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Herpetofauna of South Puget Sound Prairie Landscape

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Abstract

Eight species of amphibians and nine species of reptiles are reported to occur in the southern Puget Sound prairies. Of these 17 species, four are associated with prairie and 13 are facultative users of the prairie habitat. The latter species have wide distributions that may cover several habitat types. The four species, reported to be associated with prairies, include the Oregon Spotted Frog, Racer, Coast Gopher Snake, and Western Pond Turtle. These species are believed to be nearly or completely extirpated from the Puget Sound area.

Introduction

Eight species of amphibians and nine species of reptiles (Table 1) are reported to occur in the southern Puget Sound prairies (Cooper and Suckley 1860, Slipp 1940, Johnson 1995, McAllister 1995). Of these 17 species, four are associated with prairie and 13 are facultative users of the prairie habitat. The latter species have wide distributions that may cover several habitat types.

The four species, reported to be associated with prairies, include the Oregon Spotted Frog, Racer, Coast Gopher Snake, and Western Pond Turtle (Slipp 1940, Johnson 1990). These species are believed to be nearly or completely extirpated from the Puget Sound area (McAllister and Leonard 1990, 1991, 1993; Gilbert et al. 1991, Bury 1992, McAllister et al. 1993, Leonard 1995).

In general, the occurrence of other species in prairies appears to be closely related to the availability of surface water and/or forested

habitats in association with the prairie habitat. For instance, the three species of garter snakes are abundant along the edges of prairie ponds during the summer and in certain areas of Oregon oak woodlands in the spring and fall. The use of these areas seems more related to the availability of prey species and overwintering sites than to any particular property of the prairie habitat. The use of the open prairie habitat has been observed for relatively few species.

In this paper we will provide 1) an historical overview of the herpetology of the Puget Trough prairies, 2) discuss apparent changes in the herpetological communities of these prairies, and 3) summarize results of recent herpetological surveys of Puget Trough Prairies

Historical Overview

Since settlement of this region by persons of non-native American ancestry, there has been sporadic amphibian and reptile survey work

conducted on the outwash prairies of the Puget Trough. The published works, museum collection records, and field notes of earlier biologists are especially noteworthy, as they provide the only documentation on the historic distribution and relative abundance of amphibians and reptiles of this region.

The Wilkes Expedition 1841

The earliest scientific work with amphibians and reptiles in the southern Puget Trough was conducted by naturalists of the U.S.

Exploratory (Wilkes) Expedition operating out of Fort Nisqually in 1841. Their specimen records combined with many collected by Cooper, Suckley, and Gibbs of the Northern Route Railroad Survey (while stationed at Fort Steilacoom in 1853 and following) are incorporated in the several volumes of the Railroad Reports (Baird 1859). Subsequently, Cooper and Suckley (1860) reported the Western Pond Turtle as common, both the Racer and the Gopher Snake as found sparingly, and the Western Fence Lizard as not uncommonly found in the area around Fort Steilacoom. □

Baird and Girard 1850s

In the 1850s, Spencer F. Baird and Charles Girard conducted taxonomic works on Pacific Northwest amphibians and reptiles. While neither Baird or Girard ever visited the Washington Territory, they actively promoted the collecting of amphibians and reptiles by others visiting and living in the region (Johnson 1995). As a result of their efforts, Baird and Girard described several new species based on specimens collected at Puget Sound. These include the Western Toad, Western Pond Turtle and the Sharp-tailed Snake in 1852, and the Spotted Frog in 1853 (Baird and Girard 1852).

John W. Slipp

Beginning in the 1920s, John W. Slipp, recorded field observations and made collections of vertebrates, including amphibians and reptiles, in the Spanaway Lake watershed and the Fort Lewis Military Reservation (Ft. Lewis) area, eventually summarized in a manuscript (Slipp 1940). His collection catalogs are on loan to the Pacific Lutheran University Museum (J. Slipp, pers. comm.).

