State Wildlife Action Plan Update

Appendix A-3

Species of Greatest Conservation Need

Fact Sheets

AMPHIBIANS AND REPTILES

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Washington Department of Fish and Wildlife
2015

Appendix A-3

SGCN Amphibians and Reptiles – Fact Sheets

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What is Included in Appendix A-3

Introduction
Appendix A-3 is one component of the State Wildlife Action Plan (SWAP) Update, and contains information about amphibians and reptiles included in our Species of Greatest Conservation Need (SGCN) list for 2015. Included are fact sheets for each of the amphibians and reptiles identified as Species of Greatest Conservation Need in the 2015 SWAP. The information provided includes a summary of the conservation concern and conservation status, description distribution and habitat, climate change sensitivity and an overview of key threats and conservation actions needed.

What it means to be an SGCN
The SGCN list includes both amphibians and reptiles that have some form of official protection status and those which may be in decline, but are not yet listed as part of either the Federal or State Endangered Species program. One of the purposes of the SWAP is to direct conservation attention to species and habitats *before* they become imperiled and recovery becomes more difficult and costly. Presence on this list does not necessarily mean that conservation attention will be directed towards these species; rather, that conservation actions for the species are *eligible* for State Wildlife Grants funding, and may be more competitive for other grant programs. It also raises the profile of a species to a wide audience of conservation partners and may encourage other organizations to initiate projects that may benefit the species.

Climate Vulnerability
Please see Chapter 5 for an explanation of the methodology used to assess climate vulnerability. For a full list of all the SGCN ranks, including a narrative description of sensitivity and references, please see Appendix C.

Explanation of terms used in the document
Please see Section B (page 74) for a description of terms and abbreviations used in this document.

Alphabetical List of Species
For an alphabetical list of all the amphibians and reptiles included, please see Section A (page 73).

References
References are provided separately with each fact sheet, and also collectively for all SGCN amphibians and reptiles in the REFERENCES section at the end of this document.

SALAMANDERS

TIGER SALAMANDER (*Ambystoma tigrinum*)

*See Appendix B for a potential range and habitat distribution map

Conservation Status and Concern

The Washington status is based on the small number of populations, a range that is restricted to a region that has been heavily altered, and a lack of information about this species. Of greatest concern is the drastic decline in stream flows and water body volume in much of Lincoln County and adjacent portions of Grant and Adams Counties caused by water withdrawal for agriculture. Larger remaining water bodies may not be suitable habitat because they may contain introduced predatory fish that eat larval salamanders.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Monitor	No	G5	S3	Medium/unknown	Moderate-high

Biology and Life History

Photo: L. Hallock

This is a large, stocky, blotched salamander (to 6.4 inches snout to vent length). Metamorphosed forms spend most of their lives in the subterranean environment. Surface activity is nocturnal. They migrate to breeding ponds in the spring. Eggs are laid in mid-March to early April in the Columbia Basin. Whether or not the larval salamanders metamorphose depends on a combination of genetic and environmental factors. Larvae are capable of transforming in the fall of their first year but in permanent water bodies delay for two or more years. They can also become sexually mature in the larval form. The gilled adults (or neotenes) can grow to larger sizes than the metamorphosed forms. Ponds often contain many different size classes of larvae. All forms are gape-limited, opportunistic predators with invertebrates making up majority of the diet. Large terrestrial adults may also take small vertebrates. They are important predators in ponds and can influence both the vertebrate and invertebrate communities. They are long-lived (16 to 25 years) although the lifespan of wild individuals is likely less.

Distribution and Abundance

Tiger Salamanders are the most widely distributed of all North American salamanders. In Washington, they occur primarily within the Columbia Plateau Ecoregion. Occurrences in the Okanogan and Eastern Cascades Ecoregions are limited to the steppe and ponderosa pine vegetation zones. An isolated record for Klickitat County is documented through a specimen collected in the 1930s but no populations are currently known in this county.

Habitat

Occurrence is primarily in arid areas that support shrub-steppe vegetation. They tolerate some habitat disturbance and alteration. In the Colville area, they occupy lower elevations in dry habitat types characterized by ponderosa pine/Douglas-fir forest. They are habitat generalist but they do require fishless water bodies for breeding. Soil types suitable for burrowing are also important because they are

active burrowers and also use mammal burrows. Breeding takes place primarily in perennial ponds, although seasonal water bodies are also used. Gilled adults occur only in perennial ponds; their ability to metamorphose is lost with increasing age. Mass mortality events of the larvae can occur if ponds dry.

References

Hallock, L. A. and McAllister, K. R. 2005. Tiger Salamander. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Jones, L. L. C, W. P. Leonard and D. H. Olson (Eds.). 2005. *Amphibians of the Pacific Northwest*. Seattle Audubon Society. 227pp.

Petranka, J. W. 1998. Salamanders of the United States and Canada. Smithsonian Institutional Press, Washington. 587pp.

Tiger Salamander: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Continue research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Loss and degradation of suitable shrub-steppe habitat that this species relies upon in WA.	Protect native shrub-steppe habitat from further degradation or conversion to agriculture.	Current insufficient	Both
3	Agriculture and aquaculture side effects	Drying of water bodies and streams due to withdrawals of irrigation water at rates faster than the aquifers can naturally replenish. Surface water declines in the Lincoln County region since the 1980s are likely related to ground water withdrawals and declines in the Columbia River aquifer.	Protect Tiger Salamander habitat by preventing the drying of wetlands, ponds, lakes and streams. Protect the aquatic habitat that remains.	Current insufficient	Both
4	Invasive and other problematic species	Stocking of non-native predatory fish in Tiger Salamander habitat. Tiger Salamanders avoid water bodies with fish.	Identify important areas for Tiger Salamanders and prohibit fish stocking in occupied water bodies.	Current insufficient	WDFW

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
5	Climate change and severe weather	Drying of water bodies and streams. Loss of aquatic habitat is already an issue in parts of the Columbia Basin (see previous entry). Periods of drought would exacerbate the situation.	Maintain robust populations and suitable aquatic habitats across the range.	Nothing current - new action needed	Both

NOTE: Numbers are for reference only and do not reflect priority.

COPE'S GIANT SALAMANDER (*Dicamptodon copei*)

*See Appendix B for a potential range and habitat distribution map

Conservation Status and Concern

The main concerns for this species have to do with protection of stream integrity. Activities that alter the integrity of small and medium-sized forested streams are of concern, especially those actions that increase water temperature and sedimentation. Sedimentation is particularly problematic in low-gradient streams, as increased silt deposition may fill crucial microhabitats such as the spaces between rocks and logs that are used as sheltering, hiding and nesting sites.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Monitor	No	G3G4	S3S4	Unknown/stable	Moderate-high

Biology and Life History

Photo: W. Leonard

This is a medium-sized, marbled gold and brown salamander with a rounded snout, indistinct costal grooves and a laterally compressed tail. Metamorphosed forms are rare. Rather, most become sexually mature in the larval stage. Average size at maturity is 2.6 to 3 inches snout to vent length. Similar to other giant salamander species, most activity is probably nocturnal and much time is spent in subterranean microhabitats. Larval forms tend to be common. Larvae can be observed year round in flowing water bodies and may also be present in higher elevation still-water habitats connected to flowing water bodies. Breeding takes place in the spring, summer and fall with peak activity in the spring and fall. The female guards the eggs for 200 days or more until they hatch.

Distribution and Abundance

This species is found in western Washington and extreme northwestern Oregon. In Washington, Cope's Giant Salamanders occur primarily west of the Cascade Crest in the Pacific Coast, southern Puget Trough

and West Cascades ecoregions. They are the only giant salamander documented north of the Chehalis River in the Olympic Peninsula.

Habitat

Cope's Giant Salamanders are primarily associated with small to medium-sized mountain streams in moist coniferous forests. Giant salamanders are often the dominant vertebrate within streams. During the day, they are typically concealed under rocks or woody debris. Occasionally they can be observed moving about in the stream. As mentioned above, activities that alter the integrity of small and medium-sized forested streams are of concern, especially those actions that increase water temperature and sedimentation. Sedimentation is particularly problematic in low-gradient streams, as increased silt deposition may fill crucial microhabitats such as the spaces between rocks and logs that are used as sheltering, hiding and nesting sites.

Reference

Hallock, L. A. and K. R. McAllister. 2009. Cope's Giant Salamander. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Cope's Giant Salamander: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource management needs	Lack of information. Local declines and extirpations may have occurred but lack of documentation available.	Assess population.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Loss of riparian vegetation that results in elevated stream temperatures, erosion and increased sedimentation. This species requires cool water temperatures and microhabitats such as the spaces between rocks and logs that are used as sheltering, hiding and nesting sites.	Protect riparian buffers around occupied streams.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

CASCADE TORRENT SALAMANDER (*Rhyacotriton cascadae*)

*See Appendix B for a range and potential habitat distribution map

Conservation Status and Concern

This species is sensitive to temperature variation and increased sedimentation that may be caused by disturbances such as logging and road construction. Some populations are isolated by surrounding areas of unsuitable habitat and are vulnerable to extirpation through stochastic events exacerbated by habitat loss. Temperature sensitivity and limited dispersal ability makes this species potentially sensitive to climate change.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Candidate	Yes	G3	S3	Medium/unknown	High

Biology and Life History

Photo: W. Leonard

Cascade torrent salamanders may be active year-round at lower elevations. Larval torrent salamanders have tiny external gills. Adults have very reduced lungs and breathe mostly through their skin. Breeding phenology is unknown, but may occur during most of the warmer months of the year. Eggs are most likely laid in the spring. The first described Cascade torrent salamander nest was found on 14 August 2003 in a second-order headwater stream on the west slope of the Cascade Mountains in Skamania County under a cobble-sized rock in the middle of a calm stretch of the stream channel 4 inches deep by 24 inches wide by 28 inches long. This differs from other *Rhyacotriton* species that are described as laying eggs in deep cracks and crevices of springs and seeps. The nest contained 5 eggs that were not attached to the substrate or each other. The larval period is thought to be long; a Columbia Gorge population was estimated to require 4 to 5 years before metamorphosis.

Distribution and Abundance

In Washington, this species ranges from the west slopes of the Cascade Mountains south of Nisqually River to the Columbia River. Distribution is patchy. They can reach high densities in optimal habitat.

Habitat

This species is generally found in high-gradient, cold streams, seepages and waterfall splash zones, typically in areas with a thick canopy cover. Interestingly however, this species survived in many sites that were completely deforested by the 1980 eruption of Mount St. Helens. They usually occur in stream segments or off-channel habitats, such as seeps and waterfall splash zones, that are shallow, slow flowing and that have gravel or rock rubble that is silt-free. Adults are strongly associated with water and individuals are almost always found in contact with either free water or saturated substrates. During rainy wet periods individuals may be found in wet terrestrial forest settings away from streams or seepages.

References

Hallock, L. A. and K. R. McAllister. 2005. Cascade Torrent Salamander. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Jones, L. L. C., W. P. Leonard, and D. H. Olson, editors. 2005. Amphibians of the Pacific Northwest. Seattle Audubon Society, Seattle, Washington. xii + 227pp.

