AMPHIBIAN SURVEYS AT BULL RUN LAKE – 2012

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INTRODUCTION

As part of the 1998 Bull Run Lake Mitigation and Monitoring Implementation Plan (hereafter referred to as the Plan) for water releases from the lake, surveys of amphibian occurrence that had been conducted in 1993 were repeated during 1999, 2000, 2003, and 2006. Surveys repeated again in 2012 are covered in this report. Two amphibian species, Cope's giant salamander (*Dicamptodon copei*) and Larch Mountain salamander (*Plethodon larselli*), are Forest Service Region 6 Sensitive Species and therefore are the targets for monitoring. Cope's giant salamander (DICO) has been found in at least some of the tributary streams flowing into Bull Run Lake (Lake) during surveys in all years. Larch Mountain salamander has not been found nearer than the north buffer of the Watershed, but its typical habitats of talus fields and old growth forest occur near the Lake. Several other amphibian species have been found in and near the Lake and its tributaries during previous surveys, including Cascade torrent salamander (*Rhyacotriton cascadae*), coastal tailed frog (*Ascaphus truei*), and Cascades frog (*Rana cascadae*) which are designated Sensitive by the Oregon Department of Fish and Wildlife (ODFW).

METHODS

The Plan called for surveys of Tributaries 1 through 6, specifically the first 100 meters above the high water level of the Lake, repeated every three years. The most recent survey had been conducted in the summer of 2006. On September 26, 2012, I surveyed approximately 100 meters of Tributaries 1, 2, 3, 4A, 4B, 5, and 6. Amphibians observed in the Lake while canoeing along the edge were also recorded. No terrestrial salamander surveys were conducted around the Lake because conditions were too dry in September, although brief searching in terrestrial habitats immediately adjacent to the tributaries was included in these surveys. I did not conduct any surveys during the year of the areas behind the dike or below the outlet, or of any talus or forested habitats near the Lake.

Stream surveys in the Lake tributaries were conducted by wading upstream, and lifting or tipping cobbles, small boulders, and pieces of wood while holding a dip-net on the downstream side. Areas of gravel were gently raked by hand, or larger gravel pieces were lifted. All or a large sample of the top layer of stream substrate cover objects available for amphibians within the surveyed segment of the stream were searched, as well as a small sample of cover objects adjacent to the channel where conditions were moist. This Longitudinal Light Touch Survey method is considered the most cost efficient and the most effective for determining presence/ absence and assessing relative abundance of amphibians in streams of the Pacific Northwest (Hayes et al., 2003). Occasionally, several layers of cobble were picked up, in order to capture an amphibian that was glimpsed disappearing down into the streambed. Where large logs of moderate decay stage had fallen across or adjacent to the tributaries, these terrestrial habitats were briefly searched, if they felt moist enough for amphibians to be near the surface. As closely as possible all cover objects were returned to their original positions in or adjacent to the stream, and all amphibians, fish, and invertebrates captured were released on the upstream side of the cover object they were using. Logs that were searched were roughly reassembled afterwards, and amphibians captured in terrestrial habitats were released at the point of capture.

Several methods were used to make the notoriously difficult distinction between DICO and and the more common coastal giant salamander (*D. tenebrosus*, formerly Pacific giant salamander, hereafter called DITE). In order of weight given in the differentiation, these were: leg length in proportion to body length, head width and length in proportion to body length, ventral coloration, development of granular glands on the dorsal surface, gill filament length, and dorsal tail fin length and height (as in Corkran and Thoms, 1996, and Jones, et al., 2005). Snout-to-vent length measurements were taken of several individual DICO and DITE, and estimates were made for other amphibians captured or observed.

Water temperature was recorded in each tributary. Observations of trout and general abundance of macro-invertebrates in the tributaries were also recorded during the surveys.

All amphibian data from the surveys have been entered into a database and will be sent to both the Mt. Hood National Forest and ODFW at the end of the calendar year.

RESULTS

Figure 1 shows the location of all Lake tributaries surveyed. Table 1 shows the amphibian species found at every surveyed area around the Lake, and includes the numbers of each species found in each year of surveys since 1993.

I observed a total of 51 amphibians during the stream surveys. Several of the Dicamptodons eluded complete capture but were seen briefly. Those, as well as several smaller captured individuals, were classified as DITE but actually may have been DICO. Only one DICO was positively identified, and a second was tentatively identified but it escaped before I could examine it well. The DICO larva was 63 mm snout to vent length (SVL), a sub-adult. The DITE larvae ranged in size from 25 to 70 mm SVL, all immature individuals. No metamorphosed Dicamptodons were observed. Cascade torrent salamanders were all large larvae and adults, and 11 of the 14 observed were in Tributary 3. Most of the coastal tailed frogs were large larvae, but one adult and one juvenile were also found. Only one rough-skinned newt was seen in the Lake, and no other amphibians were observed.

