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Tideline

San Francisco Bay National Wildlife Refuge Complex

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Phalaropes of San Francisco Bay

By Hilary Papendick And Sarah Warnock

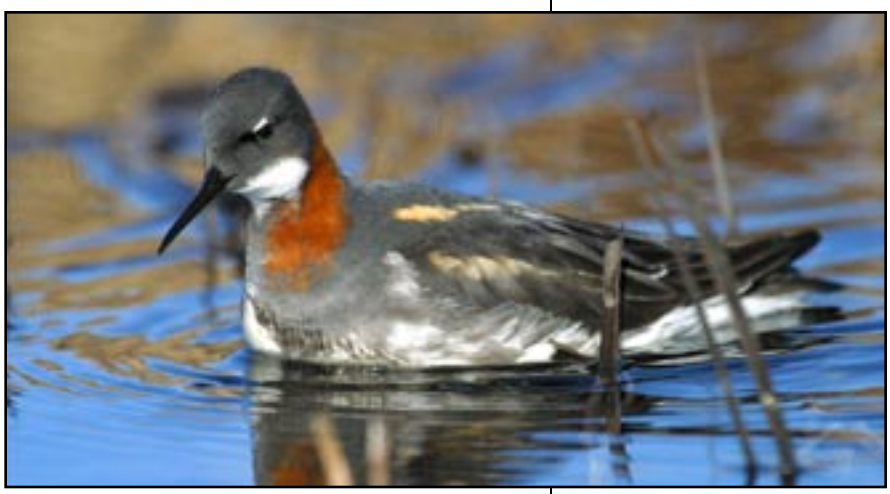
Think of a shorebird, and what comes to mind? A long-legged sandpiper, probing the soft substrate of a protected lagoon, or perhaps a snowy plover hunkered down in a dune? Less commonly thought of as a shorebird is a tight little ship of a bird, bobbing in open seas, leagues from the nearest shore... Phalaropes, the only free-swimming shorebird, are one of the oddest - and fascinating - members of the diverse shorebird order Charadriformes, a group that also includes oystercatchers, stilts and avocets, sandpipers and plovers.

Often considered their own family, the three species of phalaropes are tucked taxonomically in at the end of the shorebird section of field guides. Red phalaropes, plump little tomato-colored birds with white cheeks and yellow bills, are the most pelagic (ocean-going) of the three, and the rarest in San Francisco Bay. Their visits are accidental, and often tied to storm events. In the case of red phalaropes, the Don Edwards San Francisco Bay National Wildlife Refuge means exactly that - a refuge from tempestuous seas.

More common in the San Francisco Bay are Wilson's phalaropes and the more abundant red-necked phalaropes, which appear regularly each spring and fall as they make their way across hemispheres between breeding and wintering areas. Their natural migration stopover sites, - hyper-saline lakes and ponds packed with brine shrimp and brine flies - have been dwindling over the past century. Food resources and calm waters in San Francisco Bay's salt ponds have become an important alternative.

Identification and Breeding

Both red-necked and Wilson's phalaropes are small (7.5" - 9.5"), triangular birds with slender necks, small heads, dark, needle-sharp bills, and lobed toes that are similar to grebes and coots. Due to the rather unorthodox mating strategy of phalaropes, females in breeding plumage are more brightly colored than males.



Red-necked phalarope
Photo USFWS

Phalaropes are only territorial during breeding season, and females will fight ferociously for males during courtship. The females' brighter colors are as much for attracting males as for intimidating other females.

As a group, shorebirds exhibit almost every mating strategy known to ornithologist - including monogamy, in which both male and female share responsibilities of caring for young, and polygamy, in which one male will mate with several females and has no hand in rearing the young. Phalaropes are one of the few bird species that exhibit polyandry - an unusual strategy for birds since it involves the laying of more than one clutch by a female within a short time span, each with a different male. Because each clutch can weigh nearly as much as the female, this is no mean feat. The females then leave incubation and chick-rearing to the males.

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Feeding Behaviors

Each shorebird group forages for invertebrates in its own characteristic manner. Sandpiper bills are equipped with chemosensory nerves at the tip to help them locate invertebrates hidden in the mud. The large eye of plovers helps them to spot fast-moving prey which they pluck neatly from the surface of mud or sand.

Phalaropes, on the other hand, call for take-out. By spinning like a top on the surface of water, their food is delivered directly to them. As phalaropes spin, the water directly underneath is displaced to the outside, and replaced by deeper waters. Along with the deeper waters come invertebrates from lower down in the water column.

Considering they may live as long as 15 years, a phalarope could log a quarter of a million migratory miles, or the distance between Earth and the moon.

Now within reach of the phalarope's needle-sharp bills and quick reflexes, the invertebrates are captured and swallowed using a newly discovered feeding mechanism that was first described in phalaropes. Called surface tension transport, this behavior occurs so quickly it was only discovered through the use of high-speed video. After plucking the invertebrate from the water, phalarope bills do not clamp down, and there is no conveyer belt to carry the prey item to the throat. So, how does the prey get up the 1 1/2" bill?

Red phalarope *Photo Eric Taylor, USFWS*

Video stills show the prey is captured along with a drop of water. The water molecules on the surface of the drop adhere to the lower and upper mandibles of the bird's bill. Instead of closing the bill phalaropes actually open it wider, increasing surface area of the drop. As the bill widens, the base of the bill becomes narrower and the water molecules, seeking a surface to cling to, are drawn up the mandible. The invertebrate, still packaged inside the droplet, goes along for the ride. Total elapsed time: 2/100th of a second.

