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Repeated Surveys of Pond-Breeding Amphibians in Northern Idaho and Northeastern Washington, USA

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Abstract.—**Landscape-level occurrence and trend data are needed for effective amphibian conservation and substantial data gaps exist for pond-breeding amphibians in the Idaho Panhandle and northeastern Washington, USA. In 2018 and 2019 we conducted dip-net surveys for pond-breeding amphibians across a 21,775 km^2 study area at 124 ponds which we first surveyed five years earlier in 2013 and 2014. We documented changes in the number of sites where we observed breeding activity for each sampling session of Long-toed Salamanders (*Ambystoma macrodactylum*; from 51 to 52), Columbia Spotted Frogs (*Rana luteiventris*; from 48 to 59), Sierran Tree Frogs (*Hyliola sierra*; from 12 to 15), and Western Toads (*Anaxyrus boreas*; from 16 to 8). We detected no change in number of non-native American Bullfrog (*Lithobates catesbeianus*) breeding sites (n = 5 both surveys) although finer scale surveys have documented an American Bullfrog expansion in the northern portion of our study area. Our data concur with current conservation assessments of Long-toed Salamanders, Columbia Spotted Frogs, and Sierran Tree Frogs which are not currently considered at risk species in our study area. Our data also concur with the current conservation assessments of Western Toads as a Species of Greatest Conservation Need in Idaho and Washington. During the second sampling session, we detected Western Toad breeding activity at only 50% of sites (n = 8) of which they were detected during the first sampling session (n = 16). During both surveys, the majority (n = 14, 77%) of Western Toad breeding detections occurred in the relatively cooler northwestern portion of the study area. We present these results as a second data point for long-term amphibian monitoring in our study area.**

Key Words.—American Bullfrog; Columbia Spotted Frog; Long-toed Salamander; Sierran Tree Frog; Western Toad

Introduction

Amphibian monitoring programs are important not only for status assessment of individual species (Cushman 2006) but also because amphibians are important ecological indicators of ecosystem change (Meek 2021). Long-term monitoring datasets are, however, rare in the literature due to many factors including the length of time required to obtain power appropriate for statistical inference (Meek 2021). Data deficiency of amphibian populations is a global problem, and the Pacific Northwest of North America is no exception (Olson et al. 2009).

As a starting point to fill these data gaps, in 2013 and 2014, we conducted pond-breeding amphibian surveys at 433 ponds across a 21,775-km^2 portion of the Idaho Panhandle and northeastern Washington, USA (Lucid et al. 2020). During the 2013–2014 surveys, we determined four species of native pond-breeding amphibians are extant in the Idaho Panhandle and northeastern Washington, USA: (1) Columbia Spotted Frogs (*Rana luteiventris*); (2) Long-toed Salamanders (*Ambystoma macrodactylum*); (3) Sierran Tree Frogs (*Hyliola sierra*; Duellman et. al. 2016); and (4) Western Toads (*Anaxyrus boreas*; Lucid et al. 2020). We also detected non-native American Bullfrogs (*Lithobates catesbeianus*). Five years later, we conducted a second survey at a subset of 124 of the original 433 ponds. The objective was to document observations of amphibian species across our study area and report differences in the number and locality of ponds where we detected amphibian presence and breeding.

Materials and Methods

Study site.—Our study area consists of 21,775 km^2 centered on the Idaho Panhandle and includes adjacent northeastern Washington, USA (Fig. 1). We divided our study area into sections that comprised portions of each of five mountain ranges (Selkirk, Purcell, West Cabinet, Coeur d' Alene, and Saint Joe mountains) along with portions of their adjacent valleys (Fig. 1). Elevations range from 530–2,350 m elevation. The climate is characterized by mild summers and wet, moderately cold

