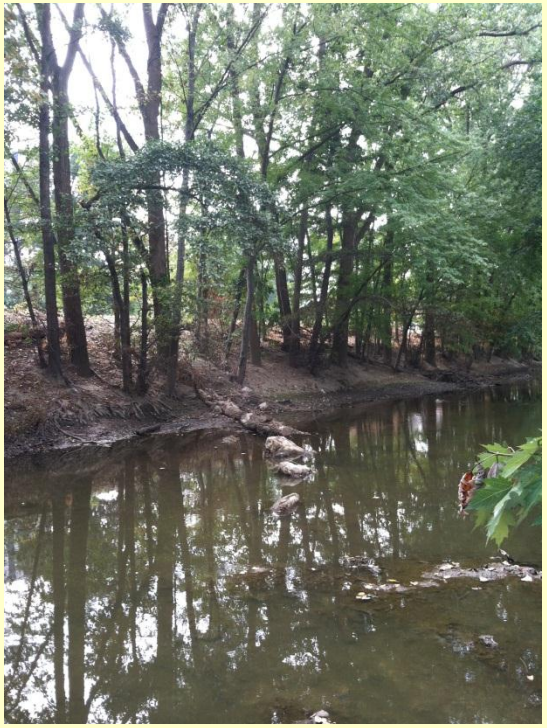
Multifaceted Urban Stream Restoration Project for the Ottawa River at the University of Toledo, Ohio

OEPA 319 Project # 09(h)EPA-20
USFWS Cooperative Agreements F11AC00834, F13AP00516

FINAL REPORT

P.I: Dr. Patrick Lawrence
Presidents Commission on the River
University of Toledo
patrick.lawrence@utoledo.edu

