

Arizona toad

Anaxyrus microscaphus

WAP 2012 species because of declining trend and hybridization of this highly fragmented species.



Agency Status	
NV Natural Heritage	G3G4S2
USFWS	No Status
CCVI	Presumed Stable

TREND: Declining, but the rate of decline is unknown. Stebbins (2003) estimates that this species has disappeared from 75% of its historic range.

DISTRIBUTION: Restricted to Meadow Valley Wash and Virgin River drainages in NV. It was historically in Las Vegas Valley but it is now believed extirpated from this area. Globally, this species has a highly fragmented range.

GENERAL HABITAT AND LIFE HISTORY:

Information in NV is largely lacking, but in other areas, they are found in riparian areas from lowlands to high uplands including pine-oak scrubland. They have been found in rocky stream courses in pine-oak zone in Arizona and New Mexico. In Utah, they occur along irrigation ditches and in flooded fields, as well as along streams bordered by willows and cottonwoods (Stebbins 1954). Irrigated cropland and reservoirs are increasingly being used in some areas (Price and Sullivan 1988). The Arizona toad lays eggs among gravel, leaves, or sticks, or on mud or clean sand, at bottom of flowing or shallow quiet waters of perennial or semipermanent streams (Dahl et al. 2000) or shallow ponds.

Diet includes snails, crickets, beetles, and ants; sometimes cannibalizes newly metamorphosed individuals. Larvae probably eat algae, organic debris, and plant tissue.

Breeding is not dependent upon rainfall, but on warming temperatures and water levels. Spring flooding delays breeding. Breeding may occur for 10-12 days at a location, then stop due to rain and floods, and continue again following warmer, drier weather. Eggs hatch in 3-6 days and tadpoles metamorphose in 3-4 months depending on varying environmental conditions.

CONSERVATION CHALLENGES:

Threatened by loss and degradation of habitat from exotic predators, OHV use, construction of water impoundments, and groundwater pumping activities that lead to declines in seeps and springs. It readily hybridizes with Woodhouse's toad (*Anaxyrus woodhousii*), which is expanding its range into traditionally *A. microscaphus* habitats. Water impoundments seem to favor *A. woodhousii* over *A. microscaphus*.

NEEDS:

Research Needs: Basic life history information and better distribution information is needed for this species in NV. Extent of interbreeding with *B. woodhousii* and current distribution of un-hybridized populations should be studied.

Monitoring and Existing Plans: Limited distribution assessment through Clark County MSHCP, no ongoing monitoring program. Evaluation Species in the Clark County MSHCP and Covered in the Partners in Amphibian and Reptile Conservation Amphibian and Reptile Habitat Management Guidelines.

Approach: Conduct investigations into life history, including basic population demography, status and trends. Develop conservation plan as demonstrated by need.

Columbia spotted frog (Great Basin pop)

Rana luteiventris pop. 3

WAP 2012 species because this species has a highly fragmented and limited range in Nevada and has demonstrated declines from historic numbers. It is also a Candidate species for listing under the Endangered Species Act.



Agency Status	
NV Natural Heritage	G4T2T3QS2S3
USFWS	C
BLM-NV	Sensitive
USFS-R4	Sensitive
State Prot	Protected Amphibians NAC 503.075.2
CCVI	Highly Vulnerable

TREND: Populations generally stable but local declines have been demonstrated.

DISTRIBUTION: Columbia spotted frogs occur in three geographically separated subpopulations in the Jarbidge and Independence Mountains, the Ruby Mountains, and in the Toiyabe Mountains.

GENERAL HABITAT AND LIFE HISTORY:

Columbia spotted frogs are closely associated with clear, slow-moving or ponded surface waters, with little shade, and relatively constant water temperatures. Breeding and egg-laying occurs in waters with floating vegetation and larger ponds such as oxbows, lakes, stock ponds, and beaver-created ponds. Females usually lay egg masses in the warmest areas of the pond, typically in shallow water. In some areas, spotted frogs are critically tied to beaver-created ponds; without these ponds, spotted frogs are typically not found. For overwintering, spotted frogs use areas that do not freeze, such as spring heads and deep undercuts with overhanging vegetation. However, they have also been observed overwintering underneath ice-covered deep ponds.