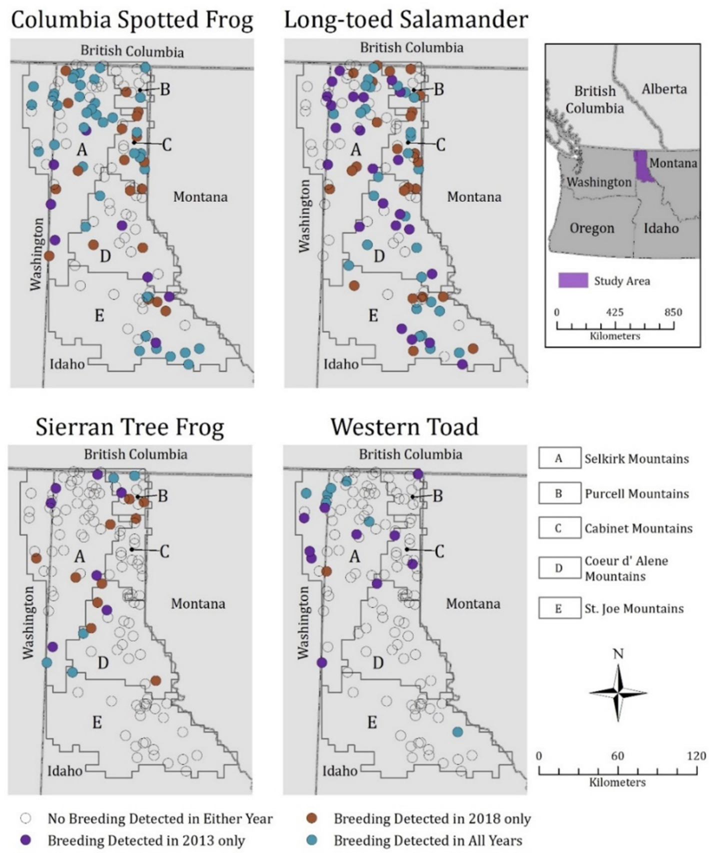

Figure 1. The study area in northern Idaho and northeastern Washington, USA, and survey sites where breeding activity of each species was detected. We surveyed 124 ponds in 2013 and 2018. The five sections are named for the mountain ranges contained within them. Species are Columbia Spotted Frogs (*Rana luteiventris*), Long-toed Salamanders (*Ambystoma macrodactylum*), Sierran Tree Frogs (*Hyliola sierra*), and Western Toads (*Anaxyrus boreas*). American Bullfrog (*Lithobates catesbeianus*) detection locations are not shown because there was no change between survey sessions but can be viewed in Lucid et al. (2020).

winters (Lucid et al. 2021b). Modeling predicts a future climate of hotter and drier summers with warmer and wetter winters (Gaines et al. 2021). This heavily forested area is dominated by a diverse mix of conifer species and portions of each mountain range are classified as Inland Temperate Rainforest (DellaSala et al. 2011).

Sampling design and site selection.—For the initial 2013 and 2014 survey, we overlaid a 5 × 5 km grid over our study area that we used along with a variety of selection methods to select a stratified sample of 433 lentic water bodies, which were representative of our study area (Lucid et al. 2020). In our original selection, we prioritized surveying small (≤ 500 m width) lentic water bodies. We attempted to survey no more than one wetland in each 5 × 5 km grid cell. In grid cells where lentic water bodies of this size were not available and a larger lentic water body was available, we surveyed a 500-m shoreline section of the latter. Henceforth in this paper we refer to all survey sites as ponds.

Because we lacked resources to re-survey all 433 sites, we selected a subset of 124 ponds. Western Toads are listed as Species of Greatest Conservation Need (SGCN) in both Idaho (Idaho Department of Fish and Game [IDFG] 2017) and Washington (Washington Department of Fish and Wildlife [WDFW] 2015) while the other three extant native species are not listed as SGCN in either state. We, therefore, intentionally selected the 21 sites where we detected breeding activity (n = 16) or individual Western Toads (n = 5) in 2013 and 2014. We defined breeding activity as detection of eggs, larvae, or recent metamorphs. We used the RANDOM function in Excel (Microsoft Corporation, Redmond, Washington, USA) to select the remaining 102 ponds. This resulted in 124 ponds spatially stratified across the Selkirk (n = 50), Cabinet (n = 19), Purcell (n = 11), Coeur d' Alene (n = 19), and Saint Joe (n = 25) study area sections (Fig. 1). We first surveyed the 124 ponds in 2013 (n = 115) or 2014 (n = 9; Lucid et al. 2020) and detected zero (n = 36), one (n = 50), two (n = 32), three (n = 5), or four (n = 1) amphibian species at each pond.

