



Photo courtesy of UC Davis

California's western and Clark's grebes are

Under Pressure

Historically, these two look-alikes have enjoyed prosperity. But conflicts with people are leading to habitat loss



Photo courtesy of UC Davis

On any hot summer day at lakes around California, the shrill calls and splashing dives of western and Clark's grebes can be heard amidst the hum of boat traffic and vacationers enjoying the summer sun. Western and Clark's grebes are conspicuous black and white waterbirds typically inhabiting inland lakes in the summer, and coastal ocean waters in the winter. The two species are difficult to differentiate between at times, but occur together year-round. In the spring, they complete a nocturnal migration from the marine Pacific coast to inland lakes and reservoirs. In fact, many Californian lake-shore residents are surprised at the sudden arrival and departure of these birds, commenting on how they seem to either appear or vanish overnight. It is at these

inland bodies of water, however, where the grebes settle down to court and nest. And to spectators of the ritualistic courtships, the grebes are described as no less than amazing. Unfortunately, the effects of human activities have had serious consequences for the populations of both species.

Until late in the 20th century, scientists described Clark's grebes as a color variant of western grebes, and did not identify the two as separate species. Although both birds are somewhat similar in appearance, western grebes are distinguished from Clark's by the presence of black feathering reaching below their red eyes. Clark's grebes, on the other hand, have white feathering surrounding their eyes.

A subtler difference lies with the birds' vocalization patterns. Clark's have a one-note call while westerns employ

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Previous pages, a Clark's grebe (Page 20) packs her chick on her back for its first two to four weeks of its life because it hasn't learned how yet to dive. Previous pages, a pair of western grebes (Page 21) attends their floating nest for the season. This page, although populations have been historically strong for both western and Clark's grebes, loss of habitat, combined with persistent human disturbance, can cause a drastic drop in their numbers. The nests can easily flood in the wake of speeding powerboats, and with a nesting season from May through September, when most people become excited about outdoor summer activities, the possibility of conflicts increases dramatically.

a two-note call. In addition, bill color can be used for identification. Clark's have a yellow-orange bill; westerns have a yellow-green bill. It is difficult to differentiate between the sexes of both species, but subtle differences do exist. Females of both species are smaller with a shorter, thinner bill that is slightly upturned in comparison to males.

Although challenging for the human eye, grebes have no problem differentiating one another, and after arriving at their nesting grounds, the birds quickly initiate courtship behavior. The most captivating of these displays is known as the rushing ceremony, which includes two or more grebes rising up in synchrony, and skirting across the water for as far as 20 yards.

Marilyn Waits, president of the Redbud Audubon Society, describes the spectacular display between grebes as a highlight to Lake County's annual heron celebration at Clear Lake. "When a grebe pair begins rhythmic head bobbing, then rears up on their feet and hydroplane together across the water surface, it is a spectacular sight that leaves our festival guests awed and amazed at the beautiful, complex behaviors these birds display," she says.

Another display is the weed ceremony, a complex ritual involving a pair of grebes. The birds begin a posturing display followed by intense vocalization. The pair then dives underwater and returns with vegetation in their bills to face each other and present the weeds.

After these courtship rituals are completed, colonial nest building is initiated. The grebes construct floating nests out of emergent or submergent vegetation that is anchored to the

substrate. As such, wetland habitat and stable water levels are vital to the success of a grebe nesting colony. Colonies composed of thousands of nests can be common at important breeding lakes such as Lake County's Clear Lake, and Eagle Lake in Lassen County. Nesting occurs between May and September. After hatching, chicks are fed and carried on the backs of parents for several weeks.

By the end of summer, the chicks are full grown, and able to fly to their wintering grounds along the Pacific coast. Migration back to the wintering grounds usually occurs between September and November, though some populations are thought to remain resident at lakes that do not freeze.

California is especially vital to western and Clark's grebes because it makes up a large portion of their range with high numbers of breeders. Western and Clark's grebes can be seen throughout the western part of North America stretching from as far north as British Columbia, Canada, and southward to Sonora, Mexico. The birds are found as far east as Minnesota. Historically, grebe numbers have remained healthy throughout their range, but in recent years these elegant birds have endured population-level threats largely due to conflicts with humans.

Some of the earliest human related threats to western and Clark's grebe populations were market hunting and egg collecting. Throughout the late 19th and early 20th centuries, these birds were sought after for their ventral white "fur," as it was called, which was used to make coats and hats.

