South Branch Paint River

Gogebic and Iron Counties, T44N R38W Sections 24-27 & 34, T44N R37W Sections 1,
Paint River Watershed, 2018

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Environment

The South Branch of the Paint River (SB Paint River) is a popular trout stream and is included in the Ottawa National Forest's 2007 "Wild and Scenic River Comprehensive River Management Plan". The total length of the SB Paint River is 42 miles (Figure 1). The headwaters, known as Paint River Springs, are in lowland swamps located in southeastern Gogebic County. The SB Paint River flows easterly into Iron County where there is private ownership sporadically along the river, but the majority is within the Ottawa National Forest and has little to no development. There is angler access along US Highway 2 and Elmwood Road, however, most anglers target the lower reaches between the confluence of Cooks Run and lower Goldmine Road. Brook Trout occur throughout the SB Paint River and Brown Trout populations are present below the Basswood location. The lower SB Paint River is swift, wide and shallow. A noteworthy area is the Uno Dam stretch which is located between the upper and lower Goldmine Road crossings (Figure 1). It has the remnants of an old logging dam that is lined with large rock outcrops and has a deep hole.

The SB Paint River is classified as a cold river until Lode Creek flows into it. Abundant groundwater and coldwater tributaries (Cooks Run, Lode Creek, and McAllister Creek) account for the cold river status. Below the confluence of Lode Creek, the SB Paint River is considered a cold transitional river. It is one of two branches of the Paint River which is classified as a warm transitional river. The North Branch is the second branch and it meets with the South Branch to form the mainstem of the Paint River. The SB Paint River has historically been important during the logging era of the late 1800s to early 1900s while today is it primarily used for recreational purposes. The surrounding area has loamy soils and vegetation is a mix of conifers, softwoods and hardwoods. The surficial geology is comprised of coarse-textured glacial till and end moraines.

The SB Paint River is a well-known trout stream which attracts anglers from across the county to fish. It currently (2019) has two regulations: 1) Type 1 Trout Regulations from the headwaters to the mouth of Cooks Run (Brook Trout and Brown Trout 7" and 8" minimum size limit, respectively) and 2) From the mouth of Cooks Run to mainstem of the Paint River, Type 2 Trout regulations (with modifications) are in place (Brown Trout 12" and 7" minimum size limit for Brook Trout) from last Saturday in April until September 30th. From October 1st to last Saturday in April, gear restricted regulations are in effect, namely the use of artificial flies only. Between 2000-2015, the minimum size for Brook Trout was 10 inches.

History

Stocking

The SB Paint River was historically stocked with Brook Trout from 1933-1965, Brown Trout from 1935-1954, and Rainbow Trout from 1938-1965 with most of those fish being adult size. Brook Trout

were last stocked in 1985, Brown Trout in 1980 and 1985 and Rainbow Trout in 1980, 1994 and 1995. No records could be found regarding the decision to discontinue stocking Brown or Rainbow Trout. A correspondence letter regarding the Paint River from 1987 mentions stocked Brook Trout not surviving and that most Brook Trout were a result from natural reproduction. This is likely the reason why Brook and Brown Trout stocking were also stopped.

Habitat Management

Historically, the SB Paint River was described as wide, shallow and devoid of any cover suitable for trout populations. Since 1961, many habitat improvement projects have been implemented, in particular where McRae Creek flows into the SB Paint River downstream to the Lower Skybooms (Figure 1). The overall goal of the projects was to increase size and biomass of trout. In 1961, the Michigan Department of Conservation (precursor to Department of Natural Resources) added log and rock structures beginning at the confluence of Cooks Run downstream to Upper Goldmine Road (~2.25 miles). In 1963, the US Forest Service improved 4,500 feet of habitat by adding log and rock structures below the confluence of Lode Creek. Intense habitat projects also occurred between 1973-2001 from the Upper Skybooms reach downstream to the Lower Skybooms reach (Figure 1). In 1973-74, a major habitat improvement project was implemented throughout this stretch of river that included the installation of log structures, rocks, and wood deflectors . Prior to these habitat projects, this section of stream averaged 60 feet in width and 10 inches in depth. The trout had suitable water temperatures and an abundance of aquatic invertebrates but lacked any cover such as deep holes. Wood deflectors were installed throughout this stretch of the river but the exact year of installation remains unclear. In 1990 and 1991, skyboom structures and platforms were installed by the USFS (United States Forest Service) and in 2001, half logs and slab structures were installed. In 1998 and 2003, the USFS installed two sediment traps. In 1999, Trout Unlimited added 18 half log structures above the Upper Goldmine Road.

Fisheries Management

Creel surveys were conducted in 1947 and from 1951-1954. These were not intensive surveys and did not have standard methods. In general, fishing effort was described as light and most anglers caught between 0-8 Brook Trout.

Multiple sites throughout the SB Paint River have been surveyed since the 1950s. Each site will be described separately, beginning in the upper section of the watershed (Figure 1).

US-2 Bridge:

On August 18,1954 a survey was conducted by the Institute for Fisheries Research from the US-2 bridge downstream 375 feet (44N 38W Sec 24). Fish captured included Brook Trout (N=73, 2-12" length range), Common White Sucker (N=9, 4-7" length range), Creek Chub (N=3, 4" lengths), Blacknose Dace (N=32, 2-4" length range), Longnose Dace (N=2, 1" lengths), Central Mudminnow (N=1, 3"), and Mottled Sculpin (N=86, 1-5" range). The average width was 28 feet and average depth was 9 inches. Habitat was described as silt (15%), silty-sand (75%) and sand (10%). Cover was "good" with overhanging tag alders and logs. Available food included mayflies, caddisflies, forage fish, crayfish, and frogs.

On August 30-31,1978 a survey was conducted by the Michigan Department of Conservation from the US-2 bridge downstream 2,000 feet (marking and recapture run, 44N 38W Sec 19). Fish captured included Brook Trout (N=89, 3-9" length range), Common White Sucker (N=6, 6-9.5" length range), Creek Chub (N=2, 4.5-5" length range), Central Mudminnow (N=1, 2.7"), and Mottled Sculpin (N=12, 1.5-3.5" length range). The deepest portions surveyed were 16 inches. The estimated Brook Trout population was calculated at the time to be 245 per acre.

Elmwood:

On October 18, 1953 a survey was conducted by the Institute of Fisheries Research at the Elmwood location (44N 37W Sections 10 and 11). Total survey length was 375 feet. Fish captured included Brook Trout (Table 1, N=18, 3-6" length range), Brown Trout (Table 1, N=3, 11-14" range), Rainbow Trout (Table 1, N=4, 6" range), Creek Chub (N=14, 1-3.5" range), Blacknose Dace (N=10, 2-3" range), Redbelly Dace (N=4, 1-2.5" range), Central Mudminnow (N=15, 1-4" range), Mottled Sculpin (N=21, 1.5-3.5" range), and Brook Stickleback (N=7, 1.5-2" range). The average width was 31 feet and average depth was 12 inches. Substrate was described as silt (5%), gravel rubble mix (90%) and boulders (5%). Cover was described as 15% shaded, tag alders, good cover with boulders and logs. Available food included mayflies, stoneflies and caddisflies.

On August 31 to September 1, 1978 a survey was conducted by the Michigan Department of Conservation (44N 37W Section 10). Total survey length was 2,000 feet (marking and recapture run). Fish captured included Brook Trout (Table 1, N=93, 2-11" range), Brown Trout (Table 1, N=1, 8"), Common White Sucker (N=20, 3.5-8" range), Creek Chub (N=11, 3-5.5" range), Blacknose Dace (N=38, 2-4" range), Northern Redbelly Dace (N=2, 3-4" range), Mottled Sculpin (N=5, 3" range), and Brook Stickleback (N=2, 2" range). Stream depth ranged from 14 inches to 2.5 feet. The estimated Brook Trout population was calculated at the time to be 1,057.

On August 21-22, 1991 a survey was conducted by the Michigan Department of Natural Resources (MDNR) (44N 37W Section 10). The total survey length was 2,000 feet (marking and recapture run). Only Brook Trout were captured and recorded (Table 1, N=176, 2-10" range, 5.3" average). The average width of reach was 25 feet. Available fish food observed included Creek Chubs, Blacknose Dace, and Common White Suckers. The estimated Brook Trout population was calculated at 388 per acre.

On August 28-29, 1995 a survey was conducted by the Michigan DNR (44N 37W Section 10). Total survey length was 2,000 feet (marking and recapture run). Only Brook Trout were captured and recorded (Table 1, N=139, 2-11" range, 6" average). The average width of reach was 25 feet and water temperature was recorded at 59°F. The estimated Brook Trout population was calculated at 262 per acre.

On August 26-27, 1996 a survey was conducted by the Michigan DNR (44N 37W Section 10). Total survey length was 2,000 feet (marking and recapture run). Brook Trout were captured and recorded (Table 1, N=157, 2-10" range, 5.4" average). One Brown Trout was also captured that was 7.5 inches in length (Table 1). The average width of reach was 25 feet and the water temperature was recorded at

57°F. Common White Suckers were noted as abundance and new beaver dams were located below the bridge. The estimated Brook Trout population was calculated at 287 per acre.

On August 14-15, 1997 a survey was conducted by the Michigan DNR (44N 37W Section 10). Total survey length was 2,000 feet (marking and recapture run). Only Brook Trout were captured and recorded (Table 1, N=347, 1-10" range, 3.5" average). The average width of reach was 25 feet and water temperature was recorded at 58°F. Estimated Brook Trout population was calculated at 809 per acre.

On August 3-4, 1999 a survey was conducted by the Michigan DNR (44N 37W Section 10). Total survey length was 2,000 feet (marking and recapture run). Only Brook Trout were captured and recorded (Table 1, N=407, 1-9" range, 4.5" average). Water temperature ranged from 60-66°F. The estimated Brook Trout population was calculated at 949 per acre.

