURE 7. 2023 CATE COUNTS RELATIVE TO LAKE LEVELS, POTHOLES RESERVOIR.

Potholes Reservoir Nest Removal and CATE Dispersal:

USDA-WS observed 0 CATE chicks and took 74 CATE eggs (up from 12 in 2022) from 56 nests. Nearly all eggs were taken from Goose Island (n=72). Figure 8 shows the numbers of nests taken from Goose Island by island region. A small number of CATE were persistent in their attempts to nest under the flagging in the Main Island Rocks region, until the coyote effigy was deployed on June 21. Island regions are displayed in Figure 4.

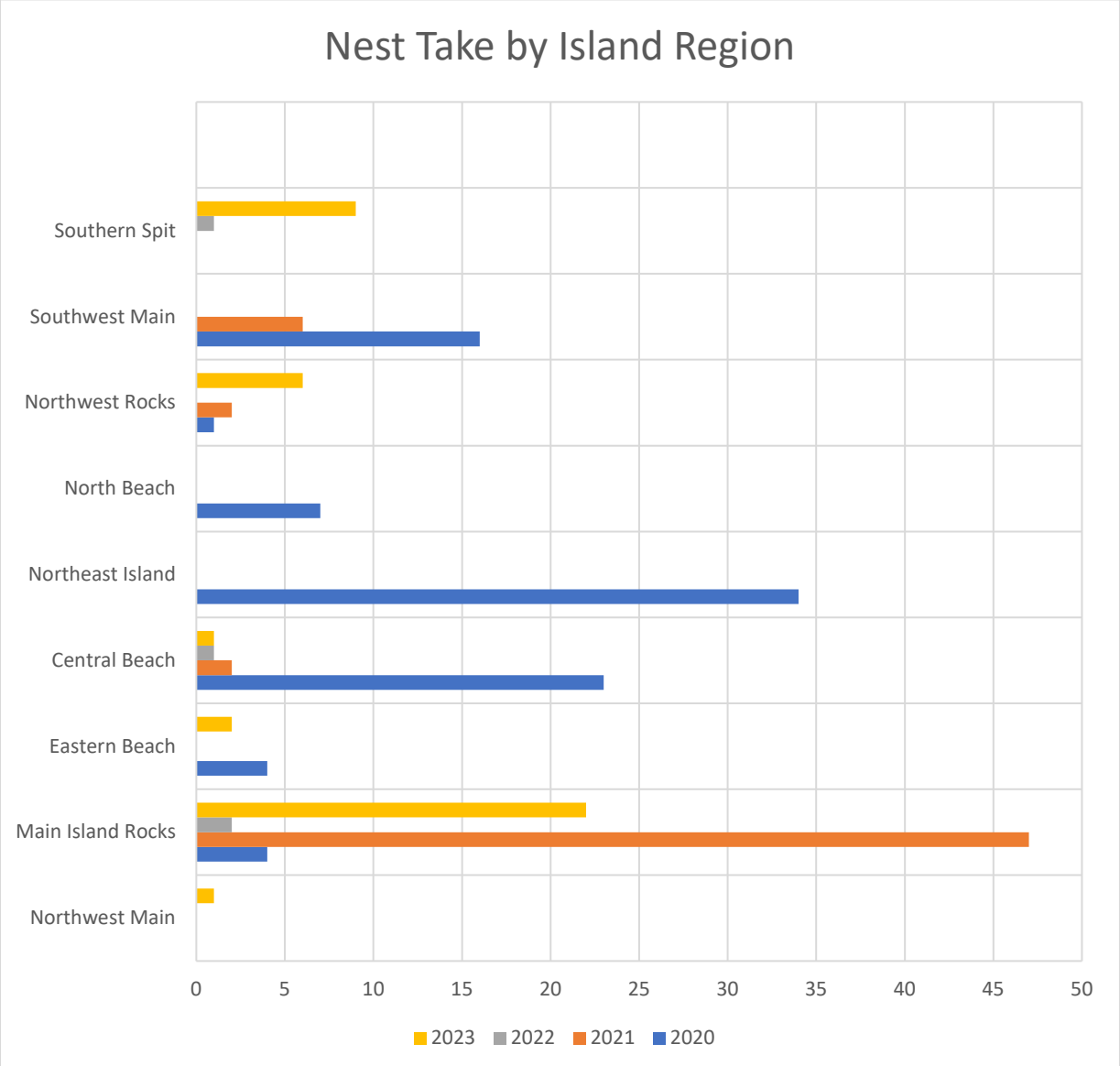

FIGURE 8. COMPARISON OF 2021-2023 CATE NEST TAKE AT GOOSE ISLAND, POTHOLES RESERVOIR. SEE FIGURE 4 FOR SPECIFIC LOCATIONS.

Egg take levels for 2023 remained lower than take levels in 2020 and 2021 but were higher than take levels for 2022 (Figure 9). The increased egg take in 2023 over 2022 may be due to contributing factors of year-to-year variability and changing CATE breeding habitats throughout the Columbia River Basin.