James Slater

Between the 1930s and 1960s, James Slater and his colleagues at the University of Puget Sound (then College of Puget Sound) made collecting trips to the Ft. Lewis, recording in Occasional Papers of the Department of Biology at the College of Puget the presence of Western Pond Turtles at the northeast corner of Fort Lewis (1939). Slater's group also collected Racers (Slater 1963) and Oregon Spotted Frogs (Slater 1955) in the vicinity of Fort Lewis during this period (Alcorn 1935, Slipp 1940, Slater 1955, 1963; Lardie 1963).

Richard L Lardie

A study of the amphibians and reptiles of McChord Air Force Base (McChord AFB) and vicinity was published by Lardie (1963). Between May 1961 and June 1962, Lardie worked at McChord AFB. During that time he saw one Western Pond Turtle (pers. comm.), in addition to Long-toed Salamanders, Northwestern Salamanders, Rough-skinned Newts, Red-legged Frogs, Bullfrogs, Western Terrestrial Garter Snakes, Northwestern Garter Snakes, and Common Garter Snake at localities around the base.

Lardie states (1963, apparently a pers. comm. with Slater) that Slater's 1939 published records of Western Pond Turtles were made at Talb Marsh, on McChord AFB. Citing a personal communication from Slater, Lardie also provides the locations of several records for the Racer near McChord AFB; one at Ponders Corner, just south of the Pierce County road shops and another two miles south of the east entrance to Fort Lewis.

The museum collection records and written works of this period provide a record of the species of amphibians and reptiles that occurred in the Southern Puget Trough between 30 and 150 years ago. Several of the species documented in these historical works are now either extremely rare or have been extirpated from western Washington.

Table 1. Historical records of the Herpetofauna of Southern Puget Trough outwash prairies
C = Common, U = Uncommon, R = Rare, X = Presumed Extirpated.

Species	Selected Sources	Occurance	
		Historical	Current
Northwestern Salamander, <i>Ambystoma gracile</i>	Lardie (1963)	C	C
Long-toed Salamander, <i>Ambystoma macrodactylum</i>	Lardie (1963)	C	C
Rough-skinned Newt, <i>Taricha granulosa</i>	Lardie (1963)	C	C
Western Toad, <i>Bufo boreas</i>	Slater (1955), Slipp (1940)	C	U
Pacific Treefrog, <i>Hyla regilla</i>	Lardie (1963), Slipp (1940)	C	C
Red-legged Frog, <i>Rana aurora</i>	Lardie (1963), Slipp (1940)	C	C
Spotted Frog, <i>Rana pretiosa</i>	Slipp (1940)	U	R
Bullfrog, <i>Rana catesbeiana</i>	Lardie (1963), Slipp (1940)	C	C
Western Pond Turtle, <i>Clemmys marmorata</i>	Slipp (1940)	C	X
Northern Alligator Lizard, <i>Elgaria coerulea</i>	Slipp (1940)	C	C
Western Fence Lizard, <i>Sceloporus occidentalis</i>	Slipp (1940)	C	?
Rubber Boa, <i>Charina bottae</i>	Slipp (1940)	U	U
Racer, <i>Coluber constrictor</i>	Alcorn (1935)	R	X
Gopher Snake, <i>Pituophis catenifer</i>	Cooper & Suckley (1860)	R	X
Western Terrestrial Garter Snake, <i>Thamnophis elegans</i>	Slipp (1940), Lardie (1963)	C	C
Northwestern Garter Snake, <i>Thamnophis ordinoides</i>	Slipp (1940), Lardie (1963)	C	C
Common Garter Snake, <i>Thamnophis sirtalis</i>	Slipp (1940), Lardie (1963)	C	C