Adults feed on invertebrates, generally within one-half meter of shore on dry days. During and after rain, they may move away from permanent water to feed in wet vegetation or ephemeral puddles. Adults also feed upon mollusks, crustaceans, and arachnids. They are thought to be opportunistic feeders and feed underwater to some extent. Green algae, most often *Spirogyra*, provides a food source and refuge for developing tadpoles. Tadpoles consume decomposed plant material, and live green algae.

Abundance may be tied to beaver ponds in some locations; when beavers decrease, frogs may decrease as well (Spotted Frog Mtg, Reno 2002, USFWS 1997a). See the Candidate Notice of Review (USFWS 2011c) for more comprehensive information.

CONSERVATION CHALLENGES:

Potential anthropogenic impacts to spotted frog populations and their habitats include capping of springs, extraction of water for stock and mineral exploration, livestock grazing (fecal contamination, reduced wetland plant cover, direct mortality to frogs), alteration and degradation of wetland and pond features, non-native vertebrate introductions, and herbicide applications to wetlands. Occurrence and effects of amphibian diseases (esp. Bd) are largely unknown.

NEEDS:

Research Needs: Life history information especially hibernacula requirements for overwinter survival, methods for effective habitat maintenance and restoration, and effects of livestock grazing should be a focus of research.

Monitoring and Existing Plans: Two Conservation Agreements and Strategies (CAS) have been implemented for all subpopulations of this species. One covers the Toiyabe subpopulation and the other one covers the Jarbidge, Independence, and Ruby Mountain populations (collectively referred to as the NE subpopulation). A long-term monitoring plan was completed and implemented in 2004 for the Toiyabe sub-population and a monitoring plan was recently drafted for the NE subpopulation in 2011. The Toiyabe subpopulation is surveyed annually and has a long-term mark/recapture study implemented. Sites within the NE subpopulation are monitored annually, but not comprehensively due to the extensive geographic area and ruggedness of these subpopulations. Additional surveys to assess occurrence and susceptibility to Bd is needed.

Approach: Continue to implement adaptive conservation actions delineated in the Conservation Strategies of the subpopulations. These actions focus on removal or preclusion of direct threats from nonnative species, disease and habitat loss, and identify corrective restoration strategies for protection and enhancement of key habitat areas. Technical teams for each sub-population CAS meet semi-annually to coordinate monitoring and develop management implementation actions.

Great Basin spadefoot

Spea intermontana

WAP 2012 species because of disease concerns and potential effects of climate change on amphibians in general due to their particular life history requirements.



Agency Status	
NV Natural Heritage	G5S4
USFWS	No Status
CCVI	Moderately Vulnerable

TREND: Trend is stable.

DISTRIBUTION: Occurs across most of Nevada. Records exist for the Great Basin and upper elevation Mojave and Colorado Plateau ecosystems, except for southern Nye County.

GENERAL HABITAT AND LIFE HISTORY:

Mainly sagebrush flats, semi-desert shrublands, pinyon-juniper woodland. Digs its own burrow in loose soil or uses those of small mammals. Breeds in temporary or permanent water, including rain pools, pools in intermittent streams, and flooded areas along streams. Eggs are attached to vegetation in water or placed on bottom of pool.

Not well documented. Adults known to eat insects. Larvae probably eat algae, organic debris, plant tissue, etc., sometimes invertebrates and amphibian larvae.

Males reach sexual maturity at 1-2 years; females at 2 years. This species breeds between April and July depending on the location in overflow pools of permanent streams and in springs. Rainfall can stimulate breeding, but isn't always necessary. Irrigation is known to stimulate breeding as well. Breeding pools must hold water for at least 40 days for larvae to successfully metamorphose.

CONSERVATION CHALLENGES:

Could be threatened by large-scale habitat conversion. Climate change effects from temporal and spatial changes in precipitation patterns may have an unknown impact on reproductive success in some locations.

NEEDS:

Research Needs: Determine the effects of anthropogenic disturbances (e.g., agriculture, mining, development, recreation, etc.) on Great Basin spadefoot terrestrial and aquatic habitats and how those disturbances affect populations. Identify potential climate change effects on habitat availability and suitability.

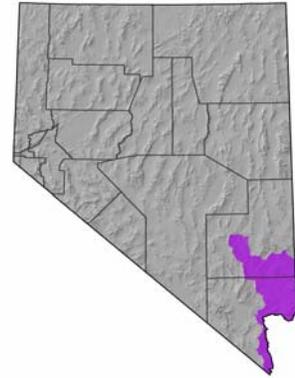
Monitoring and Existing Plans: This species is not currently monitored and does not occur within any other existing plans.

