



## **Sauk-Suiattle Amphibian Survey Report 2008**

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## Sauk-Suiattle Amphibian Survey Report 2008

This report is based on weekly amphibian surveys taken in the spring of 2008 in the Reservation Slough wetland on the east side of the Sauk-Suiattle Indian Reservation. The surveys were done as an update to the Sauk-Suiattle Wetlands Report, written in 2003. Both the original report and this update were supported by grants from the U.S. Environmental Protection Agency.

### Survey objectives

The surveys were conducted in support of the Tribe's water quality program with the following objectives in mind:

1) *Assess the annual change in amphibian species and abundance.*

This year's surveys were the second of an annual program. Over the years, the surveys could help determine trends of amphibian populations in the lone Class 1 wetland on the 25-acre Sauk-Suiattle Indian Reservation.

2) *Analyze the data to highlight potential water quality or habitat concerns.*

Dips in amphibian numbers or species or unusual numbers of deformities could serve as an additional bellwether to the Tribe's regular water quality monitoring, alerting the Tribe to potential contamination or habitat alteration nearby.

3) *Help expand the regional amphibian database.*

Biologists throughout the Pacific Northwest have been striving for more coordinated regional amphibian monitoring that follows standardized methods. (Olson, Leonard, Bury, 1997) The Sauk-Suiattle Indian Tribe can contribute to those efforts over time by developing and improving this annual amphibian survey.

### Description of survey area

The survey area covers 5.5 acres of a roughly 10-acre wetland that follows the course of an oxbow slough of the Sauk River. The survey area is confined to the portion of the wetland owned by the Tribe. Fortunately, that portion contains much of the best pond habitat. This is a Class One wetland, according to the Sauk-Suiattle Indian Tribe Wetlands Report (2003). The National Wetlands Inventory database describes the slough as a Palustrine forested and intermittently flooded area. Aerial photos show this slough was the main channel of the Sauk River in 1949. Sometime soon after, the main channel shifted to the east and has not reoccupied the slough, although channel migration will surely happen here someday again. Floodwaters from the Sauk enter this channel at above 25,000 c.f.s. at the Sauk at Sauk river gauge, which is a flood of roughly two-year occurrence. The slough also receives groundwater and is wet year-round. Beaver, otter and wood ducks are among the many wildlife species here. The dominant plant species are red alder, Reed canary grass and cottonwood.

To the east is a forested upland area that separates the slough from the Sauk River. The upland is mainly hardwoods, including some big leaf maples, but also has some conifers such as western hemlock, western red cedar and Douglas fir in the canopy. *See the aerial photo on the next page.*



**Sauk-Suiattle amphibian survey area** (outlined in light blue)

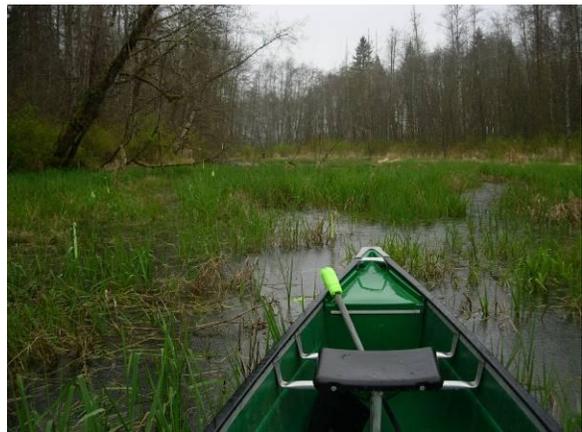
This 5.5 acre area is a Class 1 wetland, formed by relict channels of the Sauk River (at right), last occupied by the mainstem in 1949 or so. The area immediately east of the survey area is a forested upland braided with other relict channels. To the north, beyond Tribal property, the wetland extends and curves back into the Sauk River floodplain. To the west is the Sauk-Suiattle Reservation (loop road with houses).

## Summary of survey results

### Egg masses

Surveys began Feb. 21 and continued every week, ending May 29. The only exception was the survey scheduled May 21, which was missed. Also, the survey March 26 was cut short before we had finished covering the whole survey area, so we followed up with another visit March 28 to cover the rest of the area for that week. By the end of May, we counted 357 different egg masses from three different species: red-legged frog (*Rana aurora*), Northwestern salamander (*Ambystoma gracile*) and Pacific treefrog (*Hyla regilla*). It should be noted that we saw a new species this year, Western toad (*Bufo boreas*), but did not see any egg strings. We hope to make special visits in the summer of 2009 to see if toad breeding might be occurring after our normal survey season is finished.