Field methods.—We conducted all surveys between 26 May and 5 September 2013, 1 May and 12 July 2014, 7 June and 31 August 2018, and on 15 August 2019. In 2018, we re-surveyed all but one pond. The pond surveyed in 2019 was a high priority 2013 reproduction site for Western Toads that was inaccessible in 2018 due to an active forest fire. Because most surveys occurred in 2013 and 2018, and for simplicity, we henceforth refer to each survey period as 2013 and 2018.

We used a D-frame dip net 30.5 cm deep and 0.48 cm mesh (Forestry Suppliers, Jackson, Mississippi, USA) to survey all microhabitats to a depth of 1 m along the shoreline of each pond as described in detail in Lucid et al. (2020). A single surveyor dip-netted the entire shoreline of each pond one time during each survey. We estimated numbers of each species captured or visually observed to the nearest 10, 100, or 1,000 individuals (number of individuals detected are not reported within the text of this manuscript but are reported in the Supplemental Information file). We attempted to re-survey ponds within 45 d of the 2013 calendar date and the mean difference in the 2013 and 2018 survey date was 3.5 d. Due to personnel and field constraints, 2018 wildfire closures in particular, we were forced to survey some ponds before (n = 11) or after (n = 13) the 45 d cutoff (see the Supplemental Information file for details). All 2013 Western Toad sites were re-surveyed within the 45 d window.

Results

We detected breeding activity of native amphibian species at the same number of ponds in 2013 (n = 85) and in 2018 (n = 85), although we found differences in the detections on a per species basis. We detected breeding activity of Long-toed Salamanders at a similar number of ponds in 2013 (n = 51) and 2018 (n = 52), although we did not detect breeding activity at the same ponds in 2013 and 2018: 23 sites that were positive in 2013 were negative in 2018 and 24 sites that were negative in 2013 were positive in 2018 (Table 1, Fig. 1). We detected breeding activity at more ponds in 2018 than 2013 for both Columbia Spotted Frogs (from 48 to 59) and Sierran Tree Frogs (from 12 to 15) but detected fewer ponds with breeding activity of Western Toads (from 16 to eight). Seven of the eight ponds at which we detected Western Toad breeding activity in 2018 had previously had breeding activity detected in 2013. Only one new Western Toad breeding pond was detected in 2018 (Fig. 1). We detected no change in number of breeding sites of the non-native American Bullfrog (n = 5 both surveys). During both surveys, the majority (n = 14, 77%) of Western Toad breeding detections occurred in Study Area A, the northern Selkirk Mountains (Fig. 1). Detection of any life stage (including non-breeding) of amphibians followed similar patterns as the breeding activity detections (Table 2).

Discussion

Amphibian populations fluctuate over time and more than two survey sessions are necessary to reliably document trends (Storfer 2003). Therefore, we did not attempt to make statistical inference from the two sampling efforts occurring 5 y apart. Additionally, without accounting for the observation process and the probability of detection (Mazerolle et al. 2007), our sampling design is left lacking key data needed for some types of analyses such as Occupancy Modeling (Yackulic et al. 2013). Using similar survey methodology, however, Hossack (2017) demonstrated a nearly identical suite of species have comparable detection probabilities: Long-toed Salamanders detection of probability (P) = 0.787; Western Toad, P = 0.871; Columbian Spotted Frog, P = 0.800; and Pacific Treefrog (*Hyliola regilla*), P = 0.875.

Table 1. Detection of breeding activity (i.e., eggs, larvae, or metamorphs present) of pond-breeding amphibian species at 124 ponds surveyed in both 2013 and 2018 across the study area in northern Idaho and northeastern Washington, USA. Species codes are: Columbia Spotted Frog (*Rana luteiventris*; RALU), Long-toed Salamander (*Ambystoma macrodactylum*; AMMA), Sierran Tree Frog (*Hyliola sierra*; HYSI), Western Toad (*Anaxyrus boreas*; ANBO), and American Bullfrog (*Lithobates catesbeianus*; LICA).