On August 17-18, 2000 a survey was conducted by the Michigan DNR (44N 37W Section 10). Total survey length was 2,000 feet (marking and recapture run). Only Brook Trout were captured and recorded (Table 1, N=246, 2-10" range, 5.3" average). Water temperature ranged from 57-62°F. The estimated Brook Trout population was calculated at 952 per acre.

U.S. Forest Service Road 3270:

On October 18, 1953 a survey was conducted by the Institute of Fisheries Research at the U.S. Forest Service Road 3270 (44N 37W Section 12). Total survey length was 390 feet. Fish captured included Brook Trout (N=17, 2.5-10.5" range), Common White Sucker (N=72, 3.5-12" range), Creek Chub (N=3, 2.5-7.5" range), Northern Chub (N=1, 4.5"), Blacknose Dace (N=93, 1-4" range), Redbelly Dace (N=5, 2-2.5" range), Central Mudminnow (N=5, 2.5-4" range), Mottled Sculpin (N=22, 1.5-4.5" range), and Brook Stickleback (N=3, 1.5-2" range). The average width was 41 feet and average depth was 16 inches. Habitat was described as silt (10%), sand (40%), and rubble (60%). Cover was described as good with aquatic vegetation and overhanging tag alders. Observed available food was mayflies and caddisflies.

Basswood:

On October 18, 1953 a survey was conducted by the Institute of Fisheries Research at the Basswood location (44N 36W Section 20). Total survey length was 450 feet. Fish captured included Brook Trout (N=21, 2.5-7" range), Brown Trout (N=26, 3-12" range), Common White Sucker (N=4, 4-7.5" range), Blacknose Dace (N=31, 2-4" range), Longnose Dace (N=37, 2-4" range), and Mottled Sculpin (N=40, 2.5-4" range). The average width was 48 feet and average depth was 9 inches. Sediment was described as boulders (50%), sand (trace), and rubble (50%). Cover was described as fair with overhanging tag alders and boulders. Observed available food was mayflies and caddisflies.

McRae Creek:

On June 12th, 1986, a survey was conducted by the Michigan Department of Natural Resources to evaluate stocked Brook and Brown Trout that were fin clipped in September 1985 (44N 36W Section

28). Total survey length was 1,000 feet. Fish captured included Brook Trout (Table 2, N=30, 4-9" range, 6.4" average), Brown Trout (Table 2, N=27, 5-17" range, 9.1" average), and Rainbow Trout (Table 2, N=1, 8"). Surface water temperature was recorded at 49.5°F. No fin clipped Brook or Brown Trout were captured.

On October 7th and 10th, 1994 a survey was conducted by the Michigan DNR (44N 36W Section 28). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (Table 2, N=409, 2-15" range, 6.9" average), Brown Trout (Table 2, N=258, 2-18" range, 6.3" average), and Rainbow Trout (Table 2, N=2, 8 and 11 inches). Water temperature was recorded at 43°F and average stream width was 61 feet. The estimated Brook Trout and Brown Trout populations were 393/acre and 261/acre, respectively.

On August 22-23, 1995 a survey was conducted by the Michigan DNR (44N 36W Section 28). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (Table 2, N=91, 2-12" range, 6" average) and Brown Trout (Table 2, N=145, 2-19" range, 7.7" average). Water temperature was recorded at 60°F and average stream width was 61 feet. The estimated Brook Trout and Brown Trout populations were 336/acre and 192/acre, respectively.

On August 19-20, 1996 a survey was conducted by the Michigan DNR (44N 36W Section 28). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (Table 2, N=230, 1-13" range, 4.2" average), Brown Trout (Table 2, N=94, 2-13" range, 8.1" average) and Rainbow Trout (Table 2, N=5, 6-10" range, 8.5" average). Additionally, three Yellow Perch and one Northern Pike were captured. Water temperature was recorded at 59°F and average stream width was 61 feet. The estimated Brook Trout and Brown Trout populations were 258/acre and 60/acre, respectively.

On August 18-19, 1997 a survey was conducted by the Michigan DNR (44N 36W Section 28). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (Table 2, N=418, 2-9" range, 4.5" average) and Brown Trout (Table 2, N=129, 2-15" range, 5.6" average). Water temperature ranged from 49-51°F and average stream width was 61 feet. The estimated Brook Trout and Brown Trout populations were 475/acre and 168/acre, respectively.

Upper Goldmine:

On September 3, 1953 a survey was conducted by the Institute of Fisheries Research at the Upper Goldmine location (44N 36W Section 27). Total survey length was 375 feet. Fish captured included Brook Trout (Table 3, N=8, 2.5-7" range), Brown Trout (Table 3, N=4, 2.5-4" range), Rainbow Trout (Table 3, N=2, 2.5"), Creek Chub (N=2, 2.5-3" range), Blacknose Dace (N=32, 1-4" range), Longnose Dace (N=22, 2-4" range), and Mottled Sculpin (N=27, 1-4" range). The average stream width was 42 feet and average depth was 15 inches. Habitat was described at coarse gravel and rubble (no percentages recorded).

On June 12th, 1986, a survey was conducted by the Michigan DNR to evaluate stocked Brook and Brown Trout that were fin clipped in September 1985. Total survey length was 1,160 feet. Fish captured included Brook Trout (Table 3, N=36, 4-9" range, 6.3" average, Figure 3), Brown Trout

(Table 3, N=22, 5-21" range, 8.1" average, Figure 3), and Rainbow Trout (Table 3, N=2, 5"). Water temperature was recorded at 55°F. No fin clipped Brook or Brown Trout were captured.

On June 24th, 1986, a survey was conducted by the Michigan DNR to evaluate stocked Brook and Brown Trout that were fin clipped in September 1985. Total survey length was 860 feet. Fish captured included Brook Trout (Table 3, N=22, 6-10" range, 8.1" average, Figure 3), Brown Trout (Table 3, N=17, 6-22" range, 11.2" average, Figure 3), and Rainbow Trout (Table 3, N=6, 6-13" range, 9.2" average). Water temperature was recorded at 56°F. No fin clipped Brook Trout was captured. However, one fin clipped Brown Trout was captured that was 6.5 inches in length.

On August 14th and 16th, 1990 a survey was conducted by the Michigan DNR. Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (Table 3, N=458, 2-10" range, 4.7" average, Figure 3), Brown Trout (Table 3, N=393, 2-19" range, 5.6" average, Figure 3), and Rainbow Trout (Table 3, N=237, 2-17" range, 6.7" average). Water temperature was 62°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 587/acre, 531/acre, and 57/acre, respectively.

On August 12-13th, 1991 a survey was conducted by the Michigan DNR. Total survey length was 2,000 feet (marking and recap run). Fish captured and recorded included Brook Trout (Table 3, N=504, 2-10" range, 4.9" average, Figure 3), Brown Trout (Table 3, N=220, 1-16" range, 6.4" average, Figure 3), and Rainbow Trout (Table 3, N=14, 7-8" range, 8" average). Surface water temperature was not recorded. The average width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 462/acre, 323/acre, and 14/acre, respectively.

On August 12-13th, 1992 a survey was conducted by the Michigan DNR. Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (Table 3, N=241, 2-8" range, 4.5" average, Figure 3), Brown Trout (Table 3, N=111, 2-16" range, 5.4" average, Figure 3), and Rainbow Trout (Table 3, N=5, 5-12" range, 8.3" average). Water temperature was 63°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 298/acre, 139/acre, and 5/acre, respectively.

On September 3rd-7th, 1993 a survey was conducted by the Michigan DNR. Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (Table 3, N=207, 2-10" range, 5.3" average, Figure 3), Brown Trout (Table 3, N=151, 2-16" range, 6.4" average, Figure 3), and Rainbow Trout (Table 3, N=21, 3-12" range, 7.7" average). Water temperature ranged from 45-52°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 260/acre, 210/acre, and 25/acre, respectively.

On September 12th-13th, 1994 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (N=242, 2-12" range, 5.1" average, Figure 3), Brown Trout (N=214, 2-18" range, 5.9" average, Figure 3), and Rainbow Trout (N=18, 3-13" range, 9.2" average). Water temperature ranged from 59-61°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 545/acre, 346/acre, and 17/acre, respectively.

On August 22nd-23rd, 1995 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (N=189, 2-13" range, 5.4" average, Figure 3), Brown Trout (N=321, 2-17" range, 7.2" average, Figure 3), and Rainbow Trout (N=25, 6-13" range, 8" average). Water temperature ranged from 52-56°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 247/acre, 447/acre, and 29/acre, respectively.

On August 14th-15th, 1997 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (N=389, 2-11" range, 4.2" average, Figure 3), Brown Trout (N=302, 2-16" range, 4.8" average, Figure 3), and Rainbow Trout (N=16, 1-14" range, 5.6" average). Water temperature was recorded at 54°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 875/acre, 484/acre, and 15/acre, respectively.

On August 10th-11th, 1998 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (N=386, 2-11" range, 4.6" average, Figure 3), Brown Trout (N=394, 2-16" range, 5" average, Figure 3), and Rainbow Trout (N=87, 1-11" range, 3.2" average). Water temperature was recorded at 59°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 496/acre, 515/acre, and 241/acre, respectively.

On August 9th-10th, 1999 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (N=390, 2-14" range, 4.9" average, Figure 3), Brown Trout (N=338, 2-17" range, 5.6" average, Figure 3)), and Rainbow Trout (N=13, 6-7" range, 7.1" average). Water temperature was recorded at 53°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 849/acre, 628/acre, and 9/acre, respectively.

On August 14th-15th, 2000 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (N=168, 2-10" range, 5.6" average, Figure 3), Brown Trout (N=208, 2-16" range, 6.7" average, Figure 3), and Rainbow Trout (N=1, 12.5"). Water temperature was recorded at 58°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 589/acre, 491/acre, and 2/acre, respectively.