Stream temperatures were between 46 and 48° F (8 to 9° C), with the coldest reading in Tributary 6 and the warmest in Tributary 1, which ran at the surface only in the lowest 10 meters.

A few trout were observed in Tributaries 2, 3, 4A, and 5. All were juveniles roughly 25 to 40 mm total length. Few macro-invertebrates were seen in any of the tributaries except for 4B.

DISCUSSION

Numbers of most amphibian species observed in the 2012 surveys were fairly high. Previous low counts, in 2003 and 1993, might have reflected a reproductive or habitat use response to drought conditions, while this year’s counts could reflect high spring rainfall in the last two years. However, the number of DICO identified was the lowest yet recorded. This could indicate a real population decline. If global climate change had raised the stream temperatures, or if water quality had been reduced, it is possible that the more adaptable DITE could remain while DICO died out. The temperatures recorded were the same as in previous years, except in 2006 when temperatures were lower, presumably due to the late date of the surveys that year. The decreasing numbers of DICO identified might simply reflect a more conservative approach on my part to identifying this species over the years of the monitoring. Photographing a sample of Dicamptodons from each Tributary each year of surveys might help with identifications (by allowing proportional measurements to be analyzed on photographs), but would raise the project cost by greatly increasing the length of time spent at each stream and adding work with the photographs. The apparently precipitous decline of rough-skinned newts in the Lake simply reflects the time of year of the Tributary surveys, which in recent years do not include data from other visits to the Lake shore, when numerous individuals are commonly seen every year.

No terrestrial surveys specifically targeted for Larch Mtn. salamander have been conducted near the Lake, which is within the elevation range but outside the known geographic range of the species. The Plan specifies surveys of the Tributaries only, whereas habitat for Larch Mtn. salamander is talus and upland forest. In 1999 and 2000 "a complete census of potential amphibian habitat" was conducted, but was interpreted as stream and wetland habitats with direct connection to the Lake. It is unlikely that releases from the Lake could have any effect on Larch Mtn. salamanders if they did occur in adjacent upland habitats.

Subsequent surveys of the Lake tributaries should be conducted between mid-August and mid-October for optimal conditions to observe (if not always to capture) the maximum number of individuals, particularly of the target species, DICO. Perhaps in a less dry summer or towards the earlier end of that time period more individuals of that species would be found.

ACKNOWLEDGMENTS

Dave Corkran recorded data, measured or estimated stream reach lengths, and assisted with the canoeing which enabled me to conduct the surveys. I appreciate all his help. Thanks also to Doug Bloem for tracking weather forecasts that found the perfect windless day for the surveys.

CITATIONS

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Hayes, M. P., D. J. Dugger, T. L. Hicks, and T. Quinn. 2003. Comparing amphibian sampling methods: Which is best for headwater streams? Joint Conference of Society for Northwestern Vertebrate Biology and California North Coast Chapter of The Wildlife Society, Arcata, CA, Mar. 19-22, 2003.

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Figure 1. Bull Run Lake amphibian surveys in 2012. Amphibian surveys were conducted in Tributaries 1 through 6 (**T1**, **T2**, etc.), and the Lake edge.