Prairie Species of the Puget Trough

Historical accounts of the Oregon Spotted Frog, Western Pond Turtle, Racer and Gopher Snake associated these species with prairie habitats. Approximately 90% of the original native outwash prairies and associated Oregon white oak savannahs that occurred in lowland western Washington, prior to European settlement, have been destroyed by

agriculture or development, converted to forest due to tree invasion after the cessation of fires, or severely degraded by non-native species (e.g. Scotch broom) (Kruckeberg 1991, Hall et al. 1994, Chris Chappell pers. comm.). Species, such as the Racer and Gopher Snake, were reported as rare even before large scale agriculturization and development. To what extent the fragmentation and destruction of

native prairies may have influenced the presumed extirpation of these species is uncertain but must be considered. The following are account summaries of the current information on these four species.

Spotted Frog, *Rana pretiosa*. Slipp (1940) reported this species to be associated with prairie lakes in the Puget Trough. This species has declined throughout its range in Washington (McAllister and Leonard 1990,1991,1993; McAllister et al. 1993.) The last documentation for Spotted Frogs in Pierce County is four specimens □ collected on 24 February 1959 by J. N. Knudsen at Spanaway Pond at 176th Street. A population in the Black River watershed in Thurston County is the only known extant population in the lowlands of either western Washington or Oregon (McAllister et al. 1993, Hayes 1994, Blaustein et al. 1995, Stebbins and Cohen 1995).

Western Pond Turtle, *Clemmys marmorata*. Early accounts of the Western Pond Turtle suggest that it was once fairly common in the area near the Ft. Lewis (Suckley and Cooper 1860). Johnson (1995) reported that the species was common in the area south of Tacoma through the 1920s, but by 1954 it maintained a precarious existence in a once populous area. John Slipp (pers. comm.) recalls seeing up to three individuals at a time at Talb Marsh through the completion of his studies there in 1939, and Lardie (pers. comm.) observed a single individual at Talb in 1962. Slipp (1940, pers. comm.) reported it common at many outwash prairie lakes and streams prior to 1950 and recalls that it was the subject of varmint hunts on Fort Lewis. Recent surveys for this species have yielded no substantiated sightings (Gilbert et al. 1991, Bury et al. 1992, Forrester et al. 1992), none were seen during the McChord AFB survey (Leonard 1995) and none have been observed during Ft. Lewis surveys. This strongly

suggests that this species has either experienced dramatic reductions in range in western Washington or been extirpated. The few Western Pond Turtles recently encountered in the Puget Trough are believed to be the result of release or escape of pets that had been transported from Oregon or California (J. Slipp, K. R. McAllister pers. comm.).

Coast Gopher Snake, *Pituophis catenifer*. The Coast Gopher Snake may have once been closely associated with the outwash prairies and Oregon white oak savannahs in the Puget Trough. Suckley and Cooper (1860) described *P. catenifer* as found sparingly around Fort Steilacoom. Yet, few records for this species exist. McAllister (1995) raised the possibility that the two museum records of the Gopher Snake (United States National Museum) cataloged as having come from Fort Steilacoom and Puget Sound may have been collected elsewhere. However, Johnson (1995) examined both specimens and determined both to be Coast Gopher Snakes (*P. c. catenifer*), not Great Basin Gopher Snakes (*P. c. deserticola*). All extant populations of *P. catenifer* in Washington State occur east of the Cascade Mountains and are of a different taxon, *P. c. deserticola*; therefore, if mislabeling of specimens did occur, these animals must have been collected farther south such as in the Willamette Valley and could not have come from eastern parts of Washington state. The question of whether *Pituophis catenifer catenifer* occurred in the Puget Sound prairies remains unresolved. They have not, however, been reported here since the last century (Johnson 1995, McAllister 1995). The few recent sightings and collections of this species in Thurston and Pierce counties (K.R. McAllister and J. Slipp, pers. comm.) are believed to be the result of animals transported from inland areas.