On August 2nd-3rd, 2001 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (N=225, 2-9" range, 5.8" average, Figure 3), Brown Trout (N=225, 2-14" range, 7.9" average, Figure 3), and Rainbow Trout (N=2, 12-13" range). Water temperature was recorded at 62°F and the average stream width was 48 feet. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 534/acre, 314/acre, and 2/acre, respectively.

On August 5th-6th, 2002 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Captured fish species included Brook Trout (N=153, 1-13" range, 6" average, Figure 3), Brown Trout (N=138, 1-17" range, 7.2" average, Figure 3), and Rainbow Trout (N=5, 5-14" range, 8.5" average), Bluegill (N=1, 4.5" length), Longnose Dace (N=12, 1-3"

range, 2.6" average), sculpins (N=15, 2-3" range, 2.7" average), and Common White Sucker (N=3, 5",12",13" in length). Water temperature was not recorded. The average stream width was 48 feet. Population estimates for Brook Trout and Brown Trout were 306/acre and 347/acre, respectively (Figure 4). Age and growth analysis indicated ages 0-4 were present for Brook Trout and had a mean growth index of +0.5 inches above state average. Ages 0-4 were present for Brown Trout and had a mean growth index of +1.2 above state average. Ages 1 and 3 were present for Rainbow Trout but not enough Rainbow Trout were analyzed to calculate a mean growth index.

On August 6th-7th, 2003 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Fish captured and recorded included Brook Trout (N=212, 2-12" range, 5.6" average, Figure 3), Brown Trout (N=203, 1-17" range, 6.2" average, Figure 3), and Rainbow Trout (N=7, 5-11" range, 8.1" average). Water temperature ranged from 57-62°F. Stream width ranged from 31.5 to 64 feet and averaged 48 feet. Depth ranged from 0.33-1.5 feet and averaged 0.54 feet. Riparian area was described as tag alders, glassland/forbs, and large coniferous trees. Tag alder was noted as providing shelter and shade for trout within this stretch of river. Bank stability was described as good (<25% of streambank is bare soil). In stream substrate comprised of detritus/silt (7.5%), sand (6%), small (29%) and large (15%) cobble, gravel (33%), and boulder (9.5%). There were low to moderate amounts of natural woody debris and aquatic vegetation. There were also remnant habitat enhancement structures located (e.g. lunker structures and rafts). The survey reach was comprised of 36% run and 64% riffle habitat types. Discharge was recorded 175ft upstream of starting point. Depth ranged from 0-1.59ft and velocity ranged from 0-1.93ft/second. Population estimates for Brook Trout (Figure 4), Brown Trout (Figure 4) and Rainbow Trout were 438/acre, 1,044/acre, and 5/acre, respectively. Age and growth analysis indicated ages 0-4 were present for Brook Trout and had a mean growth index of +0.6 inches above state average. Ages 0-4 were present for Brown Trout and had a mean growth index of +1.1 above state average. Ages 1 and 2 were present for Rainbow Trout and had a mean growth index of +1.2 inches above state average.

Upper Skybooms

On June 25th, 1990 a survey was conducted by the U.S. Forest Service in order to gather baseline data before installation of "sky-hook" cover structures (44N 36W Section 24). Total survey length was 1,000 feet. Captured fish species included Brook Trout (Table 4, N=90, 1-10" range, 4.8" average), Brown Trout (Table 4, N=31, 2-16" range, 7.1" average), and Rainbow Trout (N=2, 5" and 6").

On August 6th-7th, 2001 a survey was conducted by the Michigan DNR to determine if the 10-inch minimum size limit special regulation for Brook Trout (Type II Trout Regulations), had improved the size structure of trout in this section of stream. Total survey length was 2,000 feet (mark and recapture run). Captured fish species included Brook Trout (Table 4, N=193, 2-9" range, 5.7" average, Figure 5) and Brown Trout (N=275, 2-22" range, 9.5" average, Figure 5). Population estimates for Brook Trout and Brown Trout were calculated at 460 and 422 per acre, respectively (Figure 6). Water temperature was recorded at 68°F. Managers at the time concluded more time and sampling was needed in order to fully evaluate the existing Type II regulation.

On August 12th-13th, 2002 a survey was conducted by the Michigan DNR (Table 4). Total survey length was 2,000 feet (marking and recapture run). Captured fish species included Brook Trout (N=123, 1-9" range, 4.3" average, Figure 5), Brown Trout (N=129, 2-16" range, 9.4" average, Figure

5), Smallmouth Bass (N=5, 5" range), and Yellow Perch (N=1, 5.5" in length). Water temperature was recorded at 60°F. Population estimates for Brook Trout and Brown Trout were calculated at 394 and 263 per acre (Figure 6), respectively.

Lower Goldmine

On September 3rd, 1953 a survey was conducted by the Institute of Fisheries Research at the Lower Goldmine Road (44N 37W Section 13). Total survey length was 190 feet. Fish captured included Brook Trout (Table 5, N=8, 2.5-9.0" range), Brown Trout (Table 5, N=6, 2-3.5" range), Rainbow Trout (Table 5, N=1, 2.0"), Common White Sucker (N=1, 8.0" range), Creek Chub (N=4, 1.5-3.5" range), Blacknose Dace (N=60, 2.0-5.0" range), Longnose Dace (N=44, 2.5-4.5" range), Central Mudminnow (N=6, 2.0-2.5" range), Mottled Sculpin (N=43, 1.5-4.0" range), and Brook Stickleback (N=5, 2.0"). The average width was 68 feet and average depth was 10 inches. Habitat was described as silt (1%), sand (9%), and coarse gravel, rubble, and boulders making up 90%. Cover was described as good with dark water, boulders and over hanging tag alder.

On September 7th and 11th, 1978, a survey was conducted by the Michigan Department of Conservation. Total survey length was 1,000 feet. Fish captured included Brook Trout (Table 5, N=36, 3.0-8.5" range, 3.8" average), Brown Trout (Table 5, N=12, 2.0"-15.5 range, 6.4" average), Rainbow Trout (Table 5, N=3, 3.0-7.5" range, 4.7" average), Common White Sucker (N=14, 4.0-16.0" range), Creek Chub (N=2, 3.0-5.5" range), Blacknose Dace (N=18, 2.5-3.5" range), Northern Red Bellied Dace (N=1, 3.0"), Longnose Dace (N=1, 2.5"), Common Shiner (N=1, 3.5"), Central Mudminnow (N=1, 3.0"), Mottled Sculpin (N=16, 2.5-3.5"), and Brook Stickleback (N=1, 1.7"). The estimated Brook Trout population was calculated at 618/acre. The stream bottom was described as sand, silt, rubble and cobble. Near stream habitat was tag alder, birch, white pine. Instream habitat noted some undercut banks. Macroinvertebrates were listed as forage for fish. Water temperature was recorded at 63.5°F.

On July 27, 1981 two surveys were conducted by the Michigan DNR to evaluate stocked Brown Trout that were fin clipped in 1980. The first survey station was located downstream from USFS Rd 3470. Total survey length was 1,500 feet. Fish captured included Brook Trout (Table 5, N=153, 1-7" range, 3.0" average), Brown Trout (Table 5, N=27, 2-8" range 5.9" average), Common White Sucker (N=32, 3-8" range, 6.4" average), Yellow Perch (N=1, 3"), Central Mudminnow (N=10), Brook Stickleback (N=4), Mottled Sculpin (N=89), Creek Chub (N=15), Hornyhead Chub (N=14), Common Shiner (N=1), Fathead Minnow (N=1), Longnose Dace (N=22), Blacknose Dace (N=152), and Pearl Dace (N=2). Lengths were not recorded for minnow species. No fin clipped Brown Trout were captured. Surface water temperature was recorded at 55°F. The second survey location was 1,300 feet upstream from USFS Rd 3470. Fish captured included Brook Trout (N=21, 2-6" range, 3.5" average), Brown Trout (N=9, 2-8" range, 5.1" average), White Sucker (N=1, 8"), Mottled Sculpin (N=8), Central Mudminnow (N=4), Longnose Dace (N=8), and Blacknose Dace (N=24). Lengths were not recorded for minnow species. Surface water temperature recorded was 53°F. No fin clipped Brown Trout were captured. Technicians noted the lack of catch in the upstream location was possibly due to poor efficiency of the stream shocker.

On June 11th, 1986, a survey was conducted by the Department of Natural Resources to evaluate stocked Brook Trout and Brown Trout that were fin clipped in September 1985. Total survey length

was 975 feet. Fish captured included Brook Trout (Table 5, N=13, 5-7" range, 6.6" average), Brown Trout (Table 5, N=15, 6-15" range, 11.3" average), and Rainbow Trout (Table 5, N=1, 5"). Surface water temperature was recorded at 56°F. No fin clipped Brook or Brown Trout were captured.

South and North Branch Confluence

On August 28th, 1953, a survey was conducted by the Institute for Fisheries Research near the confluence with the North Branch Paint River (44N 35W Section 8). Total survey length was 388 feet. No Brook or Brown Trout were captured. Fish species captured included Common White Sucker (N=4, 1.5-8.5" range), Creek Chub (N=25, 2.0-4.0" range), Blacknose Dace (N=98, 1.0-3.5" range), Longnose Dace (N=27, 1.5-4.0" range), Redbelly Dace (N=8, 1.5-2.0" range), Common Shiner (N=2, 1" range), Mottled Sculpin (N=16, 1.5-3.5" range), and Brook Stickleback (N=3, 1.0-2.5" range). The average stream width was 51 feet and average stream depth was 21 inches. In stream water temperature was recorded at 68°F. Immediate shoreline area was described as "marshy with good marsh grass and occasional willow cover."

