



**SPAWNING SURVEY
ARMSTRONG CREEK, FALL
2009**

**A Report to the Happy Trout
Chapter, TUC with Notes and
Recommendations**



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**SPAWNING SURVEY
ARMSTRONG CREEK, HAPPY TROUT CHAPTER, TUC**

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Introduction:

A spawning survey for brook trout, *Salvelinus fontinalis*, was conducted on Tuesday, December 8, 2009 by Jack Imhof, National Biologist, TUC and two members of the Happy Trout Chapter, TUC: Bob James and Don Harris.

Jack Imhof had undertaken an initial scan for spawning brook trout on November 16th. At that time, he noted spawning activity upstream of Grey Rd. 12 but downstream of the old water works site. The December 8th survey was undertaken to ascertain spawning activity and record redds in the reach of Armstrong Creek from Grey Rd. 12 upstream to County Rd. 110.

The survey was conducted between 10:30AM and 2:00PM by walking upstream along and occasionally in the stream from Grey Rd. 12 to County Rd. 110. Air temperature was approximately -8°C with little wind and a mixture of sun and cloud. There was ice along the margins of the stream in various places and there was approximately 20cm of snow on the ground. This survey follows the protocol developed by Imhof (1997).

Observations

Table 1 provides information on the general location of spawning activity or observed congregations of mature brook trout. Based on the literature and personal experiences (TUC Biologist), adult brook trout are rarely seen except around active spawning areas during spawning season. Brook trout appear to require groundwater discharge areas in relatively slow flowing water (shallow pools, margins of pools) for spawning success. Therefore, spawning locations are usually very limited in most streams and brook trout will congregate in these areas compared to other areas of the stream. Only after spawning will brook trout move to overwintering areas in a stream.

Brook trout unlike brown trout tend to spawn close to each other and can be found in large spawning schools (although the actual redd building and fertilization is usually

between only a couple of fish). Therefore, it is highly likely that even if no clearly defined spawning location is obvious, congregations of adult brook trout (20cm+) are good indications of a nearby spawning location.

Table 1: Spawning or brook trout congregation areas observed on November 16, 2009 (asterisk) and on December 8, 2009.

| Location | Coordinates (lat and long) | # of Redds | Congregation of brook trout observed |
|--|--|------------|--------------------------------------|
| Upstream of Thompson Pond site in first slow pool just below old water works channel* | 44° 18' 36".299 N 80° 39' 08".112 W | 1 – 3 | NO |
| At Diversion, old water works channel, 20m upstream of intake pipe on east side of channel | 44° 18' 34".140 N 80° 39' 03".180 W | 1 | Yes |
| 60m below Jack's Jaunt in deep, slow portion of channel | 44° 18' 32".372 N 80° 38' 40".714 W | None seen | Yes – 10-15 fish seen |
| 30m upstream of Rd. 110 on left side of deeper channel | 44° 18' 07".44N 80° 37' 57".47W | None Seen | Yes, 8-10 fish seen |

Brook trout redds are also different than brown trout redds. Rather than single large scars that are found in riffles and measure (on average) approximately 1-1.5m long, brook trout redds are found in slower water and are more circular shaped depressions cut into the stream bed (see Figure 1)

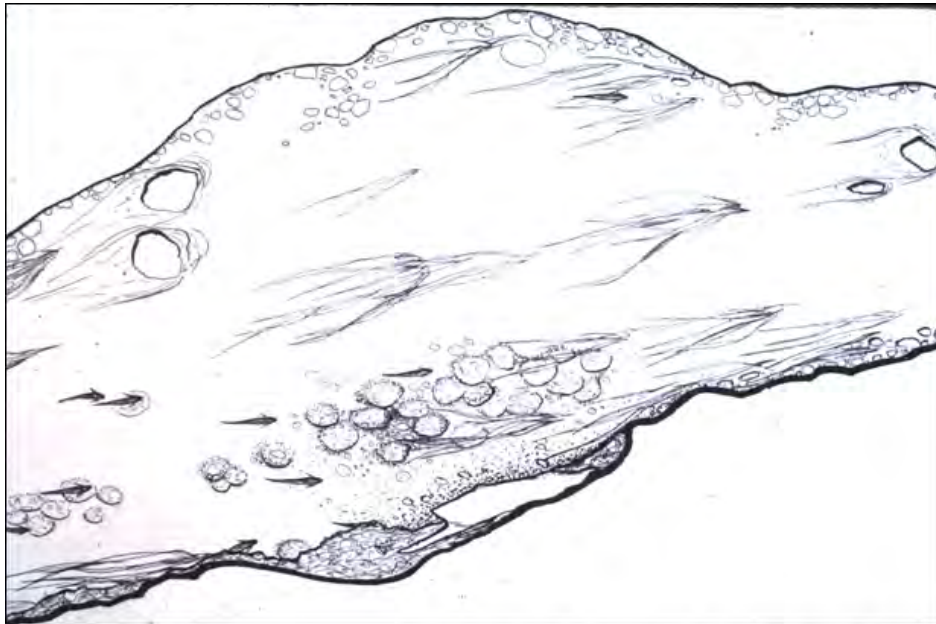


Figure 1: Demonstrating typical brook trout spawning redds (multiple circular depressions) in streams. Note that individual pairs tend to spawn side by side (illustration by G. Mercer).