Racer, *Coluber constrictor*. Prior to the turn of the century, the Racer was reported as found sparingly around Fort Steilacoom (Suckley and Cooper 1860). Racers were collected infrequently in the Puget Trough through the middle part of this century (Alcorn 1935, Slater 1963). The last documented record of a Racer from western Washington was a specimen collected by James Slater in 1963 in Thurston County near McKenna. In the western United States, this species favors open habitats such as meadows and prairies (Stebbins 1985). The locations of historic records (McAllister 1995, Slater 1963) indicate that this snake was closely associated with outwash prairies and Oregon white oak savannahs in the Puget Trough. It appears unlikely that populations of the Racer remain in western Washington, possibly due to the serious losses and fragmentation of outwash prairie and savannah habitats.

Recent Species Accounts of Puget Trough Outwash Prairie Herpetofauna

The following species accounts provide brief summaries of the distribution of the herpetofauna found in Puget Trough outwash prairies. The following species are facultative users of the prairie habitat. As stated in the introduction, the use of prairies by these species appears to be opportunistic, based on the availability of prey species and of breeding, thermoregulatory and hibernation sites. The following accounts are based on the authors' field studies conducted at McChord Air Force Base (Leonard 1995) and Fort Lewis Military Reservation (Hallock and Leonard 1997) and from available literature.

Western Long-toed Salamander, *Ambystoma macrodactylum*. This is arguably the most abundant and widespread amphibian in and adjacent to prairies in the Puget Trough (Leonard 1995, unpublished data). Adults are secretive and seldom seen. Results

of aquatic funnel trapping in breeding ponds has shown them to be abundant in grasslands at McChord AFB (Leonard 1995) and Fort Lewis (Mike Adams pers. comm.). Results of drift fence studies have shown that adults and juveniles are common in grasslands and to a lesser extent forests adjacent to both seasonal and permanent wetlands (Leonard 1995). At Ft. Lewis egg masses and larvae have been found in seasonal wetlands (puddles) in Weir (Tenalquot) Prairie and adults have been found in oak woodlands adjacent to Nisqually Lake in the Ninety-first Division Prairie.

Northwestern Salamander, *Ambystoma gracile*. This is primarily a forest-dwelling species, but is sometimes found in prairie wetlands adjacent to coniferous forests. None have been found in the open prairie. More investigation is needed to determine if this species, especially neotenic forms, utilizes prairie lakes that are isolated from forests. Both terrestrial and neotenic forms have been observed at sites at McChord AFB (Leonard 1995) and Fort Lewis (Hallock and Leonard 1997).

Rough-skinned Newt, *Taricha granulosa*. This species has been found in prairie ponds and oak woodlands along prairie edges. None have been observed in open prairie habitats. Recent aquatic funnel trapping results have shown that they may be numerous in shallow lakes and ponds surrounded by mixed Douglas-fir/Oregon white oak forests in the vicinity of prairies. Twenty-two traps set for one day yielded over 100 male newts from one small pond at Fort Lewis (Hallock and Leonard 1997).

Western Toad, *Bufo boreas*. In recent years, the Western Toad has only been found in the Rainier Training Area of Fort Lewis in Thurston County. It is most commonly encountered in forested areas near wetlands,

but juvenile toads have been encountered in Johnson and Weir prairies, especially in puddles. Adult toads have been sighted twice during night surveys in Weir Prairie. Ruth Milner (Wildlife biologist, WDF&W, pers. comm.) reported large numbers of newly metamorphosed toads at Nisqually Lake in the Ninety-first Division Prairie in the late 1980's. Due to access restrictions of this area (a.k.a. Central Impact Area) it was not possible to adequately survey for toads to confirm their current status. No toads were found during two surveys conducted in April of 1996 and 1997.

