

# Predator control helps salmon

September 2010

Predation is part of the cycle of nature. However, several species, taking advantage of human changes to the environment, have become all too successful in preying on Columbia River salmon. The Bonneville Power Administration funds several programs to reduce the impact of key predators on salmon and steelhead in the Columbia River. These efforts are part of BPA's responsibility to mitigate impacts on fish and wildlife due to construction and operation of the hydroelectric Federal Columbia River Power System.

## Northern pikeminnow

Since 1990, BPA has paid anglers to remove more than 3.5 million large northern pikeminnow from the Columbia and Snake rivers, reducing pikeminnow predation on young salmon by about 4 million to 6 million a year or an estimated 37 percent. The northern pikeminnow is indigenous to the Columbia River, but before the dams, it was not prevalent. Now pikeminnow thrive in the slack water reservoirs. BPA's sport-reward program brings the pikeminnow population back in balance. Harvested pikeminnow are used in liquid organic fertilizer for agriculture and fish meal for poultry and dairy cattle feed.

Anyone with a fishing license is welcome to participate each May through September. To find out how, go to [www.pikeminnow.org](http://www.pikeminnow.org).



*Northern pikeminnow*

## Caspian terns

Caspian terns were first observed nesting in the Columbia River estuary in 1984. By 1998, about 17,000 terns were nesting on Rice Island in the estuary, making it the largest colony in the world. That year, terns devoured an estimated 12.4 million salmon smolts, 13 percent of the year's entire seaward migration. Salmon comprised 73 to 90 percent of the terns' diet.



*Caspian tern*

Rice Island was created by the U.S. Army Corps of Engineers from dredge spoils and had little vegetation, making it perfect tern nesting habitat. Terns are a protected species under the Migratory Bird Treaty Act and cannot be harmed.

Beginning in 1999, the Corps enticed the terns to move to East Sand Island, closer to the river's mouth, where their diet might be more varied. The effort succeeded. By 2003, all terns nesting in the Columbia River estuary used East Sand Island. Nevertheless, in 2007, the 9,000 pairs of Caspian terns nesting on East Sand Island consumed an estimated 4.8 million to 6.2 million salmon smolts, including stocks listed under the Endangered Species Act.

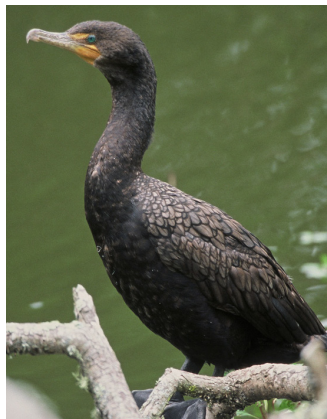


To further reduce Caspian tern predation on salmon without hurting the terns, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service are encouraging the terns to spread out their nesting colonies to enhanced habitat in southern Oregon and California. USFWS is planting grass on portions of East Sand Island to decrease its bare-sand nesting habitat. Once this project is complete in 2015, the Caspian tern colony on East Sand Island should number about 3,100 to 4,400 nesting pairs, reducing tern predation on salmon smolts in the Columbia River estuary by an estimated 2.4 million to 3.1 million per year.

## Cormorants

In recent years, double-crested cormorant populations in the Columbia River estuary also have increased, from 100 pairs in 1989 to more than 12,000 pairs in 2009, making it the largest known breeding colony of its species in western North America. In 2009, researchers estimate the colony ate more than 10 million salmon smolts.

A smaller cormorant colony near McNary Dam consumes salmon smolts passing that point on their migration from the upper Columbia or Snake river to the sea. The Corps is evaluating whether and how to address cormorant impacts on juvenile salmon.



*Double-crested cormorant*  
(Photo: U.S. Fish and Wildlife Service)

## Sea lions

Bonneville Dam is more than 140 miles from the ocean. Once rarely seen in the Columbia River, California sea lions in recent years have been arriving below the dam in increasing numbers, where they are eating increasing numbers of returning adult salmon. Sea lions ate 2,920 salmon below Bonneville Dam in 2005, increasing to 4,489 in 2009. Sea lions have eaten 2.4 to 4.2 percent of each year's returning spring salmon run since 2005. Fish managers are also concerned about high numbers of white sturgeon eaten or attacked by sea lions below the dam.



*Sea lion feeding on chinook salmon*  
(Photo: Oregon Dept. Fish and Wildlife)

In 2005, the Corps, after conferring with federal and state fish managers, began encouraging the mammals to leave the area below the dam, using non-lethal hazing techniques such as firecrackers, rubber bullets, high-pressure water hoses, Orca sounds and acoustic harassment. The hazing techniques were effective during use, but when they stopped, sea lions returned.

In 2008, the state fish and wildlife departments of Oregon, Washington and Idaho received authorization to remove the most problematic individuals through lethal means if necessary, although removal to zoos and aquariums is preferred. Through 2009, 21 individual sea lions were removed from below the dam.

In March 2010, as spring chinook salmon began returning to the Columbia River, state wildlife managers resumed efforts to remove California sea lions identified as preying on vulnerable salmon and steelhead runs below the dam.

Sea lions primarily affect the early spring runs. The mammals arrive in February. In late spring, they leave for their breeding grounds in California and Mexico.

## For more information

- Bonneville Power Administration: [www.bpa.gov](http://www.bpa.gov)
- Columbia Bird Research: [www.columbiabirdresearch.org/](http://www.columbiabirdresearch.org/)
- Pikeminnow Sport-Reward Program: [www.pikeminnow.org](http://www.pikeminnow.org)