The stream did not contain any sign of frazzle or anchor ice despite the cold temperatures. The original spawning area identified on Nov. 16th no longer exhibited

evidence of spawning (no clearly identified cleared area or fish in the immediate area). Figure 2 compares the same spawning site observed on November 16th and on December 8th. The site is now covered with fine organic muck which might hinder incubation and successful hatch of the eggs placed in this location (Figure 3).



Figure 2: Spawning location with trout on Nov. 16th compared to same location during spawning walk, Dec. 8th (circled in red). Note that you no longer can see evidence of spawning.

There was some discussion about restoration work upstream that could be done to provide sufficient current to keep this area of the pool clear of fine silt in order to increase the potential for successful recruitment. This work will need to be done very carefully in order to move sufficient current to keep the fine muck off this location, while not creating a high current area through the section.

One or two additional redds were noted upstream of the first spawning site (see comparison between first and second location in Figure 4). Both on November 16th and on December 8th, a small congregation of brook trout was noted in the water intake channel, just upstream of the



Figure 3: Air photo showing old Thompson Pond and spawning location upstream of Grey Rd. 12, circled in red.

water intake pipe (Table 1). A small spawning area was noted at this site though other spawning activity may have already been covered up by fine organic muck moving through this section.



Figure 4: Air photo showing first spawning site upstream of Grey Rd. 12, circled in red and second site on water intake canal upstream..

No other congregations of trout were observed until the survey crew was within 50m of Jack's Jaunt. Approximately 8-12 spawning size brook trout were observed in the slow deep section of the reclaimed channel upstream of the old beaver pond and blowdown area. This section has been undergoing restoration work over the last two summers and has redefined a deeper, narrower and cobble bottomed channel through the old mud flats of the old beaver pond. Figure 5 shows the location of the congregation of trout in relation to the old beaver pond that has been breached and the little spring at Jack's Jaunt that has been recently opened. The new spring has been tentatively named Joanne's Joy. There may be a potential and opportunity for additional spawning bed development in this area. The placement of spawning gravel over the springs at the top of Joanne's Joy was discussed as a possible project for this coming year.

No further evidence of redds or brook trout congregations were observed until the section of channel just upstream of Rd. 110 (Figure 6 and Table 1). A portion of the channel has been deepened approximately 40m upstream of the culverts. It was in the deepest portion of the channel (approx. 35cm deep) that approximately 6-10 mature brook trout were observed. This is the same general location as the site of previous noted spawning several years ago (2006 D'Amelio pers. comm.).



Figure 5: Pre-restoration air photo of section of Armstrong Creek upstream of old beaver dam and downstream of restored spring. Spring tentatively called Joanne's Joy. Location of trout congregation is circled in red.

Summary

This is only the second time that direct and indirect evidence of spawning has been found on Armstrong Creek. S. D'Amelio and the Happy Trout Chapter noted spawning activity upstream of Rd. 110 in 2006, but other spawning surveys over the next several years did not find any redds or note congregations of brook trout.

Although there is now more and more evidence through direct observation that brook trout are returning to the stream, this is the first year where two locations of spawning and several locations of congregations of mature brook trout have been observed. Local residents that fished the stream



Figure 6: Location of last brook trout congregation noted during survey.

many years ago (30+ years) are now indicating to Chapter members that they have fished the stream this year and for the first time in 30 years are catching brook trout.

Recommendations

1. It would be very useful to conduct a fry survey next spring around the confirmed sites and near the locations of congregations to see if fry can be observed. This would confirm that any spawning that is occurring is successful to some degree.
2. It would also be useful for the Chapter to consider enhancing those areas where spawning and spawning congregations have been observed and to pay close attention to these sites as well. Any enhancement or restoration work should be done very carefully so as not to damage or alter the conditions that are attractive to the fish. TUC biologists will be willing to help with this work.
3. Finally, it is recommended that spawning surveys continue to be conducted every year, but to try to conduct future surveys between November 1st and November 15th in order to capture the likely peak spawning period. As mentioned above in recommendation #1, fry surveys should be instituted as well to develop a continuing line of evidence of spawning success on Armstrong Creek.