The Western Toad appears to have undergone a significant reduction in range in the Puget Trough (Leonard 1995). Lardie (1963) reported them in Pierce County, a rather common inhabitant of fields, woods, and along bodies of water. Slipp (1940) reported them as common in many places around the Tacoma area. Slater (1955) lists a collection locality for the Western Toad as Spanaway Park, on Spanaway Lake approximately one-half mile east of McChord AFB. John Slipp (pers. comm.) has reported a sharp decline of this species in the lowlands of Pierce County over the last twenty years. Recent amphibian surveys at Fort Lewis (Hallock and Leonard 1997, Mike Adams and Scott Swarts pers. comm.) have revealed only one breeding population of Western Toads. A survey of the herpetofauna of McChord AFB between 1994-95 did not detect the species, though all suitable breeding sites were surveyed (Leonard 1995). Other amphibian surveys (McAllister et al. 1993, McAllister and Leonard 1990, 1991, 1993, Slipp pers. comm.) suggest that the range of this species has been reduced throughout much of the lowlands of western Washington.

Pacific Treefrog, *Hyla regilla*. The eggs and larvae of this common frog have been found in small seasonal wetlands (e.g. puddles) in

prairies, as well as, in ponds and lakes of prairies. Juveniles and adults are often found in prairies (and other habitats) during the fall, far from any potential breeding ponds. The males of this species call throughout the year. The calls have been recorded from many locations at Thirteenth Division Prairie and Ninety-first Division Prairie at Ft. Lewis. At Thirteenth Division Prairie, they have been heard calling from the forested areas on the edge of the prairie. At the north end of Ninety-first Division Prairie the frogs call from the the Oregon oak woodlands on the prairie edge. Tadpoles have been found in Nisqually Lake, in small ponds in the southwestern area of Ninety-first Division Prairie, and in a seasonal wetland at Johnson Prairie.

Red-legged Frog, *Rana aurora*. The adults are not commonly found in prairie habitats, but may be abundant in neighboring forested habitats with suitable breeding sites. Drift fences set up in disturbed grasslands/Oregon white oak habitats at McChord AFB did capture juveniles. Adults have been found in several wetlands and lakes in prairie habitats (at Fort Lewis) more than 0.5 km from the nearest conifer forest habitat. Tadpoles were found in ponds, isolated from forested habitat, in the southwestern area of Ninety-first Division Prairie (Ft. Lewis) in 1996 (Hallock and Leonard 1997). Juveniles have been found in seasonal wetlands (e.g. puddles) at Johnson Prairie (Ft. Lewis).

Bullfrog, *Rana catesbeiana*. Bullfrogs are most commonly found around permanent slow-moving water bodies (Nussbaum et al. 1983). The Bullfrog is common in almost all lentic aquatic habitats in Puget Trough prairies. They are widespread and common at Fort Lewis and McChord AFB. At Ft. Lewis tadpoles have been found in the lake (Nisqually) and ponds in the Ninety-first

Division Prairie and in Muck Creek at Thirteenth Division Prairie.

Western Terrestrial Garter Snake,

Thamnophis elegans. A study of a garter snake assemblage, of the same species as encountered in the lowland Puget Sound, on Vancouver Island (Gregory 1984a as cited in Rossman et al. 1996) found that the Western Terrestrial Garter Snake was more abundant than the other species in habitats with no water. This is consistent with observations at Ft. Lewis where this species appears to utilize prairie habitats without the direct association of wetlands, forests, or special habitat features (e.g. large woody debris, borrow pits). Adults have been found in both Thirteenth Division Prairie and the Ninety-first Division Prairie (Fort Lewis) in grassland habitats. Oregon white oak woodlands on the edges of prairies appear to be important habitats for neonates and overwintering sites.

Northwestern Garter Snake, *Thamnophis ordinoides*. This species is often associated with meadows, brushy areas, and forest edges (Nussbaum et al. 1983), as well as disturbed areas (pers. obs.). Spring and fall observations of snakes at a high knoll above the Muck Creek floodplain in a patch of Oregon white oak (Thirteenth Division Prairie, Ft. Lewis) suggest that Northwestern and Western Terrestrial Garter Snakes overwinter together at this site (Hallock and Leonard 1997). They were also found in Weir and Ninety-first Division Prairies (Ft. Lewis), primarily in patches of Oregon white oak.

