The Tern of the Season: Forster's Terns in South San Francisco Bay

by Robin Dakin, Jennifer Parkin and Tom Ryan

Forster's Tern

Approaching a Forster's tern *(Sterna forsteri)* breeding colony, you can hear the calls of the adults and see them regularly flying to and from the island, delivering fish to their young and exchanging parental duties with their mates. As you get closer to the colony, a few curious adults may fly over you, making their distinctive buzzing call, investigating you to determine whether you pose a threat to their eggs and young. Scanning the island colony with your binoculars, you can see the black caps and bright orange beaks of sitting adults peeking above the vegetation. If you view the greater surroundings, you may spot distant terns hovering, and then diving into ponds and sloughs as they forage to feed their growing chicks. And if you stay longer to watch, you will begin to understand the day-to-day lives of these fish-eating specialists.

As the adult terns stand to trade incubation duties or to tend the nest, you may be able to see two or three small olive-brown eggs, splotched with black markings, but their camouflage is nearly perfect against the dun- colored island dirt. Newly hatched chicks are identically colored, covered with a sandy-brown down with black markings. As you watch, an adult may fly in with a newly-caught, still struggling fish. It may appear too large for the chick to eat, but eventually the chick swallows the fish and sits down to digest. Other larger, partially feathered chicks run around the island, calling to adults flying overhead.

Forster's terns usually share their nesting habitat with American avocets and infrequently with black-necked stilts, Caspian terns and black skimmers. While squabbles may erupt between the different species, they generally ignore one other. However when a predator such as a northern harrier, great egret or peregrine falcon flies over the colony, all species fly up to mob it and drive it away. Most of the terns stay lower and form a protective umbrella over the island while other birds vigorously attack the predator, even striking it in mid-air.

Forster's terns are medium-sized terns. All members of the tern family are similar in body form to a gull but smaller, with a sharp beak and more pointed wings; many have a forked tail. Forster's terns are distinguished from other terns by their size, black cap and

nape, deeply forked gray tail with white outer feathers and uniformly light-colored upperwings. In August, they molt into their winter plumage, their black cap fading to just a dark eye patch. Their bill loses its bright orange breeding color and reverts to a somber black.

Locally, Forster's terns can be found nesting in the southern portion of San Francisco Bay on islands in salt ponds, sloughs and marshes. In the salt ponds, they nest on dredge spoil islands. These are created when bottom sediment is scooped up and deposited near the corners of salt ponds to prevent erosion of the levees from wind and wave action. The islands provide a secure haven with the surrounding water acting as a barrier to predators such as red fox and feral cats.

Forster's terns nest colonially in groups ranging in size between 20 and 400 individuals. Adults begin courting in April, with the males presenting fish to prospective mates. The pairs remain together for the duration of the breeding season, sharing in all the duties of chick-rearing. The nests are usually just destination for birds that breed in our area.

Currently Forster's terns nesting in south San Francisco Bay breed in 15 locations. Together, these colonies contain over 900 nests. This species has not always bred in such large numbers on the Bay. Prior to 1948, they were considered common migrants which wintered in varying numbers, breeding in scattered locations throughout the central valley and northeastern plateau of California. In 1948, a colony of about 100 pairs was located on a salt pond on the east end of the San Mateo Bridge and two other colonies were subsequently found in salt ponds at Newark in 1951 and 1953.

Man-made salt evaporation ponds provide important habitat for Forster's terns in southern San Francisco Bay. They nest almost exclusively on dredge spoil islands within these ponds, and are observed foraging in them as well. The creation of salt ponds in the south bay began around 1860. To construct them, levees were created around tidal marshes, trapping bay water in large shallow ponds. By the 1930s, 30,000 acres of tidal marsh had been flooded to create salt ponds. The ponds provide some species with both abundant food and islands on which to nest. Their existence has led to increasing numbers of Forster's terns, black-necked stilts, American avocets, western snowy plovers, phalaropes and California gulls in the southern bay region. However, some marsh-dependent species such as the California clapper rail and salt marsh harvest mouse have declined, and subsequently become listed as endangered species, due to this large-scale reduction in habitat.

Forster's tern populations are currently monitored closely by biologists and volunteers of the San Francisco Bay Bird Observatory (SFBBO). Through the SFBBO's Colonial Waterbird Monitoring Program, volunteer observers visit known nesting colonies five times during each breeding season. They document numbers of adults, numbers of nests and the current stage of the breeding cycle (courtship, incubation, etc.). This program is in its 16th continuous year.

This past season, three new studies were initiated. SFBBO is now studying nesting success of four tern colonies. At each of these colonies, we have marked nests, and have followed each nest through the season, collecting data on when the eggs were laid, how many eggs were laid, how many hatched and how many young fledged as a result. This study is combined with a Master's Thesis project being done by Robin Dakin through San Jose State University. Robin is studying nest site selection by Forster's terns, by looking at the characteristics of the habitat in which the nests are placed. These factors include the type of vegetation the birds place their nests on or near, and the island size and topography they prefer. When Robin combines this data with the results of the nesting success research, she may be able to determine what island features help or hinder the terns' reproductive efforts.

The third study SFBBO is conducting examines nest attendance patterns of adult Forster's terns. In this study, we are investigating the changes in numbers of adults at a colony over the course of a day, to determine if there is a distinct pattern to their absence or presence at their nest site. Using this information, we can plan future observations to coincide with the greatest numbers of birds present at the colony.

These studies help us to better understand the Forster's terns' habits and give us insight into their way of life in San Francisco Bay. While they are an interesting species unto themselves, they also serve as an "indicator species" for the health of our bay. Terns feed on fish which in turn feed on smaller fish and invertebrates. The health of these organisms is reflected in the health of the Forster's tern population and in its breeding success. If there is a problem with populations of fish, the terns will not be able to forage sufficiently for their young. Fewer nests will be successful and fewer chicks will fledge. As you lower your binoculars and finally turn away from the colony, it will be with the feeling that you have become a little better acquainted with the terns by spending time observing them. One way to get to better know these birds and the bay that we share as our home is to become involved in efforts to study and protect them. By volunteering your time to one of the many organizations dedicated to this effort, you not only educate yourself, but play a vital role in the conservation of both the wildlife and the bay.

Robin Dakin *is a biologist at the San Francisco Bay Bird Observatory and is working toward an M.S. in Biology at San Jose State University. She is currently studying nest site selection by Forster's Terns and will continue to work as an ornithologist in the field of conservation biology after graduation.*

Jennifer Parkin *is a candidate for a M.S. degree from Moss Landing Marine Laboratories. Her thesis is entitled Feeding and Reproductive Ecology of Caspian Terns (Sterna caspia) Breeding in Elkhorn Slough, CA. She is also currently working on the SFBBO Forster's Tern research program.*

Tom Ryan *hold an M.S. from Long Beach State University, his thesis detailing activity patterns in White- throated Swifts. He has extensive experience in the tern and skimmer colonies of southern California. As senior biologist with the SFBBO, he is the project leader for the Colonial Waterbird Monitoring Program.*