On September 18th-19th, 1978, a survey was conducted by the Michigan Department of Conservation. Total survey length was 1,000 feet. Immediate shoreline was described as tag alder and aspen. Average depth was 24 inches. Substrate was noted as having rubble, cobble and sand. Undercut banks, rocks, logs and tag alder were noted for available cover. Fish species captured included Brook Trout (N=4, 7.5-10.0" range, 9.2" average), Brown Trout (N=23, 3.5-20.0" range, 10.1" average), Rainbow Trout (N=1, 9.0"), Rock Bass (N=1, 6" in length), Common White Sucker (N=5, 5.5-17.0" range), Creek Chub (N=25, 1.5-5.5" range), Blacknose Dace (N=86, 2.5-4.0" range), Common Shiner (N=2, 2.0-2.5" range), Central Mudminnow (N=3, 3.0" range), Mottled Sculpin (N=1, 3.5" in length), and Brook Stickleback (N=1, 2.0" in length).

Brown Trout Movement Study

During May 1993, Michigan DNR Fisheries staff implanted radio tags into six adult Brown Trout. One was thought to be caught by an angler shortly after tagging (no records of where originally captured by DNR staff). Of the remaining five, two were located and tagged near the Basswood location and three were tagged near the Upper Skybooms location (Figure 1). It was concluded that in the SB Paint, Brown Trout are more active at night and show site fidelity for food and spawning habitat (i.e. small migration distances).

Current Status

Upper Goldmine

On July 19, 2004 a habitat survey was conducted by the Michigan DNR. The purpose of this sampling was to inform the Stream Status and Trends Program on the minimum number of transects needed to accurately describe true mean habitat conditions. Total survey length was 1,000 feet that included 26 transects. Stream width ranged from 34-72 feet and the average width was 51 feet. Habitat types included 15% run and 85% riffle. Riparian area was dominated by tag alders and supplemented by conifers and grassland/forbs. Bank stability was described as "good" with less than 25% of the streambank having bare soil. In stream substrate was detritus/ silt (7%), sand (11.5%), gravel (29%), small cobble (26.5%), large cobble (14%), boulder (7.5%), wood (3%) and islands (1.5%). The

average velocity was 1.2 feet per second. Depth ranged from 0-2 feet and the average was 0.13 feet. An Onset Hobo Water Temperature Pro (Model H20-001) was deployed from November 2003 to October 2004. Mean July water temperature is considered to be one of the most critical habitat variables that influence the composition of fish communities in Michigan streams and rivers (Zorn et al. 2009). Specifically, July mean temperature is an index of conditions that become limiting to trout (Terrell et al. 1996; Thompson et al. 1996). Stream survey and temperature data from around Michigan have shown that abundance and biomass of trout declines rather rapidly once mean July water temperature reaches or exceeds 68°F. The July mean temperature recorded for the Upper Goldmine location was 61°F, well below the temperature threshold (Figure 2).

On August 2nd-3rd, 2004 a survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet (marking and recapture run). Captured fish species included Brook Trout (N=199, 2-10" range, 5.8" average, Figure 3), Brown Trout (N=146, 2-18" range, 6.9" average, Figure 3), Rainbow Trout (N=4, 6-8" range, 7.5" average), Bluegill (N=3, 2-3" range, 3.2" average), Longnose Dace (N=1, 3.5" length), Mottled Sculpin (N=17, 2-3" range, 3.1" average), Blacknose Dace (N=5, 2-3" range, 3.3" average), and Common White Sucker (N=3,14-15" range, 15.2" average). Water temperature ranged from 58-64°F and the average stream width was 48 feet. Population estimates for Brook Trout, and Brown Trout were 487/acre and 252/acre, respectively (Figure 4). Age and growth analysis indicated ages 0-3 were present for Brook Trout and had a mean growth index of +0.7 inches above state average. Ages 0-4 were present for Brown Trout and had a mean growth index of +0.7 above state average. One Rainbow Trout was aged at one years old.

On September 6-8, 2011 a fisheries survey was conducted by the Michigan DNR (Table 3). Total survey length was 2,000 feet. Limnological and habitat data (14 transects) were also recorded. A total of 499 fish were captured during the September effort. Species captured included Brook Trout, Bluegill, Blacknose Dace, Brown Trout, Creek Chub, White Sucker, Hornyhead Chub, Longnose Dace, Rock Bass, and Slimy Sculpin. Brook Trout (N=146) averaged 6.7 inches and ranged from 2-12 inches in length with 6% of the catch meeting or exceeding the legal minimum size for harvest (≥10 inches, Figure 3). Two Brook Trout were aged at 1 years old and ranged from 5.5-7.0 in length. There were not enough samples collected to calculate a mean growth index. A mean growth index is used to compare growth of Brook Trout to statewide averages. The population estimate for Brook Trout was calculated at 266 per acre (Figure 4). Brown Trout (N=241) averaged 8.6 inches and ranged from 2-19 inches in length with 26% of the catch meeting or exceeding the legal size for harvest (≥12 inches, Figure 3). Age analysis indicated ages 1,2 and 4 present in the population and a mean growth index of 1.9 inches above state average. The estimated Brown Trout population was calculated at 269 per acre (Table 3, Figure 4). Habitat was described as 50% riffle and 50% run. Stream width ranged from 33.5-63.0 feet and averaged 46.7 feet. Stream depth ranged from 0-1.5 feet. Riparian area was 25% grassland/forb, 14% large coniferous trees, 7% small deciduous trees and 54% tag alder. Bank stability was classified as 96% good (<25% of streambank is bare soil) and 4% poor (>75% of streambank is bare soil). Substrate was recorded as 11% detritus/silt, 1% sand, 18% gravel, 30% small cobble, 29% large cobble, and 11% boulder. In stream temperature was recorded at 51°F. The NLMMU recommended continued monitoring of the SB Paint River. Long-term monitoring would be necessary to document any potential changes in trout numbers or size structure. Specific monitoring recommended included fisheries surveys, habitat evaluations and water temperature monitoring. The NLMMU also recommended further evaluation of the Type 2 Trout Stream regulations.

On August 7-12, 2014 a discretionary survey was completed by the Michigan DNR (Table 3). A total of 2,000 feet were surveyed. Stream discharge measurements were recorded 100 feet upstream of station starting point. Only Brook and Brown Trout were captured and recorded. A total of 215 fish were captured during the August effort. Brook Trout (N=246) averaged 4.8 inches and ranged from 2-10 inches in length with 2.4% of the catch meeting or exceeding the legal minimum size for harvest (≥10 inches, Figure 3). The estimated Brook Trout population was calculated at 1,041 per acre (Figure 4). Brown Trout (N=194) averaged 6.7 inches and ranged from 2-20 inches in length with 8.7% of the catch meeting or exceeding the legal size for harvest (≥12 inches, Figure 3). The estimated Brown Trout population was calculated at 404 per acre (Figure 4). Habitat was described as having moderate amounts of boulders, some woody debris which were mostly remnants of previous habitat projects. Submerged vegetation was sparse and there was an abundance of tag alder providing overhanging cover. In stream temperature was recorded at 58°F. Average stream velocity was calculated at 1.39 feet per second. The NLMMU recommended continued monitoring of the SB Paint River and adjustment of the Type 2 Trout Stream regulations. Specifically, from the mouth of Cooks Run to the mouth of the North Branch of the Paint River should be managed under Type 2 regulations, except the minimum size limit for Brook Trout should revert to 7 inches. Brown Trout minimum size limit should remain at 12 inches. The new regulations went into effect in 2016.

Upper Skybooms

On August 2nd-3rd, 2004 a survey was conducted by the Michigan DNR (Table 4). Total survey length was 2,000 feet (marking and recapture run). Captured fish species included Brook Trout (N=79, 2-12" range, 5.2" average, Figure 5) and Brown Trout (N=73, 2-18" range, 9.1" average, Figure 5). Estimated Brook and Brown Trout populations were calculated at 623/acre and 162/acre, respectively (Figure 6). Surface water temperature was recorded at 63°F.

Between April 6, 2010 and November 10, 2010, an Onset Hobo Water Temperature Pro v2 (Model U22-001) was deployed at the Upper Skybooms location. The July mean temperature was calculated at 65°F, which is below to the 68°F threshold for Brook Trout (Figure 7).

On September 15, 2011 a survey was conducted by the Michigan DNR (Table 4). Total survey length was 2,000 feet (marking and recapture run). Only Brook and Brown Trout species were captured and recorded. Brook Trout (N=85) averaged 6.3 inches in length (Figure 5) and ranged from 2-12 inches with 6% of the catch meeting or exceeding the legal minimum size for harvest (≥10 inches). Age analysis indicated ages 1-3 present in the population and the mean growth index was 0.9 inches above state average. The population estimate was 229 Brook Trout per acre (Figure 6). Brown Trout (N=163) averaged 10.0 inches in length (Figure 5) and ranged from 2-19 inches in length with 26% of the catch meeting or exceeding the legal size for harvest (≥12 inches). Age analysis indicated ages 1-5 present in the population and a mean growth index of 1.5 inches above state average. The estimated Brown Trout population was calculated at 198 per acre (Figure 6). Habitat was described as 20% riffle and 80% run. Stream width ranged from 22 to 63.5 feet and averaged 40.3 feet. Depth ranged from 0-2.5 feet. Riparian area was 30% grassland/forb, 20% large coniferous trees, 13% small coniferous trees, and 37% tag alder. Bank stability was classified as 97% good (<25% of streambank is bare soil) and 3% fair (25-50% of streambank is bare soil). Substrate was recorded as 20% detritus/silt, 4% sand, 23% gravel, 32% small cobble, 11% large cobble, 9% boulder and 1% wood. In stream temperature was recorded at 51°F. The NLMMU recommended continued monitoring of the SB Paint River.

Long-term monitoring would be necessary to document any potential changes in trout numbers or size structure. Specific monitoring recommended included fisheries surveys, habitat evaluations and water temperature monitoring. The NLMMU also recommended further evaluation of the Type 2 Trout Stream regulations.