Approach: Additional occurrence, monitoring, and distribution information is needed to identify appropriate conservation approaches.

Great Plains toad

Anaxyrus cognatus

WAP 2012 species because it has a very limited range within Nevada and has been extirpated from historic sites in both Lincoln and Clark Counties.



Agency Status	
NV Natural Heritage	G5S2
USFWS	No Status
CCVI	Presumed Stable

TREND: Trend is unknown but seems to be declining based on likely extirpations from Clark and Lincoln counties.

DISTRIBUTION: Historically occurred in Clark and Lincoln Counties, but currently only found in Lincoln Co. This species reaches its western edge of range in Nevada.

GENERAL HABITAT AND LIFE HISTORY:

The Great Plains toad is found in deserts, grasslands, semidesert shrublands, open floodplains, and agricultural areas; typically in stream valleys. They are proficient burrowers and are usually underground when inactive. They breed in rain pools, flooded areas, and ponds and reservoirs that fluctuate in size. Eggs and larvae develop in shallow water (usually clear).

Metamorphosed toads eat primarily small terrestrial arthropods. Larvae eat suspended matter, organic debris, algae, and plant tissue.

Great Plains toads are inactive during cold winter months and during summer dry spells. They are mostly nocturnal but may be active diurnally during wet or humid weather. They are capable of migrating up to several hundred meters between breeding pools and non-breeding terrestrial habitats. Adults are sexually mature at 2-5 years. Individuals emerge from burrows after heavy spring rains and move to breeding wetlands generally from March to September. Breeding and egg-laying occurs in temporary pools, slow streams, irrigation ditches, holding ponds, and flooded fields. Eggs hatch in 2-7 days and tadpoles metamorphose in 17-45 days after hatching depending on the water temperature and evaporation rates.

CONSERVATION CHALLENGES:

Moderately to severely threatened by dams and water diversions, competition with non-native species, and may hybridize with *B. woodhousii*. Intensive cultivation and herbicide/pesticide use may be reducing populations in some regions. Experienced loss of breeding and non-breeding habitats due to suburban sprawl.

NEEDS:

Research Needs: Information on distribution, location of breeding sites, demographics, status and trend and life history for Nevada populations is needed.

Monitoring and Existing Plans: Not currently monitored. Covered in the Partners in Amphibian and Reptile Conservation Amphibian and Reptile Habitat Management Guidelines.

Approach: Identify population loci and determine population status and trend for the species. Implement conservation actions as necessary to maintain or increase current population numbers.

northern leopard frog

Lithobates pipiens

WAP 2012 species due to its declining trend, known extirpations, potential climate change effects, and fragmented populations.



Agency Status	
NV Natural Heritage	G5S2S3
USFWS	No Status
BLM-NV	Sensitive
State Prot	Protected Amphibians NAC 503.075.2
CCVI	Presumed Stable

TREND: Declining; limited assessment of historic locations found many to be apparently extirpated. However, further surveys over multiple years needs to be conducted to determine trend.

DISTRIBUTION: Historically occurred throughout eastern and areas of northwestern NV.

GENERAL HABITAT AND LIFE HISTORY:

Northern leopard frogs require a mosaic of habitats, including aquatic overwintering and breeding habitats, as well as upland post-breeding habitats and the links between the two. Springs, slow streams, marshes, bogs, ponds, canals, flood plains, reservoirs, and lakes are used; usually permanent water with rooted aquatic vegetation. In summer, commonly inhabits wet meadows and fields. Takes cover underwater, in damp niches, or in caves when inactive. Overwinters usually underwater and requires well-oxygenated water that does not completely freeze. Eggs are laid and larvae typically develop in shallow, still, permanent water, generally in areas well exposed to sunlight. Generally eggs are attached to vegetation just below the surface of the water.

Metamorphosed frogs eat various small invertebrates obtained along water's edge or in nearby meadows or fields; rarely eats small vertebrates. Larvae eat algae, plant tissue, organic debris, and probably some small invertebrates.

The time of egg deposition varies with latitude and elevation. Breeding often peaks when water temperatures reach about 10°C. At a particular site, egg deposition generally occurs within a span of about 10 days. Aquatic larvae metamorphose into small frogs in early to late summer, a few months after egg deposition.

