

Oregon Spotted Frog Captive Breeding Program

Summary Report for Wildlife Preservation Canada Grant 2012



*Husbandry of Oregon Spotted Frogs at the Greater Vancouver Zoo
5048 264th Avenue, Aldergrove BC*

*WPC Grant Amount: \$15,000
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Project Summary

The Oregon spotted frog (*Rana pretiosa*, OSF) is a federally listed Species at Risk that, in Canada, exists only in the Fraser Valley. It is believed that there are fewer than 500 breeding individuals in the combined populations¹. Maintenance and recovery of the species is dependent on introduction of breeding populations to new wetlands.

The long term (10 year) goal of the Canadian Oregon Spotted Frog Recovery Team (OSFRT) is to improve the Oregon spotted frog's long term chances for survival, prevent its extirpation, and to maintain or restore self-sustaining viable populations throughout its current, historic and naturally occurring range². Specific objectives of Oregon spotted frog recovery include the establishment/re-establishment of self-sustaining populations at a minimum of 6 additional historically occupied and/or suitable/restorable sites².

A draft Reintroduction Strategy, prepared in 2009, recommends that the OSFRT introduce frogs to unoccupied wetlands at various life-stages, including egg mass and tadpoles from captive breeding efforts as well as metamorphs³. In addition, captive-reared frogs are necessary to support two ongoing graduate student theses that rely on radio-telemetry data from captive-reared frogs released into the wetlands. Data from a pilot study suggests that released naïve metamorphic frogs are successful in surviving until winter at least, and continuing studies will monitor the success of frogs over a one-year period. Detailed habitat use data is also being collected in order to inform new habitat identification, restoration, and creation, and will provide design criteria for OSF habitat development.

With funding from Wildlife Preservation Canada, the Oregon Spotted Frog Recovery Team (OSFRT) was able to hire an amphibian husbandry specialist (Andrea Gielens) to ensure the continued survival of the Oregon Spotted Frog. The funds were also used to initiate minor facility improvements, and provide food, medication and treatments for the captive-reared frogs as needed. Adult frogs from the husbandry program were maintained throughout the winter and kept in tanks specifically for breeding in the spring, both at Greater Vancouver Zoo and the Vancouver Aquarium. The tadpoles, which hatched in 2012, reached the size for release by fall of 2012 and were released into a restored habitat in Agassiz, within the natural range for this

¹ Craig, V. 2009. COSEWIC assessment and status report on the Oregon spotted frog *Rana pretiosa* in Canada – DRAFT. Unpublished.

² Canadian Oregon Spotted Frog Recovery Team. 2008. Recovery strategy for the Oregon Spotted Frog (*Rana pretiosa*) in British Columbia. Prepared for the BC Ministry of Environment, Victoria BC. 56 pp.

³ Hawkes, V.C. 2009. A Strategic and Operational Framework for Reintroducing the Oregon Spotted Frog (*Rana pretiosa*) to British Columbia Phase 1: Information Review and Reintroduction Strategy Outline. Unpublished report by LGL Limited, LGL Project EA3121 for Public Works and Government Services Canada, Victoria, BC. 98 pp + Appendices.

species in Canada. This year's work has yielded considerable information that provides valuable insight into increasing the breeding population for successful reintroductions of this endangered species.

Original Objectives:

During the rearing season 2012 eggs were raised from the captive breeding program at the Vancouver Aquarium. Each tub represented eggs from a distinct egg mass of known parentage. Eggs were from purebred Mariah Slough, purebred Mountain Slough or a hybrid between the two sites. By rearing these distinct groups we hoped to see any effects of increasing hybrid vigor and to see any additional variation between the different populations. These research objectives are in addition to our head-starting objectives of producing animals of sufficient health and size to allow for release to increase the number of occupied and self sustaining sites for OSF in Canada as per the mandates of the OSF Recovery Team as laid out in the OSF Recovery Strategy.