Cascade Torrent Salamander: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Continue research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Increase in water temperatures and sedimentation. This species is closely associated with cool forested streams.	Leave suitable forested buffers on occupied streams to prevent water temperature increases and sedimentation.	Current insufficient	Both
3	Climate change and severe weather	Direct mortality and loss of micro-habitat features due to stream flooding, erosion and scouring.	Leave refuge areas of intact habitat. Buffered streams in clear cuts are more likely to be impacted by extreme precipitation and wind events.	Current insufficient	Both
4	Climate change and severe weather	Stream and seep drying. This species is closely associated with cool forested streams.	Minimize habitat fragmentation and maintain robust populations across landscape.	Current insufficient	Both
5	Climate change and severe weather	Loss of suitable habitat. This species is closely associated with cool forested streams and dependent on specific microhabitat features.	Minimize habitat fragmentation and maintain robust populations across landscape.	Current insufficient	Both
6	Climate change and severe weather	Warming and drying of streams. This species is closely associated with cool forested streams.	Minimize habitat fragmentation and maintain robust populations across landscape.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

COLUMBIA TORRENT SALAMANDER (*Rhyacotriton kezeri*)

*See Appendix B for a potential range and habitat distribution map

Conservation Status and Concern

The Washington status is based on the small global range, narrow environmental specificity and the potential concern that the species' headwater habitat may not be fully protected. In Washington, some occurrences are in protected areas (e.g., Natural Area Preserves) and some riparian habitat protections occur through forest practices rules and Habitat Conservation Plans. The temperature sensitivity and limited dispersal ability makes this species potentially sensitive to climate change.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Species of Concern	Monitor	No	G3	S3	Medium/unknown	Moderate-high

Biology and Life History

Photo: W. Leonard

This is a small, aquatic, stream-adapted salamander (less than 2.4 inches snout to vent length). They are active year-round. The reproductive ecology is poorly known. The mating season is probably prolonged similar to other torrent salamander species. Only five nests have been found, presumably because the eggs are laid in inaccessible recesses in head-water streams and seeps. The situation regarding parental care and communal nesting are unclear; both have been observed but neither was consistent at the five described nests. The incubation period is long (7 to 9 months). The larval period is also long (more than 2 years). Metamorphosed forms eat a variety of aquatic and semiaquatic invertebrates and larval forms eat aquatic invertebrates. Torrent salamanders are desiccation intolerant, have highly reduced lungs and consequently depend on skin surfaces for oxygen uptake. Individuals are highly sedentary with movements limited to 10 feet or less.

Distribution and Abundance

This species is endemic to the coastal ranges of southwestern Washington and northwestern Oregon. Distribution in Washington is restricted to the Willapa Hills. Distribution within the range is patchy and they can be locally common in suitable habitat.

Habitat

Columbia Torrent Salamanders occur in mature, coastal, coniferous forests where they inhabit relatively cold, permanent streams, seepages and waterfall splash zones Stream segments tend to be shallow, slow flowing and have gravel or rock rubble with low levels of silt. They tend to be more abundant in streams with northerly aspects and steep gradients. During rainy wet periods, metamorphosed individuals may occasionally be found in wet terrestrial forest settings away from streams or seepages.

References

Hayes, M. and T. Quinn. 2014. Columbia Torrent Salamander (*Rhyacotriton kezeri*). AmphibiaWeb: Information on amphibian biology and conservation. [web application]. Berkeley, California: AmphibiaWeb. Available: http://amphibiaweb.org/. (Accessed: Nov 12, 2014).

O'Donnell, R., C. Richart. 2012. Diet of the Columbia Torrent Salamander, *Rhyacotriton kezeri* (Caudata: Rhyacotritonidae): Linkages between Aquatic and Terrestrial Ecosystems *In* Forested Headwaters. Northwestern Naturalist 93(1):17-22. 2012

Russell, K. and A. Gonyaw, J. Strom, K. Diemer and K. Murk. 2002. Three new nests of the Columbia Torrent Salamander, *Rhyacotriton kezeri*, in Oregon with observations of nesting behavior. Northwestern Naturalist 83:19-22.

Columbia Torrent Salamander: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Continue research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Increase in water temperatures and sedimentation.	Leave suitable forested buffers on occupied streams to prevent water temperature increases and sedimentation.	Current Sufficient	Both
3	Climate change and severe weather	Stream flooding, erosion and scouring. Stream flooding, erosion and scouring could result in direct mortality and/or loss of suitable microhabitat.	Leave refuge areas of intact habitat. Buffered streams in clear cuts are more likely to be impacted by extreme precipitation and wind events.	Unknown	Both
4	Climate change and severe weather	Loss of suitable habitat. These are small, salamanders that are closely associated with cool streams and seeps; they do not move long distances.	Minimize habitat fragmentation and maintain robust populations across landscape.	Unknown	Both
5	Climate change and severe weather	Drying of streams may result from unusually low rainfall for a prolonged period.	Minimize habitat fragmentation and maintain robust populations across landscape.	Unknown	Both
6	Climate change and severe weather	Warming and drying of streams. Columbia Torrent Salamanders are closely associated with cool, forested streams and cannot tolerate warm waters.	Minimize habitat fragmentation and maintain robust populations across landscape.		Both

NOTE: Numbers are for reference only and do not reflect priority.

OLYMPIC TORRENT SALAMANDER (*Rhyacotriton olympicus*)

*See Appendix B for a potential range and habitat distribution map

Conservation Status and Concern

The status is based on the small global range (Washington endemic) and narrow environmental specificity. Most known occurrences (77 percent) are within Olympic National Park with an additional 15 percent of locations on the Olympic National Forest. National Forest occurrences are within Late-Successional Reserves and Adaptive Management Areas that provide some level of riparian habitat protection. Occurrence in landscapes with more intact, mature habitat with legacy structures (e.g., coarse woody debris) will likely buffer some impacts of climate change for this temperature-sensitive species with limited dispersal ability.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Species of Concern	Monitor	No	G3	S3	Medium/unknown	High

Biology and Life History

This is a small, aquatic, stream-adapted salamander (less than 2.4 inches snout to vent length). They are active year-round. The mating season is probably prolonged. No nests have been found presumably because the eggs are laid in inaccessible recesses in head-water streams and seeps. Clutch number is also unknown but is likely small (8 or less eggs). The incubation and larval periods are long (7 to 9 months and more than 2 years respectively). They are opportunistic predators on invertebrates. They are desiccation intolerant, have highly reduced lungs and depend on skin surfaces for oxygen uptake. Individuals are sedentary with movements limited to several meters or less.

Photo: W. Leonard

Distribution and Abundance

This species is endemic to the Olympic Peninsula. Distribution within the range is patchy. The species was found to be widespread within Olympic National Park where it was found in 41 percent of 168 streams and 47 percent of 235 seeps surveyed.

Habitat

They occur in mature coniferous forests where they inhabit cold, permanent streams, seepages and waterfall splash zones. Stream segments tend to be shallow, slow flowing and have gravel or rock rubble with low levels of silt. They tend to be more abundant in streams with north aspects, steep gradients and cobble substrates. Spaces between rocks are used for cover. Occupied streams need to be protected with forested riparian buffers that provide stream shading, near-stream terrestrial ambient moisture regimes, large wood recruitment and dispersal habitat.

References

Adams, M. J. and R. B. Bury. 2002. The endemic headwater stream amphibians of the American Northwest: associations with environmental gradients in a large forested preserve. Global Ecology and Biogeography 11:169–178

Howell, B. and Roberts, C. 2008. A Conservation Assessment for the Olympic Torrent Salamander (*Rhyacotriton olympicus*). Submitted to the Interagency Special Status and Sensitive Species Program, USDA Forest Service Region 6 and USDI Bureau of Land Management, Washington and Oregon.

Olympic Torrent Salamander: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Continue research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Increased water temperatures and sedimentation. This species is closely associated with cool, forested streams and cannot tolerate warm waters. Also, sediment can fill the interstitial spaces between rocks where this species shelters.	Leave suitable forested buffers on streams occupied by torrent salamanders to prevent water temperature increases and sedimentation.	Current sufficient	Both
3	Climate change and severe weather	Direct mortality and loss of micro-habitat features due to stream flooding, erosion and scouring.	Leave refuge areas of intact habitat. Buffered streams in clear cuts are more likely to be impacted by extreme precipitation and wind events.	Unknown	Both
4	Climate change and severe weather	Changes to macro- and micro- habitat. These are small, salamanders that are closely associated with streams and they do not move long distances.	Minimize habitat fragmentation and maintain robust populations across landscape.	Unknown	Both
5	Climate change and severe weather	Streams and seeps drying. This species is closely associated with cool, forested streams and moist conditions and they do not move long distances.	Minimize habitat fragmentation and maintain robust populations across landscape.	Unknown	Both

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
6	Climate change and severe weather	Unusually warm water. This species is closely associated with cool, forested streams and cannot tolerate warm waters.	Minimize habitat fragmentation and maintain robust populations across landscape.		Both

NOTE: Numbers are for reference only and do not reflect priority.

DUNN'S SALAMANDER (*Plethodon dunni*)

*See Appendix B for a range and potential habitat distribution map

Conservation Status and Concern

The Washington status is based on the small state range, narrow environmental specificity and concern that riparian habitats the species relies upon may not be fully protected. The need for retention of large woody debris is also of concern.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Candidate	Yes	G4	S3	Low/stable	Moderate-high

Biology and Life History

Dunn's salamander is the largest of the northwestern Plethodontids (lungless salamanders). All life stages are terrestrial. They require moist conditions and, therefore, most surface activity takes place in the spring and fall when temperatures are above freezing. Dunn's salamanders lay their eggs in clusters on dry land within moist areas of cover such as in rotted logs or in crevices within wet, rocky areas. A clutch of eggs may range from 4 to 15. One nest was found in a decayed log next to a stream, with the female curled around nine eggs. There is no free-living larval stage. Hatchlings emerge as juvenile salamanders.

Photo: W. Leonard

Distribution and Abundance

This species is relatively rare in Washington. It occurs only in the Willapa Hills of the Olympic Physiographic Province. The range extends north to the Chehalis River and east to the Cowlitz River. This is the northern extreme of this species' range.

Habitat

Dunn's salamanders live in the shaded rocky edges of highly humid forested streams and moist talus (rock fragment piles). They prefer areas that are permanently moist but not in flowing water. Adults often hide under rocks, in splash zones near streams and occasionally under woody debris. This species

has also been found upslope, away from stream channels. They may wander on the forest floor during rainy nights in the wet season, seeking cover in moist microhabitats such as forest duff or downed wood during the day.

References

Hallock, L. A. and K. R. McAllister. 2005. Dunn's Salamander. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Jones, L. L. C., W. P. Leonard, and D. H. Olson, editors. 2005. Amphibians of the Pacific Northwest. Seattle Audubon Society, Seattle, Washington. xii + 227pp.

