



# **COLORADO**

## **Parks and Wildlife**

Department of Natural Resources

Water Resources Section – Aquatic,  
Terrestrial, and Natural Resources  
Branch

December 22, 2023

Mr. Rob Viehl, Section Chief  
Colorado Water Conservation Board  
Stream and Lake Protection Section  
1313 Sherman Street, 7th Floor  
Denver, CO 80203

Subject: Natural Lake Level Recommendation for Titan Lake in Water Division 2, Lake County to be presented at the January 2024 CWCB Meeting

Dear Mr. Viehl:

The information contained within and referred to in this letter forms the scientific and biological basis for a natural lake level (NLL) recommendation on Titan Lake in Water Division 2. Field investigations relating to this NLL recommendation were conducted by Colorado Parks and Wildlife (CPW) staff in 2023. Titan Lake is a high-elevation alpine lake where CPW recently translocated native boreal toads, a state endangered amphibian species. The goal of translocation is to increase boreal toad populations across the state. In 2021 through 2023, CPW stocked tadpoles in Titan Lake as part of the boreal toad translocation project. CPW observed successful overwintering of the boreal toads at Titan Lake, making the lake a prime candidate for a NLL water right. Titan Lake was presented to interested parties at the instream flow (ISF) and NLL Workshop in January 2023. CPW and CWCB staff also conducted outreach to the Lake County Commissioners in November 2023. It is CPW staff's opinion that the information contained in this letter is sufficient for the CWCB's staff to recommend a NLL appropriation to the Board on Titan Lake and to specifically address the findings required in Rule 5(i) of the Instream Flow and Natural Lake Level Program Rules.

CPW participates in the ISF and NLL Program and develops natural lake level recommendations for the Board's consideration in an effort to address CPW's legislative directives "... that the wildlife and their environment are to be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors ... and that, to carry out such program and policy, there shall be a continuous operation of planning, acquisition, and development of wildlife habitats and facilities for wildlife-related opportunities" [§33-1-101 (1) C.R.S.], and "... that the natural, scenic, scientific, and outdoor recreation areas ... be protected, preserved, enhanced and managed for the use, benefit, and enjoyment of the people of this state and (its) visitors ... and that, to carry out such program and policy, there shall be a continuous operation of acquisition, development, and management of ... lands, waters, and facilities." [§33-10-101 (1) C.R.S.].

In addition to these broad statutory guidelines, CPW's strategic planning document (CPW Strategic Plan, 2015) explains the agency's current goals to, "[c]onserve wildlife and habitat to ensure healthy sustainable populations and ecosystems." In order to, "protect and enhance water resources for fish and wildlife populations," by pursuing, "partnerships and agreements to enhance instream flows,



protect water levels, and influence water management activities,” and to, “[a]dvocate for water quality and quantities to conserve aquatic resources.” In addition to the CPW strategic plan, the agency’s fish and wildlife conservation activities are also informed by the State Wildlife Action Plan (2002, Revised 2015). The aforementioned documents direct CPW to advocate for the preservation of the state’s fish and wildlife resources and natural environment, and therefore link CPW’s mission to the goals and priorities of CWCB’s ISF and NLL Program.

#### Location and Land Status

CPW is proposing a NLL recommendation on Titan Lake which is located at UTM 13S 377505.25 4356622.28. The lake is on public lands managed by the Isabel National Forest as Holy Cross Wilderness. In the contributing watershed, there is a nearby private inholding associated with the Homestake Mine.