December 2013

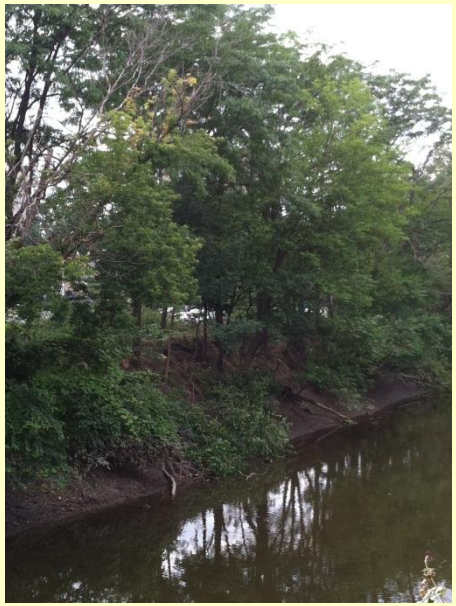


Project Summary

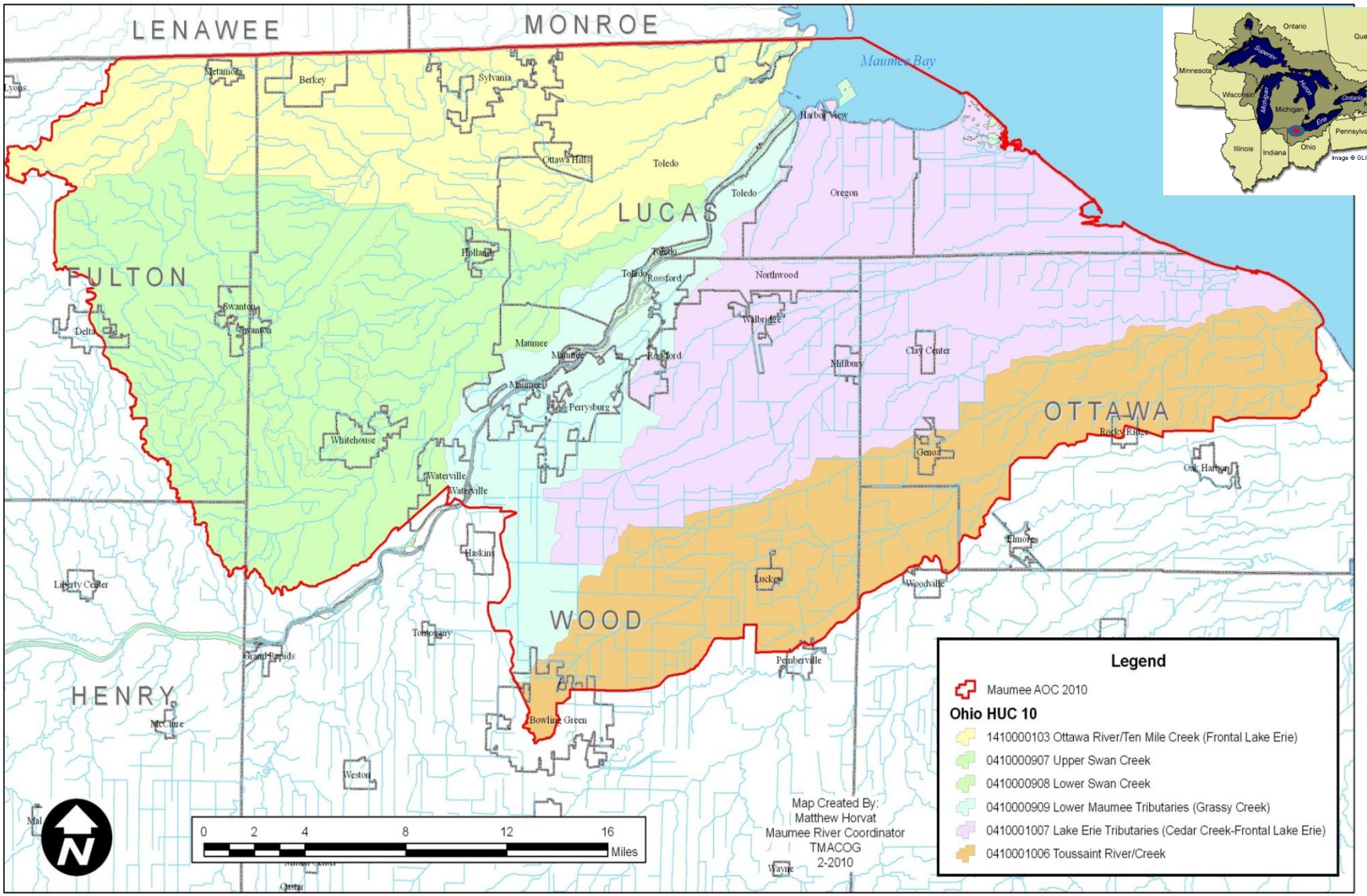
- To assist in the delisting of the Loss of Fish and Wildlife Habitat and Degradation of Fish and Wildlife Populations Beneficial Use Impairments (BUIs) within the Maumee Area of concern

- University of Toledo President's Commission on the River and other federal, state and local partners undertake a habitat restoration project for 3,700 feet of the Ottawa River on the main campus of the University of Toledo between RM 10.8 and 11.2 with the City of Toledo and Maumee Area of Concern