Dunn's Salamander: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Continue research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Loss of suitable habitat. This species is closely associated with cool forested streams and dependent on specific microhabitat features.	Prevent habitat modification at occupied sites.	Current insufficient	Both
3	Climate change and severe weather	Loss of suitable habitat. This species is closely associated with cool forested streams and dependent on specific microhabitat features.	Minimize habitat fragmentation and maintain robust populations across landscape.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

LARCH MOUNTAIN SALAMANDER (*Plethodon larselli*)

*See Appendix B for a range and potential habitat distribution map

Conservation Status and Concern

The status is based on the small global range, narrow environmental specificity and concern that there is not adequate protection for this species' specialized habitat of rocky accumulations and talus. Any ground-disturbing activity or land use that changes the moisture regimes and permeability of inhabited rocky substrates, such as over-story tree removal and gravel removal, may threaten populations. In addition, the sedentary habits and specific habitat requirements likely hinder dispersal and colonization to new areas as well as limiting gene flow between populations.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Species of Concern	Sensitive	Yes	G3	S3	Low/unknown	Moderate-high

Biology and Life History

Photo: W. Leonard

This is a small, striped salamander (less than 2 inches snout to vent length). Most of its life is spent in the subterranean environment and it is surface-active only about 20 to 90 days a year. Surface activity is triggered whenever moisture and temperature regimes are appropriate, primarily in the spring and fall. Breeding takes place in the autumn and spring months. No nests have been found. Development of larvae takes place in the egg; there is no free-living aquatic larval stage. Sexual maturity is reached at 3 to 3.5 years and 4 to 4.5 years for males and females respectively. They are predators on a variety of invertebrates. The movements are poorly documented, but it is clear that home ranges tend to be only 10 to 100 feet in diameter. These salamanders are lungless and depend on moist skin surfaces for oxygen uptake.

Distribution and Abundance

This species is endemic to Washington and northern Oregon. The main distribution is along a 34 mile stretch of the Columbia River Gorge in southern Washington and northern Oregon and discontinuously northward in the Cascades in the Snoqualmie Pass-Kachess Lake area.

Habitat

Larch Mountain Salamanders are associated with talus, scree, gravelly soils and other areas of accumulated rock where interstitial spaces exist between the rock and soil. Steep slopes are also an important habitat feature. They inhabit a diverse range of forested and non-forested habitats. Occupied rocky substrates in non-forested areas are usually north facing and nonvascular plants, especially mosses, dominate the ground cover. In some areas of the Cascade Mountains, they inhabit old-growth coniferous forests without significant exposed rocky areas. They also inhabit lava tubes in the Mount St. Helens vicinity. In all of these habitats, important microhabitats include woody debris, leaf litter and rocks.

References

Hallock, L. A. and K. R. McAllister. 2005. Larch Mountain Salamander. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

NatureServe. 2014. Larch Mountain Salamander. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: November 13, 2014).

Petranka, J. W. 1998. Salamanders of the United States and Canada. Smithsonian Institutional Press, Washington. 587pp.

Larch Mountain Salamander: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Continue research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Removal of trees. This small, non-vagile species needs cool, moist conditions.	Prevent habitat modification at sites occupied by Larch Mountain Salamanders.	Current insufficient	Both
3	Energy development and distribution	Mining of rock and boulders. This small, non-vagile species is closely associated with rock features such as talus.	Prevent habitat modification at sites occupied by Larch Mountain Salamanders.	Current insufficient	Both
4	Climate change and severe weather	Loss of suitable habitat. This small, non-vagile species needs moist conditions and is closely associated with rock features such as talus. Surface activity is limited by moisture and temperature.	Prevent habitat modification at sites occupied by Larch Mountain Salamanders.	Current insufficient	Both
5	Climate change and severe weather	Drying of habitat. Surface activity is limited by moisture and temperature (fall and spring). These salamanders are lungless and depend on moist skin surfaces for oxygen uptake.	Prevent habitat modification at sites occupied by Larch Mountain Salamanders.	Current insufficient	Both

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
6	Climate change and severe weather	Warming and drying of habitat. This small, non-vagile species needs moist conditions. Surface activity is limited by moisture and temperature. These salamanders are lungless and depend on moist skin surfaces for oxygen uptake.	Prevent habitat modification at sites occupied by Larch Mountain Salamanders.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

VAN DYKE'S SALAMANDER (*Plethodon vandykei*)

Conservation Status and Concern

Van Dyke's Salamander is one of relatively few vertebrate species endemic to Washington. It is at risk due to its limited distribution and apparently small, isolated populations.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Species of Concern	Candidate	Yes	G3	S3	Low/unknown	Moderate-high

Biology and Life History

Photo: W. Leonard

Most surface activity takes place in the spring after snowmelt and before summer drought and in the fall after the onset of fall rains and before temperatures approach freezing. More specifically, most surface activity occurs when soil moisture is high (moist or wet) and soil temperatures are between 39 to 57˚F. Because this species may occupy wet habitats, it is sometimes active on the surface even in the summer. Nests found on the Olympic Peninsula (elevations below 2300 feet) were laid in early May and development was completed by early October. Females brood and guard the eggs during the summer. One nest was under a moss covered stone; a grape-like cluster of eggs were attached to the stone by a single gelatinous thread. Another clutch was found in a moist, partially rotted log along a stream in old-growth forest (western red-cedar/Douglas-fir/western hemlock/grand fir) in Washington. There is no larval stage; hatchlings emerge as juvenile salamanders. These salamanders are lungless and depend on moist skin surfaces for oxygen uptake.

Distribution and Abundance
This species is endemic to Washington State. They occur in three disjunct areas in the Willapa Hills, on the Olympic Peninsula, and in the southern Cascade Ranges. These areas are separated by glacial and alluvial deposits that may limit regional distribution. They generally occur in small isolated populations.

Habitat
Van Dyke's Salamander is usually associated with streams, seepages, and rock outcrops. It has been associated with habitats that maintain cool temperature and moist conditions. In coastal areas, it is often most abundant in old forest stands that have complex stand structure and moderate to high levels of woody debris and colluvial rock present. It has also been reported from forested talus, upland sites, and in cave entrances. Interestingly, small populations survived in the Mount Saint Helens' blast zone; these were probably protected by their subterranean refugia and heavy snowpack. Large decaying conifer logs near streams appear to be important habitat for nests.

References
Hallock, L. A. and K. R. McAllister. 2005. Van Dyke's Salamander. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/
Jones, L. L. C., W. P. Leonard, and D. H. Olson, editors. 2005. Amphibians of the Pacific Northwest. Seattle Audubon Society, Seattle, Washington. xii + 227pp.
Washington Department of Fish & Wildlife (WDFW). 2014. WDFW Wildlife Survey and Management Database.

Van Dyke's Salamander: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution. Species occurs in small, scattered populations throughout its range. Vulnerable to stochastic events.	Continue research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Loss of suitable habitat. This species is closely associated with cool forested streams and dependent on specific microhabitat features.	Prevent habitat modification at occupied sites.	Insufficient	Both
3	Climate change and severe weather	Loss of suitable habitat. This species is closely associated with cool forested streams and dependent on specific microhabitat features.	Minimize habitat fragmentation and maintain robust populations across landscape.	Insufficient	Both

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
4	Climate change and severe weather	Loss of suitable habitat. This species is closely associated with cool forested streams and dependent on specific microhabitat features.	Minimize habitat fragmentation and maintain robust populations across landscape.	Insufficient	Both
5	Climate change and severe weather	Loss of suitable habitat. This species is closely associated with cool forested streams and dependent on specific microhabitat features.	Minimize habitat fragmentation and maintain robust populations across landscape.	Insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

TOADS

WESTERN TOAD (*Anaxyrus boreas*)

*See Appendix B for a range and potential habitat distribution map

Conservation Status and Concern

In Washington, Western Toad declines have been documented in the Puget Trough and the lower Columbia River below Bonneville Dam. Of about 107 historical sites in those areas, only about 19 are thought to still be extant. Elsewhere in the state, toads are locally common in many areas.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Species of Concern	Candidate	Yes	G4	S3S4	In lowland Puget Sound: Low/unknown	Moderate-high

Biology and Life History

Photo: K. McAllister

In general, breeding starts in mid-April at low elevation sites in western Washington and in late April or early May at low elevation sites in eastern Washington. Toads at higher elevations tend to breed later. Onset of egg laying at each location varies from 1 to 3 weeks each year depending on site conditions such as snow melt. Tadpole development to metamorphosis takes approximately 2 months depending on temperature and food availability. The newly metamorphosed toads disperse from the breeding sites *en masse* for 1 to 2 weeks. Informal observations indicate that many populations return to the same breeding location each year. Transformed toads are primarily terrestrial, but often occur near water bodies, especially in drier climates. Overwintering habitat has not been described for Washington. In lowland western Washington, individual toads have been found in mid-February within duff under sword ferns suggesting that some individuals overwinter terrestrially in areas with mild winters or at least occur terrestrially during the mild portions of winters.

Distribution and Abundance

Western Toads occur in all Washington ecoregions. Within the Washington portion of the Columbia Plateau, their distribution is limited to the edges of the ecoregion except in the southeast corner of the state. They are locally abundant in some areas, but local declines have been documented in others.

Habitat

This species occurs in a variety of terrestrial habitats including prairies, forests, canyon grasslands and ponderosa pine-Oregon oak habitat. They appear absent from most of the shrub-steppe and steppe zones with the exception of the canyon grasslands in southeast Washington. Breeding waters are usually permanent and include wetlands, ponds, lakes, reservoir coves and the still-water off-channel habitats of rivers, as well as river edges.

References

Hallock, L.A. and K.R. McAllister. 2005. Western Toad. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/speciesmain.html

Western Toad: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Fish and wildlife habitat loss or degradation	Road mortality when moving to and from breeding sites. Newly metamorphosed toads disperse *en masse* and gather in piles. When this happens on roads, thousands of toads can be killed by a single vehicle. Adults are also killed as they move to and from breeding sites.	1. Identify and map known crossings. 2. Avoid road building near breeding sites. 3. When possible, close roads to vehicles during dispersal periods (e.g., ATV use on gated dirt roads). 4. Create passage structures to circumvent roads.	Current insufficient	Both
2	Fish and wildlife habitat loss or degradation	Loss of upland habitat through the development on shorelines and aroundwaterbodies used for breeding.	Protect known pockets of abundance and breeding areas.	Current insufficient	External
3	Fish and wildlife habitat loss and degradation	Habitat alteration and degradation.	Protect known pockets of abundance and breeding areas.	Current insufficient	External
4	Resource information collection needs	Lack of information on status and distribution.	Research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
5	Resource information collection needs	Taxonomic uncertainty may mean one or more taxa are in greater decline; causes of decline not understood.	Conduct genetic studies.	Nothing current - new action needed	External
6	Invasive and other problematic species	Chytrids and other fungi, and parasites have contributed to declines throughout the species' range; however, chytrids have not yet been detected in WA toads.	Include testing for chytrids, fungal infections, and trematode infections in survey and monitoring protocols	Nothing current - new action needed	Both
7	Fish and wildlife habitat loss or degradation	Transportation and service corridors - roads and railroads.	Avoid road building near breeding sites, or provide crossings.	Current insufficient	External

NOTE: Numbers are for reference only and do not reflect priority.