On August 7-11, 2014 a discretionary survey was conducted by the Michigan DNR (Table 4). A total of 2,000 feet were surveyed (marking and recapture run). Stream discharge measurements were recorded 120 feet upstream of station starting point. Only Brook and Brown Trout were captured and recorded. A total of 248 fish were captured during the August effort. Brook Trout (N=151) averaged 4.4 inches in length (Figure 5) and ranged from 2-9 inches with 0% of the catch meeting or exceeding the legal minimum size for harvest (≥10 inches). The population estimate was 487 Brook Trout per acre (Figure 6). Brown Trout (N=64) averaged 8.5 inches in length (Figure 5) and ranged from 3-17 inches in length with 18.8% of the catch meeting or exceeding the legal size for harvest (≥12 inches). The estimated Brown Trout population was calculated at 90 per acre (Figure 6). Average stream velocity was calculated at 0.84 feet per second. The NLMMU recommended continued monitoring of the SB Paint River and adjustment of the Type 2 Trout Stream regulations. Specifically, from the mouth of Cooks Run to the mouth of the North Branch of the Paint River should be managed under Type 2 regulations, except the minimum size limit for Brook Trout should revert to 7 inches. Brown Trout minimum size limit should remain at 12 inches. The new regulations went into effect in 2016.

On August 7-8, 2017 a discretionary survey was conducted by the Michigan DNR (Table 4). A total of 2,000 feet were surveyed (marking and recapture run). All fish species were captured and recorded. However, non-trout species were captured and recorded for the first 500 feet of each 1,000 feet surveyed. A total of 378 fish were captured during the August effort. Brook Trout (N=146) averaged 4.8 inches in length (Figure 5) and ranged from 2-9 inches with 13.7% of the catch meeting or exceeding the legal minimum size for harvest (≥7 inches). The population estimate was 445 Brook Trout per acre (Figure 6). Brown Trout (N=64) averaged 8.5 inches in length (Figure 5) and ranged from 3-17 inches in length with 6.1% of the catch meeting or exceeding the legal size for harvest (≥12 inches). The estimated Brown Trout population was calculated at 73 per acre (Figure 6). Northern Muskellunge (N=2) captured were 32.5 and 34.5 inches in length and 6 years old. An insufficient number of aging samples were taken in order to calculate a mean growth index. However, both Muskellunge captured were below the state average for growth. Other species captured included Blacknose Dace, Bluegill, Brook Stickleback, Central Mudminnow, Creek Chub, Hornyhead Chub, Johnny Darter, Longnose Dace, Mottled Sculpin, and White Sucker. Instream water temperature was recorded at 59°F.

Fisheries surveys were completed at the Upper Goldmine and Upper Skybooms locations on August 6-7, 2018 by staff from the NLMMU to evaluate the trout populations within the South Branch of the Paint River. The marking surveys for both locations were completed on August 6, 2018 and the recapture surveys were completed on August 7, 2018. A total of 2,000 feet were electrofished (i.e. 1,000-foot station 2 times) at each location. All fish species were captured and recorded. However, non-trout species were captured and recorded for the first 500 feet of the first 1,000-foot station at both locations. In stream water temperature ranged from 59-63°F and 57-61°F at the Upper Goldmine and Upper Skybooms locations, respectively.

Upper Goldmine location

A total of 217 fish were captured during the August effort (Table 6).

Brook Trout (N=107) averaged 4.4 inches (Figure 3) and ranged from 2-13 inches in length with 9.4% of the catch meeting or exceeding the legal minimum size for harvest (≥7 inches). The estimated Brook Trout population was calculated at 301 per acre (Table 3, Figure 4). Age analysis indicated ages 1-3 present in the population with a mean growth index of 0.4 inches below state average.

Brown Trout (N=69) averaged 5.1 inches (Figure 3) and ranged from 2-17 inches in length with 7.2% of the catch meeting or exceeding the legal size for harvest (≥12 inches). The estimated Brown Trout population was calculated at 345 per acre (Table 3, Figure 4). Age analysis indicated ages 1-5 present in the population. Not enough samples were collected to calculate a mean growth index.

Other species captured included Bluegill (N=3, 2"-3" length range), Blacknose Dace (N=8, 2"-3" length range), Central Mudminnow (N=2, 3" range), Creek Chub (N=2, 3" range), Longnose Dace (N=13, 2"-4" range), Mottled Sculpin (N=3, 3" range), and Common White Sucker (N=10, 9"-17" range, Table 6).

Upper Skybooms location

A total of 142 fish were captured during the August effort (Table 7).

Brook Trout (N=75) averaged 4.9 inches (Figure 5) and ranged from 2-9 inches in length with 16% of the catch meeting or exceeding the legal minimum size for harvest (≥7 inches). The estimated Brook Trout population was calculated at 253 per acre (Table 4, Figure 6). No aging samples were collected.

Brown Trout (N=24) averaged 7.8 inches (Figure 5) and ranged from 2-12 inches in length with 8.3% of the catch meeting or exceeding the legal minimum size for harvest (≥12 inches). The estimated Brown Trout population was calculated at 32 per acre (Table 4, Figure 6). No aging samples were collected.

Other species captured included Blacknose Dace (N=22, 2"-4" range), Brook Stickleback (N=1, 3.5"), Central Mudminnow (N=2, 2" range), Common Shiner (N=1, 4.5"), Creek Chub (N=1, 4.5"), Johnny Darter (N=1, 2.5"), Longnose Dace (N=1, 3.5"), Mottled Sculpin (N=9, 2"-3" range), and Common White Sucker (N=5, 9"-14" range, Table 7).

Analysis and Discussion

Certain habitats need to be present to be considered a top-quality stream suitable for trout. Stable flows with consistent groundwater inputs, productive aquatic insect communities, sufficient number of riffle, run, pool complexities, abundance of clean gravel, and large woody debris are all critical components for trout habitat (Michigan Plan for Inland Trout in Michigan, draft).

The SB Paint River has an extensive history that includes substantial impacts from historical logging. While the affects from this activity can still be observed today (wide, shallow river), the Brook Trout and Brown Trout fisheries continue to be self-sustaining populations. The SB Paint River has sustained its coldwater trout fishery status through beneficial groundwater inputs and habitat rehabilitation

projects. However, complex habitats are essential components for all life stages of trout and what is currently lacking are the pool/deepwater complexes. These were virtually non-existent prior to any habitat projects. Fortunately, the addition of several forms of large woody debris has helped improve portions of the SB Paint River between the Upper Goldmine and the Lower Goldmine locations. However, much of the river remains wide and shallow. The stream corridor and banks are generally stable and vegetated with primarily tag alder that provides the needed cover for trout populations.

Mean July water temperature is one of the most critical habitat variables that influence the composition of fish communities in Michigan streams and rivers (Zorn et al. 2009). Stream survey and temperature data from around Michigan have shown that abundance and biomass of trout declines rather rapidly once mean July water temperature reaches and exceeds 68°F. In 2004, the Upper Goldmine's average July temperature was 61.4°F (Figure 2). In 2010, the Upper Skybooms average July temperature was 65°F (Figure 7). Based on these two years of data, the SB Paint River is below the critical threshold of 68°F and this is reflected in the current trout population. However, with potential impacts from climate change, periodically monitoring stream temperature is recommended.

Trout populations can vary year to year due to numerous factors. For example, age-0 Brook Trout survival, water temperatures, prey availability, availability of suitable complex habitat, competition and predation of other fish and angling pressure all can have positive or negative effects on adult Brook Trout numbers (Zorn and Nuhfer 2007). The SB Paint River Brook Trout population follows the typical pattern of high year to year variability (Figures 4 and 6). Brook Trout average length has decreased slightly since 2011 at the Upper Goldmine location however it is within the typical range seen in previous surveys (Table 3 and Figure 3). The Brown Trout population at the Upper Skybooms location has decreased since 2011 (Figure 6). Suitable habitat for adult trout could be a limiting factor for both species but more so for Brown Trout. One of the benefits of long-term monitoring is to show typical fluctuations of trout abundance within the SB Paint River. Continued monitoring will allow managers to recognize any changes in the population that may be out of the "normal" population patterns.

The 2017 Upper Skybooms survey was the first occurrence of Northern Muskellunge captured in surveys within the SB Paint River. Brown Trout numbers were decreasing prior to the 2017, so it is unlikely the Muskellunge are the sole reason for the decline in Brown Trout numbers. Rather it could be multiple factors including suitable adult trout habitat, high spring runoff conditions and/or predation (by a variety of species, including fur bearers and birds). It is unlikely Northern Muskellunge will become naturally reproducing within the SB Paint River due to the cold temperatures (Figures 2 and 7) and lack of spawning habitat.

Management Direction

The NLMMU's goal for the SB Paint River is to continue monitoring of the SB Paint River. Long-term monitoring is necessary to document any potential changes in trout numbers or size structure. Monitoring should include fisheries surveys, habitat evaluations and water temperature monitoring. In particular, the habitat between the Upper and Lower Goldmine Roads should be evaluated for any potential maintenance needs. A potential obstacle in obtaining this goal would be limited staff and funds available to conduct surveys and any habitat projects deemed necessary to sustain the trout fishery. In order to meet these goals and objectives on the SB Paint River, the NLMMU will engage partners and seek funding opportunities that support monitoring and habitat improvement efforts.

