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Living Bird

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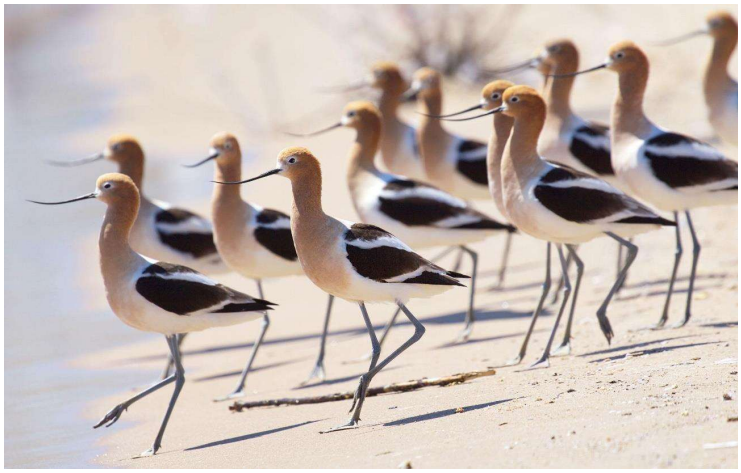


Credit: Lisa Sproat (Audubon Photography Awards)

Is there still hope for the American Avocet in this Rapidly Changing World?

---------- INGRID SCHOONOVER

The American Avocet (*Recurvirostra americana*) is a beautiful North American migratory shorebird that lives in freshwater wetlands, marine intertidal areas, salt marshes, and brackish mudflats.

They are migratory in nature: traveling northward to the breeding grounds between February and May, returning to their southern winter grounds between June and December.

Despite their listing as a species of Least Concern by the IUCN Red List, the American Avocet faces numerous threats to its survival. Unfortunately, in a world that is being rapidly modified and polluted by humans, most migratory shorebirds are being exposed to an ever-increasing variety of environmental dangers.

Historically, American Avocet populations have been negatively affected by shooting and trapping, but this has not been an issue since hunting them has been criminalized since the Migratory Bird Treaty Act of 1918.

The biggest threat to the American Avocet today is reduced breeding range due to the massive wetland loss that has occurred over the last 200 years because of human development.

Climate-change in the form of increasing sea levels, droughts, and changing weather patterns present another set of issues, especially during incubation and developmental periods.

Runoff and technology from the agricultural industry has contributed to the contamination of wetlands with toxic elements (such as selenium which causes embryonic deformities). Similarly, wetlands have been contaminated by other industries including coal burning, metal smelting, crude oil processing, and mining.

Oil pits and gold-mining cyanide leach ponds are another huge danger because to the American Avocet they appear as attractive nesting grounds, but the metals and elements at these sites are toxic and will kill their eggs.

About the American Avocet

The American Avocet is easily identified by their rusty-orange head with a long upturned black bill, and long blueish-gray legs with webbed feet and black claws. They are large birds that reach 17 to 18.5 inches (43-47 cm) in length and weigh between 10 to 12 ounces (275-350 g). They have large black wings with a wingspan of 36 inches (91 cm), that are contrasted with a white 'V' that runs down both wings and connects along their lower back. The dark wings stand out against their white underparts. The plumage on their head and neck changes with seasons. During the breeding season they display alternate plumage, which is characterized by a rusty head and neck. During the non-breeding season, they display basic plumage, distinctive due to a light grey head and neck.

They are migratory birds, traveling northward to the breeding grounds between February and early May. The breeding range is expansive and includes the San Francisco Bay area, to the east of the Sierra Nevada and Cascade mountain ranges, the Southwestern United States, the Central United States, and Northward to Alberta and British Colombia in Canada. They return to the non-breeding winter ground between the end of June and beginning of December. Most flocks overwinter along southern California and southern Mexico, occasionally overwintering on the Atlantic Coast of the southern United States between Florida and South Carolina.

Credit: Young Avocet with down feathers (Susan Hodgson/Audubon Photography Awards)

Credit: Ron Dudley (Feathered Photography)

Disappearing Wetlands

Only half of original wetlands remain in the United States.

Wetland habitats are important breeding sites for many species of birds including the American Avocet, but wetlands are destroyed and degraded by processes of human development including but not limited to peat mining, drainage, damming, logging, construction, runoff, dredging, agricultural grazing, and damage from invasive species.