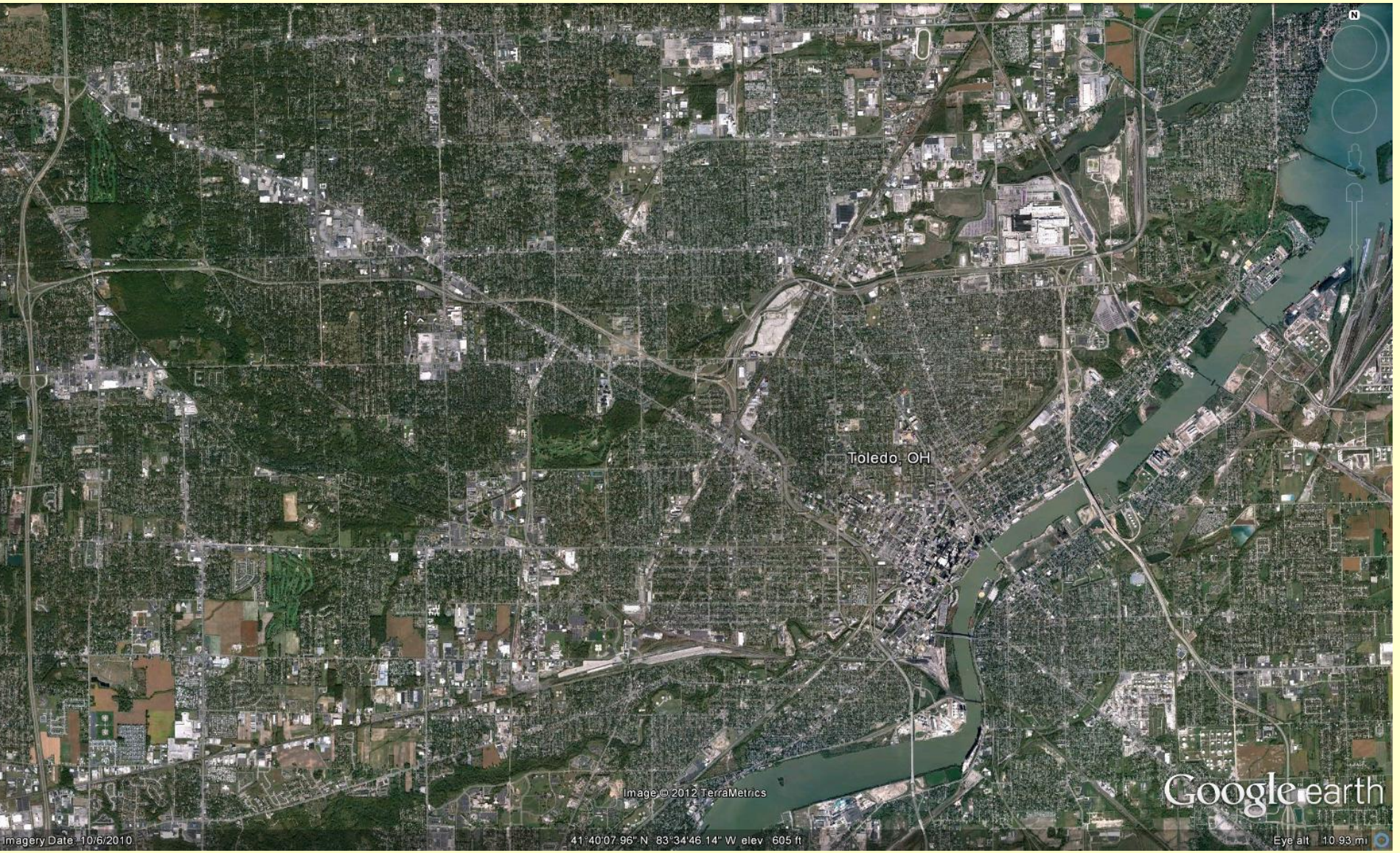
- Restoration will include stream and stream bank restoration and stabilization efforts and address the critical issue of aquatic habitat loss by the use of innovative demonstrative techniques