	Breeding Detected n (%)	
Species	2013	2018
LILU	48 (39%)	59 (48%)
AMMA	51 (41%)	52 (42%)
HYSI	12 (10%)	15 (12%)
ANBO	16 (13%)	8 (6%)
LICA	5 (4%)	5 (4%)

Table 2. Detection of any life stage of pond-breeding amphibian species at 124 ponds surveyed in both 2013 and 2018 across the study area in northern Idaho and northeastern Washington, USA. Species codes are: Columbia Spotted Frog (*Rana luteiventris*; RALU), Long-toed Salamander (*Ambystoma macrodactylum*; AMMA), Sierran Tree Frog (*Hyliola sierra*; HYSI), Western Toad (*Anaxyrus boreas*; ANBO), and American Bullfrog (*Lithobates catesbeianus*; LICA). The first four of these species are native to the study area.

	Species Detected n (%)	
Species	2013	2018
LILU	81 (65%)	86 (69%)
AMMA	53 (43%)	54 (44%)
HYSI	14 (11%)	18 (15%)
ANBO	21 (17%)	14 (11%)
LICA	6 (5%)	8 (6%)

We used the same survey methodology at each site during each survey period to standardize our results between surveys. Our data should be viewed as a baseline dataset from which only further in-depth study of our target species would determine their true status.

While we did not make statistical inference from our two sampling sessions, we frame our results in the broader context of what is known about our study species both within their distributions and our study area. Our data corroborate current conservation assessments of Columbia Spotted Frog (G4: Globally Apparently Secure, ID S4: Idaho Apparently Secure, WA S4: Washington Apparently Secure) and Long-toed Salamanders (G5: Globally Secure, ID S5: Idaho Secure, WA S5: Washington Secure), which are both considered to be relatively stable in our study area (Olson et al. 2009; WDFW 2015; IDFG 2017; https://explorer.natureserve.org/). Sierran Tree Frogs were re-classified too recently (Duellman et. Al. 2016) to have undergone conservation status review and our data are not suggestive of an immediate need for designation as a species of concern.

Although these species are common and appear stable, like most amphibian populations, they are subject to multiple threats and vulnerable to local declines. For example, in other portions of their range, Columbia Spotted Frog populations are declining both at landscape (Pilliod and Scherer 2015) and local (Patla and Peterson 2022) scales. Across our study area, the fungal pathogen *Batrachochytrium dendrobatidis* (*Bd*), was detected on 65% of 399 Columbia Spotted Frogs tested in 2013 and 2014 (Lucid et al. 2016; Phillip Campos, unpubl. data). *Bd* zoospore counts were relatively low across samples, and it is unknown if Columbia Spotted Frogs are coping with the pathogen or if future climatic conditions may make populations more vulnerable to chytrid disease (Lucid et al. 2016; Phillip Campos, unpubl. data).

Western Toads (G5, ID S2: Idaho Imperiled, WA S3: Washington Imperiled) are considered to be at risk in our study area (WDFW 2015; IDFG 2017; https://explorer.natureserve.org/). Toads in the genus *Anaxyrus* have experienced widespread declines across North America (U.S. Fish and Wildlife Service 2017; Franklin et al. 2018), landscapes (Hossack 2017; Ray et al. 2022), and in local populations (Slough and DeBruyn 2018). Rare species, specifically Western Toads, sometimes require unique monitoring approaches that are best informed by past work (Ray et al. 2022) for a variety of reasons including that they can be disturbance breeders (Bartelt et al. 2004) and sometimes do not breed every year (Muths et al. 2010). Lucid et al. (2021a) found no evidence of geographically based genetic structuring within the study area and the majority of Western Toad breeding detections (n = 14, 77%) occurred in Study Area A, which has a high concentration of cool-air microclimate refugia (Lucid et al. 2021b). Subsequent work should prioritize population monitoring tailored to Western Toads and explore if climate change impacts Western Toad demography.