Range and Migration

The red-necked phalarope nests throughout Alaska and Canada's northern territories. Wilson's phalaropes breed in the in the western interior of the U.S. and Canada, from northeast California to the Dakotas to northern Saskatchewan. Both species construct grass-lined nests, nestled among low vegetation near the edge of small ponds or lakes. Once the chicks reach a few weeks of age and can fend for themselves, they leave the breeding grounds. Females depart before the males. The juveniles undergo their first migration on instinct alone. Alaskan red-necked phalaropes migrate along the west coast of the U.S. and Canada. Millions have been recorded in the Prince William Sound area in spring on their way to their northern breeding grounds. Most Alaskan red-necked phalaropes spend the winter in the Pacific waters of South America.. Less ocean-oriented than the red-necked, Wilson's phalaropes migrate through the Great Basin to the highland plains of Bolivia and Argentina. A phalarope's one-way migration may cover a distance of as much as 8000 miles. Considering they may live as long as 15 years, a phalarope could log a quarter of a million migratory miles, or the distance between Earth and the moon. Pretty good for a bird that weighs only a few ounces! The eastern range of the red-necked's fall migration route overlaps with the western range of the Wilson's in San Francisco Bay. Phalaropes of both species begin to arrive in early July, and numbers peak in late July and August. By the end of October, almost all phalaropes will have departed for the wintering grounds.

Threats to phalarope populations

Trends in phalarope populations are difficult to determine but are likely declining, as are most shorebird species, due to habitat loss and degradation throughout their breeding, migration and wintering areas. The propensity of shorebirds such as the phalaropes to gather in huge concentrations in a single migration area like Prince William Sound leaves them especially vulnerable to human-caused disasters, such as oil spills. For many years, up to 20,000 red-necked phalaropes also stopped to feed and rest in the western Bay of Fundy in New Brunswick. In the mid-1980s, bird numbers decreased, and by the 1990s, not a single phalarope appeared at the site. The disappearance of a group of phalaropes is alarming. More information is needed to determine whether the phalaropes simply shifted to a new feeding site or whether a catastrophe has occurred to the population.

In California, the loss of Owen's Lake, the near-loss of Mono Lake, and the possible loss of

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the Salton Sea due to water diversions means a potentially huge loss of the phalaropes' favored migration stopover areas. These invertebrate-packed hyper-saline lakes play a crucial role in the migration of grebes and other shorebirds. Political and scientific collaborations are underway to preserve enough of these unusual yet critical habitats for both the birds and for the health of local human populations.

People are mobilizing to reduce another threat to millions of night-migrating birds, including phalaropes. Fatally attracted to tall, brightly-lit buildings, especially in wet weather, phalaropes are in danger of collision with windows that reflect the night sky, and of becoming confused by the lights of buildings. Unable to escape the brightness, they grow exhausted and fall to the ground, prey for urban scavengers. Birders and building managers in large cities across the nation are working together to reduce building lights during peak migration, saving thousands of birds' lives.

Role of the South Bay Salt Ponds

Of five bay-wide surveys conducted by PRBO Conservation Science in the late 1980's, 60-70% of all shorebirds in the San Francisco Bay were located in the southern regions of the Bay, including nearly all phalaropes. Greater availability of high-tide foraging habitat in the salt pond system was cited as one probable reason for shorebird affinity to the South Bay. Why are the ponds so influential to bird diversity and abundance? The answer lies in the mix of low and high salinity ponds that are maintained during active commercial salt production. Because salinity levels determine which invertebrates and fish can survive, and pond depth determines the availability of the prey to different bird predators, a diversity of ponds leads to a diversity of birds.

Low salinity ponds support a variety of invertebrates as well as fish, which in turn support sandpipers, terns, pelicans, and waterfowl. At higher salinities, fish and most invertebrates can no longer survive, but brine shrimp, brine fly and water boatmen populations explode. These large invertebrate blooms are visible even from the air. Taking advantage of the feast are the phalaropes, black-necked stilts, eared grebes by the hundreds of thousands, and flocks of delicate Bonaparte gulls.

The recent acquisition of more than 15,000 acres of South Bay salt ponds provides an unprecedented opportunity to restore marshlands and improve the Bay ecosystem. Because of their affinity to salt ponds, and because hyper-saline habitats are disappearing throughout their range, phalaropes stand to lose by the conversion of ponds to other habitats. For this reason, scientists from state, federal, private and non-profit agencies and organizations are working with managers to engineer a comprehensive plan to develop a mix of managed habitats to maximize diversity of birds and other animals. This mix would include vegetated marsh with large, permanent ponded areas managed for high-salinity to attract the invertebrates so necessary to the phalaropes, grebes and other species to ensure these important habitat resources will remain.

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San Francisco Bay National Wildlife Refuge Complex

Founded in 1974 and administered by the U.S. Fish and Wildlife Service, Don Edwards San Francisco Bay National Wildlife Refuge exists to preserve wildlife habitat, protect threatened and endangered species, protect migratory birds, and provide opportunities for nature study. Six additional refuges are managed from the headquarters located in Fremont: San Pablo Bay NWR, Antioch Dunes NWR, Salinas River NWR, Ellicott Slough NWR, Marin Islands NWR, and Farallon NWR.

San Francisco Bay Wildlife Society

A nonprofit 501(c)(3) cooperating association established in 1987 to promote public awareness and appreciation of San Francisco Bay and fund education and outreach programs at San Francisco Bay National Wildlife Refuge Complex.

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