CONSERVATION CHALLENGES:

Habitat degradation, fragmentation and loss due to unsustainable grazing, water impoundments or other alterations, and development (urban, agriculture) are the main threats to this species. Interactions with introduced species may also be contributing to declines. Inadequate information exists to adequately characterize current distribution and status/trend of individual isolated sub-populations. Some populations likely occur on private lands with limited access. Occurrence and effects of amphibian diseases (esp. Bd) are largely unknown. Potential climate change effects on ephemeral and permanent habitats are not well understood.

NEEDS:

Research Needs: Information is needed on the distribution of this species as well as its long-term trend.

Comprehensive assessment of historic and potential sites is needed to better document statewide distribution and extensive, multi-year surveys of known populations are needed to gain a better understanding of status and trend. Additional surveys to assess occurrence and susceptibility to Bd is needed.

Monitoring and Existing Plans: Periodic monitoring is conducted by Humboldt-Toiyabe National Forest and NDOW for some populations. Spring Valley populations are monitored by SNWA and Pahrnagat Valley populations are monitored by the USFWS. No other regular population monitoring or assessment is conducted.

Approach: Continue monitoring through USFS/NDOW partnership, SNWA, and USFWS refuges. Additional monitoring should include occupied and potential habitats on BLM and private lands. A statewide cooperative management strategy should be developed and consideration be given to development of a CCAA or similar mechanism for conservation of populations on private lands.

relict leopard frog

Lithobates onca

WAP 2012 species due to its very restricted population, well-documented declines, and on-going need for extensive management actions to insure conservation of the species.



Agency Status	
NV Natural Heritage	G1G2S1
USFWS	C
BLM-NV	Sensitive
State Prot	Protected Amphibians NAC 503.075.2
CCVI	Moderately Vulnerable

TREND: Trend appears to be declining to stable in NV; variable depending on the site.

DISTRIBUTION: Restricted to only a few isolated localities including Overton Arm of Lake Mead, Black Canyon below Lake Mead, and Gold Butte area the Clark County although historically present along the Virgin, Muddy, and Colorado Rivers.

GENERAL HABITAT AND LIFE HISTORY:

Relict leopard frogs occupy spring, spring outflow, and associated marsh and wetland habitats generally in close proximity to river systems. They are active year-round, and are most often observed in shallow water along channel or pool margins. Breeding has been documented in September, November, and late January through March.

Adults probably are mainly invertivorous. Larvae probably eat algae, organic debris, plant tissue, and minute organisms in water.

Individuals reach sexual maturity in 1-2 years.

CONSERVATION CHALLENGES:

Current distribution of this species is severely reduced to eight natural and eight experimental isolated populations in Lake Mead NRA and nearby areas of Clark County and Mohave County, Arizona. Key concerns include habitat degradation from water development and diversion; modifications to spring source pools and outflows; inundation of historic habitats; changes in plant communities, including invasive plant encroachment and grazing by feral and domestic livestock; competition and predation by nonnative species; small population size; limited habitats; and fragmentation and isolation of existing habitats. Habitats in Black Canyon are subject to severe stochastic storm events which have caused the extirpation or near-loss of some natural and experimental populations. Effects of Bd and other amphibian diseases are unknown, particularly at cooler-water sites.

NEEDS:

Research Needs: Continue efforts to define current and historic distribution. Determine important breeding areas for known populations. Determine habitat requirements and conditions required for long-term survival; develop methods for maintaining favorable habitat quality. Determine population and life history characteristics. Identify and evaluate additional potential translocation or repatriation sites. Better assess occurrence and effect of Bd and other diseases. Develop additional strategies for nonnative species control and exclusion.

Monitoring and Existing Plans: Semi-annual monitoring of all known populations is ongoing under direction of the Relict Leopard Frog Conservation Team (RLFCT). The National Park Service (NPS) is the lead for monitoring efforts on NPS lands with assistance from NDOW, AGFD, UNLV, and other cooperative partners. The range-wide Relict Leopard Frog Conservation Agreement was completed in 2005 and the species is a covered species in both the Lower Colorado River MSCP and the Clark County MSHCP. Limited monitoring for occurrence of Bd is being conducted by UNLV.

Approach: Implement conservation strategy actions identified in Relict Leopard Frog CAS through direction of the RLFCT. Key actions include management of active threats, restoration and maintenance of existing and historic habitats, identification and development of additional experimental populations through translocation, and maintenance of head-start and captive breeding efforts to provide animals for population augmentation and translocation.