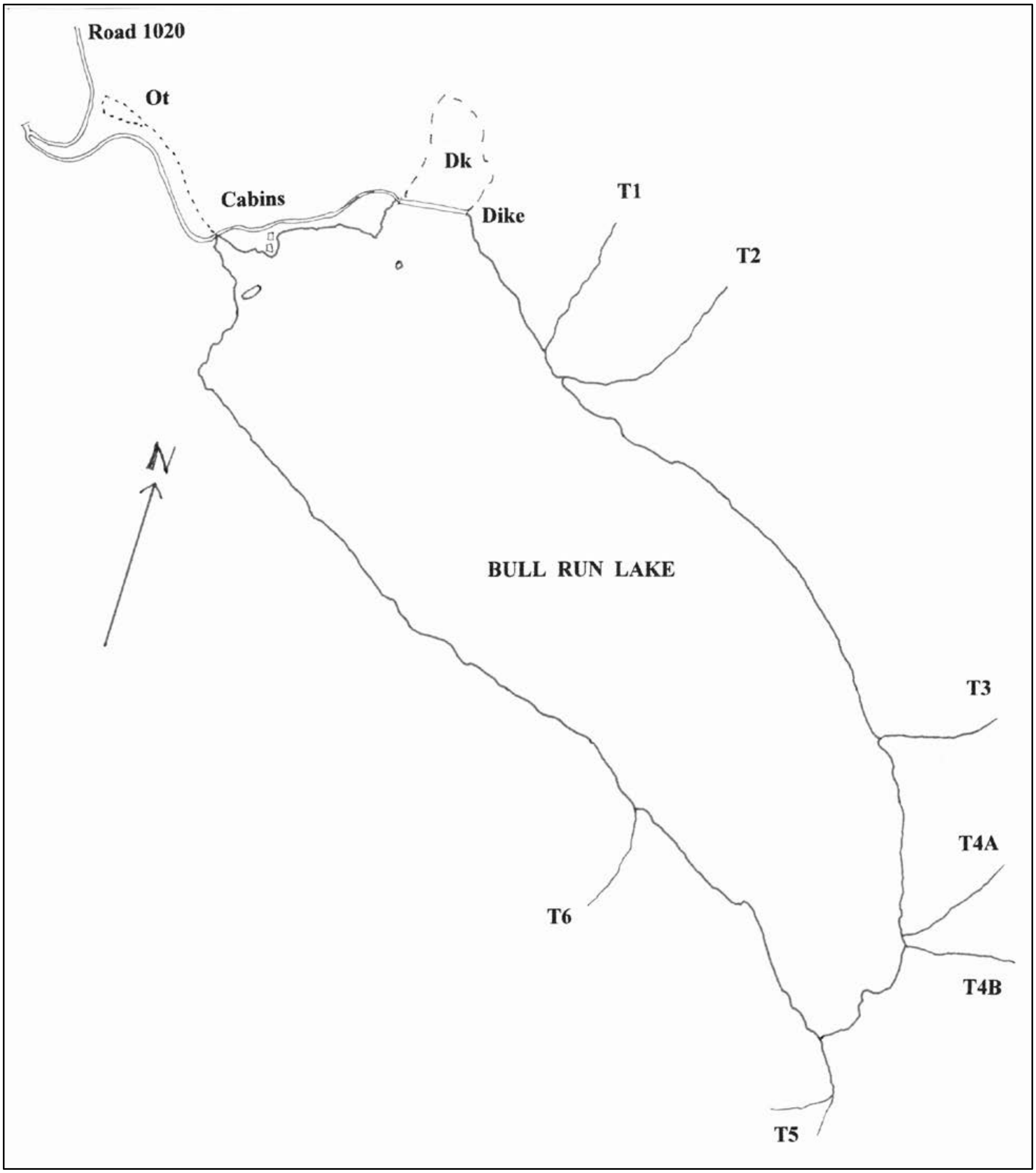

Table 1. Amphibian surveys in the Bull Run Lake area in 1993 through 2012. **AMGR** = northwestern salamander, **TAGR** = rough-skinned newt, **DICO** = Cope's giant salamander, **DITE** = coastal giant salamander, **met.** = metamorphosed adult, **RHCA** = Cascade torrent salamander, **ASTR** = coastal tailed frog, **HYRE** = Pacific treefrog, **BUBO** = western toad, **RACAS** = Cascades frog. **T1,...T6** = Tributary number, **Lk** = Lake edge, **Dk** = Area behind dike**, Ot** = Pooled area below outlet.

SITE - YEAR	AMGR	TAGR	DICO*	DITE*	RHCA	ASTR	HYRE	BUBO	RACAS
T1 – '99				3		6			
'03									
'06						1			
2012				**1**					
T2 – '93					1				
'99			4		1	6			
'00			1	3	1	3			
'03			4	3		2			
'06				1					
2012			**1**	**5**		**5**			
T3 – '93									
'99			2	1					
'03					1				
'06				1	4				
2012					**11**	**1**			
T4A-'93			1			3			
'99			4	3	1	4			
'00			2	5	13	13			
'03				1	3				
'06				13	1				
2012				**4**		**3**			
T4B –93	1		1		1	7			
'99				3					
'00			4		1				
'03				1,1 met.	5				1
'06				1,1 met.					1
2012				**7**	**2**				
T5 - '93						3			1
'99			4	8	3	4			1
'00			4	6	4	2			
'03			2	6		1			3
'06			1						
2012				**1**		**2**			
T6 - '93				1	1	3			
'99			4	2	1	9			
'00			2	9	1	1			
'03				6	3				1
'06			1	3	1				
2012			**1?**	**4**	**1**	**2**			

(Table 1 – continued)

SITE - YEAR	AMGR	TAGR	DICO*	DITE*	RHCA	ASTR	HYRE	BUBO	RACAS
Lk - ‘93	eggs	~500							1
‘99		~50							
‘00		~50							1
‘03		9							
‘06		4							
2012		**1**							
Dk - ‘99							1 dead		
‘03									
‘06							6		
Ot - ‘99							2		2, eggs
‘00								1	13
TOTALS									
1993	1, eggs	~500	2	1	3	16	0	0	2
1999	0	~50	18	20	6	29	3	0	3, eggs
2000	0	~50	13	23	20	19	0	1	14
2003	0	9	7	17	12	3	0	0	5
2006	0	4	2	20	6	1	6	0	1
2012	**0**	**1**	**1 & 1?**	**22**	**14**	**13**	**0**	**0**	**0**

* Several of the Dicamptodons shown as either DICO or DITE each year may have been misidentified and actually were the other Dicamptodon species.