



# Better understanding shell disease in northwestern pond turtles

A WDFW wildlife diversity grant project

Northwestern pond turtles have suffered population declines and extirpations in the past century mainly due to habitat loss, over-harvesting, and more recently, disease. In Washington, there have been many documented cases of severe fungal-associated shell disease, mostly among captive-released free-ranging pond turtle populations in the state. This project is an interdisciplinary study to evaluate the role of pathogen prevalence, environmental quality, and host genetics on the prevalence of fungal-associated shell disease in northwestern pond turtles throughout Washington. The project will also identify locations in the species' range that will serve as reference or potential donor samples for translocations.



Credit: WDFW

**Project name:** Fungal-associated shell disease and immunogenetics assessment of northwestern pond turtles to evaluate their long-term health potential in the state of Washington

**Primary species benefitting:** Northwestern pond turtle

**Grant total:** \$77,486

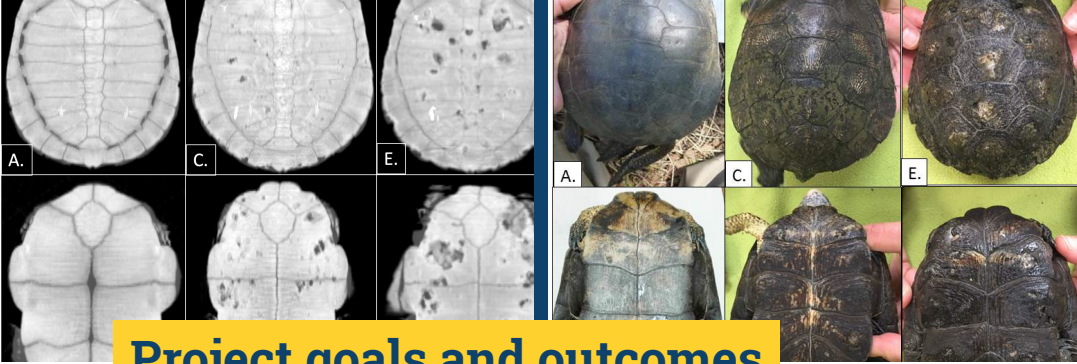
**Grantee & associated entity:** Dr. Obed Hernandez-Gomez, New Mexico State University

**Webpage:** [obedhg.com](http://obedhg.com)

Understanding the distribution of disease and genetic diversity of northwestern pond turtles in Washington is crucial for conservation managers to make decisions related to turtle conservation. The project's Washington-based assessment of host genetics, fungal-associated shell disease, and pathogen parameters will allow for a greater understanding of the distribution of shell disease and other disorders throughout management areas in the state. The project team will work with WDFW scientists to generate information needed to plan conservation actions such as translocations and biological control policies.



Credit: WDFW

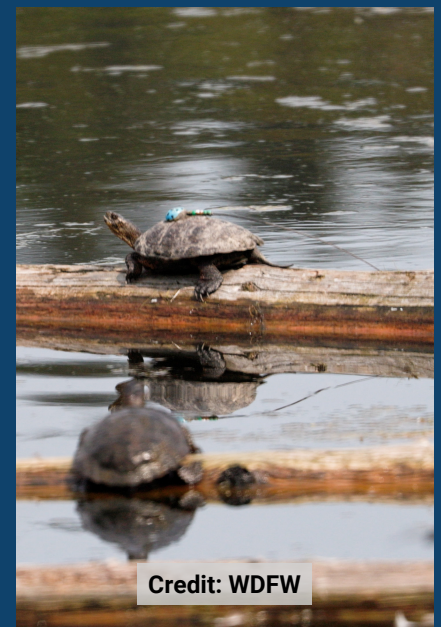


## Project goals and outcomes

- **Collect tissues and conduct fungal-associated shell disease surveys in northwestern pond turtles.** To achieve this outcome, the project will trap free-ranging northwestern pond turtles in permanent waterbodies around Puget Sound and the Columbia Gorge. Researchers will collect samples and conduct CT scans from these turtles that will be used to evaluate the presence of fungal and viral pathogens, assess the presence of shell disease, and bank DNA samples for analysis.
- **Evaluate immunogenetic diversity of free-ranging northwestern pond turtles.** Conservation managers are concerned that the severity of shell disease in Washington may be due to reduced genetic diversity. The project will collect blood from up to 30 individuals, in addition to banked samples, and process them for immunogenetic characterization. The project will compare the immunogenetic diversity of Washington's northwestern pond turtles to areas outside of Washington where disease is not present.

## Shedding more light on shell disease and future recovery efforts

In recent years, shell disease has become more severe in Washington's pond turtles. The fungus *Emydomyces testavorans* has not been confirmed as the cause of shell disease among pond turtles, but it is associated with disease presence. The results of this project will help to further understanding of the relationship between the fungus, shell disease, and possible mechanisms that could explain the increase in the prevalence of shell disease severity in Washington's pond turtles. For example, if the project finds that Washington's free-ranging pond turtles have low immunogenetic diversity, potentially explaining their susceptibility to shell disease, recovery actions could include efforts to increase genetic diversity through translocations or captive breeding/rearing that includes pond turtles from other populations that are not experiencing severe effects of shell disease. **This study includes important information related to the health of Washington's pond turtles and the potential source and health of non-Washington turtles that could provide this added diversity to the Washington population.**



This project was funded by WDFW through the [Wildlife Diversity Grant Program](#).

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