Washington Department of FISH and WILDLIFE

Oregon spotted frog pilot reintroduction project

2007-2012

Updated 2009

Description and status of Oregon spotted frog (OSF)

The Oregon spotted frog (*Rana pretiosa*) is a medium-sized amphibian with adults ranging in size from 2-4 inches long. Oregon spotted frogs are brown to reddish brown in color, with irregularly shaped black spots on their backs, often with a brightly colored red or orange tinge on their undersurfaces. The amount of wash depends on their size or age. Adults weigh 25-90 grams (1-3 ounces). Females are larger at maturity than males.

Oregon spotted frog reproduction and life span

Males and females typically reach sexual maturity during their first and second year, respectively, when they reach a size large enough to have the energy to reproduce. Longevity for this species is poorly understood, but adults are thought to be short-lived (generally 2-5 years).

Oregon spotted frog habitat

Oregon spotted frogs inhabit permanent wetlands because they live in water year-round. It is believed that large marshes are needed to achieve the warm water temperatures the frogs require for growth and to maintain a population. Breeding occurs along shallow wetland margins or on floating vegetation mats, often in water less than six inches deep. During the non-breeding active season frogs live among aquatic vegetation, while over-wintering occurs in springs, beaver dams or slow-moving streams.

Endangered species in Washington

The Oregon spotted frog became listed as an endangered species in Washington state in 1997 and is a candidate species for federal listing. Historically, OSFs ranged from the southern margin of the Fraser River in southwest British Columbia to the upper Pit River system in northwest California. This distribution has been dramatically reduced and OSFs are now known to reproduce in fewer than 10 locations in two disjunct Washington counties – Thurston and Klickitat. The frog has likely disappeared from California and Oregon's Willamette Valley, where it once resided.

The decline of Oregon spotted frog populations

It is believed that habitat loss, introduced predators and disease have caused the decline of OSF populations. Many wetlands within the historical range of the species have been drained, filled, developed, or severely altered. Breeding habitat has been directly affected by development and associated water-system changes. Furthermore, most ponds and lakes within the historic range

of the OSF contain one or more species of introduced fish and an introduced amphibian - the American bullfrog - all of which can prey on native frogs. Most recently, the amphibian-specific fungus, *Batrachochytrium dendrobatidis* (BD), has appeared in frogs worldwide and has been identified at every OSF-occupied site. BD is likely responsible for many amphibian declines and may be one important reason for recent declines in OSF populations. In addition to being predators, American bullfrogs often carry BD without showing any symptoms and their presence may be important in spreading this pathogen. Plant community shifts and succession have also likely played a role. Reed canary grass (*Phalaris arundinacea*), which is an exotic plant, can choke wetland habitat, exclude shorter native vegetation, and make water temperatures cooler, which may negatively affect OSF populations.

Recovery efforts

The reason for recovery efforts

The OSF is a key indicator or "umbrella" species for emergent warmwater marsh, a habitat representing the wetland type in the Pacific Northwest that has undergone the greatest loss in area since European settlement. The OSF requires relatively large areas of complex habitat to complete its seasonal life history and maintain large-enough populations to survive. Presence of a viable population of OSF in these emergent and widespread warmwater marshes likely guarantees the presence of other native species associated with this habitat. The protection, restoration or enhancement of the OSF will help ensure that a number of species associated with warmwater marsh will also benefit.

Oregon spotted frog populations are an important link in a complex food web and aid in nutrient cycling with the wetland ecosystem, acting as a bridge between lower and higher nutrient levels. For example, grasshoppers eat plant matter, birds and frogs eat grasshoppers; snakes eat birds, frogs and mice; owls and hawks will eat the birds as well as snakes, frogs and mice. When an animal dies, it is decomposed by worms, fungi and bacteria action. Nutrients are released to upland or wetland soils during the decaying process for plants to use, completing the cycle.