WOODHOUSE'S TOAD (*Anaxyrus woodhousii*)

*See Appendix B for a potential range and habitat distribution map

Conservation Status and Concern

The Washington State status is based on the small number of populations, a limited distribution restricted to shrub-steppe habitat in a region heavily altered for agriculture and urban development (e.g., Tri-Cities area), and a lack of information about the species.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Monitor	No	G5	S3	Unknown/unknown	Moderate-high

Biology and Life History

Photo: W. Leonard

This is a medium to large (2 to 5 inches snout to vent length) terrestrial toad with a stout body, broad waist, short legs, a round head and short snout. Activity starts in late April to early May and continues into October. Adult activity is crepuscular and nocturnal; smaller toads can occasionally be found during the day, as can newly metamorphosed "toadlets" on shorelines. Male chorusing and breeding in Franklin, Benton and Grant Counties occurs from May to July depending on conditions at each breeding site. Egg development to hatching is rapid (less than 10 days). Tadpole development is completed in approximately 2 months and metamorphosis occurs in the summer or fall of the first year. The toads are opportunistic predators that primarily eat invertebrates such as insects. The adult toads are terrestrial but burrow below the surface during the day. Information about overwintering behavior is not known for Washington but likely is terrestrial and in the vicinity of the breeding pond.

Distribution and Abundance

In Washington, Woodhouse's Toads occur in a small area of the Columbia Plateau Ecoregion along the Snake River and along the Columbia River between the Priest Rapids Dam and John Day Dam. Occurrences have also been documented in the Eltopia and Wahluke Branch irrigation canal systems in Franklin County on the Hanford Site and Juniper Dunes.

Habitat

Occurrences are found in shrub-steppe habitat near the Columbia and Snake Rivers. Breeding takes place in a variety of still-water habitats, including shallow temporarily flooded sites, ponds and sloughs. They will also lay eggs in stagnant areas of small, slow-flowing streams. Transformed toads are terrestrial. Soil types suitable for burrowing are important because they spend the day burrowed below the surface. Habitats include riparian areas, shrub-steppe and grassland.

References

Hallock, L. A. and K. R. McAllister. 2005. Woodhouse's Toad. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Jones, L. L. C., W. P. Leonard and D. H. Olson (Eds.). 2005. *Amphibians of the Pacific Northwest*. Seattle Audubon Society. 227 pp.

Woodhouse's Toad: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Loss and degradation of suitable shrub-steppe habitat that this species relies upon in WA.	Protect native shrub-steppe habitat from conversion and degradation due to agriculture.	Current insufficient	Both
3	Resource information collection needs	This species has a limited distribution in WA.	Research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
4	Resource information collection needs	Little is known about the habitat requirements of this species in WA.	More information is needed on this species to understand its status and habitat management.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

FROGS

ROCKY MOUNTAIN TAILED FROG (*Ascaphus montanus*)

Conservation Status and Concern

This species is vulnerable to management practices that alter the riparian or aquatic zones of streams, especially those practices that change the moisture regime, increase sediment load, reduce woody debris input and change stream bank integrity. Protection of headwater streams is particularly important.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Species of Concern	Candidate	Yes	G4	SNR	Low/unknown	Moderate-high

Biology and Life History

Photo: B.Moon

Rocky Mountain Tailed Frogs are present year-round in and near perennial streams. They are generally active at night, but tadpoles and frogs can also be observed during the day. They are most active from April to October, but this varies by site and conditions. Mating occurs typically in fall; females retain sperm and lay eggs in early summer. Eggs hatch usually in late summer, but larvae may remain in nest site until the following summer. The larval period lasts a few years. Metamorphosis usually takes place in late summer, and metamorphs require several additional years to attain sexual maturity. All life stages are adapted for life in fast-flowing streams. The male's "tail" is used for internal fertilization, which prevents sperm from being washed away. Eggs are attached to the undersides of rocks to keep them in place. The tadpoles have a large sucker-like mouth that allows them to feed and move in high-energy streams without losing contact and unintentionally drifting.

Distribution and Abundance

In Washington, populations are found only in the Blue Mountains. The Washington Department of Fish and Wildlife database contains 229 observation records reported from 1997 to 2010. The occupied area is small and little is known about population size, habitat conditions or threats.

Habitat

This species is restricted to perennial streams found in or associated with cold, clear, rocky streams in mature forests. During wet weather, adults and juveniles may move into upland habitat adjacent to the stream. A recent study in Idaho found tailed frogs persisted in streams that occurred in burned forest and post-burn regenerated forest showing that under certain conditions, tailed frogs can be resilient to physical stream changes resulting from natural disturbance. This included persisting in water much warmer than previously reported in the field.

References

Dunham, J. B., A. E. Rosenberger, C. H. Luce, and B. E. Rieman. 2007. Influences of wildfire and channel reorganization on spatial and temporal variation in stream temperature and the distribution of fish and amphibians. Ecosystems 10(2):335-346

Hallock, L. A. and K. R. McAllister. 2005. Rocky Mountain Tailed Frog. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

WDFW. 2014. WDFW Wildlife Survey and Management Database.

Rocky Mountain Tailed Frog: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Inventory is needed in the Blue Mountains.	Continue research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	This species is closely associated with cool forested streams. Protection of headwater streams is particularly important.	Prevent habitat modification at occupied sites.	Current insufficient	Both
3	Fish and wildlife habitat loss and degradation	Degradation of riparian areas from livestock. This species occurs on livestock rangeland and livestock impacts, well known to influence riparian systems, are currently not being paid attention to as potentially significant to this species.	Survey rangeland locations where Rocky Mountain Tailed Frogs are known to occur and assess habitat impacts.	Current insufficient	Both
4	Climate change and severe weather	Loss of suitable habitat. This species is closely associated with cool forested streams and adapted for a life history in swiftly flowing water.	Minimize habitat fragmentation and maintain robust populations across landscape.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

COLUMBIA SPOTTED FROG (*Rana luteiventris*)

*See Appendix B for a range and potential habitat distribution map

Conservation Status and Concern

Populations of this species in the Columbia Basin are declining, likely due primarily to habitat loss and alteration, although other factors such as fish stocking may also cause declines. This species is aquatic, so drying of ponds and creeks related to agricultural water withdrawals is a threat in the region.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Candidate	Yes	G4	S4	In Columbia Basin: Low/unknown	Moderate-high

Biology and Life History

Breeding in the Columbia Basin begins in late March to early April. In the Okanogan Highlands breeding starts in late April to early May at mid-elevation sites between 2,000 to 3,500 feet and late May to early June at elevation sites greater than 4,500 feet. Typically the egg masses are deposited in communal clusters. Embryos take approximately 3 to 5 weeks to develop, depending on the temperature regime and elevation. Metamorphosis typically occurs in late summer but may be delayed at higher elevation sites. They become sexually mature in 2 to 6 years, depending on location and elevation. Though movements of up to 4 miles have been recorded, the species generally stays in wetlands along streams within .6 miles of their breeding pond. Frogs in isolated ponds may not leave those sites.

Photo: W. Leonard

Distribution and Abundance

In Washington, the Columbia Spotted Frog occurs east of the Cascade Mountain crest in the East Cascades, Okanogan, Canadian Rocky Mountain, Columbia Basin, and Blue Mountain Ecoregions, and spilling over the Cascade crest to the west slope in the north Cascades near Harts and Rainy Passes. Small, scattered populations occur in the shrub-steppe vegetation zones of the Columbia Basin.

Habitat

This species is relatively aquatic and is rarely found far from water. It occupies a variety of still-water habitats and can also be found in streams and creeks. It is common to see these frogs basking on the shore or on floating debris. Breeding habitat is the seasonally flooded margins of wetlands, ponds and lakes. Flooded pools and still water edges of creeks may also be used in some areas. Egg masses are laid in shallow water where they receive little or no shading from vegetation. Waters that remain aerobic and do not freeze to the sediments (such as springs and creeks) are most likely necessary for winter survival in areas subject to freezing.

References

Bull, E. L. and M. P. Hayes. 2001. Post-breeding season movements of Columbia spotted frogs (*Rana luteiventris*) in northeastern Oregon. Western North American Naturalist 61:119-123.

Hallock, L. A. and K. R. McAllister. 2005. Columbia Spotted Frog. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Columbia Spotted Frog: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Invasive and other problematic species	Introduced, non-native, predatory species such as American Bullfrog and warm-water game fish.	Better understand overlap of species range and fish, then minimize impacts from fish in lakes and ponds. If possible, exterminate bullfrogs where found.	Current insufficient	Both
2	Resource information collection needs	Successional changes in vegetation may threaten this species, but are unstudied and poorly understood.	Research, surveys and habitat monitoring to understand successional changes in vegetation.	Nothing current—new action needed	Both
3	Fish and wildlife habitat loss and degradation	Altered hydrology, agricultural water withdrawal and other factors (e.g., salmon restoration projects) can eliminate suitable aquatic habitat.	Protect known sites; identify and protect potential habitat.	Nothing current – new action needed	Both
4	Resource information collection needs	Lack of information on status and distribution.	Research, surveys and monitoring to understand species distribution and status.	Current insufficient	Both
5	Resource information collection needs	Loss of beaver and beaver ponds.	Conserve beaver populations and dynamic stream processes.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

OREGON SPOTTED FROG (*Rana pretiosa*)

Conservation Status and Concern

The Washington status is based on the rarity of the species. Human-caused stressors include wetland loss and alteration, loss of disturbance processes that set back succession, introduction of non-native/invasive flora and fauna and alteration of creek and river channels. Only six watersheds are currently known to be occupied in Washington. Within a watershed, most breeding populations are small and many are isolated from other breeding populations. They require breeding sites in shallow water with short vegetation and full sun exposure. This habitat type is rapidly lost to invasive grasses without management such as grazing, haying, mowing or restoration to native flora.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Candidate	Endangered	Yes	G2	S1	Low/declining	Moderate-high

Biology and Life History

Photo: W. Leonard

This is a medium to large (adults from 2 to 4 inches snout to vent length) aquatic frog. The dorsal color is olive-brown to brick red with black spots. They are communal breeders that return to the same breeding areas each year. Breeding takes place in February and March. Breeding times differ depending on location and elevation and vary annually depending on water temperatures. Embryos take approximately 3 weeks to develop to hatching. Tadpoles transform in mid-summer of their first year. Radio-telemetry and mark-recapture studies have revealed that Oregon Spotted Frogs are relatively sedentary during the summer (driest period) and remain active underwater during the winter. The longest movement between captures in Washington was 1.5 miles and in Oregon was 1.7 miles.

Distribution and Abundance

The historical range in Washington is the Puget Trough Ecoregion and the southern extent of the Eastern Cascades Ecoregion in Whatcom, Skagit, Thurston, Skamania and Klickitat Counties. Current occurrences are in the Sumas River, Black Slough, Samish River, upper Black River drainage, lower Trout Lake Creek drainage and at Conboy Lake and Camas Prairie in the Outlet Creek drainage.

Habitat

This species is highly aquatic and rarely found away from water. Extant populations occur in large shallow wetland systems associated with a stream or stream network. Breeding habitat is in seasonally flooded margins of wetlands and areas of extensive shallows (approximately 6 to 8 inches deep). Egg masses are placed in areas where they receive little or no shading from vegetation. Waters that remain aerobic and do not freeze to the sediments are necessary for winter survival in areas subject to freezing. Beaver impounded systems appear to provide many of the habitat requirements of this species.

References

Hallock, L. A. 2013. Draft State of Washington Oregon Spotted Frog Recovery Plan. Washington Department of Fish and Wildlife, Olympia. 93 pp.