In 1899, an unknown writer described the extent to which the grebes were hunted while



Photo courtesy of UC Davis

writing about Tule Lake in Siskiyou County. The writer states, "... many thousand grebe skins have been shipped from this one lake ...". In addition, profit estimates of grebe harvest from the Klamath Basin in 1904 reached into the \$30,000 range. Egg collecting was also popular during this time, and served to compound population declines that had resulted from market hunting. With the passage of the federal Migratory Bird Treaty Act of 1918, western and Clark's grebes became protected from such disturbances. The statute forbids the "take" of any migratory bird or migratory bird nest, making market hunting and egg collecting of both western and Clark's grebes illegal.

Today, issues are a bit more complex. Late in the 20th century, pesticide applications exerted negative effects on grebe populations. Pesticides became widespread after World War II as an all-purpose solution for eliminating pest species throughout the United States. For example, the synthetic pesticide Dichloro-Diphenyl-Trichloroethane, most commonly known as DDT, was heavily applied from 1949 to 1963 in the Klamath Basin, which lies on the Pacific Flyway for many migratory bird species. The flyway is used by western and Clark's grebes. Another toxic pesticide, toxaphene, was applied to the same area from 1956 to 1963. Both chemicals were linked to direct mortality in fish-eating birds, including the grebes. Dichlorodiphenyldichloroethane, a breakdown product of DDT under anaerobic conditions, was itself applied to Clear Lake in the 1940s as an attempt to exterminate a non-biting gnat. Grebe populations were severely affected, and breeding failures ensued. Another of DDT's breakdown

products, Dichlorodiphenyldichloroethylene was linked later to eggshell thinning in many avian species. This news helped break the story to the world of DDT's toxic effects on animals, including the bald eagle and other bird species. In 1972, the U.S. banned use of DDT and its byproducts.

Even though the threat of breeding failure due to these toxic chemicals has lessened, ongoing risks affecting western and Clark's grebes persist in the form of habitat loss. Other wetland species feel the pressure from that failure as well. Because of the specific habitat type required for construction of grebes' nests, damage to such areas adds stress on breeding grounds, and has a disproportionate effect on the breeding population. Because grebes often construct nests from emergent or submergent vegetation, availability of wetland habitat remains crucial. California has lost 90 percent of its historic wetlands, due in large part to an increasing human population, which limits the number of adequate nesting locations that still exist.

Associated with habitat loss is human disturbance. The nesting season for the western and Clark's grebes coincides with the state's popular boating season, which leads to a threat—in most cases unintentional—of particular importance. For example, the floating nests constructed by these birds can be flooded by boat wakes. In addition, water level manipulation at reservoirs can leave nests stranded on dry ground causing nest abandonment by the birds, and exposure to terrestrial predators. Alternatively, flooding of nests can occur when water levels are raised at reservoirs. Even with successful nesting, the chicks are still vulnerable to direct boat strikes, and hypothermia

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Marilyn Waits, president of the Redbud Audubon Society, describing the rushing ceremony between grebes during Lake County's annual heron celebration at Clear Lake.



Photo courtesy of UC Davis

Skirting across the surface of Clear Lake in Lake County, a pair of Clark's grebes perform the rushing ceremony, part of the bird's courtship behavior. The ritual, sometimes done by three or more birds at a time, involves the birds rising together and scurrying along for as much as 20 yards.

Tips on enjoying grebes without disturbing them

So what can California residents do to help protect grebes, their nests and their vulnerable chicks? Because the grebe nesting season coincides with the busy boating and fishing seasons, there are several tips, that when followed, can help these birds, and allow boaters to enjoy the water.

AVOID NESTING AREAS: Stay at least 300 feet away from colonies, and avoid prolonged presence near them.

WATCH THE WAKE: When moving near colonies, go slowly and quietly to avoid swamping nests and minimize disturbance.

TAKE A SCENIC DETOUR: Motor, sail, or paddle around flocks and colonies instead of through them.

AVOID BOAT STRIKES: Watch for grebes in open water, especially between May and September, to avoid lethal collisions.

RESPECT BUOYS AND LIMITS: Obey buoy markers and posted speed limits for the safety of all.

PACK OUT TRASH: Adults and young grebes can become tangled in fishing line and other plastic trash, and drown.

EDUCATE OTHERS: With everyone's help, we can ensure the survival of these beautiful, valuable birds.

when left at the surface by their diving parents. This is due to the chick's inability to dive within the first two to four weeks of life. Threats to these birds, however, are not isolated to their breeding grounds.

Oil spills comprise the main threat faced by grebes on their wintering grounds off the Pacific coast. Spills come without warning, and, depending on the size, usually kill thousands of birds; a significant portion of which can be grebes.

"Western and Clark's grebes are among the most frequent victims of oil spills along the California coast, with an estimated 8,000 killed in the last 20 years," says Steve Hampton, a Department of Fish and Game resource economist with the Office of Spill Prevention and Response, known as OSPR.

