



Kids Creek Restoration Project - Final Narrative Report

Background/Overview

This project helped improve fish habitat and water quality on an impaired tributary to Kids Creek in the Grand Traverse Bay watershed. Project partners worked together to daylight a section of creek by replacing underground culverts and channelized ditches with a natural meandering channel, replacing two street culverts with open bottom bridge structures, installing in-stream habitat and establishing a riparian buffer and floodplain. Kids Creek is a tributary to the Boardman River, which flows into West Grand Traverse Bay. The Kids Creek sub-watershed has a long history of degradation from human activity, both agricultural and urban. Since much of the watershed is urbanized, Kids Creek suffers from high amounts of stormwater runoff. The project took place on a major tributary (known as "Tributary A") of Kids Creek in a highly visible Traverse City neighborhood on the campus of Munson Medical Center (MMC). Both the main stem of Kids Creek and the subject tributary are on the State of Michigan's 303(d) Impaired Waters list due to poor macroinvertebrate communities as a result of stormwater impacts.

The project is located in a highly visible urban area of Traverse City. As such, one of the key project goals was to increase public awareness of the importance of Great Lakes fisheries and water quality to the region's prosperity and quality of life.

This project was completed successfully and as originally intended. Ultimately, over time, the project will help improve fish habitat and water quality and will reduce sedimentation in Kids Creek, helping lead to its removal from the 303(d) Impaired Waters list.

Outcomes

This project daylighted a section of Tributary A of Kids Creek that had been diverted and covered as Traverse City was developed over the last 150 years. The following activities were completed successfully as part of the overall project goal:

- 900 feet of underground culverts and channelized ditches were restored to a natural meandering channel that is 1,275 feet in length.
- Two street culverts, on 6th Street and Beaumont Street, were replaced with open bottom bridge structures.
- Boulders and root wads were installed to provide both in-stream habitat improvements and bank stabilization.
- Eliminated 72,000 ft² of impervious surfaces.
- Establishment of a 15-30 foot wide riparian buffer and 27,000 ft² floodplain in a new park-like setting.

Work was completed in conjunction with MMC's development of a new \$45 million Cancer Center, which strengthened an already existing partnership between TWC and MMC. These two groups, as well as the Grand Traverse Conservation District (GTCD), have partnered since 2008 on other activities to improve the health of Kids Creek. In 2011, these partners completed

a smaller “urban buffer” project on MMC’s campus downstream from this project site. That project involved approximately 850 linear feet of vegetative buffer plantings, in-stream habitat improvements, trails and sitting/observation areas along Kids Creek. This public-private collaboration continued with this project. Additionally, TWC and MMC will be partnering in the coming years on Michigan Department of Environmental Quality (MDEQ) and US Environmental Protection Agency (EPA) funded projects to reduce the amount of stormwater runoff getting into Kids Creek from MMC’s campus.

Evaluation

Success for this project will not only be shown by the successful channel relocation activities, but also by the increase in aquatic insect and fish communities. An assessment of the macroinvertebrate community in the old stream channel was conducted before stream relocation activities took place (see Appendix A) using the Michigan Clean Water Corps (MiCorps) testing protocols. The existing channel ranked 'Good' for macroinvertebrates with a score of 42.5. The new stream channel will continue to be tested twice a year for macroinvertebrates using the MiCorps protocols. The MDNR also conducted a fish community assessment of the channel before it was re-routed by shocking with a backpack electrofishing unit starting at Elmwood Ave and continuing upstream 180 feet (along 6th Street). A total of 70 fish were found, mostly comprised of brown trout with some rainbow trout - see results table from report below. A full copy of the DNR's assessment is included with this report as Appendix B. The MDNR also plans to conduct additional fish community assessments in the newly restored channel annually for the next 5 years.

Table taken from the DNR's Kids Creek 2012 Fisheries Survey Report

Table 2. Kids Creek electrofishing survey results, August 23 2012.					
Species	Number	Percent by number	Weight (lbs)	Percent by weight	Length Range (inches)
Brown trout	64	91.4	3.6	99.4	2 to 10
Rainbow trout	6	8.6	0	0.6	1 to 2
Total:	70	100	3.6	100	

Project Benefits

This project was completed successfully and one of its main benefits is the improvement of fish habitat and water quality as well as the reduction of sedimentation in Kids Creek over time. The restored section of Tributary A also presents a unique opportunity of a newly created urban fishery consisting of high quality spawning, rearing, and feeding habitat required by species currently residing within the stream such as brook trout and sculpin. By daylighting this stream section we are taking a critical first step to help restore fish passage to 4,500 feet of stream in the upper reaches of this tributary.

Additionally, one of the most significant benefits to this project is the kick-off of a large-scale restoration phase for Kids Creek. This project was the first major step in a strong partnership between TWC and MMC to begin work implementing the Kids Creek Action Plan (discussed below) and restoring Kids Creek to improve water quality and eventually have it removed from the Impaired Waters List.

The project is located in a highly visible urban area of Traverse City. As such, another key benefit of the project was the increase in public awareness of the project and its importance to Great Lakes fisheries and water quality as well as the region's prosperity and quality of life.

Related Efforts

GLFT funds were leveraged to help fund restoration construction activities with this project, which had a total cost of \$3.9 million (including land acquisition costs). The bulk of project costs were covered by MMC. Other project funders include: EPA's Great Lakes Restoration Initiative, Rotary Charities of Traverse City, and Consumer's Energy. This project was integral to the construction of MMC's new Cancer Center and will eventually incorporate trails and donor recognition features, as well as sitting and stream observation areas in the new floodplain buffer area to provide a "healing garden" for patients and their families.