### *Survey improvements*



*Flags mark Pacific chorus frog egg masses. Canoe gives better access. Photos by Scott Morris.*

Our total egg mass count was a little higher in 2008 than our first survey year in 2007, but two major improvements in our survey techniques should be considered. In

2008 we used a canoe to access the middle of the wetland's main pond. This surely must have boosted our egg mass numbers compared to 2007, when we were restricted to the wadeable areas on the edges of the pond. This seemed particularly true for Northwestern salamanders. (Incidentally, numbers almost doubled in 2008. See Table 1, next page.) We counted numerous deep salamander masses that we could not have seen from the edges, and even some along the edges that were more easily seen from a boat. The same seemed true to a lesser degree for the frogs. (Numbers were less conclusive, up for red-leggeds, down slightly for chorus frogs. See Table 1, below.)

We made another key improvement, using 3-foot long wire flags to mark each egg mass. In 2007 we simply used ribbon, but this proved too difficult to keep track of the tiny individual egg masses for chorus frogs. The best we could do that first year was count the numbers of chorus frog masses in defined subareas and track those numbers week-to-week. Thus it was difficult to rule out under-counts or double-counts. Lacking a better method, we considered any increase in each subarea to reflect the number of new masses for that spot that week.

In 2008, the tiny diameter of the wire flags made it quite easy to mark individual egg masses, even in dense breeding areas. (See top photo, previous page.) This increased the confidence of our count for 2008 and beyond, but it also means comparing the numbers against 2007 is not as clean.

Another difference in 2008 to consider is that beaver activity slightly raised a dam at the pond's outlet, extending suitable breeding habitat by flooding an area of Reed canary grass that in 2007 was a dry grassy clearing. It is unclear what affect this had. One small pond that had the highest concentration of chorus frog breeding in 2007 was noticeably more sparse in 2008, but perhaps they simply had more room to spread out in the adjacent newly flooded field. Another popular breeding spot in 2007 for chorus frogs at the south end of the wetland showed less egg mass density in 2008.

**Table 1. Egg masses**

<i>New weekly masses</i> 2008	<b>New egg masses</b>	<b>Red-legged frogs</b>	<b>Pacific chorus frogs</b>	<b>NW salamanders</b>
<b>2/21/2008</b>	0	0	0	0
<b>2/28/2008</b>	13	13	0	0
<b>3/6/2008</b>	62	60	0	2
<b>3/13/2008</b>	17	14	0	3
<b>3/19/2008</b>	13	13	0	0
<b>3/26/2008</b>	13	8	1	4
<b>3/28/2008</b>	4	0	0	4
<b>4/3/2008</b>	42	5	30	6
<b>4/10/2008</b>	30	2	28	0
<b>4/17/2008</b>	65	2	58	5
<b>4/24/2008</b>	37	1	31	5
<b>5/1/2008</b>	30	0	24	6
<b>5/8/2008</b>	15	0	13	2
<b>5/14/2008</b>	15	0	9	6
<b>5/29/2008</b>	1	0	1	0
<b>Total</b>	357	118	195	43

The egg mass count in 2007:

■ Red-legged frog:	87
■ Northwestern salamander:	23
■ Pacific chorus frog:	<u>212</u>
	Total: 322



*Pacific chorus frog. Photo by Scott Morris.*

*Amphibian sightings*

The big find in 2008 was the presence of Western toads. We did not see any in 2007, but we positively identified four Western toads in 2008.

The other difference in 2008 is we saw fewer frogs. In 2007 we saw 114 frogs, but only 90 in 2008. One difference was red-legged frogs. In 2007 we saw 41 red-

***Table 2. Amphibian sightings***

<i>Species and age</i>	<b>Totals</b>	<b>Max</b>
<b>Red-legged frog adults</b>	7	6
<b>Red-legged frog juveniles</b>	12	4
<b>Pacific chorus frog adults</b>	45	13
<b>Pacific chorus frog juveniles</b>	3	2
<b>NW salamander adults</b>	0	0
<b>NW salamander juveniles</b>	0	0
<b>Western toad adults</b>	1	1
<b>Western toad juveniles</b>	3	2
<b>Unidentified adults</b>	14	6
<b>Unidentified juveniles</b>	<u>5</u>	1
<b><i>Total</i></b>	<b>90</b>	

leggeds. In 2008, we only found 19. We also saw nearly twice as many unidentified frogs: 34 in 2007 and 19 in 2008. But we saw more chorus frogs in 2008 – 48, compared to just 31 in 2007. Again, we saw no salamanders.

The amphibian sighting numbers are more directly comparable from 2007 to 2008, because our protocol and intensity of effort remained the roughly the same. Of all these frogs, we saw no deformities. We did see one injured chorus frog that we suspect we inadvertently stepped on.