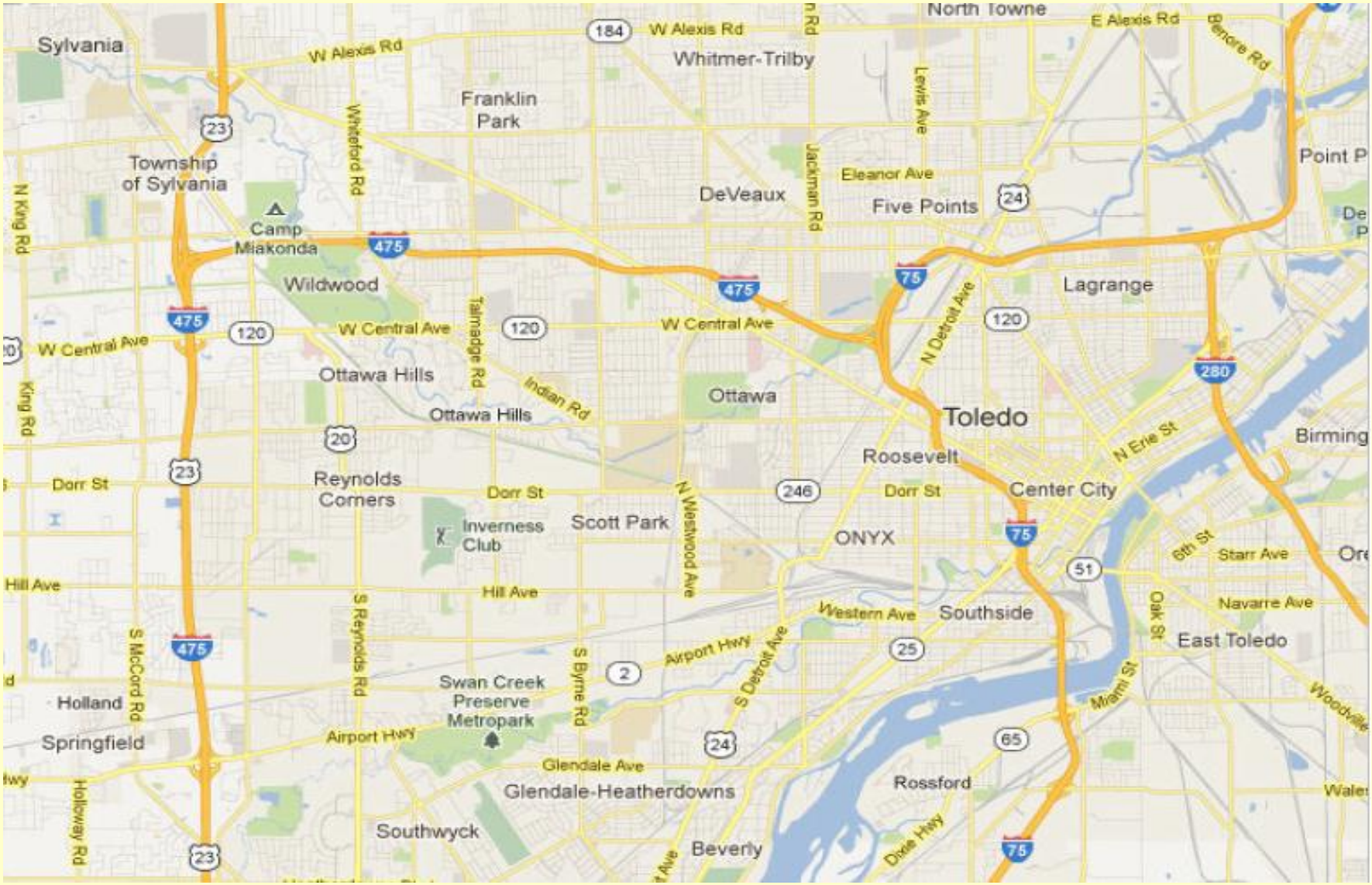
Maumee AOC Boundary



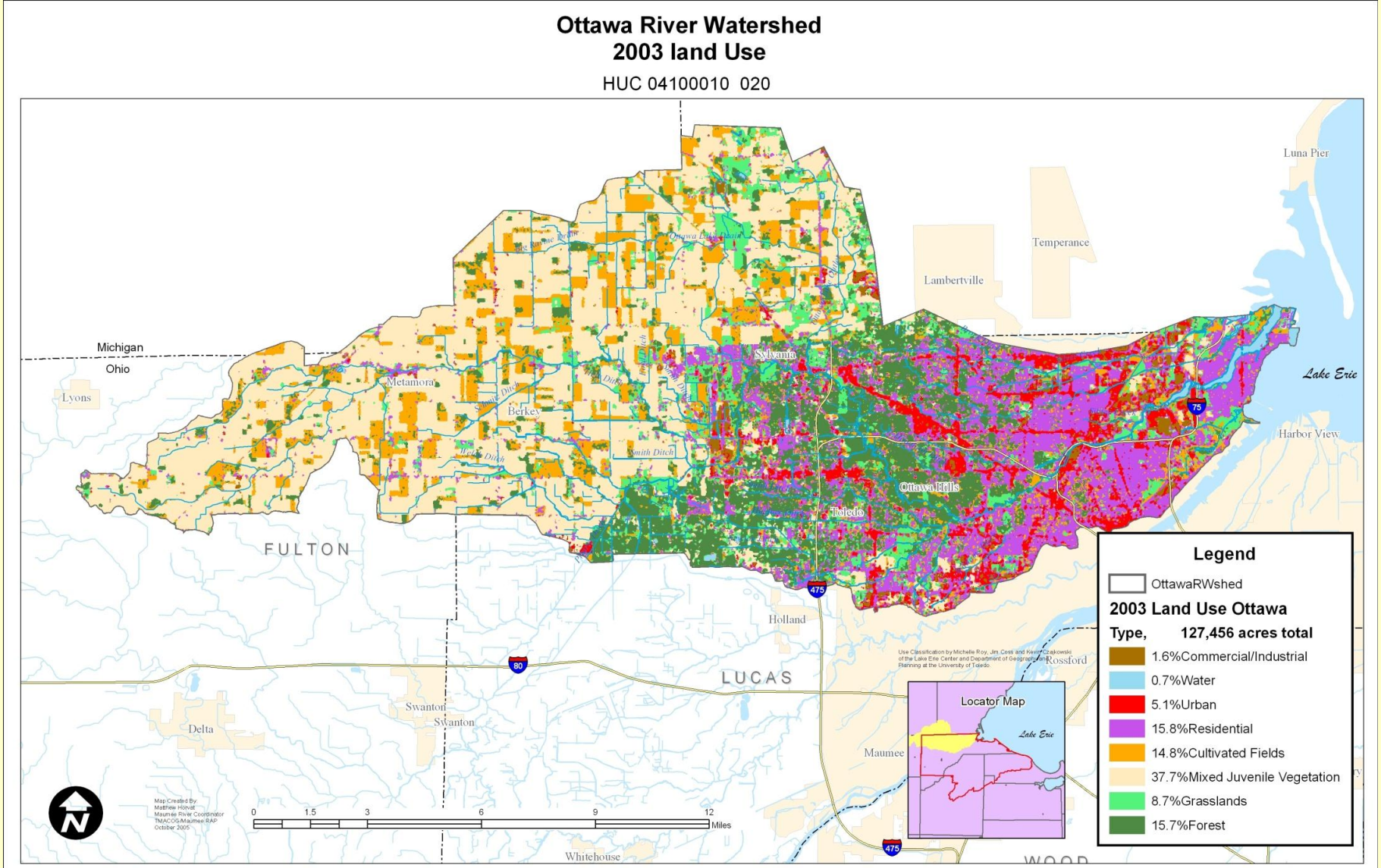
The Ottawa River watershed is within the Maumee Area of Concern (designated by the IJC and USEPA as a Great Lakes AOC in 1987) and located in the Toledo area, NW Ohio



With a watershed area of 140 sq. miles and 45 river miles, the Ten Mile Creek/Ottawa River extends westward into surrounding rural townships, with the central and lower river sections running 18 miles throughout the urban area and draining into the Maumee Bay in Western Lake Erie