#### Boreal Toad Conservation Goals and Translocation Project

Boreal toads (*Anaxyrus boreas*) were historically common in the Southern Rocky Mountains but have experienced rapid population declines in the last two decades. A boreal toad recovery team was formed in 1994 to respond to the significant declines in boreal toad distributions. The cause of declines appears to be related to an infection called chytrid fungus (*Batrachochytrium dendrobatidis*, or “Bd”), which has a very high mortality rate. Habitat loss is another major contributing factor to declines. Currently, boreal toads are listed as an endangered species by the states of Colorado and New Mexico and are a protected species in Wyoming. They have been petitioned for federal listing in the past. The boreal toad recovery team is working to expand populations by translocating toads into unoccupied habitats. The goal of the boreal toad translocation project is to stock new populations of boreal toads into suitable habitat with the goal of establishing new breeding populations. Establishing new breeding populations of boreal toads and protecting the habitat where translocated populations reside are both critical steps to the successful recovery of the species. CPW believes that securing a lake level protection on waterbodies that support populations of boreal toads, such as Titan Lake, is critically important to the recovery of boreal toads in Colorado.

#### Natural Environment and Biological Summary

Titan Lake is a high-elevation natural lake located near the Continental Divide in the West Tennessee Creek watershed. The alpine lake is relatively shallow with depths between 1 to 3 feet on average. The contributing drainage basin is approximately 3.9 square miles at and above treeline, surrounded by coniferous forest. The lake supports a minor amount of emergent grasses and aquatic vegetation which serves as habitat for boreal toads. Colorado wood-rush is one type of aquatic vegetation that has been observed in the area. Rare fens, the Homestake peak fen complex, have also been observed by the Colorado Natural Heritage Program surrounding Titan Lake.

In 2021 through 2023, CPW biologists translocated boreal toad tadpoles with the goal of establishing a population at Titan Lake. Yearling toadlets were first found at Titan Lake in June of 2022 following the 2021 stocking effort. Yearling toads serve as evidence of successful overwintering and initial establishment of a new population of boreal toads in Lake County. This was a historic first in the Arkansas River Basin. Since then, successful overwintering has been documented in large numbers of

toads of two distinct age classes. Additionally, in 2023 CPW found two adult toads that previously went undetected and were not part of the stocking efforts.

#### Hydrologic Analysis

A bathymetric survey was completed to support this NLL recommendation. CPW conducted a bathymetric survey on June 13, 2023 using a castable sonar unit (Deeper Sonar Pro+ 2) and float tube. A map depicting survey results is provided as an attachment to this recommendation letter. The survey results indicate that at full pool the lake stores approximately 2.3 acre-feet of water. Average depth of the lake is 2.2 feet and the surface area is approximately 1 acre. CPW recommends that any quantity of water stored in Titan Lake, up to the full pool at an elevation of 11,560 feet and up to 2.3 AF of storage, be protected with a NLL right. This will support the resident boreal toad population by providing adequate habitat as the toads emerge from their hibernacula in the spring to make their way to ponds to breed. Full pool at Titan Lake also provides gradual sloping shallows along the shoreline which supports a temperature gradient ideal for both egg and tadpole development.

#### Water Availability

The surface water elevation of Titan Lake varies throughout the year because of changing inflow and evapotranspiration rates. The lake is typically at full pool during the elongated snowmelt runoff season. The lake stays relatively full due to limited evapotranspiration and sustained inflows from late-summer snowmelt reserves. At the time of the bathymetric survey described above, the surface water elevation of the lake was at full pool. CPW is not aware of any surface water diversion or groundwater diversions presently affecting the natural lake level.

#### Summary

The purpose of this letter is to formally transmit this NLL recommendation to CWCB for the Board's consideration. CPW believes there is a water level-dependent natural environment in Titan Lake that can be preserved to a reasonable degree with an NLL water right. CPW also believes that protecting suitable habitat for boreal toads using the CWCB's NLL program is a worthwhile conservation strategy supporting recovery of the species. Please refer to attachments which include bathymetry results, toad survey findings, and photographs.

CPW personnel will be available at the January 2024 CWCB meeting to answer any questions that the Board might have regarding these flow recommendations. We appreciate your consideration.