Results Achieved and Challenges Encountered

Despite a cold and slow start to the growth season for OSF in 2012 all but 12 of the frogs brought into the program achieved releasable size and were release on the first week of October, totaling 256 head started animals released this year. Typical release of tadpoles occurs in the first week of September. However, when marking occurred in September the majority of the frogs were too small to be released. Due to atypical warm weather in September it was decided to keep the frogs in captivity an extra month to allow them to grow to a more suitable size. Reweighing the frogs again in October proved that this method worked, with most of the frogs gaining enough weight to be released, many reaching double or triple the average size seen in September. Due to the continuation of un seasonably warm weather in early October, as well as the abundance of insects still available, it is suspected that this delayed release will have little overall effect on survival, in fact the additional time in captivity combined with the warm temperatures producing larger than usual animals may increase survival. Continuation of the mark-recapture program will monitor this years success.

In addition to rearing frogs for release and investigating the effects of crossing populations in the breeding program the head-starting program this year also provided additional benefits in terms of monitoring the fitness of tadpoles produced by the captive breeding program over an extended rearing time. Tadpoles from the Vancouver Aquarium were counted and retained for the head-starting program and the remaining tadpoles were released just after hatching to the historical site on Department of National Defense land in Aldergrove. The tadpoles that were maintained in the head-starting program grew as normal for the next few months at the Greater Vancouver Zoo. Over the course of a few days, once reaching

approximately 2.5 cm in length a large number of the tadpoles became almost completely white in colour. The percentage affected varied by tub from 0-93%. They remained distinctly white for approximately a month before returning to their normal colour and completing metamorphosis. In previous years there have been occasional individuals present with this “albinism”; less than two individuals per year, often none. In past years all individuals with this trait never developed beyond the emergence of back legs. The sudden occurrence of so many tadpoles with this trait this year was shocking and could have potentially been disastrous for the individuals released into the wild. The monitoring of the success of the tadpoles from the captive breeding program over a longer period, at least to metamorphosis, is critical for our analysis of the success of the release program when we consider the release of tadpoles and pre-metamorphic individuals.

Training

Each year an intern from University of the Fraser Valley supports the head-starting program. This years intern Ashley Pinter is a second year student from the Ecology class at UFV. She helped with husbandry one day a week for the course of the rearing program and now continues to volunteer with the frogs after the end of her placement.

Ashley spent considerable time measuring tadpoles and recording temperature data as well as spending time in the field and assisting on release day with data management, cleaning of equipment and releasing tadpoles. She also got a chance to participate in community outreach with participants from the Little Sisters program as well as daily during her work with the general public giving talks and presentations at the rearing facility to patrons of the zoo.

New Knowledge

During the course of work in 2012, husbandry coordinator Andrea Gielens finished her MSc in Environmental Management where she studied the effects of diet and density on OSF rearing success. This thesis directly impacted the rearing techniques used this year and in the future for the recovery program. Thesis results are intended to be published within the next year.

Work by Amanda Kissel for her masters program that has been ongoing for the past 2 years with assistance from the head-starting program will be continued as Amanda expands her project into a PhD, still incorporating data from past years of head-starting but now enveloping an entire ecosystem approach. Currently preliminary data from this work is being prepared for publication.

Andrea Gielens presented the results from her masters’ research at the World Herpetology Congress held at UBC in August 2012. WPT was acknowledged during the presentation.

In addition, WPT supported the production of a new husbandry manual for OSF head starting for the Canadian Program, which was needed since the production of the original manual had not been expanded to include new procedures and knowledge since 2002. This document is scheduled for completion in January 2013.

Outreach

Outreach throughout the rearing season included a variety of venues and groups. During the course of the rearing program, public information and educational talks were given daily at the rearing facility at Greater Vancouver Zoo. This provided a unique opportunity to educate the patrons as to the nature of this species, its plight and its close geographical relation to the area.