Our surveys did not detect a change in sites occupied by American Bullfrogs (G5, Idaho Exotic, Washington Exotic; https://explorer.natureserve.org/); however, our initial 2013 surveys included the first verifiable detection of American Bullfrogs in Boundary, County, Idaho (https://explorer.natureserve.org/), approximately 25 km from the last known extant Northern Leopard Frog (*Lithobates pipiens*) population in British Columbia, Canada. This detection initiated an international collaborative to monitor and control invasive American Bullfrog expansion into British Columbia (Swartz and Lucid 2017; Lucid et al. 2020; Fraser et al. 2021), which is why intensified monitoring occurs in this portion of the study area.

Amphibian populations can change rapidly as did Northern Leopard Frogs in our study area. This species was common in our study area and adjacent British Columbia until the 1970s (Committee on the Status of Endangered Wildlife in Canada [COSEWIC] 2000). During the mid to late 1970s populations declined severely over a 1–5-y period (COSEWIC 2000) leaving the species extirpated from our study area (Lucid et al. 2020) and nearly extirpated in British Columbia (COSEWIC 2000). This underscores the importance of amphibian monitoring programs at the landscape level (Storfer 2003) as the common species of today may not be the common species of tomorrow.

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Literature Cited

Bartelt, P.E., C.R. Peterson, and R.W. Klaver. 2004. Sexual differences in the post-breeding movements and habitats selected by Western Toads (*Bufo boreas*) in southeastern Idaho. Herpetologica 60:455–467.

Cushman, S.A. 2006. Effects of habitat loss and fragmentation on amphibians: a review and prospectus. Biological Conservation 128:231–240.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2000. COSEWIC assessment and update status report on the Northern Leopard Frog *Rana pipiens* (Southern Mountain and Prairie population) in Canada. Committee on the Status of

Endangered Wildlife in Canada, Ottawa, Ontario, Canada. 69 p.

DellaSala, D.A., P. Alaback, L. Craighead, T. Goward, P.C. Paquet, and T. Spribille. 2011. Temperate and Boreal Rainforests of inland northwestern North America. Pp. 82–110 *In* Temperate and Boreal Rainforests of the World. DellaSala, D.A. (Ed.). Island Press, Washington, D.C., USA.

Duellman, W.E., A.B. Marion, and S.B. Hedges. 2016. Phylogenetics, classification, and biogeography of the treefrogs (Amphibia: Anura: Arboranae). Zootaxa 4104:1–109.

Franklin, T.W., J.C. Dysthe, M. Golden, K.S. McKelvey, B.R. Hossack, K.J. Carim, C. Tait, M.K. Young, and M.K. Schwartz. 2018. Inferring presence of the Western Toad (*Anaxyrus boras*) species complex using environmental DNA. Global Ecology and Conservation 15:1–9. https://doi.org/10.1016/j.gecco.2018.e00438.

Fraser, K., M. Morrison, and E. Bates. 2021. Northern Leopard Frog Preservation - American Bullfrog Control (COL-F21-W-3258). Centrail Kootenay Invasive Species Society, Nelson, British Columbian, Canada.

Gaines, W.L., P.F. Hessburg, G.H. Aplet, P. Henson, S.J. Prichard, G.M. Jones, D.J. Isaak, and C. Vynne. 2022. Climate change and forest management on federal lands in the Pacific Northwest, USA: managing for dynamic landscapes. Forest Ecology and Management 504:119794. https://doi.org/10.1016/j.foreco.2021.119794.

Hossack, B.R. 2017. Amphibian dynamics in constructed ponds on a wildlife refuge: developing expected responses to hydrological restoration. Hydrobiologia 790:23–33.

Idaho Department of Fish and Game (IDFG). 2017. State Wildlife Action Plan. Idaho Department of Fish and Game, Boise, Idaho, USA. 597 p.

Lucid, M.K., S. Ehlers, L. Robinson, and J. Sullivan. 2021a. Genetic structure not detected in northern Idaho and northeast Washington Western Toad (*Anaxyrus boreas*) populations. Northwestern Naturalist 102:89–93.

Lucid, M.K., L. Robinson, and S. Ehlers. 2016. Multispecies Baseline Initiative project report: 2010-2014. Idaho Department of Fish and Game. Coeur d'Alene, Idaho, USA. 443 p.