Hallock, L. A. and K. R. McAllister. 2005. Oregon Spotted Frog. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Oregon Spotted Frog: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Inventory areas that might still support this species and monitor known populations.	Current insufficient	Both
2	Invasive and other problematic species	Invasive reed canarygrass. Oregon Spotted Frogs oviposition habitat is located in seasonally flooded, shallow water (less than 6 inches), with short vegetation and full sun exposure. Reed canarygrass is invasive, has a dense growth pattern and grows to over 5 feet tall.	Manage reed canarygrass either by keeping it short (mowing, haying, livestock grazing) or remove it.	Current insufficient	Both
3	Invasive and other problematic species	Lack of disturbance to wetlands. Oregon Spotted Frogs oviposition habitat is located in seasonally flooded, shallow water (less than 6 inches), with short vegetation and full sun exposure. This is typical of early successional wetland plant growth.	Create or mimic disturbance processes at sites occupied by Oregon Spotted Frogs. Examples include introducing beaver, use of fire, mowing, haying and/or grazing.	Current insufficient	Both
4	Invasive and other problematic species	Non-native predatory fish and American Bullfrogs. These species prey on Oregon Spotted Frogs.	Prevent non-native predatory fish and American Bullfrogs from establishing populations at Oregon Spotted Frog occupied sites.	Current insufficient	Both
5	Climate change and severe weather	Drying of aquatic habitats occupied by Oregon Spotted Frog and subsequent changes to vegetation (expansion of trees, shrubs, and reed canarygrass etc.)	Prevent drying of wetlands and streams occupied by Oregon Spotted Frogs. Remove and manage trees, shrubs and reed canarygrass in breeding habitat.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

NORTHERN LEOPARD FROG (*Lithobates pipiens*)

Conservation Status and Concern

Only one known population remains in Washington; there is limited information about population status and trends; efforts are underway to determine the feasibility of translocations to portions of the former range.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Species of Concern	Endangered	Yes	G5	S1	Low/declining	Moderate-high

Biology and Life History

Photo: J. Wisniewski

Northern Leopard Frogs are semi-aquatic, requiring aquatic and terrestrial habitats. They typically overwinter underwater, but are primarily terrestrial during summer months, and forage predominately for insects in moist areas. During late spring, males attract females to breeding ponds by vocalizing. A grapefruit-sized egg mass is deposited just below the water surface and attached to vegetation in warm, shallow, open, lentic areas. Eggs may hatch within a few days or weeks depending on conditions. Tadpoles forage mainly on algae and detritus and complete metamorphosis in 60 to 90 days; newly metamorphosed frogs emerge from ponds in mid-July through September. Northern Leopard Frogs may be preyed on by many species throughout their life history, but the most common are likely mustelids, bullfrogs, and fish.

Distribution and Abundance

The last known population of Northern Leopard Frog in Washington occupies the North Potholes Reservoir Unit of the Columbia Basin Wildlife Area in the Crab Creek drainage; this area has been designated the Northern Leopard Frog Management Area (NLFMA). This species has experienced range-wide declines throughout the western states and Canada. Historically, Northern Leopard Frogs were found throughout eastern Washington, and 17 occupied sites were recognized throughout the Columbia, Crab Creek, Pend Oreille, Snake, Spokane, and Walla Walla River drainages.

Habitat

Northern Leopard Frogs require unique breeding, foraging, and overwintering habitats in close proximity due to their limited dispersal ability. Breeding occurs in shallow, lentic areas exposed to sunlight with short emergent vegetation for attachment of egg masses. In summer, Northern Leopard Frogs forage throughout moist areas including meadows, fields, irrigation ditches and scrublands. Northern Leopard Frogs require deep, well-oxygenated water that does not freeze solid for hibernation. Invasion by non-native vegetation and tall emergent encroachment through wetland succession reduces exposed shoreline, limiting the availability of suitable habitat for breeding and foraging. Bullfrog colonization and fish entry to the NLFMA by surface water connections during spring flooding increases predation vulnerability; ideal Northern Leopard Frog habitat would be bullfrog and fish-free.

References

Alberta Northern Leopard Frog Recovery Team. 2005. Alberta Northern Leopard Frog Recovery Plan, 2005-2010. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Recovery Plan no. 7. Edmonton, AB. 26pp.

Germaine, S., and D. Hays. 2007. Distribution and post-breeding environmental relationships of northern leopard frogs (Rana pipiens) in Grant County, Washington. Final Report. Washington Department of Fish and Wildlife, Wildlife Program, Olympia.

Hallock, L. A. and K. R. McAllister. 2005. Northern Leopard Frog. Washington Herp Atlas. http://www.1dnr.wa.gov/nhp/refdesk/herp/

Northern Leopard Frog: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Invasive and other problematic species	Non-native aquatic species including American Bullfrogs, mosquito fish and other non-native fish. Bullfrogs are predatory for all life stages of Northern Leopard Frogs, mosquito fish prey on amphibian egg masses and tadpoles.	1. Remove mosquito fish from ponds previously occupied by Northern Leopard Frogs. 2. Prevent introduction of non-native fish to ponds occupied by this species. 3. Manage habitat to favor this species but not favor bullfrogs and fish (e.g., create seasonal ponds). 4. Create and maintain barriers such as dikes that prevent non-native fish from entering ponds occupied by this species.	Current insufficient	WDFW
2	Fish and wildlife habitat loss and degradation	Loss of suitable breeding habitat due to water management in the reservoir (drawdowns, backups).	Create and restore breeding habitat (seasonal ponds).	Nothing current – new action needed	Both
3	Agriculture and aquaculture side effects	The upcoming Odessa Supplemental Feed Route will influence water levels in Potholes Reservoir and may impact the amount of suitable habitat in the NLFMA.	1. Maintain suitable habitat to allow for dispersal and movement. 2. Monitor population. 3. Pursue opportunities to establish new populations. 4. Use adaptive management to deal with the high level of uncertainty regarding potential habitat changes.	Current insufficient	Both

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
4	Invasive and other problematic species	Unknown impacts to population from disease.	Additional disease monitoring is necessary to determine the extent of the disease threat in the NLFMA.	Current insufficient	WDFW
5	Invasive and other problematic species	Wetland succession and tall emergent vegetation encroachment (e. g. Reed Canary Grass, phragmites, and non-native cattails) reduces suitability of habitat.	Set back succession; reduce tall emergent vegetation and encourage short emergent cover through chemical and mechanical treatments.	Current insufficient	WDFW

NOTE: Numbers are for reference only and do not reflect priority

TURTLES

GREEN SEA TURTLE (*Chelonia mydas*)

Conservation Status and Concern

A rare visitor off the outer Washington coast, this declining species is threatened by a number of factors occurring primarily outside of the state. However, issues related to consumption of plastic pollution could be addressed in Washington.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Threatened	Threatened	No	G3	SNA	Low/unknown	Moderate

Biology and Life History

Green sea turtles are unique among sea turtles in that adults are herbivorous, feeding primarily on seagrass and algae. Sexual maturity occurs at 20 to 50 years. Adult females return every 2 to 4 years to lay eggs at the same beaches where they were born. Females nest at two-week intervals, laying an average of five clutches of eggs per nesting season. In Florida, green turtle nests contain an average of 135 eggs; incubation lasts about 2 months. Hatchlings swim to the open ocean, where they feed on pelagic plants and animals. At 3 to 5 years of age, juveniles travel to nearshore foraging sites. Adult females migrate hundreds or thousands of kilometers between foraging areas and nesting beaches.

Photo: B. Inaglory

Distribution and Abundance
The species is most widely distributed in tropical and subtropical waters near islands and along continental coasts between 30°N and 30°S worldwide. Along western North America, it occurs primarily south of California, but rarely extends northward to southern Alaska. It is rare in Washington, with four individuals stranded on outer coast beaches from 2002 to 2012.

Habitat
Feeding occurs in shallow, low-energy marine waters with abundant submerged vegetation, and also in convergence zones in open ocean. Coral reefs and rocky outcrops near feeding areas are often used for resting. Nesting occurs on sandy beaches, usually on islands but also on the mainland.

References
NatureServe Explorer. http://explorer.natureserve.org/servlet/NatureServe?init=Species K. Wilkinson and L. Todd, unpublished data

Green Sea Turtle: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Improve documentation of green sea turtles recorded in Washington.	Work with National Marine Fisheries Service, stranding organizations, vessel operators, and others to better document presence of green sea turtles in Washington.	Current insufficient	Both
2	Fish and wildlife habitat loss or degradation	Oceanic pollution. Plastics such as plastic bags, balloons, and other debris are eaten, which can result in mortality.	Support efforts to reduce plastic pollution in oceans.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

LEATHERBACK SEA TURTLE (*Dermochelys coriacea*)

Conservation Status and Concern

This declining species, which may occur more regularly off the outer Washington coast than previously known, is threatened by numerous factors happening primarily outside of the state. However, issues related to oil spills and fishing gear entanglement as well as consumption of plastic pollution could be addressed in Washington.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Endangered	Endangered	No	G2	SNA	Low/unknown	Moderate

Biology and Life History

This species, which is the world's largest sea turtle, moves hundreds or thousands of kilometers between nesting beaches and distant marine waters; transequatorial migrations have been documented. Gravid females go directly from temperate latitudes to preferred nesting beaches. Individual females may nest on multiple beaches within a region. The principal food is jellyfish, although other invertebrates, fishes, and seaweed are sometimes eaten. The species dives almost continuously, sometimes to several thousand meters, but may linger at the surface at midday.

Photo: C. Lombard

Distribution and Abundance

Leatherback turtles occur in tropical, temperate, and subpolar oceans worldwide. Some of the turtles foraging off the west coast of North America, including Washington, nest in western New Guinea. Most populations in the Pacific are in steep decline. Numbers of turtles visiting Washington's waters are unknown, but telemetry suggests abundance may be higher than indicated by the few sightings.

Habitat

The species inhabits open ocean, often near the edges of continental shelves. Inshore waters (e.g., bays and estuaries) are occasionally used; higher latitude waters are visited in summer. Nests are placed on sloping sandy beaches backed by vegetation, often near deep water and rough seas. The largest colonies occur on continental, rather than island, beaches. Absence of a fringing reef appears to be important for nesting sites. Newly formed nesting habitat may be rapidly utilized.

References

Benson, S. R., T. Eguchi, D. G. Foley, K. A. Forney, H. Bailey, C. Hitipeuw, B. P. Samber, R. F. Tapilatu, V. Rei, P. Ramohia, J. Pita, and P. H. Dutton. 2011. Large-scale movements and high-use areas of western Pacific leatherback turtles, *Dermochelys coriacea*. Ecosphere 2(7):art84. doi:10.1890/ES11-00053.1.