Sincerely,

**Katie Birch**  
Digitally signed by Katie Birch  
Date: 2024.01.10 11:21:42 -0700

Katie Birch  
CPW Instream Flow Program Coordinator  
Attachments (as stated)

Date	Air Temp	Water Temp	YOY	1yr	2yr	Adults	Comments
6/13/2023	40F	9.9C	0	0	0	0	Bathymetry Day - Snowy
6/26/2023	66F	19.3C	0	28	3	1	Adult was Female. Boreal Chorus Frog heard but not seen. SV: 61mm)
7/11/2023	68F	NA	0	191	35	0	Most toads found on NW shoreline. Toads also found up above Titan to the west, near a Mining Claim. Afternoon survey.
7/12/2023	75F	NA	0	0	2	0	This survey was done at a wet meadow approximately 0.5 miles downstream of Titan, along the creek. We found two 2yr toads in dense willows. This shows the first evidence of dispersal by stocked toads at Titan.
8/1/2023	NA	NA					Tadpole stocking day, no data taken on encounters, but numerous 1 and 2 year olds seen around edges of pond while stocking tadpoles.
8/17/2023	72F	28C (shallows)	742	201	3	0	Post stocking
8/23/2023	NA	NA	651	151	14	2	Both adults were Female, one of them was a recapture from the first adult we encountered on 6/26 (SV1: 80mm, SV2: 56mm)
8/30/2023	NA	18	529	23	14	0	
9/8/2023	NA	NA	200	6	1	0	Last visit of 2023 by Forest Service Bio