Over the past two years, TWC and MDEQ have been conducting a hydrologic study for Kids Creek and developing an Action Plan to conduct activities leading to the removal of the creek from the Impaired Waters List. The plan was completed in 2013 and MDEQ supports this project as an initial step under that Action Plan. Other activities in the Kids Creek Action Plan for future implementation include improving other stream crossings, in-stream habitat placements, additional riparian buffers, hydrologic restoration and bank stabilization measures on the main stem of Kids Creek and its tributaries. As stated earlier, TWC and MMC plan to continue their highly successful partnership in the coming years on state and federally funded projects to reduce the amount of stormwater runoff getting into Kids Creek from MMC's campus.

Kids Creek is a major tributary of the Boardman River and, as such, this project is integral to other fisheries and water quality efforts in the Boardman River Watershed. The Boardman River is currently undergoing historic and positive change in that one dam was recently removed, two more dams are slated for removal, and a fourth is slated for modification to improve fish passage opportunities. That project represents the largest river restoration initiative in Michigan and one of the largest in the Great Lakes basin. This project is also integral to implementing a new Boardman River Watershed Prosperity plan which integrates ecological, economic and social goals and objectives for the Boardman River Watershed.

Communication/Dissemination

Both TWC and MMC disseminated information about this project to the public during its timeframe. Both organizations had information on their websites:

- TWC: <http://www.gtbay.org/our-programs/kids-creek-restoration/>
- MMC: <http://www.munsonhealthcare.org/kidscreek>

During the construction process TWC posted numerous photos on its Facebook page to keep the public up-to-date with progress: www.facebook.com/WatershedCenter/photos_albums. Additionally, TWC included information about this project in our May and December newsletters in 2013 (Appendix C). TWC also made short video during placement of one of the bridge structures and posted it to our YouTube page: www.youtube.com/watch?v=zwwQLQ4tEW4.

MMC also had a project sign made and put it up at the site during and after construction to inform people about the project.

Giving New Life to Kid's Creek

In 2008, Munson Medical Center partnered with The Watershed Center and the Grand Traverse Conservation District to restore Kid's Creek bordering the hospital's main parking lot. With funding from the Edmund & Virginia Ball Foundation, the Beers Family Foundation, and volunteer labor including Master Gardeners, the Kid's Creek Healing Garden is a good example of an urban stream buffer and now protects the creek and provides a pleasant place for staff, patients, and visitors. The project has received praise from the Michigan Department of Natural Resources.

Urban Restoration Project Continues

Building on the success of the Kid's Creek restoration project at Sixth and Elmwood streets, attention is now focused on restoring an even more challenging section of the creek north of Sixth Street. Munson Medical Center's updated Master Facility Plan, in keeping with City of Traverse City zoning, calls for future growth to occur north of the main campus. A key preliminary step to any future new construction will be returning the creek to a more natural state, which will result in ecological benefits, such as improved fish passage and enhanced wildlife and aquatic habitat. With funding from Consumers Energy Foundation, EPA's Great Lakes Restoration Initiative Program, Great Lakes Fishery Trust, and Rotary Charities of Traverse City, this project is part of a larger effort being coordinated by The Watershed Center and Grand Traverse Conservation District to remove Kid's Creek from the Michigan DEQ's "Impaired Waters" list.

If you would like to financially support this project, please contact the Munson Healthcare Regional Foundation at (231) 935-6482.

munsonhealthcare.org/kidscreek

Grand Traverse Conservation District

MUNSON MEDICAL CENTER

The opening of the new channel was highly publicized by MMC as a public event where funders, local stakeholders, and nearby residents were invited to the opening. About 300 people attended the opening.

Kid's Creek Celebration!

We're giving new life to Kid's Creek.

Please join us as we open a newly restored section of historic Kid's Creek near Munson Medical Center.

MUNSON HEALTHCARE
Regional Foundation

Copy of postcard sent by MMC inviting guests to stream channel opening.

Kid's Creek Celebration!

Friday, Sept. 27 | 1 - 3 pm

Beaumont Place
(north of Sixth Street, across from Munson Medical Center)

- Light Refreshments
- Exhibits and Information

For more information, call (231) 935-2368 or email TWittkopp@mhc.net.

Thank you to our partners:

MUNSON HEALTHCARE
Regional Foundation
210 Beaumont Place
Traverse City, MI 49684

In addition, on the day of the new channel opening, TWC and GTCD coordinated with a local school to bring students down to the stream to 'rescue' macroinvertebrates from the section that was soon to be dry and transfer the insects to the new flowing channel. The students used D-nets and gathered insects in large buckets to transfer them to the new stream section. They also included woody debris and leaf packs to 'season' the new stream section with habitat. Approximately 60 students participated.

After the students were done gathering macroinvertebrates, volunteers from the local Trout Unlimited chapter and staff from the Grand Traverse Band of Ottawa and Chippewa Indians netted off sections of the old channel and used fish shocking equipment to gather fish in buckets and transfer them to the new stream channel as well.

Right: TWC staff member Maureen McManus works with students from the Greenspire School to gather aquatic insects. (Photo by Terry Clark)

Below: GTCD staff member Steve Largent releases fish from the old section of Kids Creek to the newly opened channel. (photo by Jody Clark)



Reflections

One of the biggest unanticipated benefits of this project was the amount of public interest and awareness that this project generated regarding proper stewardship of our water resources. The genuine interest that Munson employees showed was also a positive benefit as well, many employees stopped by the project site either on their way to and from work, or on their break. Additionally, many nearby residents stopped in to see what was going on and watch the project's progress.

A surprise during the project was the number of trout that we rescued (300+) from the old channel before closing it and opening the new one. Trout Unlimited volunteers were not expecting that many fish in such a small section. Additionally, on the day the channel opened a large number of Munson employees and officials came to the project site to see what was going on - they were generally surprised to learn that many fish were living in what they considered a ditch. This indicates a couple things - 1) the upstream culvert is obviously blocking fish from moving further upstream, and 2) Tributary A of Kids Creek has the raw material and potential, if given the chance, to be an incredibly productive trout stream.