NatureServe Explorer. http://explorer.natureserve.org/servlet/NatureServe?init=Species

Leatherback Sea Turtle: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Improve documentation of leatherback sea turtles recorded in Washington.	Work with National Marine Fisheries Service stranding organizations, vessel operators, and others to better document presence of leatherbacks in Washington.	Current insufficient	Both
2	Overharvesting of biological resources	Incidental capture in fishing gear.	Support efforts to reduce fisheries bycatch, including turtle exclusion devices in trawl fisheries, large circle hooks in longline fisheries, and time and area closures for gillnets.	Current insufficient	Both
3	Fish and wildlife habitat loss or degradation	Oceanic pollution. Plastics such as plastic bags, balloons, and other debris are commonly eaten, which can result in mortality.	Support efforts to reduce plastic pollution in oceans.	Current insufficient	Both
4	Energy development and distribution	Mortality from oil spills.	Expand safeguards to prevent oil spills.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

LOGGERHEAD SEA TURTLE (*Caretta caretta*)

Conservation Status and Concern

A very rare visitor off the outer Washington coast, this declining species is threatened by factors occurring primarily outside of the state. However, issues related to consumption of plastic pollution could be addressed in Washington.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Endangered	Threatened	No	G3	SNA	Low/unknown	Moderate-high

Biology and Life History

Diet of all life stages is mostly benthic invertebrates (crabs, other crustaceans, and mollusks) and occasionally jellyfish. Sexual maturity is reached at about 45 years of age. Nesting occurs mainly at night, often at high tide. Females lay eggs in three to five nests per nesting season, with 80 to 120 eggs per clutch. In the eastern U.S., nesting takes place in late April to early September. Incubation lasts about two months. The species is known to make long migrations; some Pacific loggerheads migrate over 7460 miles between nesting beaches in Japan and feeding grounds off Mexico.

Photo: B. Gratewicke

Distribution and Abundance

The species occurs throughout the tropical and temperate regions of the Atlantic, Pacific, and Indian Oceans. Most records along the U.S. west coast are of juveniles along the coast of California, with very few sightings reported off Washington, Oregon, and northward to Alaska. The west coast of Mexico, including the Baja Peninsula, provides critically important habitat for juveniles. Loggerheads nest in tropical and subtropical regions; the only known nesting areas in the North Pacific are in southern Japan. The species is very rare in Washington, with none stranded on outer coast beaches from 2002 to 2012.

Habitat

Loggerhead sea turtles mostly inhabit continental shelf and nearshore marine waters, but occur pelagically during migration. Hatchlings move to masses of sargassum at sea, where they remain for perhaps 3 to 5 years. Nesting occurs on open sandy beaches in warm temperate and subtropical regions, generally at high energy, relatively narrow, steeply sloped, coarse-grained beaches.

References

NatureServe Explorer. http://explorer.natureserve.org/servlet/NatureServe?init=Species K. Wilkinson and L. Todd, unpublished data

Loggerhead Sea Turtle: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Improve documentation of Loggerhead Sea Turtles recorded in Washington.	Work with National Marine Fisheries Service, stranding organizations, vessel operators, and others to better document presence of Loggerhead Sea Turtles in Washington.	Current insufficient	Both
2	Fish and wildlife habitat loss or degradation	Oceanic pollution. Plastics such as plastic bags, balloons, and other debris are eaten, which can result in mortality.	Support efforts to reduce plastic pollution in oceans.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

WESTERN POND TURTLE (*Actinemys [Clemmys] marmorata*)

Conservation Status and Concern

In the 1990s, only two populations remained in the Columbia River Gorge with estimates of less than 200 individuals. Because of recovery efforts, currently there are six populations with approximately 800 turtles. Many issues remain for the recovery of this species. Habitat must be managed to prevent invasive weeds from overgrowing the nesting areas. Predation by non-native American Bullfrogs on hatchlings, as well as mammalian predation on nests, prevents natural recruitment of hatchlings at many sites. Disease has emerged as a major concern in recent years due to the discovery that a substantial number of turtles have diseased shells (ulcerative shell disease). The cause of the disease is under investigation but is not yet known.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
In review	Endangered	Yes	G3G4	S1	Low/increasing	Moderate

Biology and Life History

This species is primarily aquatic, but strays from water to lay eggs, to disperse to new water bodies, to overwinter and to aestivate during periods of drought. Western Pond Turtles are active as soon as water temperatures are warm enough and basking is possible, usually in late March or early April. Adult activity continues until late September or October depending on weather conditions and location. Western Pond Turtles spend a great deal of time basking

Photo: OR Dept. Fish & Wildlife

on logs at the surface of ponds. A recent telemetry study of juvenile turtles found that some turtles were still active in December at a site in the Columbia River Gorge. Western Pond Turtles are omnivorous.

Distribution and Abundance

The range of the Western Pond Turtle extends from the Puget Sound Lowlands in Washington through western Oregon and California, and south to Baja California. Western Pond Turtles disappeared from the Puget lowlands by the 1980s, with only a few isolated adult turtles remaining. By 1990, the Western Pond Turtle population in Washington had declined to an estimated 150 animals remaining in the wild at only two sites in the Columbia River Gorge. Because of recovery efforts, currently six populations occur in Washington with approximately 800 turtles. Two sites are in South Puget Sound and four occur in the Columbia River Gorge.

Habitat

Western Pond Turtles utilize a variety of flowing and still water habitats in other parts of their range, but in Washington they are only known from ponds and lakes. They nest in grasslands and open woodland around ponds.

References

Hallock, L. A. and K. R. McAllister. 2005. Western Pond Turtle. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp

Pramuk, J. F. Koontz, M. Tirhi, S. Zeigler, K. Schwartz, and P. Miller (eds.) 2013. The Western Pond Turtle in Washington: A Population and Habitat Viability Assessment. IUCN/SSC Conservation Breeding Specialist Group, Apple Valley, M. N. Schmidt, T, and M. Tirhi. 2014.

Western Pond Turtle: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Fish and wildlife habitat loss or degradation	Habitat loss, degradation and fragmentation. Lack of suitable habitat for reintroduction sites.	Conserve suitable habitat; protect significant areas; Protect or restore nesting habitat at existing and potential sites. Establish new sites to meet reintroduction plan goals.	Current sufficient	Both
2	Invasive and other problematic species	American Bullfrogs and introduced warm-water fish.	Implement bullfrog and fish control as needed.	Current insufficient	Both
3	Invasive and other problematic species	Invasive tall vegetation overgrowing the nesting habitats and uplands.	Continue to remove and control vegetation in areas significant for Western Pond Turtles such as nesting sites.	Current insufficient	WDFW

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
4	Resource information collection needs	Continue to monitor populations to trigger intervention if necessary to avoid massive declines.	Study mortality rates & nature/intensity of threats acting on key demographic stages (i.e. hatchlings reared in the wild and adults).	Current sufficient	WDFW
5	Resource information collection needs	Understand shell disease epidemiology, survival rate of affected individuals, and effects on reproduction.	Study shell disease and make management decisions from the science.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

LIZARDS

PYGMY HORNED LIZARD (*Phrynosoma douglasii*)

*See Appendix B for a potential range and habitat distribution map

Conservation Status and Concern

The conservation concern for this species is because its distribution is primarily restricted to the highly altered and fragmented shrub-steppe in Eastern Washington.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Monitor	No	G5	S3	Medium/unknown	Moderate

Biology and Life History

Photo: W. Siegmund

This is a medium-sized lizard, rather toad-like in appearance with a blunt snout, round flattened body, short legs and a short triangular tail. They are cryptic and their coloration tends to match the substrate. The females are significantly larger than the males. Activity starts in late March in the Columbia Basin. Adults are active mid-day during spring and fall but in summer are inactive during the middle of the day when temperatures are at their maximum. Mating takes place soon after emergence in the spring. Young are born live in late summer approximately two months after mating. Surface activity continues into October. A study in Washington found that neonates feed almost exclusively on ants (89 percent), while ants made up about 72 percent of the adult diet.

Distribution and Abundance
They reach the northern extent of their range in Washington and occur primarily in the Columbia Plateau Ecoregion. Abundance varies from site to site. The statewide trend for this specie is unknown.

Habitat
In Washington, they occupy shrub-steppe habitat. They require soil conditions that allow them to burrow below the surface and substrate that is well-drained. Field research in Kittitas County found Pygmy Horned Lizards to have a disproportionate preference for lithosol terrain. Females in the final month of gestation, however, tended to use loamy and ecotone terrains. Other findings of this study suggest populations may need a variety of substrate types to meet all their needs. In addition to these terrain types, Pygmy Horned Lizards in Washington are also known to occur in loamy terrain without lithosols, on vegetated sand dunes, and even in some agricultural settings where patches of native habitat are present.

References
Hallock, L. A. and K. R. McAllister. 2005. Pygmy Short-horned Lizard. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Lahti, M. 2005. Ecology of the Pygmy Short Horned Lizard (*Phrynosoma douglasii*) in Washington. Master's Thesis. Central Washington University, Ellensburg, Washington. 73 pp.

Lahti, M. and D. Beck. 2010. Ecology of the Pygmy short-horned lizard (*Phyrnosoma douglasii*). Northwestern Naturalist. 91(2):134-144.

Lahti, M. and D. Beck. 2007. Ecology and ontogenetic variation of diet in the pygmy short-horned lizard (*Phyrnosoma douglasii*). American Midland Naturalist 159:327-339.

Pygmy Horned Lizard: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Research, survey and monitoring are needed to understand the status, distribution and habitat needs of this species.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Loss and degradation of suitable shrub-steppe habitat due to conversion to agriculture.	A strategy needs to be developed to make sure that enough suitable shrub-steppe habitat is maintained to support viable populations of this lizard.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

SAGEBRUSH LIZARD (*Sceloporus graciosus*)

*See Appendix B for a potential range and habitat distribution map

Conservation Status and Concern

The Washington status is based on the species' obligate association with sand dunes in the Columbia Basin where greater than 70 percent of this habitat type has been lost since the 1970s.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Species of Concern	Candidate	Yes	G5	S3	Low/declining	Moderate-high

Biology and Life History

Photo: T. Thompson

This is a small (less than 2.4 inches snout to vent length) gray or brown lizard with a mid-dorsal stripe, two light colored dorsolateral stripes, and a series of dark chevron-shaped blotches between the stripes. They are primarily ground dwelling lizards. In Washington, they are active on warm, sunny days from early April through October. They are gregarious and interact with other lizards, often under the canopy of shrubs. They prey on small insects and arachnids. Eggs are laid in early summer. Hatchlings appear in early August.

Distribution and Abundance

In Washington, Sagebrush Lizards occur in the Columbia Plateau and Okanogan ecoregions where they occur on sand dunes. Sagebrush Lizards tend to be common where they occur but their habitat is being fragmented by various factors.

Habitat

In Washington, Sagebrush Lizards are associated with vegetated sand dunes and associated sandy habitats that support shrubs and have large areas of bare ground. Typically, they can be seen on the ground at the edge of shrubs and other vegetation that provide cover from predators and relief from mid-day heat. They will also climb into the lower branches of shrubs to shelter from the mid-day heat. At night, on rainy days and on cool, cloudy days they move underground or shelter under cover objects such as rocks and woody debris. Habitat for these lizards is degraded by invasive plants, such as cheatgrass, that grow densely between shrubs and eliminate bare ground. Excessive livestock grazing can also degrade habitat by removing too much vegetation and damaging the lower limbs of shrubs. Without the lower limbs, shrubs do not provide retreats for Sagebrush Lizards. Overwintering habitat has not been studied in Washington but is likely within sand dune habitat.

References

Green, G. A., K. B. Livezey, and R. L. Morgan. 2001. Habitat selection by Northern Sagebrush Lizards (Sceloporus graciosus graciosus) in the Columbia Basin, Oregon. Northwestern Naturalist 82(3): 111-115.

Hallock, L. A., R. D. Haugo and R. Crawford. 2007. Conservation Strategy for Washington Inland Sand Dunes. Unpublished report from Washington Department of Natural Resources' Natural Heritage Program (Olympia), Report 2007-05.

