

Leopard Frogs



ASSESSING HABITAT QUALITY FOR PRIORITY WILDLIFE SPECIES IN COLORADO WETLANDS



NORTHERN LEOPARD FROG © KEITH PENNER / PLAINS LEOPARD FROG © RENEE RONDEAU, CNHP

Two species of leopard frogs occur in Colorado. Northern leopard frogs (*Rana pipiens*; primary photo, brighter green) are more widespread than plains leopard frogs (*R. blairi*; inset photo).

Species Description

Identification

Two leopard frogs are included in this guild: northern leopard frog (*Rana pipiens*) and plains leopard frog (*R. blairi*). They are roughly the same size (3–4 inches as adults), but plains leopard frogs are usually browner than the mostly green northern leopard frogs.

Preferred Habitats

Due to their complicated life history traits, leopard frogs occupy many habitats during different seasons and stages of development, but they are closely associated with wet environments. In general, leopard frogs occupy three categories of habitat: (1) over-wintering habitat with deep water that does not freeze solid; (2) foraging habitat for adults, which may consist of uplands, riparian areas, and wet meadows; and (3) breeding habitat suitable for egg development and tadpole survival. In general, plains leopard frogs breed in more ephemeral ponds, while northern leopard frogs use semi-permanent ponds.

Diet

Adult leopard frogs eat primarily insects and other invertebrates, including crustaceans, mollusks, and worms, as well as small vertebrates, such as other amphibians and snakes. Leopard frog tadpoles are herbivorous, eating mostly free-floating algae, but also consuming some animal material.

Conservation Status

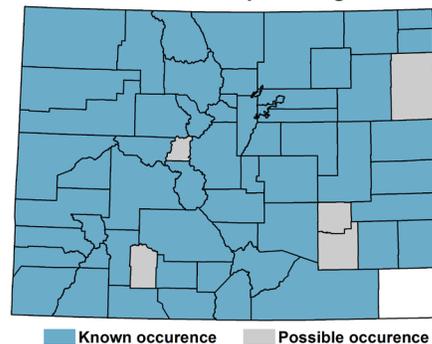
Northern leopard frog populations have declined throughout their range; they are listed in all western states and Canada as sensitive, threatened, or endangered. In Colorado, northern leopard frogs are listed as a Tier 1 Species of Greatest Conservation Need (CPW 2015). Less is known about plains leopard frog populations, but threats to plains leopard frogs are probably similar to those of northern leopard frogs. They are listed as a Tier 2 Species of Greatest Conservation Need in Colorado (CPW 2015).

Species Distribution

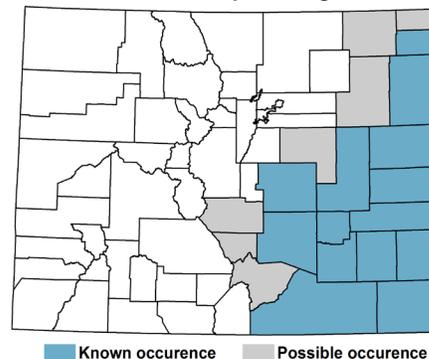
Range

Northern leopard frogs range from the northern United States and Canada to the more northern parts of the southwestern United States. With the exception of a few counties, they occur throughout Colorado. Plains leopard frogs have a much smaller distribution than northern leopard frogs, occurring through the Great Plains into southeastern Arizona and eastern Colorado.

Northern Leopard Frog



Plains Leopard Frog



Leopard frog distribution maps for Colorado adapted from Hammerson (1999) and NDIS (2014).

Preferred Habitat Conditions

Dominant vegetation in adult foraging wetlands	varies but includes grasses, sedges, and forbs
Dominant vegetation in breeding wetlands	emergent vegetation with buffer of grasses, sedges, rushes, and spike rushes
Landscape context	0.6–1.2 miles between categories of habitat (see above habitat types)
Percent vegetation cover	dense and extensive
Predatory fish and bullfrogs	none
Size of habitat	can be very small
Sunlight	high sunlight exposure
Vegetation height in adult foraging wetlands	6–12 inches
Water depth for winter hibernation	deep enough not to freeze to the bottom
Water depth in breeding wetlands	25–40 inches but can vary
Water quality	neutral pH, well-oxygenated, and unpolluted
Water temperature	54–73°F



NORTHERN LEOPARD FROG © TOM KOERNER, UFWFS

Acknowledgements

Tina Jackson (Colorado Parks and Wildlife) reviewed an earlier version and provided input on preferred habitat conditions.

Suggested Reading and Citations

Corn, P.S., and L.J. Livo. 1989. Leopard frog and wood frog reproduction in Colorado and Wyoming. *Northwestern Naturalist* 70: 1-9.

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Hammerson, G. A. 1999. Amphibians and Reptiles in Colorado: A Colorado Field Guide. University Press of Colorado and Colorado Division of Wildlife.

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NDIS (Natural Diversity Information Source). 2014. On-line mapping tool formerly available through Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, Colorado.

Smith, B. E., and D. A. Keinath. 2004. Species assessment for the northern leopard frog (*Rana pipiens*) in Wyoming. United States Department of the Interior, Bureau of Land Management, Wyoming State Office, Cheyenne, Wyoming.

Smith, B. E., and D. A. Keinath. 2005. Plains leopard frog (*Rana blairi*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region.

Smith, B.E. and D.A. Keinath. 2007. Northern leopard frog (*Rana pipiens*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region.