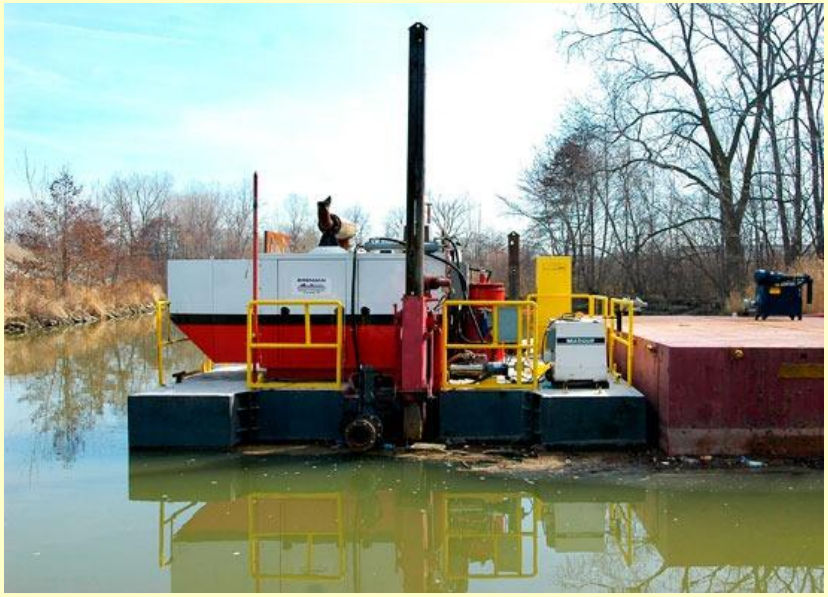


The main branch of the Ten Mile Creek/Ottawa River starts in the City of Sylvania and runs SE through BSA Camp Miakonda, Wildwood MetroPark, Village of Ottawa Hills, main campus of the University of Toledo, city parks of Ottawa and Jermaine, then the industrial area of I475/I75



Although the Ten Mile/Ottawa River watershed is approximately 50% rural agriculture and 50% urban/residential, the area of recent habitat restoration efforts is within the largely urbanized area including the City of Sylvania, Village of Ottawa Hills and City of Toledo in the lower portion of the watershed

The last several miles of river that represent the lower portion of the Ottawa River is associated with an area of heavy industrialization, including former city and industrial landfills sites that resulted in a legacy of serious sediment contamination with PCSs, heavy metals and other materials dating back as far as the early 1900s.