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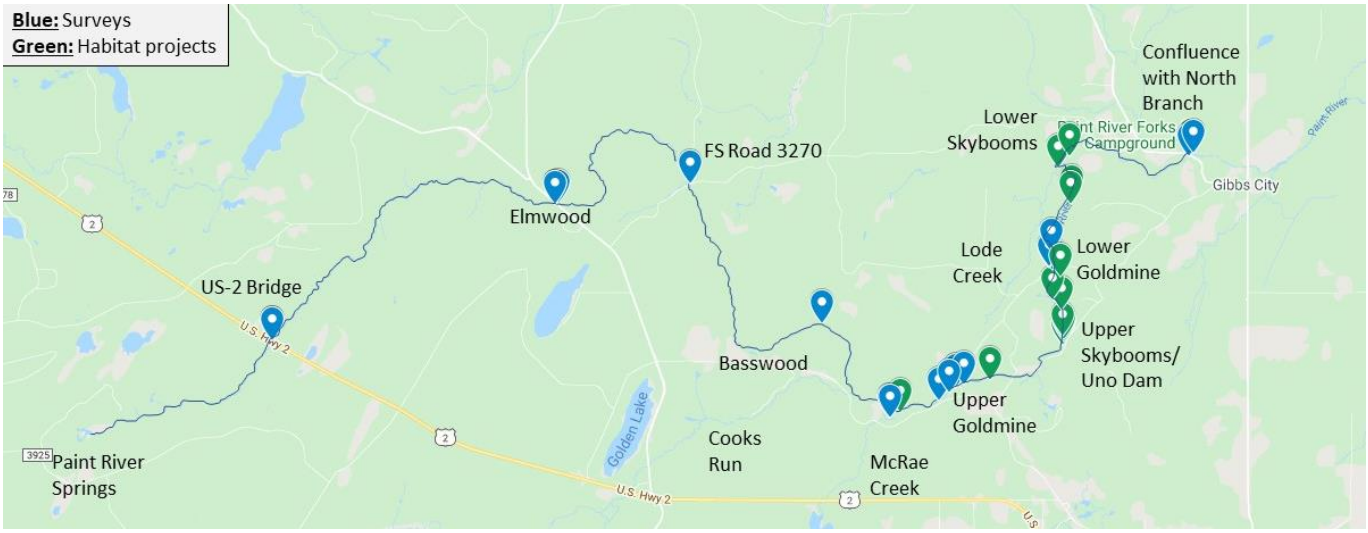

Figure 1: Map of various survey and habitat project locations along the South Branch Paint River, Iron River County Michigan. Source: Google maps.

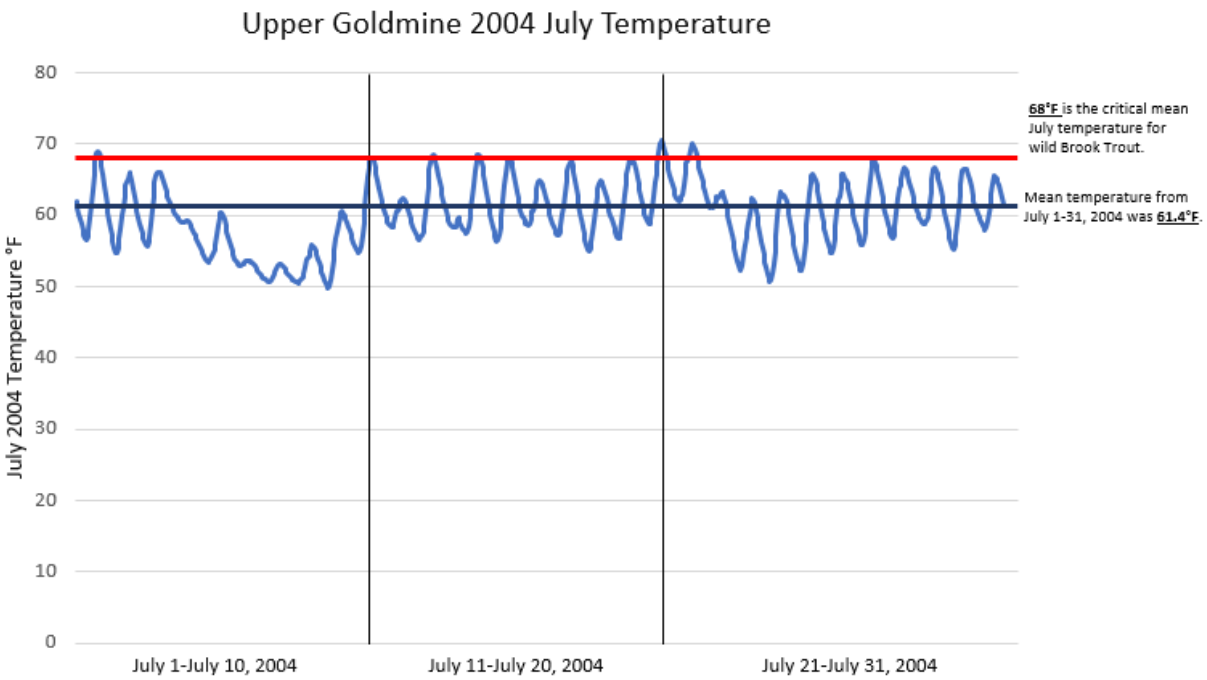

Figure 2: Average July temperature for South Branch Paint River at Upper Goldmine location. Average July temperature is below the critical mean July temperature for wild Brook Trout. Data from DNR Fisheries Division records.

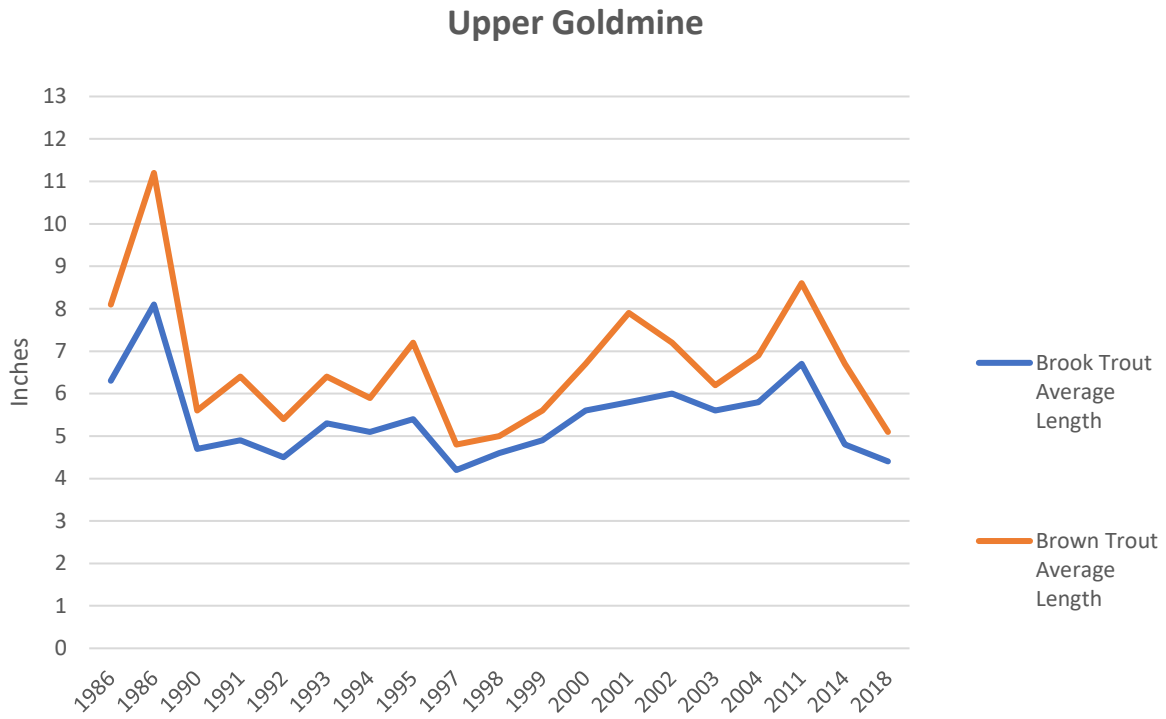

Figure 3: Brook and Brown Trout average lengths at the Upper Goldmine location within the SB Paint River, Iron County Michigan from 1986-2018. Data from DNR Fisheries Division records.

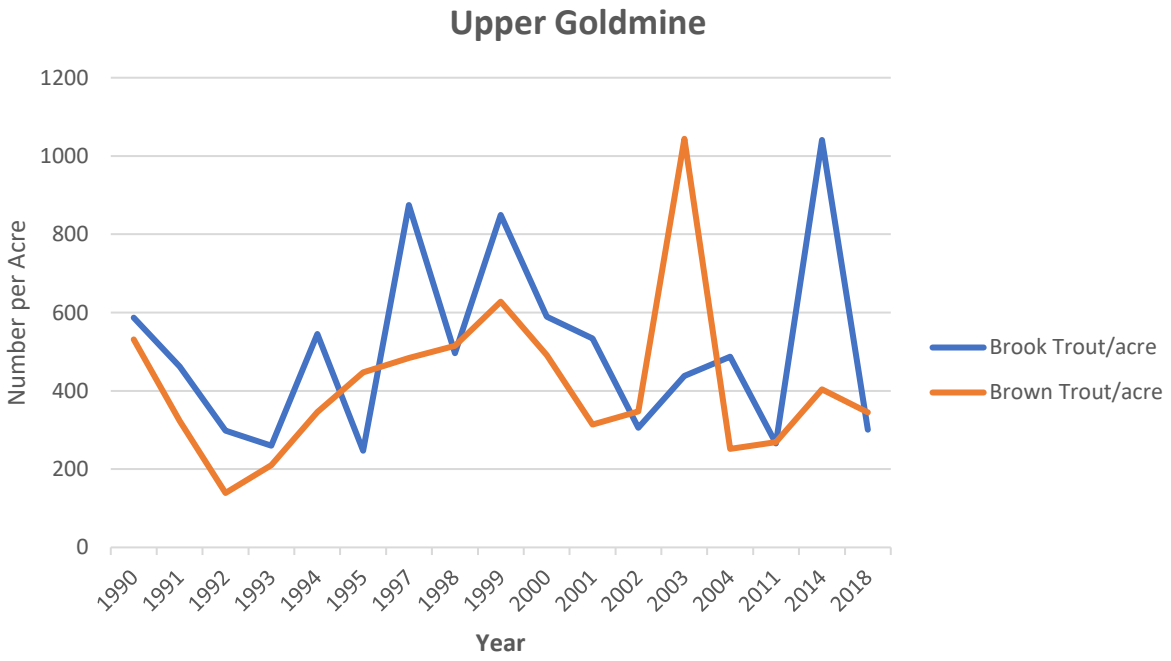

Figure 4: Estimate Brook and Brown Trout abundance at the Upper Goldmine location within the SB Paint River, Iron County Michigan from 1990-2018. Data from DNR Fisheries Division records.