Due to the relatively small number of OSF populations remaining across its geographic range and recent dramatic declines, it is critical to engage in recovery efforts to save this important member of the Pacific Northwest's aquatic ecosystem.

Pilot reintroduction

The Washington Department of Fish and Wildlife (WDFW), in collaboration with a number of organizations, began a project in 2007 to reintroduce frogs to the Fort Lewis Military Reservation in Pierce County, Washington.

Selecting Fort Lewis

Fort Lewis Military Reservation (86,000 acres) contains some of the largest relatively intact wetland complexes that remain in the Puget Lowlands of Washington. OSFs were collected near Fort Lewis during the early 20th century, and at least one historic site once existed on Fort

Lewis, although no OSFs were detected during extensive surveys conducted in the early 1990s. However, because the area provides enough appropriate habitat, WDFW believes a pilot OSF reintroduction is likely to be successful at Fort Lewis.

Goals of pilot reintroduction project

Key goals are to:

- Explore whether components of a translocation effort, such as rearing and post-release monitoring could be successful.
- Establish a self-sustaining population on the Fort Lewis Military Reservation.
- Set the stage for a systematically structured recovery effort for this species.

Reintroduction process

In 2008, eggs collected from populations in the Black River in Thurston County and Conboy Lake in Klickitat County were transported in early spring to Northwest Trek Wildlife Park in Pierce County and the Oregon Zoo in Portland for rearing.

Approximately 530 juvenile frogs reared at Northwest Trek were released into a pre-selected site on Fort Lewis in September 2008. Approximately 100 frogs nurtured at Oregon Zoo were released in early spring 2009. Under this plan, releases of additional individuals are to continue at least through 2012. Up to 5,000 individuals are expected to be released to establish a self-sustaining population.

In fall 2009, approximately 436 frogs reared at Woodland Park Zoo, 62 from Cedar Creek Corrections Center and 12 from Oregon Zoo were released at the same site on Fort Lewis. Another 38 frogs from the Woodland Park Zoo and 28 from Oregon Zoo too small for release will be overwintered at Cedar Creek Corrections Center for spring release.

Evaluation and monitoring

Several methods are being used to monitor OSF reintroduction. In 2008, 28 frogs were outfitted with radio transmitters and all frogs were color-marked with fluorescent plastic injected under the skin on their feet. Colors were differentiated according to the year eggs were collected and site origin of eggs.

After the 2008-09 release, no mortality from predation was identified during fall and spring tracking, but this is limited evidence. One dead frog was found, two were recaptured in spring from fall release.

Eighteen frogs have received radio transmitters for release in fall 2009. All juvenile frogs large enough to be PIT-tagged will receive a tiny microchip so they can be scanned by a wand reader in the field.

In the third project year (2010), egg mass searches will be conducted for the first time (some of the released frogs will be adult-sized) to determine if the frogs established breeding populations. Whether further releases are needed will be determined after a five-year

evaluation. Monitoring is anticipated to continue at least until 2017 to assess rate of establishment.

Funding and support

The reintroduction program was first developed in 2007 through a collaborative effort spearheaded by WDFW, which includes many partners that provided funding and/or staff. These include Fort Lewis, Northwest Trek Wildlife Park, Point Defiance Zoo & Aquarium, Oregon Zoo, Washington State Department of Transportation, U.S. Fish and Wildlife Service, Woodland Park Zoo, The Evergreen State College, the Washington State Department of Corrections, Port Blakeley Tree Farms, Washington Department of Natural Resources, NW Zoo & Aquarium Alliance, U.S. Geological Survey, Mountain View Conservation & Breeding Centre, and The Nature Conservancy.

In 2009, the Washington Department of Fish and Wildlife received a Department of Interior State Wildlife Grant to coordinate numerous, ongoing projects into a cohesive, rangewide (British Columbia through California) recovery program for the Oregon spotted frog and associated species. Among its objectives is supporting rearing and reintroduction programs such as the Fort Lewis effort.