One of the challenges of this project was working in such a highly visible urban area around a busy hospital. Construction coordination and communication between partners was key. Weekly meetings were held with Munson officials, the construction firm, subcontractors, and other project partners. Munson officials did a great job coordinating the project to keep everyone safe and traffic flowing smoothly.

Our recommendations for other project directors doing a similar project would be to:

- Have weekly project meetings and communicate project progress and activities often.
- Involve the regulatory agencies early on in the process.
- Keep the public informed.
- Involve children and school groups.

Pictures



Left: Example of new stream section with root wads placed.

Right: Open bottom bridge structure placement on 6th Street.





Top and Right: Vegetation planted along new stream section.



Open bottom bridge structure placement on Beaumont Ave.



Bird's-eye view of restoration site - Beaumont Ave runs north-south at left of photo, 6th Street stream crossing at bottom-right of photo by orange cones.




Left: New stream channel just after letting water in (west side of Beaumont Ave crossing)

Below: Newly moved in and doing great



Appendix A: MiCorps Scoring sheet for Kids Creek 'Before' Daylighting

MiCorps Site ID#: _____



Stream Macroinvertebrate Datasheet

Stream Name: Kids Creek

Location: Channelized Portion 6th St. N. To (Circle one: Upstream or Downstream of road?)

Date: 9/10/2013 **Collection Start Time:** 3:20 (AM/PM)

Major Watershed: Grand Traverse Bay **HUC Code (if known):** _____

Latitude: _____ **Longitude:** _____

Monitoring Team:

Name of Person Completing Datasheet: Maurcen McManus

Collector: Maurcen McManus

Other Team Members: John Nelson

Stream Conditions: **Average Water Depth:** 1.0 feet

Is the substrate covered with excessive silt? No Yes (describe: In Poles Sink up to 1.5 feet)

Substrate Embeddedness in Riffles: 0-25% 25-50% > 50% Unsure SPAF

Did you observe any fish or wildlife? Yes () No If so, please describe: Small minnow + Brook Trout IS

Macroinvertebrate Collection: Check the habitats that were sampled. Include as many as possible.

<input checked="" type="checkbox"/> Riffles	<input checked="" type="checkbox"/> Stream Margins	<input checked="" type="checkbox"/> Submerged Wood
<input checked="" type="checkbox"/> Cobbles	<input checked="" type="checkbox"/> Leaf Packs	Other (describe: _____)
<input type="checkbox"/> Aquatic Plants	<input checked="" type="checkbox"/> Pools	
<input checked="" type="checkbox"/> Runs	<input checked="" type="checkbox"/> Undercut banks/Overhanging Vegetation	

Did you see, but not collect, any **live crayfish**? (Yes No), or **large clams**? (Yes No)
remember to include them in the assessment on the other side!

Collection Finish Time: 3:50 (AM/PM)

Datasheet checked for completeness by: _____ Datasheet version 10/08/05
 Data entered into MiCorps database by: _____ Date: _____

MiCorps Site ID#: _____



IDENTIFICATION AND ASSESSMENT

Use letter codes [R (rare) = 1-10, C (common) = 11 or more] to record the approximate numbers of organisms in each taxa found in the stream reach.

**** Do NOT count empty shells, pupae, or terrestrial macroinvertebrates ****

Group 1: Sensitive

- C ~~III~~ Caddisfly larvae (Trichoptera)
EXCEPT Net-spinning caddis
- _____ Hellgrammites (Megaloptera)
- C ~~IIIIII~~ Mayfly nymphs (Ephemeroptera)
- _____ Gilled (right-handed) snails (Gastropoda)
- R ~~III~~ Stonefly nymphs (Plecoptera)
- _____ Water penny (Coleoptera)
- _____ Water snipe fly (Diptera)

Group 2: Somewhat-Sensitive

- _____ Alderfly larvae (Megaloptera)
- R ~~I~~ Beetle adults (Coleoptera)
- R ~~I~~ Beetle larvae (Coleoptera)
- _____ Black fly larvae (Diptera)
- _____ Clams (Pelecypoda)
- R ~~IIII~~ Crane fly larvae (Diptera)
- _____ Crayfish (Decapoda)
- _____ Damselfly nymphs (Odonata)
- R ~~I~~ Dragonfly nymphs (Odonata)
- C ~~IIIIIIII~~ Net-spinning caddisfly larvae (Hydropsychidae; Trichoptera)
- C ~~I~~ Scuds (Amphipoda)
- C ~~IIIIIIII~~ Sowbugs (Isopoda)

Group 3: Tolerant

- C ~~IIIIIIIIII~~ Aquatic worms (Oligochaeta)
- _____ Leeches (Hirudinea)
- C ~~IIIIIIIIII~~ Midge larvae (Diptera)
- R ~~II~~ Pouch snails (Gastropoda)
- R ~~IIII~~ True bugs (Hemiptera)
- R ~~I~~ Other true flies (Diptera)
- R ~~IIII~~ fleas

Identifications made by: Maureen A. McManis

Rate your confidence in these identifications: Quite confident Not very confident

5 4 3 2 1

STREAM QUALITY SCORE

Group 1:
 $\frac{1}{2}$ # of R's * 5.0 = $\frac{5.0}{2}$
 $\frac{2}{2}$ # of C's * 5.3 = $\frac{10.6}{2}$
 Group 1 Total = 15.6

Group 2:
 $\frac{4}{3}$ # of R's * 3.0 = $\frac{12.0}{3}$
 $\frac{3}{3}$ # of C's * 3.2 = $\frac{9.6}{3}$
 Group 2 Total = 21.6

Group 3:
 $\frac{3}{2}$ # of R's * 1.1 = $\frac{3.3}{2}$
 $\frac{2}{2}$ # of C's * 1.0 = $\frac{2.0}{2}$
 Group 3 Total = 5.3