At the beginning of the 19th century there were 221 million acres of wetlands in the geographic region that today makes up the continental United States, but today only 110 million acres remain, which is a 50% reduction.

The American Avocet form breeding pairs before and during migration, with over half of all migrating breeding pairs stopping at wetland sites to breed.

The massive wetland losses over the last 200 have reduced the breeding range of the American Avocet which has led to population declines and has forced birds to nest on less ideal or even dangerous sites.

Many other species of waterbirds have been declining in abundance in areas of wetland loss, including the American White Pelican, Snowy Plover, Marbled Godwit, and Wilson's Phalarope. This negative trend is especially true within the Great Basin where populations of shorebirds have declined by 70% since 1973.

Fortunately, the rate of wetland decline has been slowing since the early-2000s, this is the result of wetland restoration projects, coastal monitoring programs, public education, enforcement of wetland protections, and eliminating incentives for wetland drainage.

Ecology of the American Avocet

American Avocet breeding pairs will search for a nesting-site together between early April and mid-June. They nest on soft ground, within 10 to 200 feet (3-63 m) from waterlines, and they build their nest by the process of scraping, where the pair use their breast and feet to dig a small hole that is surrounded by a mound that is usually 1 to 4 inches tall (2-10 cm). Most nests are fully or partially lined with grasses, feathers, pebbles, and shells. Pairs have one brood per season (mid-April to late-June), usually consisting of four eggs. Pairs will incubate the eggs together, alternating shifts during the day and with the female usually incubating alone at night. The eggs hatch after 18 to 29 days of incubation. The newly hatched chicks only have downy feathers, and they leave the nest within 24 hours of hatching. Together the parents and the chicks move to a nursery area which has shallow water and low vegetation to cover the chicks. The chicks forage for their own food while parents watch over them closely. They quickly develop juvenile plumage, which is like breeding adult/Alternate plumage, but all the colors are washed out. They can fly at four to five weeks old (27 days approximately). They will migrate to the winter ground and stay for up to a year, and they breed at one or two years of age.

Surviving a Changing Climate?

Dealing with floods, droughts, and a shifting climate.

Global climate change has resulted in sea level rise, increased temperatures, and changing weather patterns including increased frequency of storms, droughts, and floods, and shifts in precipitation. In the coming decades as the severity of climate-change worsens the American Avocet will face significant obstacles to survival and reproduction, and they are in danger of losing half of their range by 2050 due to climate change.

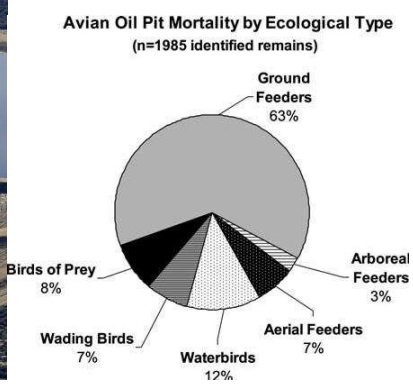
Within the range of the American Avocet, shifts in precipitation have led to a reduced water availability and in some cases increased water salinity.

When salinity increases above an optimal level then the invertebrate prey that the Avocet feeds on will suffer from smaller body size and lower reproductive rates, which reduces food availability for the birds.

Climate threats are the most dangerous to Avocets during incubation and development of their young, because they build their nests on the ground. Storms and fluctuating water levels can flood nests causing egg failure. Additionally, storm-related cold weather events also lower the rate of reproductive success.

American Avocets are restricted to habitats with shallow water areas no deeper than 8 inches (20 cm), these areas are very drought-sensitive, so when water levels drop due to droughts the breeding range of the Avocet is further restricted.

The odds of survival are already rough without these added dangers, within the year of hatching it is predicted that 19% to 93% of hatchlings survive, after that they have an annual survival rate of 83% to 86%. On average they survive 8.7 years in the wild, but they can live at least 15 years.



Left: Oil pits in Kern County (Brian van der Brug/Los Angeles Times). Right: Avian Mortality at Oil Pits in the USA (Pepper W Trail)

The Agricultural Impact on Wetlands

Selenium Poisoning Persists Across Generations of Avocet.

Selenium is an element that is essential to plants and animals in trace amounts, but it is highly toxic at higher concentrations.

Selenium is often added to fertilizers in agricultural settings to improve crop productivity, but through agricultural runoff it finds its way into wetlands and waterways.