### **Summary of protocols**

Protocols are detailed in the Tribe’s “Surface Water Quality Monitoring Manual and Standard Operating Procedures.” In summary, two to four people spread out through the Tribe’s 5.5-acre portion of the wetland, looking for amphibians and their egg masses in a Visual Encounter Survey. We looked in the most likely terrestrial habitat, and we also focused concentrated efforts in and near the wet spots, which proved to have hundreds of egg masses throughout the spring. Egg masses were flagged and given individual numbers to avoid double counting and to track their development. Egg masses that were flagged were tracked for health with weekly estimates of the percentage of eggs that appeared dead. For our field identification guides, we used “Amphibians of Oregon, Washington and British Columbia,” (1996) by Charlotte C. Corkran and Chris Thoms, and “Amphibians of the Pacific Northwest,” (2005) edited by Lawrence L.C. Jones, William P. Leonard and Deanna H. Olson.

We also kept watch for any amphibians as we moved through the survey area, keeping track of age and species whenever possible. We tried to capture by hand any amphibian we saw, to facilitate identification. We kept them moist while handling the animals, then released them once identified.



*Adult red-legged frog hiding underwater. Photo by Scott Morris*

We did not continue the wetland habitat survey this year, because of time constraints. The main difference in habitat this year was an expansion of suitable breeding habitat thanks to beaver activity that raised the water level enough to flood the grassy clearing near the wetland's main pond. Water depth in the grassy area tended to be about 18 inches.

### **Discussion of results**

We started the survey two weeks earlier in 2008 than in 2007 to try to find egg masses of long-toed salamanders, which typically breed in winter when temperatures are above freezing (Bull, 2005). This can even mean January in some lower elevations, but we had a fairly cold winter with a heavy snowpack, so our timing was not bad. We have yet to find any definitive sign of long-toed salamanders, but it seems possible we could have some in this wetland. We had hoped to make some early visits in January of 2009, but as of this writing the snowpack is unusually thick. We will start the survey Feb. 25.

The egg mass data shows red-leggeds peaking March 6 and dropping sharply after that, with no new eggs found after April. Pacific chorus frogs peaked in April and dropped off by the end of May. Northwestern salamanders showed a steadier pattern from early March through May. As in 2007, many of the salamander egg masses had not hatched by the end of May.

The experience we gained in 2007 and the improved survey techniques we used in 2008 resulted in better data. For example, looking at our 2008 data, it seems likely in 2007 that we missed the first few weeks of Pacific chorus frog egg masses. In 2008, we started to see chorus frog eggs in late March and early April. In 2007, we didn't record our first chorus frog eggs until April 26, but we saw 169 that day in various stages of development. The reason is likely we were inexperienced and did not have our eyes adjusted to the small target. In 2008, the data shows an earlier, less abrupt start, probably because we knew what we were looking for.

The canoe helped us better document Northwestern salamander breeding, doubling our count and finding some earlier breeders, too. It's obviously hard to draw many conclusions from just two years of data, particularly when the canoe's better access and visibility in 2008 is considered.

As for predators, we did not find many snakes in 2008, but they are surely active in the plentiful canary grass here. The area shows lots of signs of river otters and beavers, and we did find one salamander larva with its head chomped off. One pool that has the highest concentration of chorus frog egg masses also has predacious diving beetles that like to take bites out of the larva after they hatch. We have seen the beetles both years. Dogs and kids wandering through can take a toll on egg masses, because this wetland is close to the Reservation's housing, but we did not notice much evidence of stomping in 2008.

Now that we have improved our flagging method for the egg masses, we have decided to continue counting all egg masses in the survey area, instead of doing a grid or transect tied to habitat types. I discussed this with Michael Adams, a research ecologist for the U.S. Geological Survey, and he said given that we've got the time and crew, this is a more thorough approach. We still have the potential problem of not surveying good habitat to the north, beyond the Tribe's property. The concern is that perhaps more egg masses would be laid on one side of the property line one year, then shift the other way in another year, creating a breeding graph that shows increases and decreases that would not necessarily reflect reality. A grid system would not eliminate this problem. It's something we have to live with and take into consideration.

We tracked the number of surveyors and the hours spent surveying each week. This data is meant to help adjust if we had weeks or years with more intensive surveying efforts than others. The numbers require some caution, because our survey method causes an increase in survey hours as the egg mass numbers increase. The reason is we are tracking the development of each egg mass. So the first week, which is hopefully early enough to be at or near zero, goes pretty quickly. But by May, we are required to check nearly 300 masses, which slows us down, even if we have the same number of surveyors. Also, the numbers in early 2007 appear longer than in 2008, probably because we were learning and not as experienced as in 2008.