Total Stream Quality Score = 42.5
 (Sum of totals for groups 1-3; round to nearest whole number)

- Check one:
- Excellent (>48)
 - Good (34-48)
 - Fair (19-33)
 - Poor (<19)

Datasheet checked for completeness by: _____ Datasheet version 10/08/05
 Data entered into MiCorps database by: _____ Date: _____

**Appendix B: MDNR Fish Community Assessment -
Kids Creek 'Before' Daylighting**



Kids Creek 2012 Fisheries Survey
Heather Hettinger

Introduction:

Kids Creek (also known as Hospital Creek and Asylum Creek) is a tributary to the Boardman River located in Grand Traverse County in the northwest lower peninsula of Michigan. Kids Creek originates to the southwest of Traverse City, and is comprised of many small tributaries that converge all along the length of the creek (Figure 1). The Kids Creek watershed drains approximately 4,500 acres, 640 of which lie within the city limits of Traverse City (U.S. Soil Conservation Service 1973). Kids Creek flows to the north for most of its course, and makes a hard turn to the east before joining the Boardman River just downstream of Hannah Park.

Kids Creek has a mainly sandy bottom, with some areas of gravel and silt. The creek rises in a hilly, former agricultural area on the west side of Garfield Township. From here the surrounding landscape becomes a mix of open fields, lightly forested areas, and residential land before switching to a moderately developed urban setting. Kids Creek flows through the campus of the Grand Traverse Commons, as well as Munson Medical Center. Finally Kids Creek flows through a residential area where it joins the Boardman River less than a mile from Lake Michigan. Because it enters the Boardman River downstream of Union Street Dam, Kids Creek is accessible to migratory Great Lakes fish.

History:

Kids Creek has a history of degradation and manipulation along its entire course that has been documented in the Michigan Department of Natural Resources (MDNR) Fisheries Division files. Fish kills have occurred throughout its documented history; the most recent of which occurring in 1997 when a local ice-making equipment company dumped Freon and ammonia into the stream. In this case the responsible parties were prosecuted, convicted, and held accountable for restitution and clean-up. Other notable fish kills occurred in 1978 and 1995. Agricultural practices in the watershed have also impacted Kids Creek. For many years the Oleson family farm ran a trout farm using water diverted from Kids Creek, and their large buffalo herd grazed along the stream banks. Concerns were raised for many years about the erosion damage caused by buffalo crossing the stream at various locations, and well as the input of buffalo manure into the stream channel. Both the MDNR and Michigan Department of Environmental Quality (DEQ) monitored the stream for contaminants while the farm was in operation, but the results were mostly inconclusive. Stream manipulations have occurred in the form of channelization, stream burial, and rerouting. The stream reach flowing through the Grand Traverse Commons and Munson Medical Center campuses have seen the worst of this; portions of the tributaries have actually been encased in underground channels until just recently.

Three major restoration projects have taken place in the Kids Creek watershed in the last ten years. The first of these occurred at the site of the old buffalo farm and trout farm ponds (currently near Kohl's and the Great Wolf Lodge). This parcel of land was placed into a conservation easement held by the Grand Traverse Regional Land Conservancy, and the underlying ownership of the property has since been transferred to Garfield Township and developed into the Kids Creek Natural Area (The Watershed Center 2013). At the start of the project the stream flowed through three former ponds used in the trout farm and



mill operation, below flowing through a small dam and returning to normal stream flow. Throughout the course of this project (2003-2008) the mill dam was removed, the stream flow was diverted around the existing ponds, and over 3,000 feet of streambank was stabilized and re-vegetated. This site is now home to a network of hiking trails, kids fishing pond, and platforms for wildlife viewing. This project was conducted by a large conglomerate of partners, including the Great Lakes Companies (Great Wolf Lodge), Kohl's, The Watershed Center, Grand Traverse Conservation District, Oleson Family Foundation, Garfield Township, Hinman Group, Natural Resources Conservation Service, National Park Service (Rivers, Trails, and Conservation Assistance Program), and the Grand Traverse Regional Land Conservancy.

The second and third restoration sites are located on the campus of Munson Medical Center. These projects were spearheaded by Munson Hospital in a partnership with The Watershed Center, Oleson Foundation, and the Grand Traverse Conservation District. In 2008, a section of Kids Creek that borders the hospital's main parking lot was re-vegetated and tuned into the hospital's "healing garden", creating a buffer zone between the parking lot and the creek along both Sixth Street and Elmwood Street. In 2013, work began on a section of Kids Creek just across Sixth Street that had been diverted underground for decades to make room for parking lots and buildings. With these buildings removed, nearly 350 feet of Kids Creek was day-lighted, woody debris and native vegetation was installed, and a more natural flood plain was created. Not only does this project allow for improved fish passage and increased spawning habitat, it will also help to combat a long standing flooding issue in the residential neighborhood surrounding the hospital campus.

Surveys:

Kids Creek has been sampled many times historically by MDNR Fisheries Division. The first known survey of Kids Creek took place in September 1960, when the creek was shocked in two locations; one from the mouth to a point 250 feet upstream, and one 250 stretch near the hospital. Near the mouth the water temperature was 54°F, and sea lamprey, creek chub, blacknose dace, bluntnose minnow, and sculpin were collected. Near the hospital the water temperature was 68°F, and sea lamprey, brook lamprey, blacknose dace, and sculpin were collected. No salmonids were collected at either site.

Kids Creek was surveyed again in August 1966, when the creek was sampled in two locations; one just downstream from the Silver Lake Road crossing, and one downstream from a service road on what is now the Grand Traverse Commons. At the Silver Lake Road location the water temperature was 60°F, and rainbow trout and brook trout were collected. At the Grand Traverse Commons location the water temperature was 58°F, and brook trout and sculpin were collected.