These oiling events can be human-caused or natural, and can lead to significant losses of many species of marine birds. These losses have been attributed to direct death from plumage

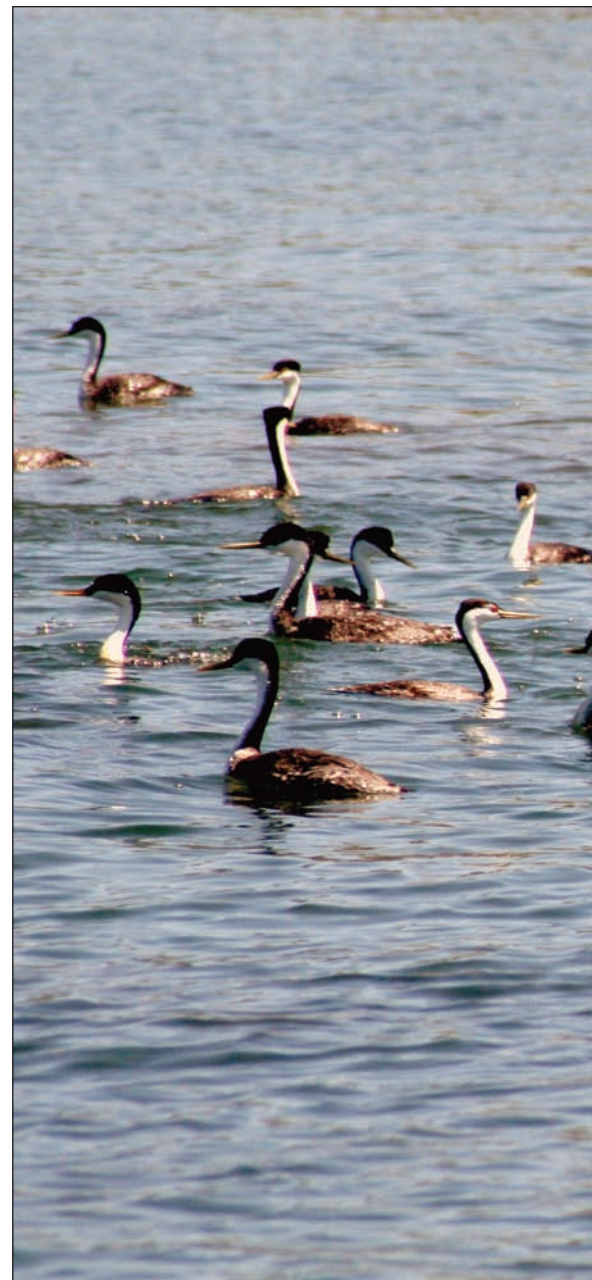




Photo courtesy of Frank Gress

A tight raft of grebes mix at Clear Lake. Although both species appear similar, western grebes have black feathers reaching below their red eyes, and have a yellow-green bill. Clark's grebes have white feathering surrounding their eyes, and they have a yellow-orange bill. Females of both are smaller with a shorter and thinner bill that is slightly upturned in comparison to males.

fouling and loss of thermoregulatory abilities, or indirect effects caused by oil ingestion and stress. In November 2007, the oil spill from the container ship Cosco Busan affected approximately 3,000 birds, 19 percent of which were western and Clark's grebes.

Fortunately, specialists are working to conserve these two beautiful species of grebe. The University of California, Davis, in cooperation with DFG and other state, as well as federal agencies, has launched a long-term project. Specialists from DFG's OSPR have provided exceptional support, and have been intimately involved in the project. UC Davis professor and principal investigator on the project, Dan Anderson, sees promise in the efforts being taken to conserve these birds. "This multi-agency project is hopefully just what California's

western and Clark's grebes need," Anderson says. "It is meant to engender a long-term conservation program, which will permanently conserve these wonderful birds. We want to leave something behind that is lasting."

The project includes population and nesting surveys, as well as disturbance monitoring at grebe breeding grounds. It focuses on educating boaters and residents at lakes around California about what they can do to prevent negative impacts on nesting colonies while enjoying popular recreational lakes. Additionally, signs are posted, and informational materials are distributed to inform the public about grebe conservation.

"Part of OSPR's mission is to restore natural resources injured in oil spills," says Hampton. "Concentrating our attention

at grebe breeding grounds is the most effective way to accomplish this goal for these species. With this project, we hope to protect the colonies, and educate lake users how to coexist with the grebes. Most people are more than happy to do so, as they're beautiful birds. We hope this project will prevent some of the accidents that have occurred in the past in which major disturbance events have inadvertently decimated grebe nesting colonies." 🐼

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