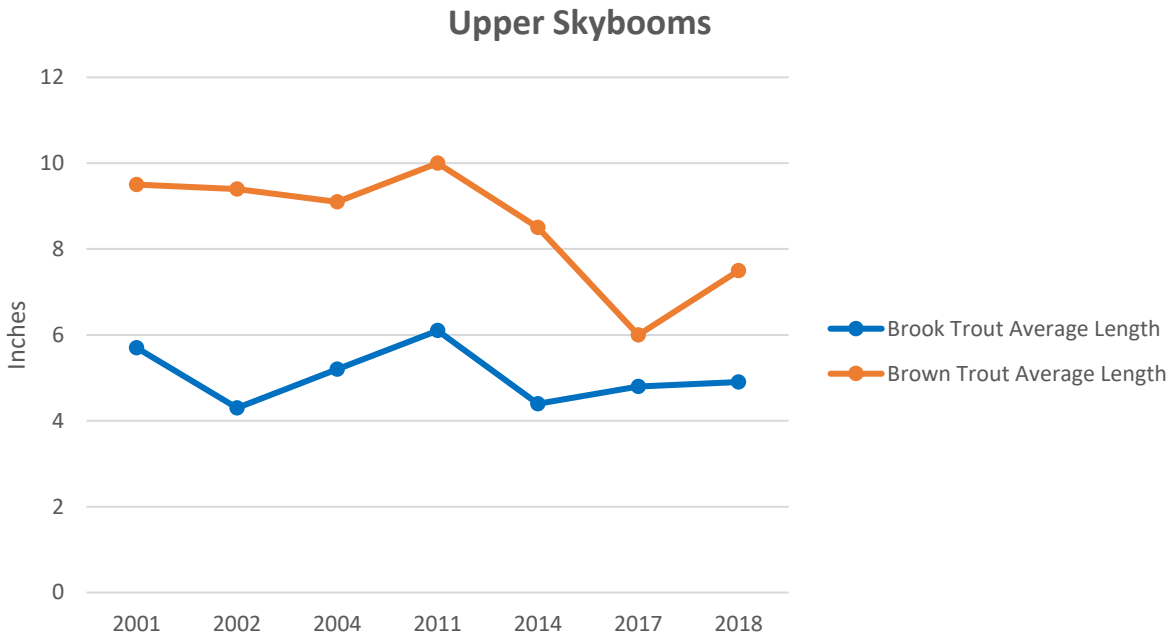

Figure 5: Brook and Brown Trout average lengths at the Upper Skybooms location within the SB Paint River, Iron County Michigan from 2001-2018. Data from DNR Fisheries Division records.

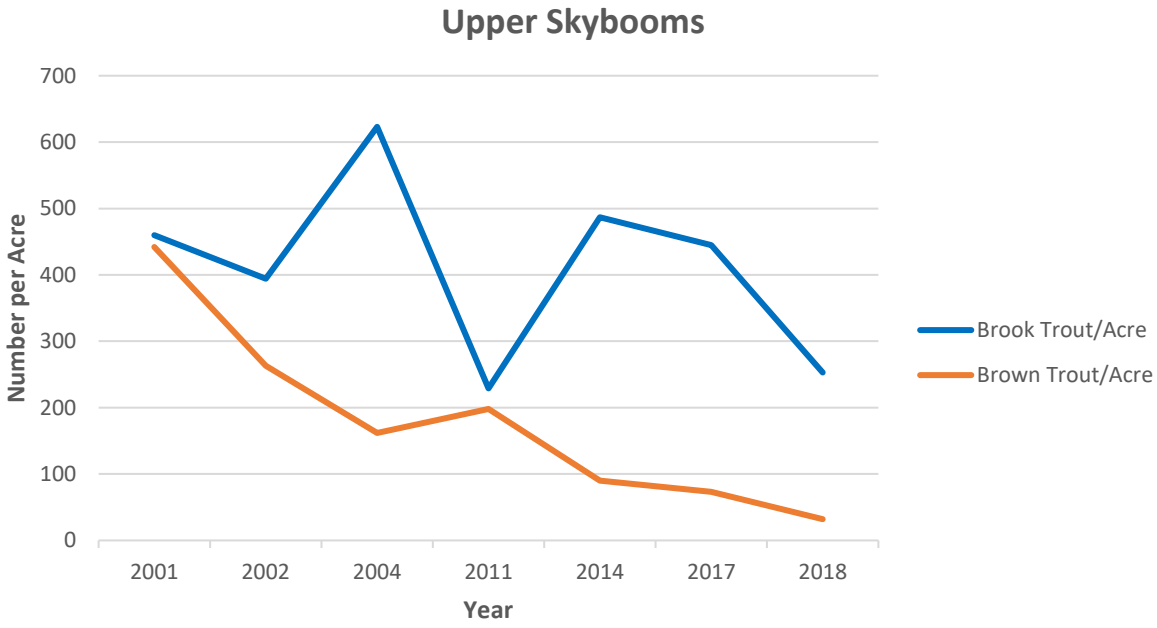

Figure 6: Estimate Brook and Brown Trout abundance at the Upper Skybooms location within the SB Paint River, Iron County Michigan from 2001-2018. Data from DNR Fisheries Division records.

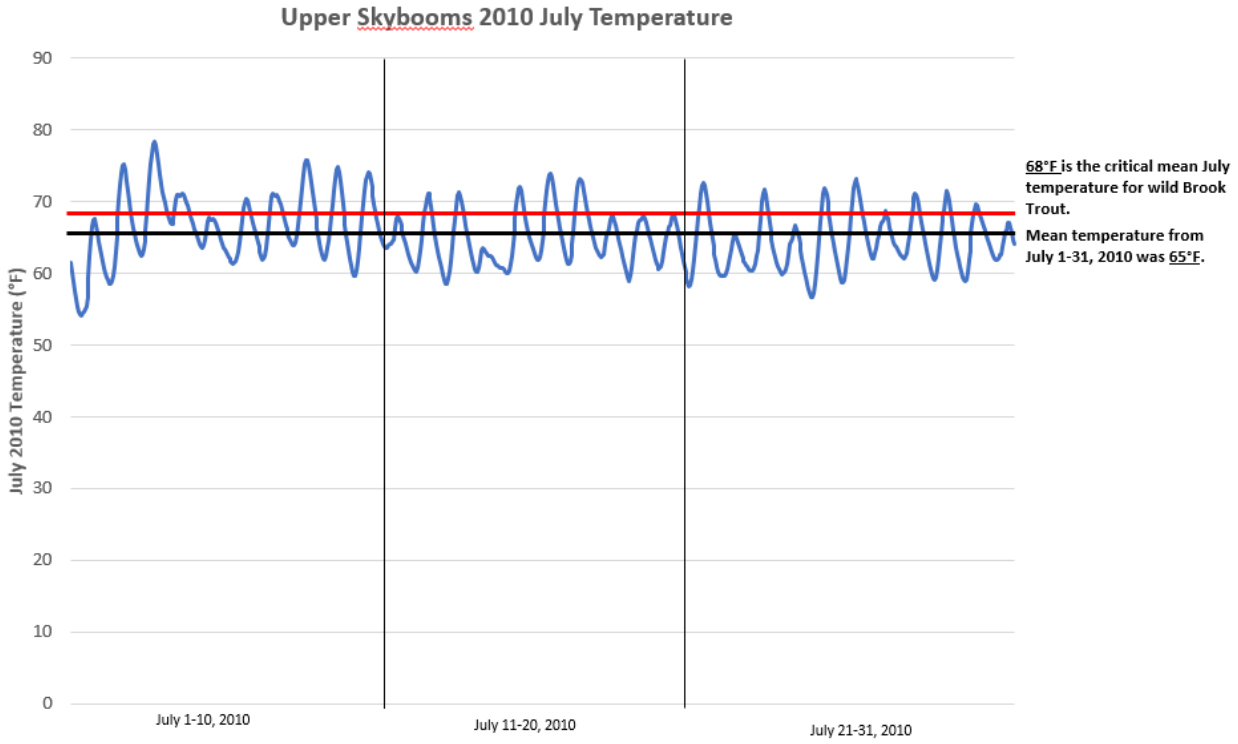

Figure 7: Average July temperature for South Branch Paint River at Upper Skybooms location. Average July temperature is below the critical mean July temperature for wild Brook Trout. Data from DNR Fisheries Division records.

Table 1: Numbers, average length, length ranges, Brook Trout population estimates, level of effort and surface water temperatures for SB Paint River, Elmwood location, Iron County Michigan, between the years 1953-2000. Data from DNR Fisheries Division records.