Kids Creek was not surveyed again until June 1973, in response to a construction related erosion incident that discharged a large quantity of sand into the creek in July 1972. A total of 12 locations throughout the watershed were sampled over a five day time frame. On the first day, June 12, four locations were sampled; from Front Street upstream 225 feet (Station 1), from Lower Cedar Street to 6th Street (Station 2), from 6th Street upstream 150 feet (Station 3), and from 1,050 feet downstream of 11th Street back up to 11th Street (Station 4). At Station 1, sculpin and white sucker were collected; at Station 2, brook trout, brown trout, rainbow trout, coho salmon, creek chub, sculpin, sea lamprey, and white sucker were collected; at Station 3, white sucker and sculpin were collected, and at Station 4 brook trout, brown trout, rainbow trout, white sucker, sea lamprey, creek chub, sculpins, and blacknose dace were collected.



On the second day of the 1973 survey (June 13), 820 feet of stream along highway M-37 was shocked up to the driveway of the National Cash Register Company (Station 5). While it appears as though this was a mark/recap run, only data from the first run is available. Here brook trout, rainbow trout, coho salmon, white sucker, sea lamprey, creek chub, and sculpin were collected.

On the third day of the 1973 survey (June 14), only one location was sampled; approximately 615 feet of stream parallel to M-37 from the National Cash Register Company to Pine Grove Trailer Sales (Station 6). At this station brook trout, brown trout, rainbow trout, coho salmon, white sucker, sea lamprey, and creek chub were collected.

On the fourth day, June 21, two locations were sampled; from 11th Street upstream to North Elmwood Street (Station 7), and from North Elmwood Street upstream to Silver Lake Road (Station 8). At Station 7, brook trout, brown trout, rainbow trout, coho salmon, white sucker, creek chub, blacknose dace, and sculpin were collected. Station 8 showed a similar fish community, with brook trout, brown trout, rainbow trout, coho salmon, white sucker, creek chub, blacknose dace, sculpins, and even goldfish were collected.

On the final day of the 1973 survey, June 27, four locations were sampled; from 900 feet above Silver Lake Road to 1,350 feet downstream of M-37 (Station 9), from Silver Lake Road to 900 feet upstream (Station 10), just above M-37 to 795 feet upstream (Station 11/ site of the erosion incident), and from M-37 to 1,350 feet downstream (Station 12/ above the location of the erosion). At Station 9, brook trout, brown trout, rainbow trout, coho salmon, creek chub, blacknose dace, white sucker, and sculpins were collected; at Station 10 brook trout, brown trout, rainbow trout, coho salmon, white sucker, creek chub, blacknose dace, and sculpins were collected; At Station 11 brook trout, brown trout, rainbow trout, coho salmon, creek chub, blacknose dace, and sculpin were collected (all in noticeably lower densities than other locations, according to the field notes); and at Station 12 brook trout, brown trout, rainbow trout, coho salmon, white sucker, creek chub, blacknose dace, and sculpins were collected. While the species composition found at most of the locations sampled was what the investigators expected to see, many notes were made in the files in regards to lower than normal densities of trout, and the fact that certain stream reaches were capable of supporting more trout than what was collected there.

Kids Creek was not sampled again until May 1996. This sampling was conducted in order to monitor the streams recovery from the 1995 fish kill. Three locations on the creek were sampled; upstream of the Cedar Run Road stream crossing, the corner of Sixth Street and Elmwood, and on west side of Cedar Street between the two road crossings. At Cedar Run Road, only brook trout were collected. At Sixth Street, one brook trout, 10 rainbow trout, and 70 brown trout were collected. At Cedar Street two sculpin, two coho salmon, five rainbow trout, and five brown trout were collected. One adult steelhead was also shocked at this station.

In July 2003, a section of creek was sampled in the Kids Creek Natural Area. A total of 500 feet of stream directly behind the Kohl's building was sampled. In this stretch 65 sculpin and 106 brook trout from 1 to 9 inches in length were collected.

In July of 2006, Kids Creek was again sampled within the Kids Creek Natural Area, prior to removing the old dam. Sixty feet of stream from the M-37 road crossing upstream was sampled, and then another 60 feet of stream right up to the old dam was sampled. Fish collected here included nine Chinook salmon, 19 brown trout, 22 sculpins, 25 brook trout, 31 rainbow trout, and 48 coho salmon.



Kids Creek is also a stream that frequently receives lampricide treatments from the U.S. Fish and Wildlife Service (USFWS). It is treated in conjunction with the Boardman River mainstem, and these treatments typically occur in the summer months. The USFWS utilizes a chemical known as TFM (3-Trifluoromethyl-4-nitrophenol), a selective and quickly biodegrading compound, in an effort to kill larval sea lamprey living in the bottom sediments.

Kids Creek is a Designated Trout Stream, and is regulated by MDNR as a Type 1 stream, open to all tackle types. The daily possession for Type 1 streams is five fish, with an 8 inch minimum size limit (msl) for brown and brook trout and a 10 inch msl for rainbow trout, coho and Chinook salmon.

Stocking:

Stocking has occurred on Kids Creek since as early as 1905 (Table 1). Brook trout were stocked exclusively in 1905, 1941, 1944- 1947, and from 1951-1954. At this point in time brook trout were replaced by rainbow trout, which were stocked continuously up until 1963. In 1963 brook trout were once again stocked, only to be replaced by brown trout in 1964. Stocking domestic trout into Kids Creek was put on hold until 1985 when rainbow trout stocking resumed; but the trout were quickly replaced in favor of a salmon stocking program which started in 1987. Salmon stocking in Kids Creek started as an opportunity to bolster the salmon fishery in Grand Traverse Bay. The goal of the salmon stocking program was to create a sport troll, stream, and shore fishery in Grand Traverse Bay. This stocking location has encouraged salmon to return to the Boardman River and Kids Creek, as evidenced by naturally reproduced coho and Chinook salmon that are routinely found in stream surveys of Kids Creek, despite salmonid access to Kids Creek being blocked by the Boardman Weir during much of the fall run. (Fish Division files). With the exception of 1993 when coho salmon were stocked, and 1997 and 1998 when brown trout were stocked, Chinook salmon were stocked exclusively and annually in Kids Creek from 1987 to 2011. In 2012 the number of Chinook stocked in the Lake Michigan basin was reduced significantly, and the decision was made to combine the Boardman River and Kids Creek Chinook salmon stockings into the Boardman River net pen stocking.