**Titan Lake, CPW tadpole stocking in 2022**



**Titan Lake, CPW tadpole stocking in and 2023**





**Titan Lake, Yearling boreal toad discovered in 2022**



**Titan Lake, Watershed**



**Titan Lake, Bathymetric survey in June 2023**



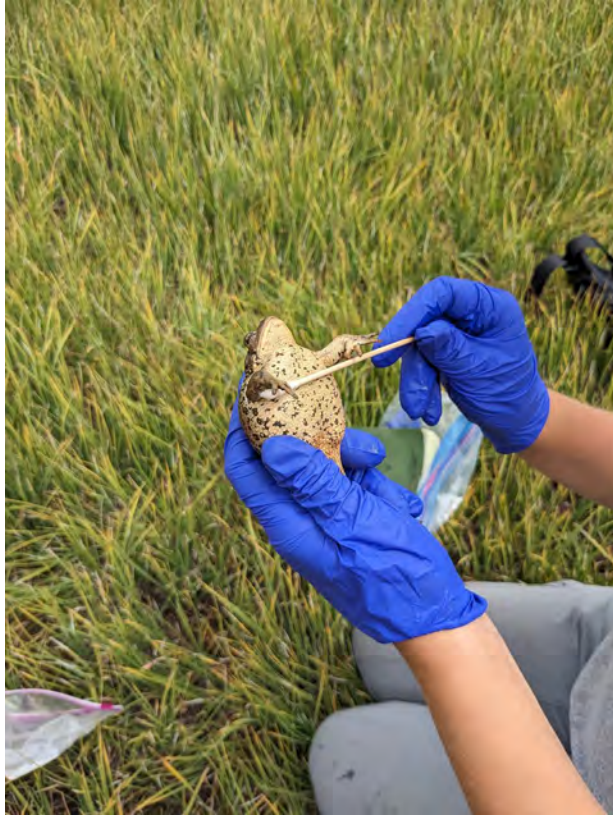


**Titan Lake, Full pool elevation**

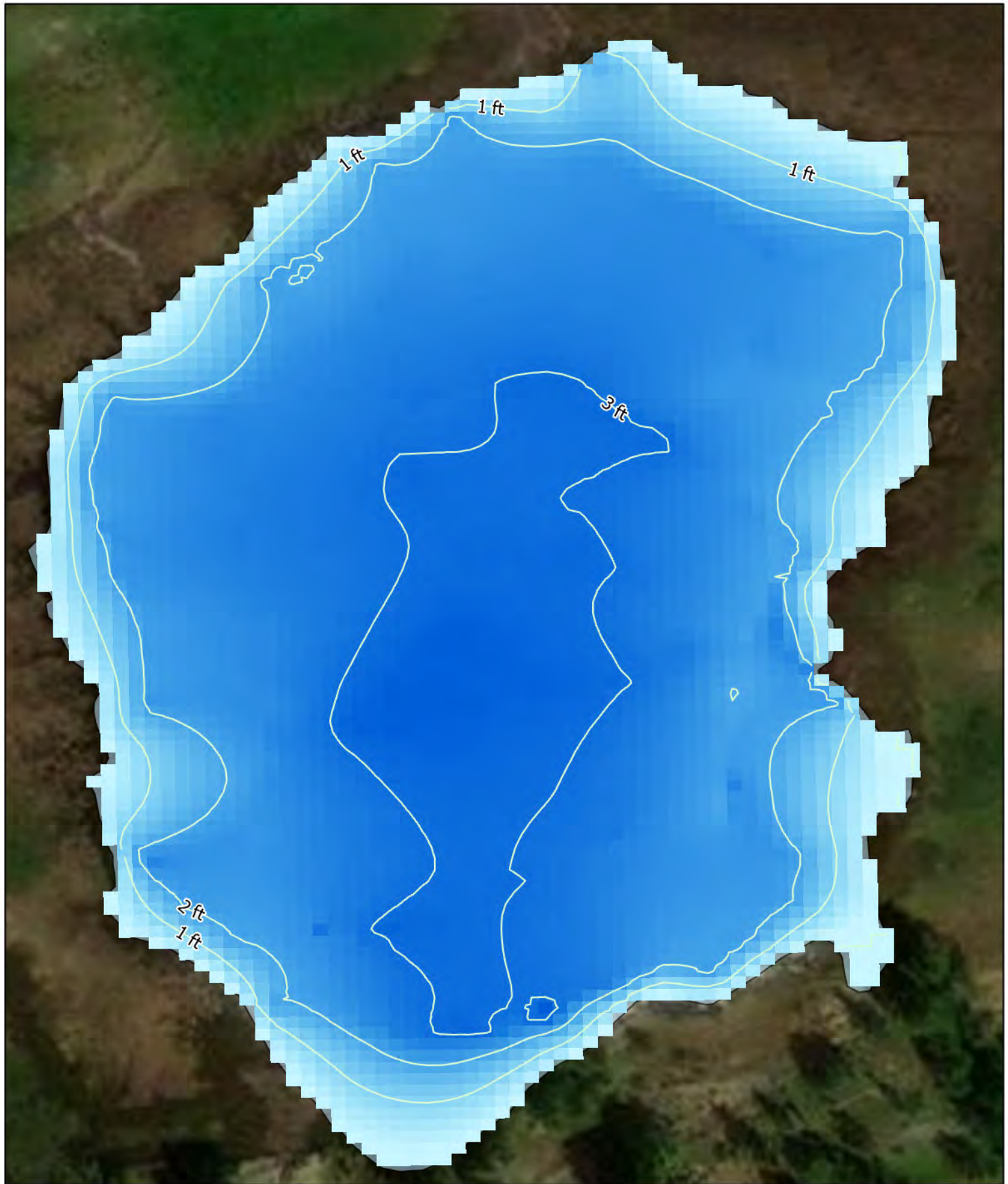


**Titan Lake, Tadpole**

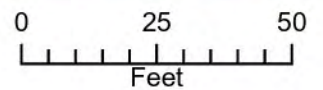




**Titan Lake, Adult Boreal Toads found in 2023**



## Titan Lake Bathymetry



1.04 acres with an average depth of 2.19 ft for a volume of 2.3 acre feet.



General Site Field Visit Data Report (Filters: Name begins with Titan Lake;)

Type		Div	Name	CWCB Case Number	Segment ID	Visit Date	Location Description	Watershed Name
Lake		2	Titan Lake	24/2/A-003	1000003	9/21/2023	Pictures taken of the site	Arkansas Headwaters
	Remarks	No Remarks for this site visit.						
	GPS Log	No GPS Log records for this visit.						
	Photo Log	No Photo Log records for this visit.						





