		Brook Trout				Brown Trout			Rainbow Trout				
Year	Month	Number	Average Length (in.)	Range (in.)	BKT/acre	Number	Average Length (in.)	Range (in.)	Number	Average Length (in.)	Range (in.)	Effort (ft.)	Surface Water Temp (°F)
1953	October	18	-	3-6	-	3	-	11-14	4	-	6	375	-
1978	August	93	-	2-11	1057	1	8	-	0	0	-	2000	-
1991	August	176	5.3	2-10	388	0	-	-	0	-	-	2000	-
1995	August	139	6.0	2-11	262	0	-	-	0	-	-	2000	59
1996	August	157	5.4	2-10	287	1	7.5	7	0	-	-	2000	57
1997	August	347	3.5	1-10	809	0	-	-	0	-	-	2000	58
1999	August	407	4.5	1-9	949	0	-	-	0	-	-	2000	60-66
2000	August	246	5.3	2-10	952	0	-	-	0	-	-	2000	57-62

Table 2: Numbers, average length, length ranges, Brook and Brown Trout population estimates, level of effort and surface water temperatures for SB Paint River, McRae Creek location, Iron County Michigan, between the years 1986-1997. Data from DNR Fisheries Division records.

		Brook Trout				Brown Trout				Rainbow Trout				
Year	Month	Number	Avg Length (in.)	Range (in.)	BKT/acre	Number	Avg Length (in.)	Range (in.)	BNT/acre	Number	Avg Length (in.)	Range (in.)	Effort (ft.)	Surface Water Temp (°F)
1986	June	30	6.4	4-9	-	27	9.1	5-17	-	1	8	8	1000	49.5
1994	October	409	6.9	2-15	393	258	6.3	2-18	261	2	10	8-11	2000	43
1995	August	91	6.0	2-12	336	145	7.7	2-19	192	0	-	-	2000	60
1996	August	230	4.2	1-13	258	94	8.1	2-13	60	5	8.5	6-10	2000	59
1997	August	418	4.5	2-9	475	129	5.6	2-15	168	0	-	-	2000	49-51

Table 3: Numbers, average length, length ranges, trout population estimates, level of effort and surface water temperatures for SB Paint River, Upper Goldmine location, Iron County, between the years 1953-2018. Data from DNR Fisheries Division records.

		Brook Trout					Brown Trout					Rainbow Trout						
Year	Month	Number	Average Length (in.)	Range (in.)	Growth	BKT/acre	Number	Average Length (in.)	Range (in.)	Growth	BNT/acre	Number	Average Length (in.)	Range (in.)	Growth	RBT/acre	Effort (ft.)	Surface Water Temperature (°F)
1953	September	8	-	2-7	-	-	4	-	2-4	-	-	2	-	2.5	-	-	375	68
1986	June	36	6.3	4-9	-		22	8.1	5-21	-		22	5.5	5	-	-	1160	55
1986	June	22	8.1	6-10	-		17	11.2	6-22	-		6	9.2	6-13	-	-	860	56
1990	August	458	4.7	2-10	-	587	393	5.6	2-19	-	531	237	6.7	2-17	-	57	2000	62
1991	August	504	4.9	2-10	-	462	220	6.4	1-16	-	323	14	8	7-8	-	14	2000	-
1992	August	241	4.5	2-8	-	298	111	5.4	2-16	-	139	5	8.3	5-12	-	5	2000	55-63
1993	September	207	5.3	2-10	-	260	151	6.4	2-16	-	210	21	7.7	3-12	-	25	2000	45-52
1994	September	242	5.1	2-12	-	545	214	5.9	2-18	-	346	18	9.2	3-13	-	17	2000	59-61
1995	August	189	5.4	2-13	-	247	321	7.2	2-17	-	447	25	8	6-13	-	29	2000	52-56
1997	August	389	4.2	2-11	-	875	302	4.8	2-16	-	484	16	5.6	1-14	-	15	2000	54
1998	August	386	4.6	2-11	-	496	394	5	2-16	-	515	87	3.2	1-11	-	241	2000	59
1999	August	390	4.9	2-14	-	849	338	5.6	2-17	-	628	13	7.1	6-7	-	9	2000	53
2000	August	168	5.6	2-10	-	589	208	6.7	2-16	-	491	1	12.5	12.5	-	2	2000	58
2001	August	225	5.8	2-9	-	534	225	7.9	2-14	-	314	2	12.5	12-13	-	2	2000	62
2002	August	153	6.0	1-13	+0.5	306	138	7.2	1-17	+1.2	347	5	8.5	4-14	*	-	2000	-
2003	August	212	5.6	2-12	+0.6	438	203	6.2	1-17	+1.1	1044	7	8.1	5-11	+1.2	5	2000	57-62
2004	August	199	5.8	2-10	+0.7	487	146	6.9	2-18	+0.7	252	4	7.5	6-8	*	-	2000	58-64
2011	September	146	6.8	2-12	*	266	241	8.7	2-19	+1.9	269	0	-	-	-	-	2000	51
2014	August	246	4.8	2-10	-	1,041	194	6.7	2-20	-	404	0	-	-	-	-	2000	58
2018	August	107	4.4	2-13	-0.4	301	69	5.1	2-17	*	345	0	-	-	-	-	2000	59-62

*Not enough samples taken to calculate a mean growth index.

Table 4: Numbers, average length, length ranges, Brook and Brown trout population estimates, mean growth indices, level or effort and surface water temperatures for SB Paint River, Upper Skybooms location, Iron County Michigan between the years 1990-2018. Data from DNR Fisheries Division records.

		Brook Trout					Brown Trout						
Year	Month	Number	Avg Length (in.)	Range (in.)	BKT/acre	Growth	Number	Avg Length (in.)	Range (in.)	BNT/acre	Growth	Effort (ft.)	Surface water temp (°F)
1990	June	90	4.8	1-10	-	-	31	7.1	2-16	-	-	1000	-
2001	August	193	5.7	2-9	-	-	275	9.5	2-22	-	-	2000	68
2002	August	123	4.3	1-9	394	-	129	9.4	2-16	-	-	2000	60
2004	August	79	5.2	2-12	623	-	73	9.1	2-18	162	-	2000	63
2011	September	85	6.1	2-12	229	+0.9	163	10	2-19	198	+1.5	2000	51
2014	August	151	4.4	2-9	487	-	64	8.5	3-17	90	-	2000	-
2017	August	146	4.8	2-9	445	-	33	6.0	2-11	73	-	2000	59
2018	August	75	4.9	2-9	253	-	24	7.8	2-12	32	-	2000	57-61

Table 5: Numbers, average length, length ranges, Brook Trout population estimate, level of effort and surface water temperatures for SB Paint River, lower Goldmine location, Iron County Michigan between the years 1953-1986. Data from DNR Fisheries Division records.

		Brook Trout				Brown Trout				Rainbow Trout					
Year	Month	Number	Avg Length (in.)	Range (in.)	BKT/acre	Number	Avg Length (in.)	Range (in.)	BNT/acre	Number	Avg Length (in.)	Range (in.)	RBT/acre	Effort (ft.)	Surface Water Temperature (°F)
1953	September	8	-	2.9-8.7	-	6	-	2.3-3.5	-	1	-	2	-	190ft	69
1978	September	36	3.8	2.9-8.5	618	12	6.4	1.9-15.5	-	3	4.7	3.2-7.7	-	2000ft	63.5
1981	July	153	3.0	1-7	-	27	5.9	3-8	-	0	-	-	-	1500ft	55
1981	July	21	3.5	2-6	-	9	5.1	2-8	-	0	-	-	-	1300ft	53
1986	June	13	6.6	5-7	-	15	11.3	6-15	-	1	5.4	5.4	-	975	56

Table 6: Number, weight and percent legal size of fishes caught in the SB Paint River Upper Goldmine location, Iron County Michigan, August 2018. Data from DNR Fisheries Division records.

Common name	Scientific name	Number	Percent by number	Weight (lb.)	Percent by weight	Average length (in.)	Percent legal size
Bluegill	*Lepomis macrochirus*	3	1.4	0.1	0.2	2.8	0
Blacknose Dace	*Rhinichthys atratulus*	8	3.7	0.1	0.4	3.1	-
Brook Trout	*Salvelinus fontinalis*	107	49.3	6.7	22.4	4.4	9.4
Brown Trout	*Salmo trutta*	69	31.8	11.6	38.8	5.1	7.2
Central Mudminnow	*Umbra limi*	2	0.9	0.0	0.1	3.5	-
Creek Chub	*Semotilus atromaculatus*	2	0.9	0.0	0.1	3.5	-
Longnose Dace	*Rhinichthys cataractae*	13	6.0	0.3	1.1	3.7	-
Mottled Sculpin	*Cottus bairdii*	3	1.4	0.1	0.2	3.5	-
Common White Sucker	*Catostomus commersoni*	10	4.6	11.0	36.8	13.7	-

Table 7: Number, weight, and percent legal size of select fishes caught in the SB Paint River Upper Skybooms location, Iron County Michigan, August 2018. Data from DNR Fisheries Division records.

Common name	Scientific name	Number	Percent by number	Weight (lb.)	Percent by weight	Average length (in.)	Percent legal size
Blacknose Dace	*Rhinichthys atratulus*	22	15.5	0.4	2.6	3.4	-
Brook Stickleback	*Culaea inconstans*	1	0.7	0.0	0.0	3.5	-
Brook Trout	*Salvelinus fontinalis*	75	52.8	4.9	29.9	4.9	16.0
Brown Trout	*Salmo trutta*	24	16.9	6.1	37.4	7.8	8.3
Central Mudminnow	*Umbra limi*	2	1.4	0.0	0.1	2.5	-
Common Shiner	*Luxilus cornutus*	1	0.7	0.0	0.2	4.5	-
Creek Chub	*Semotilus atromaculatus*	1	0.7	0.0	0.2	4.5	-
Johnny Darter	*Etheostoma nigrum*	1	0.7	0.0	0.1	2.5	-
Longnose Dace	*Rhinichthys cataractae*	1	0.7	0.0	0.1	3.5	-

Mottled Sculpin	*Cottus bairdii*	9	6.3	0.1	0.7	2.8	-
Common White Sucker	*Catostomus commersoni*	5	6.3	4.7	0.7	13.1	-