Methods & Materials:

On August 23, 2012, Tributary A of Kids Creek was shocked with a backpack electrofishing unit. This was a discretionary survey, and the goal of this study was to collect fisheries information from this location prior to an upstream streambed re-location project.

One station was shocked; starting at Elmwood Ave and running along 6th Street, 180 feet of stream was sampled. Length data was collected for all individuals. Water temperature was 60°F and air temperature was 75 °F.

Results:

See Table 2 for results of the survey.

Discussion:

Throughout its documented survey history Kids Creek has maintained a relatively stable trout population, and the ability to support anadromous trout and salmon. Despite seeing development in the watershed increase dramatically, warmer water temperatures, siltation of spawning gravel and deep holes, low water levels, and various incidences of contamination, Kids Creek seems to be flourishing; especially in areas where these negative impacts have been addressed and restoration is occurring. While the numbers of trout collected in this survey are good, this stretch of Kids Creek has the potential to support much higher densities of fish. It is anticipated that follow-up surveys in the coming years will show such results.



As part of the stream relocation project, DNR Fisheries Division has committed to sampling Kids Creek in the vicinity of the 2013 day-lighting project before the work occurs, and once a year for at least three years after the relocation in order to monitor how the fish community responds. The stream relocation project was completed in September of 2013, therefore stream monitoring will continue in 2014, 2015, and 2016.

Recommendations:

1. Although Kids Creek has been dramatically degraded for many years, it remains a naturally reproducing trout and salmon stream. Therefore, it should be protected from uncontrolled development and poor land-use practices by working with MDEQ Water Resources Division to evaluate permit applications.
2. Kids Creek lacks woody debris and vegetative cover at multiple locations throughout its course. The lack of shade along the river has degraded the trout populations of this creek. Some of this habitat and vegetation can be restored by working with the Grand Traverse Conservation District, The Watershed Center, and riparian property owners.
3. Surveys of Kids Creek should be performed at additional upstream locations in order to gain a better understanding of the current fish populations found throughout its watershed.
4. Surveys of Kids Creek should continue to occur in this vicinity to ensure proper documentation of the fish community's response to restoration projects.

References:

The Watershed Center. 2013. <http://www.gtbay.org/about-us/achievements/kids-creek-restoration-project/>. [January 7 2013].

U.S. Soil Conservation Service. 1973. Kid's Creek Watershed Land and Water Resource Inventory and Evaluation. Prepared for Garfield Township. Traverse City, Michigan.



Figure 1. Map of the Kids Creek watershed, Grand Traverse County, including the 2012 sampling site.