Hallock, L. A. and K. R. McAllister. 2005. Sagebrush Lizard. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Sagebrush Lizard: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information about status. This species is associated with sand dunes. Loss and alteration of sand dune habitat continues to occur throughout the Columbia Basin. Therefore, Sagebrush Lizard populations must be monitored to make sure they are persisting.	Monitor populations to make sure their habitat remains suitable and the populations persist.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Sand dune conversion to agriculture.	Protect sand dune habitat.	Current insufficient	Both
3	Invasive and other problematic species	Stabilization of sand dunes and loss of bare soils interspersed with vegetation. Non-native invasive species, especially cheatgrass, are stabilizing sand dunes and altering the habitat so that it is not suitable for Sagebrush Lizards.	Prevent land use practices that increase non-native invasive species. Where these plants already occur, find ways to remove and/or prevent expansion.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

SIDE-BLOTCHED LIZARD (*Uta stansburiana*)

*See Appendix B for a potential range and habitat distribution map

Conservation Status and Concern

The Washington State status is based on the small number of populations and a distribution that is restricted to the heavily altered shrub-steppe vegetation of Eastern Washington.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	None	No	G5	S3	Medium/unknown	Moderate

Biology and Life History

Photo: W. Flaxington

This is a small (maximum size 2.2 inches snout to vent length) brown or gray lizard with a mottling of black, brown and light colored markings on the dorsal surface. They are very cryptic and blend into their surroundings. In Washington, activity typically starts in early to mid-March and continues through October. They are ground dwelling lizards that do not climb in vegetation although they will climb on rocks and basalt outcrops. They are gregarious and interact with other lizards, often under the canopy of shrubs. They are active mid-day during spring and fall but in summer are inactive during the middle of the day when temperatures are at their maximum. They are not surface active on rainy days or cool cloudy days. Eggs are probably laid in May and hatchlings start to appear in mid-July. Both adults and juveniles prey on insects and arachnids.

Distribution and Abundance

In Washington, Side-blotched Lizards are shrub-steppe obligates that occur primarily in the driest areas of the central Columbia Basin. Most documented occurrences are in Grant and Benton Counties with additional occurrences in adjacent counties. Side-blotched Lizards are gregarious and tend to be common to abundant where they occur.

Habitat

Side-blotched Lizards are associated with arid areas that support shrub-steppe habitat. They are most common in areas with bare ground interspersed with shrubs and other vegetation (*e.g.*, shrubland with grasses). They also occupy dry washes, rocky canyons, sand dunes and road edges. Typically, individuals can be seen on the ground at the edge or under shrubs or other vegetation that provides cover from predators. During the heat of the day and during rainy and/or cool periods, they retreat underground or move under cover objects such as rocks and woody debris. Habitat for these lizards is degraded by invasive plants such as cheatgrass and knapweed that grow densely between shrubs and eliminate bare ground. Excessive livestock grazing can also degrade habitat by removing too much vegetation and damaging the lower limbs of shrubs. Without the lower limbs, shrubs do not provide retreats for Side-blotched Lizards.

References

Hallock, L. A. and K. R. McAllister. 2005. Side-blotched Lizard. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp/

Side-blotched Lizard: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Research, survey and monitoring are needed to understand the status, distribution and habitat needs of this species.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Loss and degradation of suitable shrub-steppe habitat that this species relies upon in WA.	Protect native shrub-steppe habitat from conversion and degradation due to agriculture.	Current insufficient	Both
3	Invasive and other problematic species	Changes to vegetation/habitat from non-native invasive plant species. This species requires habitat with bare ground between plants. Non-native, invasive species, such as cheatgrass, create dense ground cover that is not suitable for this species.	Prevent land use practices that increase non-native invasive species. Where these plants already occur, find ways to remove and/or prevent expansion.	Current insufficient	Both
4	Fish and wildlife habitat loss and degradation	Changes in vegetation due to livestock grazing. Livestock grazing can result in removal of too much vegetation, introduction of invasive weeds, crushing of burrows and changes to the structure of shrubs (e.g., cattle can damage/destroy the lower branches of shrubs as they graze under the shrubs).	Prevent livestock use and grazing practices that remove excessive amounts of vegetation (change the character of the habitat), introduce invasive weeds, and change the structure of shrubs (e.g., cattle can damage/destroy the lower branches of shrubs as they graze under the shrubs).	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

SNAKES

CALIFORNIA MOUNTAIN KINGSNAKE (*Lampropeltis zonata*)

Conservation Status and Concern

In Washington, occurs at the northern extreme of its range and the population is isolated from the rest of its range by approximately 200 miles. The species' range in Washington is small with few individuals documented. They occur in the Columbia River Gorge in an area of the state that ~~is highly desirable and~~ is likely to see increased development and vehicular traffic over the next decade.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Candidate	Yes	G4G5	S2?	Low/unknown	Low-moderate

Biology and Life History

Little is known about this species in Washington. It is chiefly diurnal, but may be nocturnal during warm weather. Similar to other snake species occupying the same area, it most likely becomes active in late March or April and remains active until October. Mating probably takes place in May with three to nine eggs laid in June or July. The incubation period is approximately 60 days.

Photo: A.P. Summers

Distribution and Abundance

The Washington range is limited to the southernmost areas of eastern Skamania County and western Klickitat County. The Washington range is isolated from the rest of the species' range by approximately 200 miles. Unsubstantiated reports exist for the Blue Mountains and Yakima County. Nothing is known about their abundance in Washington.

Habitat

The species occurs in moist microhabitats in Oregon white oak-ponderosa pine forest, where individuals are usually found under woody debris and rocks.

References

Hallock, L. A. and K. R. McAllister. 2005. California Mountain Kingsnake. Washington Herp Atlas. http://www.1dnr.wa.gov/nhp/refdesk/herp/

California Mountain Kingsnake: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Conduct comprehensive surveys to determine distribution and population numbers.	Current insufficient	WDFW
2	Fish and wildlife habitat loss or degradation	Loss, degradation and fragmentation of habitat and well as an increase in vehicle traffic. They occur in the Columbia River Gorge - an area of the state that is highly desirable and is likely to see increased development and vehicular traffic over the next decade.	Determine where populations occur and how to protect those populations from development and road mortality.	Current insufficient	WDFW
3	Overharvesting of Biological Resources	Removal from the wild. These are attractive snakes with docile temperaments that can be easily tamed and kept in captivity. This makes them vulnerable to collecting as pets.	Public outreach and education. Make sure that laws protecting this species are enforced.	Current insufficient	WDFW

NOTE: Numbers are for reference only and do not reflect priority.

DESERT NIGHTSNAKE (*Hypsiglena chlorophaea*)

Conservation Status and Concern

The Washington State status is based on a distribution that is primarily restricted to the shrub-steppe vegetation that has been heavily altered in Washington.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Monitor	No	G5	S3	Medium/unknown	N/A

Biology and Life History

This is a small, (less than 18 inches in total length) spotted snake with dark brown blotches in the neck region. In Washington, Desert Nightsnakes are active from April to October. As their common name suggests, they are primarily nocturnal. Mating takes place in the spring. Three to nine eggs are laid in June or July each year. Little else is known regarding Desert Nightsnake reproduction in Washington. Similarly, survival rate, growth rates, and longevity are largely unknown. Nightsnakes eat small lizards and smaller snakes, as well as lizard eggs, frogs, and other small prey.

Photo: B. Hughes

Distribution and Abundance

In Washington, Desert Nightsnakes have been documented in the Columbia Plateau, Eastern Cascades, and Okanogan Ecoregions. Distribution may be limited by the occurrence of certain lizard prey species. From 2003 to 2004, 66 new observations were made from seven Washington counties by a student as part of his graduate studies. This suggested that the species was more common than was previously known.

Habitat

Most Desert Nightsnake occurrences in Washington are from arid areas that support shrub-steppe vegetation, but occurrences in the Leavenworth area are in ponderosa pine forests. Individuals are usually found in rocky areas, but have also been found in sagebrush flats that are not rocky. During the day, individuals can be found sheltering under surface objects, generally rocks. However, during prolonged periods of hot weather, they may move deep into talus, rock fissures or rodent burrows.

References

Hallock, L. A. and K. R. McAllister. 2005. Night Snake. Washington Herp Atlas. http://www1.dnr.wa.gov/nhp/refdesk/herp

Nussbaum, R. A., E. D. Brodie, Jr., and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, Idaho. 332 pp.

Weaver, R. E. 2008. Distribution, abundance, and habitat associations of the Night Snake (*Hypsiglena torquata*) in Washington State. Northwestern Naturalist 89: 164-170.

Desert Nightsnake: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Research, survey and monitoring are needed to understand the status, distribution and habitat needs of this species.	Current insufficient	Both
2	Fish and wildlife habitat loss and degradation	Loss and degradation of suitable shrub-steppe habitat that this species relies upon in WA.	A strategy needs to be developed to make sure that enough suitable shrub-steppe habitat is maintained to support viable populations of this snake.	Current insufficient	Both
3	Overharvesting of Biological Resources	Destruction of rattlesnake hibernacula also negatively affects nightsnakes because they often share hibernacula with rattlesnakes.	Environmental education and outreach. Protect snake dens on public lands.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

RING-NECKED SNAKE (*Diadophis punctatus*)

*See Appendix B for a potential range and habitat distribution map

Conservation Status and Concern

The Washington State status is based on the small number of observations, patchy distribution and lack of information. Some of the distribution is in the Columbia Basin, a heavily altered region of the state heavily impacted by agriculture.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Monitor	No	G5	S3S4	Unknown/unknown	Low-moderate

Biology and Life History

This is a small, dark snake with shiny scales and an orange band or "ring" around the neck. The underside is bright orange. They are secretive and rarely surface active during the day. Little is known about them in Washington. Similar to other snake species in Washington, they are likely active from March through October varying somewhat from year to year and by location. Females deposit about three eggs per year in early in July. They feed primarily on salamanders and lizards, but may also eat earthworms, frogs, insects and smaller snakes.

Photo: W. Flaxington

Distribution and Abundance

The main distribution in Washington follows the east slope of the Cascade Mountains from the Ellensburg area south to the Columbia Gorge and west to Longview. They also occur along the eastern portion of the Snake River. Distribution is likely continuous between the Klickitat and Yakima Counties but there are no records in WDFW's database to support this. Isolated records of individual snakes were collected in Whitman County in 1937 and 1938; Walla Walla County in 1975; and two locations in Cowlitz County (Kalama and confluence of Mill Creek and the Columbia River) in 1959 and 1982 respectively. Observations for this species are rarely submitted to the WDFW database and no studies have been conducted in Washington. Consequently, nothing is known about the status or abundance of this species.

Habitat

Based on collection and observation records, Ring-necked Snakes occur in ponderosa pine-Oregon white oak, mixed forest and shrub-steppe. Occurrences in shrub-steppe are often associated with riparian areas. Ring-necked Snakes are usually found under woody debris, rocks or on roads at night. Eggs are deposited in stabilized talus and rotting logs.