Selenium bioaccumulates in these aquatic habitats because it concentrates in the body of small invertebrates and insects and then moves up the food chain. So, when an American Avocet feeds on small crustaceans, insects, and fish it receives a highly concentrated dose of selenium which causes low reproductive success, embryo deformities, and congenital disorders.

Additionally, the nutrients and chemicals in agricultural runoff increase algae blooms, decrease water oxygen content, and decrease the abundance of invertebrates.

Other sources of selenium pollution include mining, smelting of ore, coal burning, oil processing, industrial manufacturing, and petrochemical operations.

A notable selenium bird poisoning event caused by agricultural runoff occurred at the Kesterson National Wildlife Refuge where thousands of birds and fish died.

Selenium poisoning can last for generations even after the environment is cleaned because it is passed from the parents to the offspring, and very high levels of selenium have been found in avocet eggs.

Credit: Melissa Usrey (Audubon Photography Awards)

Oil Pits and Cyanide Ponds

Nesting Sites or Graveyard?

Oil pits and gold-mining cyanide leach ponds might not seem like the place that you would want to raise a family, but these are actually highly attractive nesting grounds for breeding American Avocets, especially as natural wetlands disappear. Unfortunately, these sites have metal and trace elements that are toxic to Avocets and their eggs, which results in nest failure.

Cyanide is used in mining processes to extract gold from ore, where cyanide solutions are sprayed onto ore processing ponds. Cyanide is highly toxic and can kill wildlife that are attracted to the cyanide ponds. Cyanide solutions often spill or are discharged into waterways and groundwater which contaminates aquatic habitats, since the 1970s billions of gallons have been spilled and leaked into the environment. Furthermore, when the mining process is abandoned the ponds can continue filling with water and may form toxic lakes contaminated with cyanide, arsenic, boron, copper, fluoride, and zinc.

The process of producing oil creates waste fluids that contain salts, hydrocarbons, and toxic metals. This waste is often stored in open oil pits or large ponds that resemble wetlands, and birds can be poisoned or trapped in such pits.

The US Fish and Wildlife Service estimates that these oil pits are responsible for up to a million bird deaths annually.

One such example is Soda Lake, a wastewater basin in Wyoming that attracts nesting colonies of American Avocets. An investigation found that the concentration of hydrocarbons, selenium, chromium, copper, mercury, and zinc in the bird livers and eggs was way above the threshold that would cause reproductive impairment and deformities in the offspring.

Credit: Anuradha Shankar (Audubon Photography Awards)

What Comes Next for the American Avocet?

How we can save migratory shorebirds.

The American Avocet is listed as a Species of Least Concern on the IUCN Red List as of a 2016 assessment, and thus has no specific protection from state or federal agencies. Although, they are protected by broad-sweeping wildlife laws like the United States Migratory Bird Treaty Act of 1918, which criminalized the hunting of the American Avocet. Populations of American Avocet have been stable over the last forty years but there are regional declines, and historically the Avocet population has been negatively affected by shooting and trapping prior to Migratory Bird Treaty Act of 1918. Despite being listed as a species of Least Concern there are still many threats for the American Avocet now and in the future, a lot of effort and action is required to protect them and other migratory shorebirds.

Wetland habitats must continue to be protected because they are an important breeding and nesting ground for the American Avocet and other migratory shorebirds, and human-made wetlands can be constructed to counteract the losses. Public education and outreach are necessary to increase respect for protected areas and to prevent trespassing on breeding grounds.

The chemical degradation of wetlands must also be addressed and prevented by increasing the regulation of agricultural and industrial processes that contaminate waterways with toxic run-off. Consumers also have a role to play in this battle for conservation by choosing to support farmers that use sustainable agricultural practices that prevent the accumulation of toxic compounds in water or land.

New policies and regulations should also target cyanide mining operations and petroleum waste fluids. Closed containment systems should replace open pits to prevent wildlife from having access. Solutions for open pits are more limited and previous deterrents such as strobe lights, flags, noisemakers, and reflectors have failed and do not reduce bird deaths. Steel-framed netting can be used to enclose an open pit and effectively exclude birds where closed containment systems are not an option. Innovative technology such as enzymes and microbes can be used to breakdown selenium and other metalloids.

Credit: David Allen Sibley (The Sibley Field Guide)

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