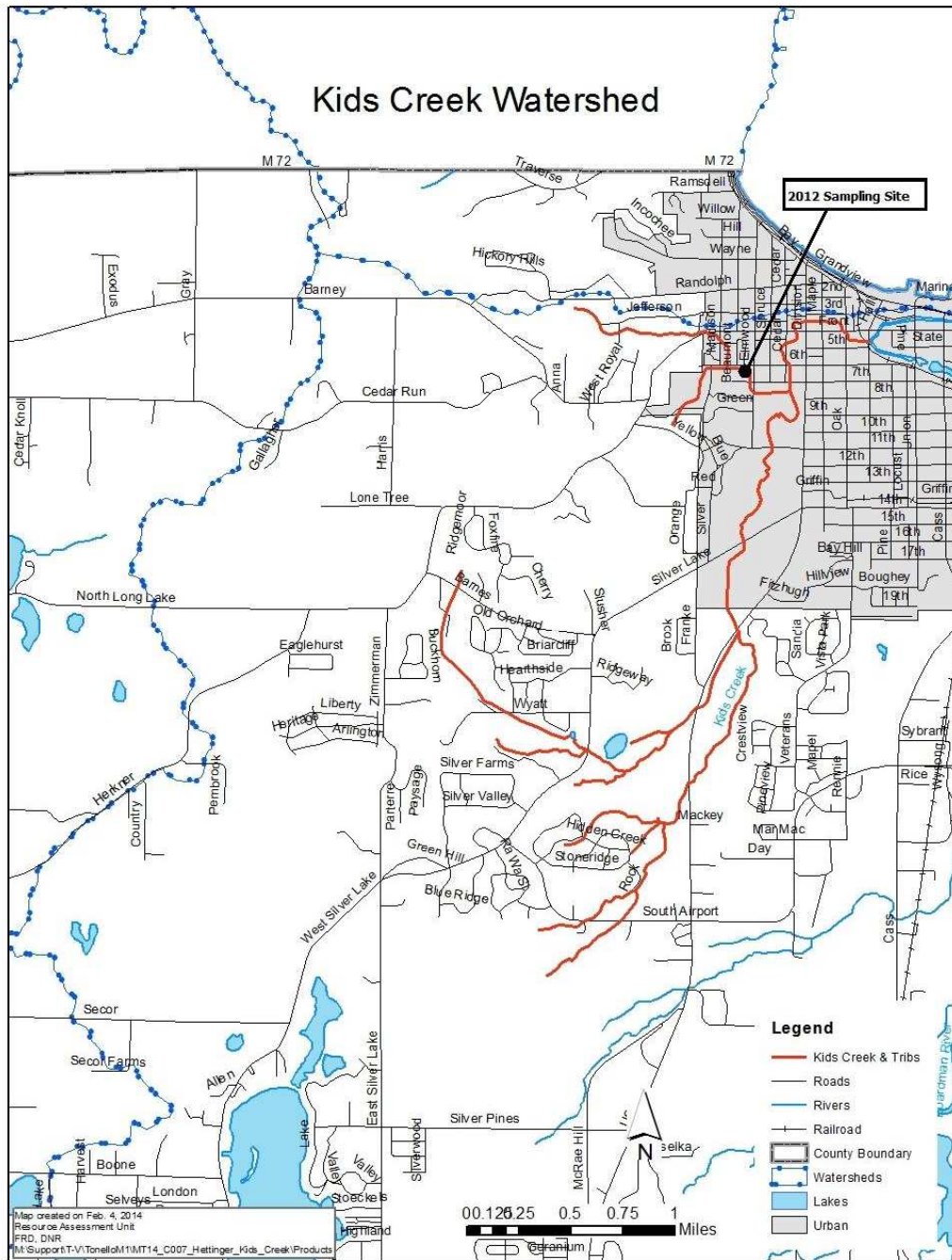




Figure 2. Various sampling sites from the 1973 Kids Creek fisheries surveys.

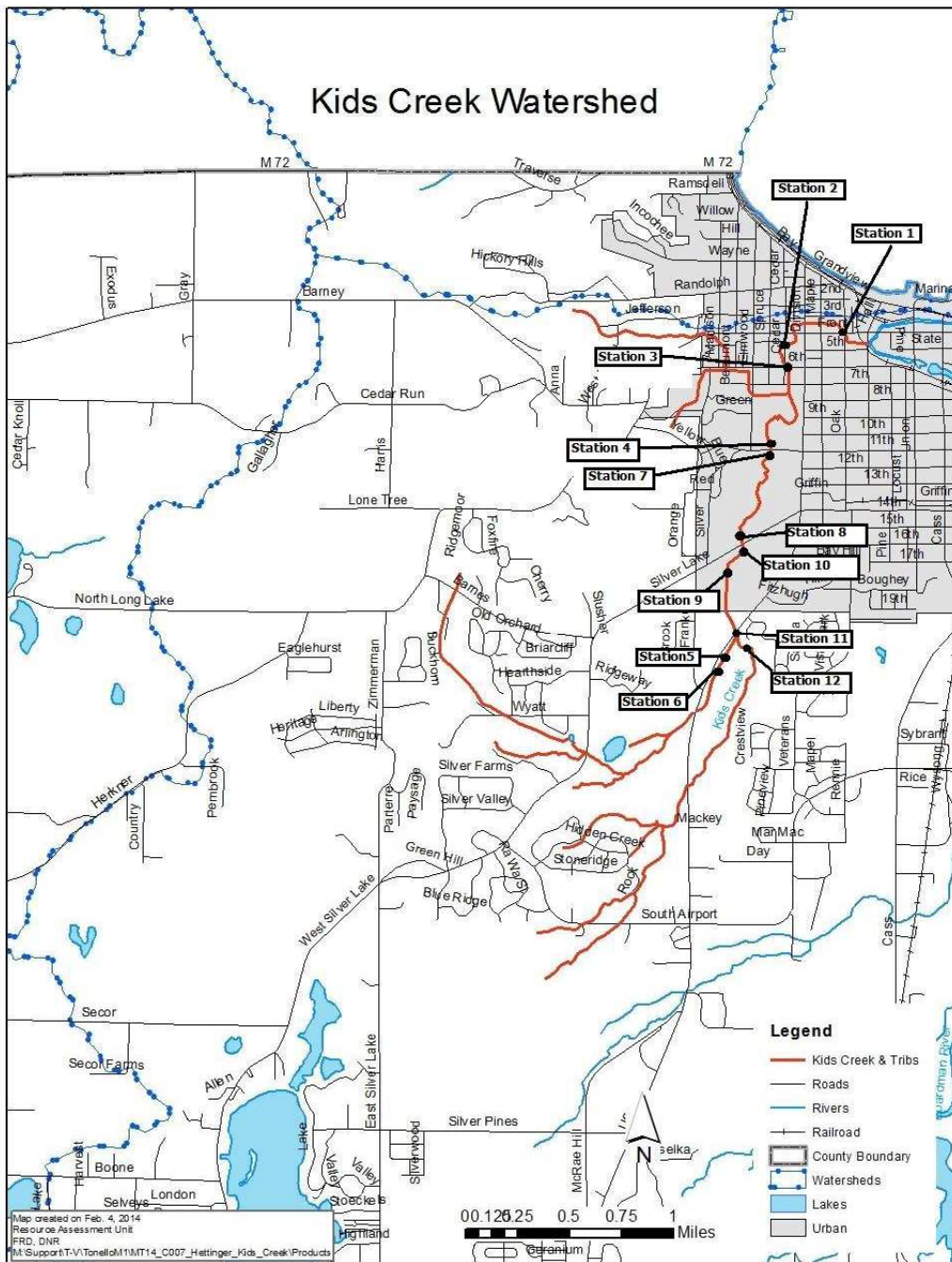




Table 1. Kids Creek stocking in Grand Traverse County, 1905-2012.