Common Garter Snake, *Thamnophis sirtalis*. In the Lowland Puget Sound, this garter snake is found primarily in or near areas of standing water (Storm and Leonard 1995). It has been found in upland forests and grassland habitats at Fort Lewis and McChord

AFB. They were found to be common in the vicinity of Nisqually Lake (Ninety-first Division Prairie) during a mid-May survey. They have also been found in the oak woodlands at the northern end of Ninety-first Division Prairie in spring and fall, presumably near overwintering sites.

Western Fence Lizard, *Sceloporus*

occidentalis. Historic reports of this species being found in association with prairies appear to be in error. Nearly all western Washington populations of the Western Fence Lizard are closely associated with Puget Sound and Hood Canal shoreline environments. Extant populations do occur at Chambers Creek (north of Steilacoom), Anderson Island, Ketron Island, McNeil Island, the Tacoma Narrows Bridge and Point Defiance Park (K. R. McAllister pers. comm., pers obs.). Reports of blue-bellies continue to be made, but appear to be misidentifications of Northern Alligator Lizards.

Northern Alligator Lizard, *Elgaria*

coerulea. This lizard inhabits forest edges and clearings, but can also be found in grasslands. It occurs under objects such as rocks and logs (Nussbaum et. al. 1983) and is rarely found in the open. They have been found at Ninety-first Division Prairie, Weir Prairie and Johnson Prairie at Ft. Lewis (Hallock and Leonard 1997). The lizards found at Ninety-first Division Prairie were in oak forested woodland near Nisqually Lake. Both were under a log. This lizard is able to operate at cooler temperatures than other lizards in the region (Storm and Leonard 1995) and may prefer cooler habitats. The presence of appropriate cover, such as logs and rocks, may be an important determining factor of their ability to tolerate open prairie habitat. None were found on McChord AFB (Leonard 1995).

Rubber Boa. Rubber boas are reported to frequent a variety of habitats including grasslands (Stebbins 1985). They have been recorded recently at the Bald Hills Natural Area Preserve (Joanne Schuett-Hames, pers comm., pers obs.). The shed skin of an adult was found under a rock outcrop on the prairie balds (pers. obs.). The balds are upland Idaho fescue (*Festuca idahoensis*) dominated grasslands that occur in a mosaic with Oregon white oak (*Quercus garryana*) savannah. Two rubber boas have recently been reported from forested habitats at Fort Lewis (Jim Stevenson, pers. comm.) but have not been found in prairie habitats. None were found at McChord AFB (Leonard 1995).

Literature Cited:

