

Pond-breeding Amphibian Surveys in Stanley Park 2007-2009

Native pond-breeding amphibians require standing water for their reproduction, but most spend the majority of their time in the forest and only come to aquatic sites in the spring to breed. Historically, more species of amphibians have been observed in the park than in recent years. Pond breeding salamanders observed in the park include the rough-skinned newt (*Taricha granulosa*), northwestern salamander (*Ambystoma gracile*) and long-toed salamander (*Ambystoma macrodactylum*). Native frogs included the Pacific chorus frog (tree frog) (*Hyla regilla*) and the red-legged frog (*Rana aurora*). The introduced American bullfrog (*Rana catesbeiana*) and green frog (*Rana clamitans*) are now very common in many of the park's major water bodies.



SPES staff conducting pond breeding amphibian survey at Beaver Lake 2007. (Photo by Peter Woods)

In spring 2007, pond-breeding amphibian surveys were conducted in Beaver Lake and Lost Lagoon as a part of the Restoration. Biologist Elke Wind and SPES staff conducted visual searches and funnel trapping over several days in the spring. The visual searches revealed many invasive green frogs and bullfrogs as well as four northwestern salamander egg masses. Funnel trapping was conducted by setting collapsible, unbaited, nylon mesh minnow traps in the water overnight. Following similar protocols, a second visual search and funnel trapping survey was conducted in the Park in 2009 that produced similar results.

Table 1 shows the results of the trapping surveys in various locations in the Park in 2007 and 2009. The data show that there were many more green frog / bullfrog tadpoles recovered in Beaver Lake in 2007 (about 1.0 tadpole per trap) as opposed to 2009 (about 0.4 per trap)



A bullfrog in Beaver Lake.

despite the traps being set in similar locations. This may not actually indicate a decrease in population, as half of the traps were set about one month earlier in 2009 which may have skewed the results. The trapping also revealed similar numbers of northwestern salamander larvae observed in the lake between the two years. In 2009, Beaver Pond and Moose Pond (located in the miniature train area) were also added to the study but only one northwestern salamander larva was caught.

Table 2: Results of amphibian funnel trapping surveys conducted in various locations in Stanley Park in 2007 and 2009.

Amphibian Funnel Trapping Results in Stanley Park						
	Dates	Green/Bullfrog Tadpoles	Green Frog Juv./Adults	Bullfrog Juv./Adults	Northwestern Salamander Larvae/Neotene	# Traps (all traps were left for one night)
Beaver Lake (2007)	18-May	19	-	-	1	18
Beaver Lake (2009)	19-Apr, 16-May	7	1		2	16
Biofiltration pond (2007)	18-May	2		1	-	5
Beaver Pond (2009)	29-Apr	-	-	-	1	3
Moose Pond (2009)	29-Apr	-	-	-	-	5
Total		28	1	1	4	

Visual searches in the major water bodies of the Park revealed that there are many egg masses being laid by northwestern salamanders and they are especially prominent in Beaver Pond and Moose Pond (see Table 2 below). These two water bodies also appear to be free, so far, from invasive bull frogs and green frogs. Visual searches for amphibians in Beaver Lake across the three years turned up similar levels of northwestern salamander egg masses (see table 2). In 2007 there were about 0.10 egg masses found per search minute, 0.15 masses in 2008, and 0.7



A northwestern salamander egg mass (hatched out) found in Beaver Lake.

masses in 2009. Visual searches in Beaver Pond and Moose Pond represent almost a complete inventory of egg masses present because the shallow, clear water and small size make it possible to see almost the entire area. Beaver Pond contained about 20 egg masses in both 2008 and 2009 while Moose Pond had 27 in 2008 and only 2 in 2009. The difference across years likely reflects annual population fluctuations, which are common in aquatic-breeding amphibians. However, two red-eared sliders were also present in both years, the impact of which on local amphibian populations is unclear. The juvenile and adult salamanders observed in these ponds were all found during nighttime searches

which may explain why none were found in the same location in 2008. In all of the water bodies (except Beaver Pond) some egg masses were found to have been depredated, but the predator was not identified.

Table 2: Results of amphibian visual surveys conducted in various locations in Stanley Park between 2007 and 2009.

Amphibians found per minute of search time						
	Dates	Green Frog Adults	Bullfrog Adults	Northwestern Salamander Egg Masses	Northwestern Salamander Larvae	Northwestern Salamander Adults
Beaver Lake (2007)	18-May	many	many	0.10	-	-
Beaver Lake (2008)	29-Apr	-	-	0.15	-	-
Beaver Lake (2009)	19-Apr, 16-May	0.04	0.01	0.07	-	-
Beaver Pond (2008)	21-Apr	-	-	1.40	-	-
Beaver Pond (2009)	29-Apr	-	-	0.45	0.18	-
Moose Pond (2008)	24-Apr	-	-	0.60	-	-
Moose Pond (2009)	29-Apr	-	-	0.03	-	0.03
Total number found		5	1	108	7	2

Perhaps the most significant result of the three years of RISC standard surveys as well as those conducted in 1998-1999, is that no Pacific chorus frogs or red-legged frogs have been found in the Park. These amphibians may be considered locally extirpated from the Park since they have not been recorded since the 1970's despite efforts on the part of SPES staff and local naturalists to locate them.

The small ephemeral ponds existing in the park may be of particular importance to native amphibians. Invasive bullfrog and green frog tadpoles usually spend one year or more as tadpoles, while the young of some native species can emerge from ephemeral ponds before they dry up in the summer. This means that these ponds may serve as safe areas for native amphibians to reproduce because they lack invasive frogs, fish and turtles. Further study is needed to see if these ponds are being used by native amphibians in the park.



Checking traps in Beaver Lake, spring 2009.

To view interactive maps of the amphibian trapping sites please visit:
<http://stanleyparkecology.ca/GoogleMaps/amphibians.php>