USFS (United States Forest Service). 2003. Conservation assessment for plains leopard frog (*Rana blairi*). USDA Forest Service, Eastern Region.

Management Recommendations

This fact sheet contains easy-to-use guidelines for understanding habitat needs of Colorado Parks and Wildlife priority wetland-dependent wildlife. A number of practical steps can be taken to improve habitat for leopard frogs.

Hydrology

- Maintain water depths to avoid water column freezing solid.
- For breeding ponds, maintain depth of >20 in. until metamorphosis completed.
- After mid-July, draw down water containing predatory fish and bullfrog larvae.

Vegetation

- Provide grass buffers around breeding ponds.

Contamination

- Reduce nitrogen loading.
- Reduce pesticides, chemicals and other toxins.
- Reduce predatory fish.
- Possibly reduce or change mosquito control.

Land Use

- Eliminate livestock access to ponds.
- Avoid or minimize clear-cutting.

Conservation

- Translocate frogs to re-establish populations.
- Promote conservation programs to provide grassland component in the landscape.
- Promote native species in adjacent lands.



NORTHERN LEOPARD FROG © KRISTA LUNDGREN, USEWS



PLAINS LEOPARD FROG © BRAD LAMBERT, CNHP

Habitat Scorecard for Leopard Frogs (v. Jan 2016)

Assessment of habitat before and after restoration or management actions

Project Name: _____ Date(s) of Assessment: _____

Instructions: Select appropriate checklist: (1) **Breeding Wetlands** (e.g., emergent marshes, playas, seeps, springs, moist soil units, reservoirs, other impoundments), (2) **Adult Foraging Wetlands** (e.g., wet meadows, riparian areas), or (3) **Over-wintering Wetlands** (oxbows, stream channels, warm water sloughs, gravel pits, and reservoirs). Enter one value that best describes each habitat variable during the appropriate season, using the numbers in the value column. Habitat variables are in shaded boxes; ranges of condition are directly below each variable. If condition is outside range or is not described, enter a zero.

Breeding Wetlands (e.g., emergent marshes, playas, seeps, springs, moist soil units, reservoirs, other impoundments)

Key habitat variable and conditions	Value	Before	After
Water pH			
6.1 – 7	16.3		
Water quality			
No visual evidence of turbidity or other pollutants	16.3		
Some turbidity or presence of other pollutants, but limited to small and localized areas within the wetland; water may be slightly cloudy	10.8		
Water is cloudy or has unnatural oil sheen, but the bottom is still visible (note: if the sheen breaks apart when you run your finger through it, it is a natural bacterial process and not water pollution)	5.4		
Predominant depth of water			
>25 – 40 inches	16.3		
>40 – 80 inches	10.8		
4 – 25 inches	5.4		
Percent total canopy cover 6.6 feet			
0 – 30%	15.4		
>30 – 50%	10.3		
>50 – 100%	5.1		
Percent emergent vegetation			
>50 – 90%	12.2		
>30 – 50%	8.1		
10 – 30%	4.1		
Height of emergent vegetation			
8 – 40 inches	12.2		
>40 – 80 inches	8.1		
>80 inches	4.1		
Dominant vegetation			
Robust wetland herbs (cattail, bulrush, reedgrass, etc.) tall sedges and rushes >8 inches, aquatic vegetation (submergent, floating leaves, algae)	11.3		
Tall grasses (>8 inches), open willows/shrubs	7.6		
Total (of 100 possible): add all numbers in before or after columns			

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Adult Foraging Wetlands (e.g., wet meadows, riparian areas)

Key habitat variable and conditions	Value	Before	After
Height of herbaceous cover			
2 – 20 inches	23.0		
>20 – 40 inches	15.3		
>40 – 80 inches	7.7		
Predominant depth of water			
0 – 4 inches	23.0		
>4 – 8 inches	15.3		
>8 – 12 inches	7.7		
Water pH			
6.1 – 7	23.0		
Percent of herbaceous cover			
>30 – 90%	17.2		
25 – 30% or >90%	5.7		
Dominant vegetation			
Low grasses <8 inches, annual forbs, perennial forbs	11.3		
Total (of 100 possible): add all numbers in before or after columns			

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Over-wintering Wetlands (oxbows, stream channels, warm water sloughs, gravel pits, and reservoirs)

Key habitat variable and conditions	Value	Before	After
Percent of habitat covered by water			
>90 – 100%	19.4		
>60 – 90%	12.9		
40 – 60%	6.5		
Predominant depth of water			
>40 inches	19.4		
35 – 40 inches	6.5		
Water pH			
6.1 – 7	23.0		
Water quality			
No visual evidence of turbidity or other pollutants.	18.4		
Some turbidity or presence of other pollutants, but limited to small and localized areas within the wetland; water may be slightly cloudy	12.3		
Water is cloudy or has unnatural oil sheen, but the bottom is still visible (note: if the sheen breaks apart when you run your finger through it, it is a natural bacterial process and not water pollution)	6.1		
Percent of submergent vegetation			
>30 – 60%	14.6		
>10 – 30%	9.7		
0 – 10%	4.9		
Dominant vegetation			
Robust wetland herbs (cattail, bulrush, reedgrass, etc.) tall sedges and rushes >8 inches, aquatic vegetation (submergent, floating leaves, algae)	9.7		
Total (of 100 possible): add all numbers in before or after columns			