- Alcorn, G. D. 1935. The western yellow-bellied racer in western Washington. *Copeia* (2):135.
- Baird, S.F. and C. Girard. 1852. Description of some new species of reptiles collected by the U.S. exploring Expedition under the command of Captain Charles Wildes. *U.S.N. Proc. Acad. Nat. Sci. Phila.*, 6:174-177.
- Baird, S. F. 1859. Reptiles. *Pacific Railroad Report* (10)3:9-16.
- Blaustein, A.R., J. J. Beatty, D. H. Olson, and R. M. Storm. 1995. The biology of amphibians and reptiles of old-growth forests in the Pacific Northwest. *Gen. Tech. Rep. PNW-GTR-337*. Portland OR:U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 98 p.
- Bury, R.B. 1992. Fort Lewis biodiversity study: western pond turtle and herpetofauna study. National Ecology Research, U.S. Fish and Wildlife Service, USDA Forest Service, PNW Research Station, Olympia WA. 27 p.
- Cooper, J. G. and G. Suckley. 1860. Report upon the reptiles collected on the survey. *United States Pacific R.R. Explor. & Surv. 47th parallel*. Vol. 12, book 2, pt. 3, No. 4:292-306, pls.12-16, 19-22, 29-31.
- Forrester, B. And R. Storre. 1992. Western pond turtle survey: Fort Lewis, Washington. Unpublished report for Depart. Of Army. David Evans Assoc., Bellevue, WA. 19 p.
- Gilbert, B. T. Williams and J. Bottorff. 1991. 1991 spotted frog survey Fort Lewis Military Reservation, Pierce County, Washington. U.S. Fish and Wildlife Service, Olympia, WA. 5 p.
- Hall, H. L., R. C. Crawford and B. Stevens. 1994. Regional inventory of prairies in the Southern Puget Trough: Phase 1. Washington Natural Heritage Program. unpublished report.
- Hallock, L.A. and W.P. Leonard. 1997. Herpetofauna of the Fort Lewis Military Reservation, Pierce and Thurston Counties, Washington. Washington Natural Heritage Program. 62 p.
- Hayes, M. P. 1994. The spotted frog (*Rana pretiosa*) in western Oregon. Oregon Department of Fish and Wildlife Diversity Program. 30 p.
- Johnson, M. L. 1995 (1954). Reptiles of the State of Washington. *Northwest Fauna* 3:3-80.
- Kruckeberg, A. 1991. *The Natural History of Puget Sound Country*. Seattle: University of Washington Press. 468 p.
- Lardie, R. L. 1963. Checklist of the Amphibians and reptiles of Pierce County, Washington, with special reference to those

found on McChord Air Force Base. *Tricor*, 3(1):10-17.

Leonard, W. P. 1995. Survey of amphibians and reptiles at McChord Air Force Base, Pierce County, Washington. Washington Natural Heritage Program. 50 p.

McAllister, K. R. 1995. Distribution of amphibians and reptiles in Washington State. *Northwest Fauna* 3:81-112.

McAllister, K. M. and W. P. Leonard. 1990. 1989 progress report past distribution and current status of the spotted frog in western Washington. Wash. Dept. of Wildlife. 16 p.

_____ and _____. 1991. 1990 progress report past distribution and current status of the spotted frog in western Washington. Wash. Dept. of Wildlife. 21 p.

_____ and _____. 1993. Searches for spotted frogs (*Rana pretiosa*) and other amphibians on National Forest lands in Washington. Wash. Dept. of Wildlife. 47 p. + appendices.

McAllister, K. M., W. P. Leonard, and R. M. Storm. 1993. Spotted frog (*Rana pretiosa*) surveys in the Puget Trough of Washington, 1989-1991. *Northwestern Naturalist*. 74:10-15.

Nussbaum, R.A., E.D. Brodie and R.M. Storm. 1983. *Amphibians and Reptiles of the Pacific Northwest*. Moscow ID: University Press of Idaho. 332 p.

Rossman, D.A., N.B. Ford and R.A. Seigel. 1996. *The Garter Snakes: Evolution and Ecology*. Animal Natural History Series. University of Oklahoma Press. 331 p.

Slater, J. R. 1939. *Clemmys marmorata* in the State of Washington. College of Puget Sound Occasional Paper 5:32.

_____. 1955. Distribution of Washington amphibians. College of Puget Sound Occasional Paper 16:122-154.

_____. 1963. Distribution of Washington reptiles. College of Puget Sound Occasional Paper 24:212-242.

Slipp, J. W. 1940. The mammals, reptiles, and freshwater fishes of the Tacoma area. Unpublished thesis submitted to College of Puget Sound. 50 p.

Stebbins, R. C. 1985. *Western Reptiles and Amphibians*. Peterson Field Guild Series. Houghtons Mifflin Company, Boston. 336 p.

Stebbins, R. C. and N. Cohen. 1995. *A Natural History of Amphibians*. Princeton: Princeton University Press. 316 p.

Storm, R.M. and W.P. Leonard (eds.). 1995. *Reptiles of Washington and Oregon*. Seattle, WA: Seattle Audubon Society. 176 p.

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