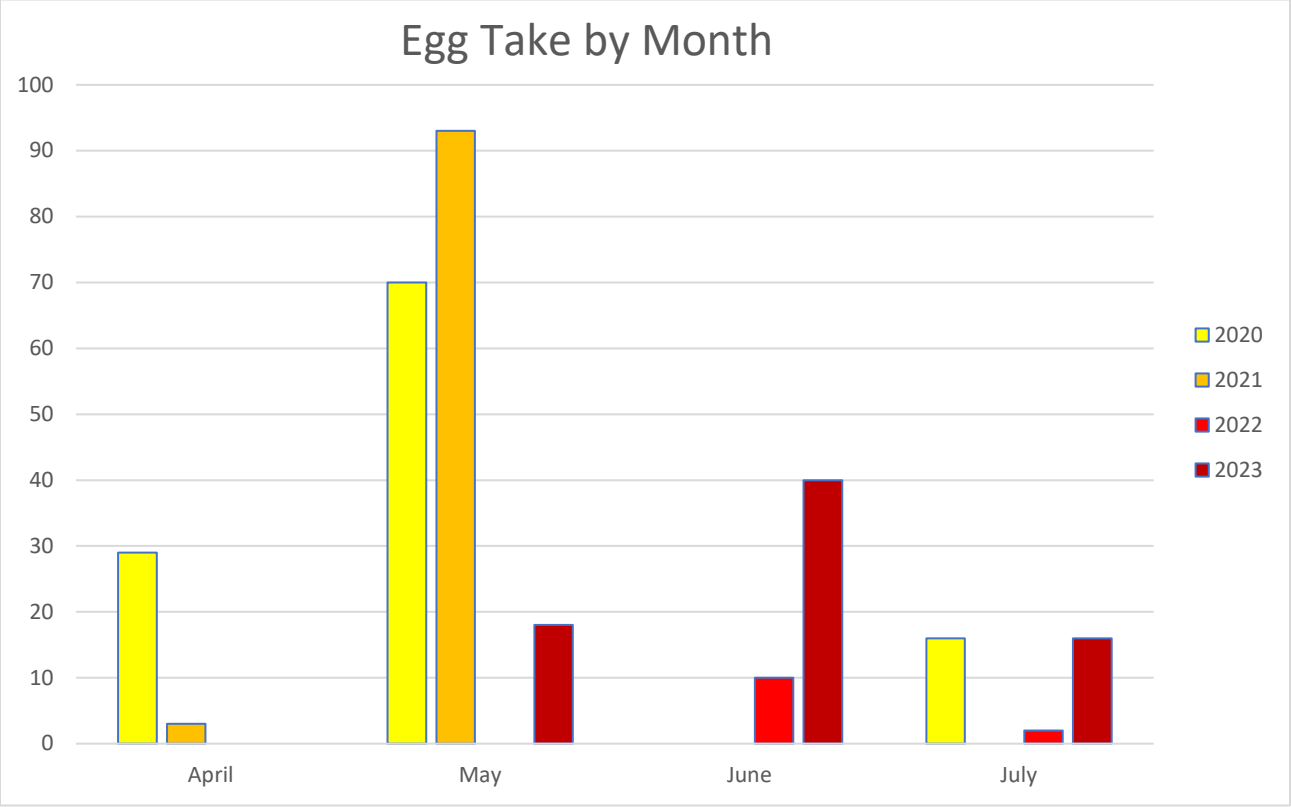

FIGURE 9. EGG TAKE BY MONTH, POTHOLES RESERVOIR.

One nest was taken from Campsite Beach and the remainder were taken from Goose Island (Figure 10). This was the first nesting attempt off Goose Island reported since USDA-WS began dissuasion efforts in 2020.

FIGURE 10. MAP SHOWING ALL CATE NEST LOCATIONS IN 2023, POTHOLES RESERVOIR.

Banks Lake Survey Results:

In 2023, Reclamation requested exploratory surveys[1] to be conducted at Banks Lake for tern activity. Five total surveys were conducted in which 89 CATE were observed (Figure 11). The two surveys conducted in May observed no CATE breeding activity and eight CATE. The three survey days conducted in June observed 25 breeding CATE on Goose Island starting on June 15 and 81 CATE counted during the survey.

FIGURE 11. BANKS LAKE CATE SURVEYS 2023. FIGURE REPRESENTS ALL SURVEY TRACKS OCCURRING FOR A GIVEN SURVEY MONTH.

[1] See Section 3.4 of the IAPMP's Adaptive Management Plan

Banks Lake Future Plans:

USDA-WS will continue coordination with Reclamation on potential amendments or additional agreements to include survey and dissuasion (as necessary and appropriate under Migratory Bird Treaty Act) at Banks Lake in future years.

Recommendations

In keeping with the IAPMP's Adaptive Management Plan, USDA-WS and Reclamation are currently investigating strategies to further decrease Goose Island's suitability for CATE residence and nesting. As this process progresses, new actions will be coordinated with stakeholders through an Adaptive Management Work Group (per the IAPMP) made up of the Action Agencies, resource agencies, tribes, and other interested parties with relevant experience as required. USDA-WS will continue to coordinate with Reclamation to ensure compliance with all relevant laws and regulations.

In keeping with this framework, USDA-WS recommends application of water-soluble dyes in select areas where CATE have nested, are likely to nest, or immediately following nest removal. USDA-WS has successfully deterred nesting CATE away from airfield movement areas using this method. Water-soluble dyes are typically made from solvent (e.g., water), pigment (e.g., chlorophyll or other water-soluble pigments), binder (e.g., resin styrene or acrylic polymers), and additives (e.g., thickeners or surfactants). Due to the variety of water-soluble dyes that are available, all products selected for application would be irrigation safe and environmentally safe (e.g., non-toxic and inert). Applications would be greater than 10 feet from nesting gulls and greater than 5feet from the water line. The initial applications would be monitored during surveys for any potential impacts to nesting gulls and effectiveness of CATE deterrence. As stated earlier, USDA-WS will coordinate with the Adaptive Management Work Group and Reclamation to ensure compliance with all relevant laws and regulations.

Citations

United States Army Corps of Engineers Walla Walla District. 2014. Inland Avian Predation Management Plan.