In April Andrea Gielens guest lectured two classes at University of the Fraser Valley, to the Urban Ecology class as well as the Ecology class. In addition she participated in a frog day program with the Fraser Valley Regional Watersheds Coalition where she spoke to 4 classes of grade 3/4 students at Parkside Elementary as well as % classes of k-7 students at Alex Hope Elementary and led them in educational wetland related games and activities.

Outreach to local Langley elementary schools continues throughout the fall and winter with numerous presentations scheduled through this fall and the coming spring.

Impact on Conservation:

- Maintenance of F1 generation in captivity
- Increased diversity of captive assurance population
- Increasing awareness of Species at Risk through education at Greater Vancouver Zoo and Vancouver Aquarium and extensive public outreach
- Training of students both in the field and in situ, creating a passion for herpetofauna in new Biologists

Impact on other species:

- Protecting wetlands increases habitat use for countless other species and increases awareness for other amphibians and reptiles at risk both locally and globally. The successful OSF head starting program at Greater Vancouver Zoo has now expanded to include Western Painted Turtles.
- Future work with this program hopes to incorporate work with other endangered and threatened species (Western Painted turtles and Northern Leopard frog) in BC and the Pacific Northwest (see application for future funding being submitted)

Impacts of program on a local/regional/international scale:

- This program uses, where ever possible, local talent and encourages local residents, concerned citizens and budding biologists to participate actively in the conservation of local endangered species
- Regionally this program is known throughout the area as a proactive and community reaching program, with participants frequently being greeted with “Oh, you’re one of the frog people!”
- Through work she completed at Durrell Wildlife Conservation Trust, returned husbandry coordinator Andrea Gielens has expanded the program to include multiple species and, upon the request of a previous Durrell student, to expand the intern program to include international volunteers
- Previous work on this program has led to close collaboration between Canadian Recovery Team members and our colleagues in the US leading to the development of their head-starting program and continued success, continuing to work towards species conservation range wide
- Success with head starting OSF has led to the successful completion of a trial program for head starting Western Painted Turtles. In the summer of 2012, 2 nests were saved from destruction and the eggs were incubated at Greater Vancouver Zoo. Of the 14 eggs salvaged, 12 were fertile and all 12 fertile eggs hatched. The hatchlings are growing and thriving throughout the winter.

Plans for the Future:

During the next 6 months, frogs raised this year that were too small for release will be grown in our heated indoor area. Throughout the winter they will be monitored and measured to track their growth and released in the spring. Adults used in telemetry and for breeding will be held outdoors to allow for a natural cool cycle to promote breeding in 2013.

Egg mass surveys and collection of eggs from the wild will begin in late February/early March along with the laying of eggs from captive animals. Eggs produced from captive breeding efforts will be reared in 2013 as part of the head starting program.

We will also be continuing our public education, with speaking events already scheduled for local naturalist groups and at the surrounding universities and grade schools. We will also be continuing our engagement with the US recovery team and strengthening an alliance for future work with Western Painted Turtles.

We are currently at a very exciting time during the history of OSF recovery efforts in BC. The combination of enthusiastic individuals has increased the strength of the program and pushed forward the progress we have made towards recovery. The construction of new habitat and the exploration of potential new release sites have increased the pressure on the husbandry program to provide suitable candidates to populate these new areas. As well, the development, expansion and fine tuning of

captive breeding also brings its own challenges, set of goals to achieve and new topics to investigate. The assistance received from Wildlife Preservation Canada has been critical in our successes this past year and we hope in future years to come in the expansion of our efforts for both this species and Western Painted Turtles (please see application for support 2013 and *Population Augmentation of the Western Painted Turtle in the Lower Mainland: Headstarting Feasibility Study*).

Budget:

Source	Amount
Wildlife Preservation Trust- Husbandry Coordinator wage	\$15,000
IRF grant- Support and supplies (2012/13)	\$10,000
Greater Vancouver Zoo In-kind support, staff	\$10,000
Greater Vancouver Zoo In-kind support, supplies	\$3,000
Ministry of Environment- supplies	\$1,600
Total	\$ 39,600