Sierra Nevada yellow-legged frog

Rana sierrae

Although this species is considered extirpated from Nevada, this has not been confirmed and surveys and management actions should be considered for long-term reintroduction or natural repopulation as the species is extant in adjacent areas in California.



Agency Status	
NV Natural Heritage	G1G2SH
USFWS	No Status
BLM-NV	Sensitive
LTBMU	Sensitive
IUCN	Endangered
CCVI	Presumed Stable

TREND: Declining rapidly if still extant in Nevada, although it is currently considered to be extirpated from the State.

DISTRIBUTION: Restricted to the Sierra Nevada, California, and extreme western Nevada (Mt. Rose).

GENERAL HABITAT AND LIFE HISTORY:

Rarely found more than 1m from water, usually near rocky stream beds, lakes, ponds, and tarns, typically with grassy or muddy banks and edges. Both adults and larvae overwinter for up to 9 months in the bottoms of lakes that are at least 1.7m deep (some evidence that lakes at least 2.5m are ideal), under ledges of stream or lake banks, or in rocky streams.

Adults eat aquatic and terrestrial invertebrates and anuran larvae; availability of larval anuran prey may be an important factor in distribution, body condition, and survival of adults (Pope and Matthews 2002). Larvae eat algae, organic debris, plant tissue, and minute organisms in water.

Mating and egg-laying occur from May to August. Egg-laying sites must be connected to permanent lakes or ponds that do not freeze to the bottom in winter, because the tadpoles overwinter, possibly taking as many as three or four summers before they transform.

CONSERVATION CHALLENGES:

Global population declines have occurred, some in seemingly pristine environments. In the high Sierra Nevada lakes, this species does not successfully coexist with introduced fishes, which is likely the cause for its decline. This species exhibits strong site fidelity and is subject to decline due to drying habitats (Matthews and Preisler 2010). This species no longer occurs in Nevada.

NEEDS:

Research Needs: This species may be extirpated in NV, so basic surveys of suitable habitat are needed. If no occupied habitats are located, habitat evaluation is needed to determine the likely success of transplanted individuals from nearby California populations.

Monitoring and Existing Plans: No monitoring of this species occurs in NV. Covered in the Humboldt-Toiyabe Forest Plan Revision and the Partners in Amphibian and Reptile Conservation Amphibian and Reptile Habitat Management Guidelines.

Approach: Prohibit introductions of non-native fishes in suitable habitats. Removal of non-native fishes and re-establishment of metapopulation dynamics might reverse the decline (Knapp and Matthews 2000).

western toad

Anaxyrus boreas

Although this species is common throughout the Great Basin, there are potentially distinct and isolated endemic species cryptically found within *B. boreas*.



Agency Status	
NV Natural Heritage	G4S4
USFWS	No Status
CCVI	Presumed Stable

TREND: Trend is unknown.

DISTRIBUTION: North and central NV.

GENERAL HABITAT AND LIFE HISTORY:

This species is found in a wide variety of habitats ranging from desert springs to mountain wetlands, and it ranges into various uplands habitats around ponds, lakes, reservoirs, and slow-moving rivers and streams. It digs its own burrow in loose soil or uses those of small mammals, or shelters under logs or rocks. The eggs and larvae develop in shallow areas of ponds, lakes, or reservoirs, or in pools of slow-moving streams.

Metamorphosed individuals feed on various small terrestrial invertebrates. Larvae filter suspended plant material or feed on bottom detritus (Nussbaum et al. 1983).

This species is sexually mature at 4-6 years. Mating and egg-laying occur between January and July depending on elevation and snowpack. Eggs are laid in still or barely moving waters of seasonal pools, ponds, streams, and small lakes. Eggs hatch in 3-10 days; may be up to 12 days in colder waters at higher elevations. Larvae metamorphose in 1-3 months; speed of larval development is dependent upon temperature.

CONSERVATION CHALLENGES:

No threats currently identified.

NEEDS:

Research Needs: Genetic analysis of potentially distinct species needs investigation and publication. Distinct and rare species arising from such an analysis would then be the focus of appropriate conservation actions.

Monitoring and Existing Plans: Some isolated populations, such as in Dixie Valley, are actively being monitored and have proactive conservation measures in place.

Approach: Additional occurrence, trend, and distribution information is needed to identify appropriate conservation approaches.