Lucid, M.K., L. Robinson, A.C. Gygli, J.O. Neider, A. DeLima, and S. Ehlers. 2020. Status of pond-breeding amphibians in northern Idaho and northeastern Washington, USA. Herpetological Conservation and Biology 15:526–535.

Lucid, M.K., H. Y. Wan, S. Ehlers, L. Robinson, L.K. Svancara, A. Shirk, and S. Cushman. 2021b. Land snail microclimate niches identify suitable areas for climate refugia management on a montane landscape. Ecological Indicators 129:107885. https://doi.org/10.1016/j.ecolind.2021.107885.

Mazerolle, M.J., L.L. Bailey, W.L. Kendall, J.A. Royle, S.J. Converse, and J.D Nichols. 2007. Making great leaps forward: accounting for detectability in herpetological field studies. Journal of Herpetology 41:672–689.

Meek, R. 2021. Population trends of four species of amphibians in western France; results from a 15 year time series derived from road mortality counts. Acta Oecologica 110:1–13. https://doi.org/10.1016/j.actao.2021.103713.

Muths, E., R.D. Scherer, and B.A. Lambert. 2010. Unbiased survival estimates and evidence for skipped breeding opportunities in females. Methods in Ecology and Evolution 1:123–130.

Olson, D.H., D.T. Ashton, B.A. Bancroft, A.R. Blaustein, W. Bosworth, R.B. Bury, P.S. Corn, W.C. Gilgert, P. Govindarajulu, L. Hallock, et al. 2009. Herpetological conservation in northwestern North America. Northwestern Naturalist 90:61–96.

Patla, D.A., and C.R. Peterson. 2022. The slow decline of a Columbia Spotted Frog population in Yellowstone National Park: a cautionary tale from a developed zone within a large protected area. Ecological Indicators 136:1-11. https://doi.org/10.1016/j.ecolind.2022.108606.

Pilliod, D.S., and R.D. Scherer. 2015. Managing habitat to slow or reverse populations declines of the Columbia Spotted Frog in the northern Great Basin. Journal of Wildlife Management 79:579–590.

Ray, A.M., B.R. Hossack, W.R. Gould, D.A. Patla, S.F. Spear, R.W. Klaver, P.E. Bartelt, D.P. Thoma, K.L. Legg, R. Daley, and P.S. Corn. 2022. Multispecies amphibian monitoring across a protected landscape: critical reflections on 15 years of wetland monitoring in Grant Teton and Yellowstone national parks. Ecological Indicators 135:1-16. https://doi.org/10.1016/j.ecolind.2021.108519.

Slough, B.G., and A. DeBruyn. 2018. The observed decline of Western Toads (*Anaxyrus boreas*) over several decades at a novel winter breeding stie. Canadian Field-Naturalist 132:53–57.

Storfer, A. 2003. Amphibian declines: future directions. Diversity and Distributions 9:151–163.

Swartz, L., and M.K. Lucid. 2018. Distribution of native pond breeding amphibians and potential threat mitigation on and adjacent to Boundary-Smith Creek Wildlife Management Area. Idaho Department of Fish and Game, Coeur d'Alene, Idaho, USA. 27 p.

U.S. Fish and Wildlife Service (USFWS). 2017. Endangered and threated wildlife and plants; 12-month finding on petitions to list 25 species as endangered or threated species. Federal Register 82(2017):46618–46645.

Washington Department of Fish and Wildlife (WDFW). 2015. Washington State Wildlife Action Plan. Washington Department of Fish and Wildlife, Olympia, Washington, USA. 523 p.

Yackulic, C.B., R. Chandler, E.F. Zipkin, J.A. Royle, J.D. Nichols, E.H. Grant, and S. Veran. 2013. Presence-only modelling using MAXWNT: when can we trust the inferences? Methods in Ecology and Evolution 4:236–243.

Supplemental Information: http://www.herpconbio.org/Volume_17/Issue_3/Lucid_etal_2022_Suppl

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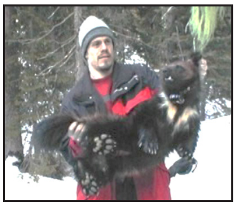

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