Year	Species	Number stocked	Year	Species	Number stocked
1905	Brook trout	3,000	1989	Chinook salmon	300,093
1941	Brook trout	1,000	1990	Chinook salmon	306,964
1944	Brook trout	2,000	1991	Chinook salmon	295,334
1945	Brook trout	75	1992	Chinook salmon	300,634
1946	Brook trout	100	1993	Coho salmon	110,026
1947	Brook trout	100		Chinook salmon	253,162
1951	Brook trout	550	1994	Chinook salmon	300,820
1952	Brook trout	550	1995	Chinook salmon	292,789
1953	Brook trout	1,000	1996	Brown trout	145
1954	Brook trout	200		Chinook salmon	270,975
	Rainbow trout	800	1997	Brown trout	150
1955	Rainbow trout	1,000		Chinook salmon	252,636
1956	Rainbow trout	1,300	1998	Brown trout	145
1957	Rainbow trout	1,000		Chinook salmon	245,467
1958	Rainbow trout	1,000	1999	Chinook salmon	240,327
1959	Rainbow trout	1,000	2000	Chinook salmon	256,854
1960	Rainbow trout	1,000	2001	Chinook salmon	234,520
1961	Rainbow trout	800	2002	Chinook salmon	235,480
1962	Rainbow trout	600	2003	Chinook salmon	237,508
1963	Brook trout	200	2004	Chinook salmon	238,983
	Rainbow trout	600	2005	Chinook salmon	237,434
1964	Brown trout	600	2006	Chinook salmon	150,021
1984	Rainbow trout	200	2007	Chinook salmon	100,075
1985	Rainbow trout	200	2008	Chinook salmon	96,762
1986	Rainbow trout	300	2009	Chinook salmon	93,263
1987	Chinook salmon	238,500	2010	Chinook salmon	6,696
1988	Chinook salmon	277,00	2011	Chinook salmon	10,000

Table 2. Kids Creek electrofishing survey results, August 23 2012.

Species	Number	Percent by number	Weight (lbs)	Percent by weight	Length Range (inches)
Brown trout	64	91.4	3.6	99.4	2 to 10
Rainbow trout	6	8.6	0	0.6	1 to 2
Total:	70	100	3.6	100	



Watershed Moments

May 2013

Kids Creek Gets Treatment at Munson

Kids Creek isn't so healthy, so the Watershed Center and Munson Medical Center are treating it. Kids Creek is on Michigan's list of impaired waters due to being overloaded with sediments and high water flows.

A section of Kids Creek running through Munson's north campus will be restored by replacing 900 feet of underground culverts and channelized ditches with a natural, above-ground meandering channel. This is called daylighting the creek.

The new creek section will cross Beaumont Avenue and then meander between Beaumont Avenue and the adjacent alley before crossing Sixth Street to meet the existing channel.

The new stream channel will:

- eliminate 73,000 square feet of impervious area
- establish 27,000 square feet of floodplain
- create a buffer between the hospital campus and surrounding neighborhoods.

The buffer along the creek will be planted with attractive flowers and shrubs that will absorb runoff and provide a healing garden for Munson patients and their loved ones.

continued on page 2



Please help protect our Up North waters for Future Generations~gtbay.org

Kids Creek Gets Treatment at Munson

continued from page 1

Funding from the US EPA's Great Lakes Restoration Initiative for this project is \$250,000. Munson is providing at least \$500,000 in matching funds. Consumers Energy Foundation and the Great Lakes Fisheries Trust are also providing funding. Rotary Charities of Traverse City is also providing fundraising technical assistance as part of its \$500,000 challenge grant for Munson's Cancer Center.

The project coincides with preparations for constructing a new Cancer Center on the northern part of Munson's campus, anticipated to break ground in 2014.

Residents should expect road closures on Sixth Street and Beaumont Avenue during construction. Work on the daylighting project should be completed by October.



Page 1, clockwise from top left: Kids Creek runs mostly underground near Sixth and Beaumont on the Munson campus. Plans illustrate the stream's new above-ground meandering channel. Logs are put into place to define streambanks. Workers create the new stream bed. This page, clockwise from top left: Workers place root wads to create the new streambank, which prevent erosion and provide fish habitat. Rocks and logs shape the new streambed. Workers install root wads along the sides of the new meandering stream channel. Executive Director Andy Knott and Program Director Sarah U'Ren chat about the project with one of the crews. Photos by Denise Baker.

Kids Creek Ready for Phase Two

Phase one of restoring Kids Creek on Munson Medical Center's campus is complete.

We replaced 900 feet of underground culverts and channelized ditches with a natural, aboveground channel. This is called daylighting the creek. The new stream bed eliminates 73,000 square feet of impervious, or paved, area and establishes 27,000 square feet of floodplain. This is vital for reducing runoff.

Kids Creek is on the state's list of Impaired Waters due to poor aquatic insect populations, which is caused by heavy sedimentation from runoff. Robust aquatic insect populations are important for fish habitat.

The new meandering stream channel incorporates tree root wads embedded in the banks, which provide fish habitat and reduce erosion. The Grand Traverse Conservation District helped with streambed design.

Now we're beginning phase two, which focuses mostly on installing green runoff design, otherwise known as Low Impact Development. Features will include rain gardens, green roofs and pervious pavement. Such green infrastructure absorbs more runoff, which will help reduce sedimentation impacts on Kids Creek.

Some of the features will be designed as part of the new Cowell Family Cancer Center, while others will be installed at various locations on the Munson campus.

Engineering work takes place this winter. Construction will begin in summer 2014.

We're also working with DEQ to determine how much sediment Kids Creek can handle while also meeting water quality standards. The plan is called a Total Maximum Daily Load. The plan will help determine how much runoff we need to reduce to improve the creek. The ultimate goal is to get Kids Creek off the Impaired Waters list.

Watershed Center funding for this project comes from the U.S. Environmental Protection Agency's Great Lakes Restoration Initiative, MDEQ, Munson, the Great Lakes Fishery Trust and the Oleon Foundation. Munson funding partners include Rotary Charities of Traverse City and Consumers Energy Foundation.



Top left and top center: Steve Largent of the Grand Traverse Conservation District and future generations release brook trout into Kids Creek. Photos by Jody M. Clark. Top right: The new aboveground stream channel before receiving water. Photo by Denise Baker. Center: A bird's eye view of the new meandering stream bed. Photo by Denise Baker. Bottom left: Celebrants line the banks of the new Kids Creek. Photo courtesy of TC Rotary. Bottom right: Workers install sheet piling to slow water to flow into the new stream channel. Photo courtesy of TC Rotary.