References

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Ring-necked Snake: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Research, survey and monitoring are needed to understand the status, distribution and habitat needs of this species.	Current insufficient	Both

SHARP-TAILED SNAKE (*Contia tenuis*)

*See Appendix B for a range and potential habitat distribution map

Conservation Status and Concern

The Washington status and concern is based on the small number of populations, patchy distribution and lack of information.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
Species of Concern	Candidate	Yes	G5	S3	Low/unknown	Moderate

Biology and Life History

Photo: W. Leonard

This is a diminutive, semi-fossorial species with a distinct ventral pattern of alternative black and cream colored bands and a short tail that terminates with a small spike-like scale. These snakes are rarely encountered and little studied. Most surface activity occurs when the surface is cool and moist in the spring and fall although observations have been made in most months of the year. The snakes are typically found under cover objects. Aggregations are often observed. Breeding takes place in April or May. Eggs are laid in late June or July and hatching occurs in the fall. Activity is confined to relatively small areas. The greatest distance moved by two study snakes in Canada was 128 and 305 feet. Snakes also show evidence of site tenacity, with some snakes found repeatedly under the same cover objects. The long, re-curved teeth appear to be a specialization for grasping and holding mollusks, the primarily prey of this snake.

Distribution and Abundance

Sharp-tailed Snakes occur from British Columbia, Canada into southern California. In Washington, Common Sharp-tailed Snakes are known from thirteen disjunct areas. West of the Cascade Crest there is an historical record for Pierce County and two recently discovered sites on Orcas and San Juan Islands. East of the Cascade Crest observations are from Chelan, Kittitas, Yakima, Klickitat and Skamania Counties. Almost nothing is known about abundance and some occurrences are based on a single observation.

Habitat

In the Pacific Northwest, they are found on the edges of coniferous or open hardwood forest. In Washington, the snakes have been found in 1) forest openings dominated by Garry Oak often with rock accumulations; 2) riparian/river floodplain with deciduous trees, shrubs and accumulations of decaying down woody logs; 3) shrub-steppe uplands with riparian areas that support deciduous trees and have accumulations of woody debris and rocks. The snakes are usually found in moist rotting logs or stable talus, often near streams or in other damp habitats. Small canopy gaps with rocky substrates, especially those that are south-facing, may be important for thermoregulation, egg development and growth of young.

References

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Sharp-tailed Snake: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Research, survey and monitoring are needed to understand the status, distribution and habitat needs of this species.	Current insufficient	Both
2	Fish and wildlife habitat loss or degradation	Loss of prairie and oak habitat. With the exception of recent observations on San Juan Island, no extant occurrences are known from western Washington. This species is thought to have been associated with prairie habitat in western Washington and most of this habitat type was converted to agriculture or developed for housing.	Inventory and outreach to determine if this small, secretive snake still occurs in areas of western Washington other than the San Juan Islands.	Nothing current - new action needed	WDFW
3	Fish and wildlife habitat loss and degradation	Loss of suitable habitat due to harvest of trees. Little is known about threats to this species from habitat alteration but forestry practices likely impact local populations because the loss of canopy changes the moisture regime, increases temperature and removes down woody debris and leaf litter.	Identify where this species occurs and work with landowners to conserve habitat features important for the persistence of this species such as downed woody debris and rock features.	Nothing current - new action needed	WDFW

NOTE: Numbers are for reference only and do not reflect priority.

STRIPED WHIPSNAKE (*Coluber taeniatus*)

Conservation Status and Concern

The Washington status is based on the small number of populations. Currently only two populations are verified extant. Threats include conversion of habitat to agriculture, degradation of native shrub-steppe habitat from irrigation water and invasive weeds, basalt mining, single home construction and increasing vehicular traffic on roads and highways that bisect the occupied areas.

Federal Status	State Status	PHS	Global Ranking	State Ranking	Population size/trend	Climate Vulnerability
None	Candidate	Yes	G5	S1	Low/declining	Low-moderate

Biology and Life History

Photo: D. Hagin

They are long, slender, striped snakes that are alert, visual and fast-moving. Adults can grow to 6 feet total length but are typically shorter in Washington. They are diurnal. Spring emergence starts in late-March in Washington. Females lay eggs in July. Clutch sizes range from three to seven. The incubation period is 44 to 58 days. Lizards are the predominant prey; small mammals, snakes, young birds and insects are also taken occasionally. Maximum recorded dispersal distance from a den at Tooele Valley, Utah was 2.2 miles. They return to the vicinity of the hibernaculum in September. They overwinter communally with other snake species and use the same hibernaculum every year. Striped Whipsnakes may live as long as 20 years.

Distribution and Abundance

Striped Whipsnakes reach the northern extent of their range in Washington. They were probably never common in Washington. Only 15 museum specimens are known and until 2004, only 11 sight observations had been submitted to the WDFW database. Together these represent 16 unique locations in Yakima, Kittitas, Grant, Benton, Franklin, Lincoln and Walla Walla counties. Concern about the species' status was triggered by lack of observations during large scale herpetological inventories in the 1990s that included inventory at historically occupied areas. Only two areas located 4.4 miles apart are verified extant currently. The population size is unknown.

Habitat

In Washington, Striped Whipsnakes are shrub-steppe obligates and occur primarily in the driest areas of the central Columbia Basin. The habitat of the extant populations included basalt outcrops and relatively undisturbed shrubland with grasses and a low cover of invasive cheatgrass. Soils surrounding the basalt outcrops are sandy and supported larger shrubs including big sage and spiny hop sage. The snakes shelter during the active season in basalt outcrops and mammal burrows. The hibernacula are also in basalt outcrops. The snakes show strong site fidelity to sheltering and overwintering locations. Mammal burrows may be important for egg laying.

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Striped Whipsnake: Conservation Threats and Actions

	STRESSOR	DESCRIPTION	ACTION NEEDED	LEVEL OF INVESTMENT	LEAD
1	Resource information collection needs	Lack of information on status and distribution.	Currently, only two extant populations are known in Washington. Inventory efforts and outreach must continue to determine if other populations occur in the state.	Current insufficient	WDFW
2	Fish and wildlife habitat loss and degradation	Loss and degradation of suitable shrub-steppe habitat that this species relies upon in WA.	Because of the apparent rarity of this species, lands where it occurs need to be protected from agricultural conversion.	Current insufficient	Both
3	Fish and wildlife habitat loss and degradation	Shrub-steppe habitat degraded by irrigation water.	Protect habitat at risk for conversion to irrigated cropland that could provide suitable habitat within or between occupied areas.	Current insufficient	Both
4	Invasive and other problematic species	Changes to vegetation/ habitat. This species, and its lizard prey, requires habitat with bare ground between plants. Non-native, invasive species such as cheatgrass create dense ground cover.	Prevent land use practices that increase non-native invasive plant species. Where these plants already occur, find ways to remove and/or prevent expansion.	Current insufficient	Both
5	Fish and wildlife habitat loss and degradation	Changes in vegetation may result from unsustainable livestock grazing through the removal of too much vegetation, the introduction of invasive weeds, crushing of mammal burrows (used by the snakes) and damage to the lower branches of shrubs from grazing under the shrubs.	Provide technical assistance to producers grazing within vicinity of known Striped Whipsnake hibernacula.	Current insufficient	Both

NOTE: Numbers are for reference only and do not reflect priority.

REFERENCES

SECTION A: Alphabetical list of species

California Mountain Kingsnake..... 46
Cascade Torrent Salamander..... 8
Columbia Spotted Frog..... 27
Columbia Torrent Salamander..... 10
Cope's Giant Salamander..... 6
Desert Nightsnake..... 48
Dunn's Salamander..... 14
Green Sea Turtle..... 33
Larch Mountain Salamander..... 16
Leatherback Sea Turtle..... 35
Loggerhead Sea Turtle..... 37
Northern Leopard Frog..... 31
Olympic Torrent Salamander..... 12
Oregon Spotted Frog..... 29
Pygmy Horned Lizard..... 40
Ring-necked Snake..... 50
Rocky Mountain Tailed Frog..... 25
Sagebrush Lizard..... 42
Sharp-tailed Snake..... 51
Side-blotched Lizard..... 44
Striped Whipsnake..... 54
Tiger Salamander..... 4
Van Dyke's Salamander..... 18
Western Pond Turtle..... 38
Western Toad..... 21
Woodhouse's Toad..... 23

SECTION B: Explanation of Terms

Conservation Status Table

Federal Status
Refers to legal designations under the Federal ESA (listed as Endangered or Threatened or recognized as a Candidate species for listing), or designated as a Sensitive species.

State Status
The Washington Fish and Wildlife Commission has classified 46 species as Endangered, Threatened or Sensitive, under WAC 232-12-014 and WAC 232-12-011. Species can also be designated Candidate Species for state listing by WDFW policy.

PHS (Priority Habitats and Species Program)
A species listed under the PHS program is considered to be a priority for conservation and management and requires protective measures for survival due to population status, sensitivity to habitat alteration and/or tribal, recreational or commercial importance. Management recommendations have been developed for PHS species and habitats, and can assist landowners, managers and others in conducting land use activities in a manner that incorporates the needs of fish and wildlife.

Global (G) and State (S) Rankings: Refers to NatureServe status rankings provided by the Natural Heritage Program. These conservation status ranks complement legal status designations and are based on a one to five scale, ranging from critically imperiled (1) to demonstrably secure (5). The global (G) and state (S) geographic scales were used for the SGCN species fact sheets. For more on the methodology used for these assessments, please see: Methodology for Assigning Ranks - NatureServe.

State Rank: characterizes the relative rarity or endangerment within the state of Washington.
S1 = Critically imperiled
S2 = Imperiled
S3 = Rare or uncommon in the state – vulnerable
S4 = Widespread, abundant, and apparently secure i
S5 = Demonstrably widespread, abundant, and secure in the State
SA = Accidental in the state.
SE = An exotic species that has become established in the state.
SH = Historical occurrences only are known, perhaps not verified in the past 20 years, but the taxon is suspected to still exist in the state.
SNR = Not yet ranked. Sufficient time and effort have not yet been devoted to ranking of this taxon.
SP = Potential for occurrence of the taxon in the state but no occurrences have been documented.
SR = Reported in the state but without persuasive documentation which would provide a basis for either accepting or rejecting the report (e.g., misidentified specimen).
SRF = Reported falsely in the state but the error persists in the literature.
SU= Unrankable. Possibly in peril in the state, but status is uncertain. More information is need.
SX = Believed to be extirpated from the state with little likelihood that it will be rediscovered.
SZ = Not of conservation concern in the state.

Qualifiers are sometimes used in conjunction with the State Ranks described above:

B - Rank of the breeding population in the state.
N - Rank of the non-breeding population in the state.

Global Rank: characterizes the relative rarity or endangerment of the element world-wide.
G1 = Critically imperiled globally
G2 = Imperiled globally
G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range - vulnerable
G4 = Widespread, abundant, and apparently secure globally
G5 = Demonstrably widespread, abundant, and secure globally, though it may be quite rare in parts of its range
GH = Historical occurrences only are known, perhaps not verified in the past 20 years, but the taxon is suspected to still exist somewhere in its former range.
GNR = Not yet ranked. Sufficient time and effort have not yet been devoted to ranking of this taxon.
GU = Unrankable. Possibly in peril range-wide but status uncertain. More information is needed.
GX = Believed to be extinct and there is little likelihood that it will be rediscovered.

Qualifiers are used in conjunction with the Global Ranks described above:
Tn Where n is a number or letter similar to those for Gn ranks, above, but indicating subspecies or variety rank. For example, G3TH indicates a species that is ranked G3 with this subspecies ranked as historic.

SECTION C: Full List of References

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