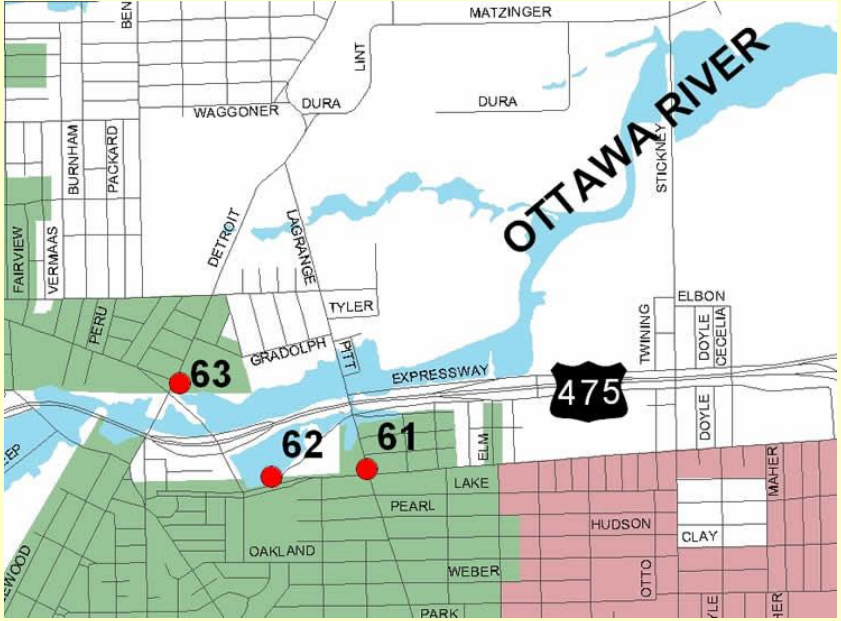


CITY TO SHARE COST

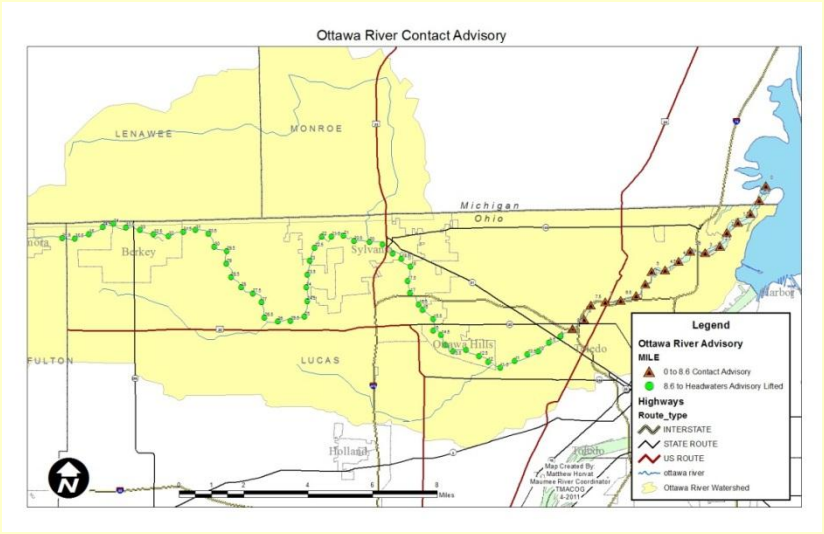
Toledo would contribute space in its Hoffman Road landfill to meet its $4 million obligation toward the $43 million cleanup of contamination between Lagrange Street and Suder Avenue.

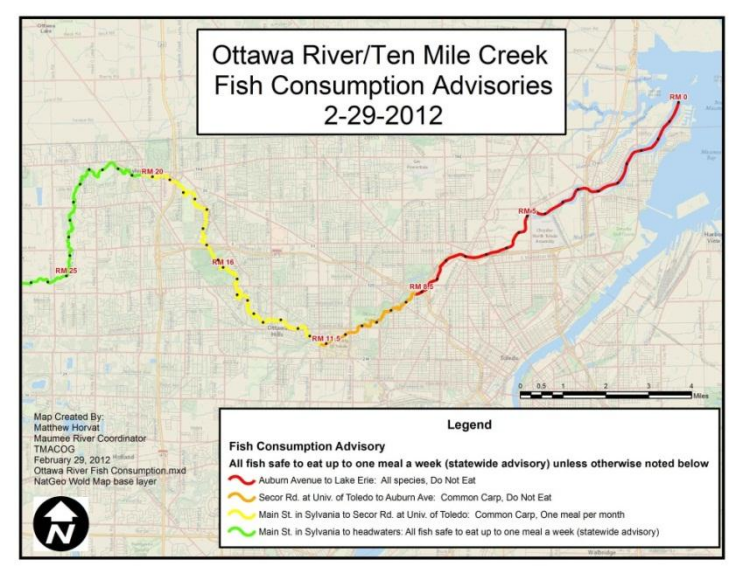
SOURCE: City of Toledo THE BLADE

With funding from the Great Lakes Legacy Act, a major dredging and treatment project was undertaken via a partnership of USEPA, OEPA, City of Toledo and local industries, to remove contaminated sediments and set the stage for efforts to then improve river habitat conditions



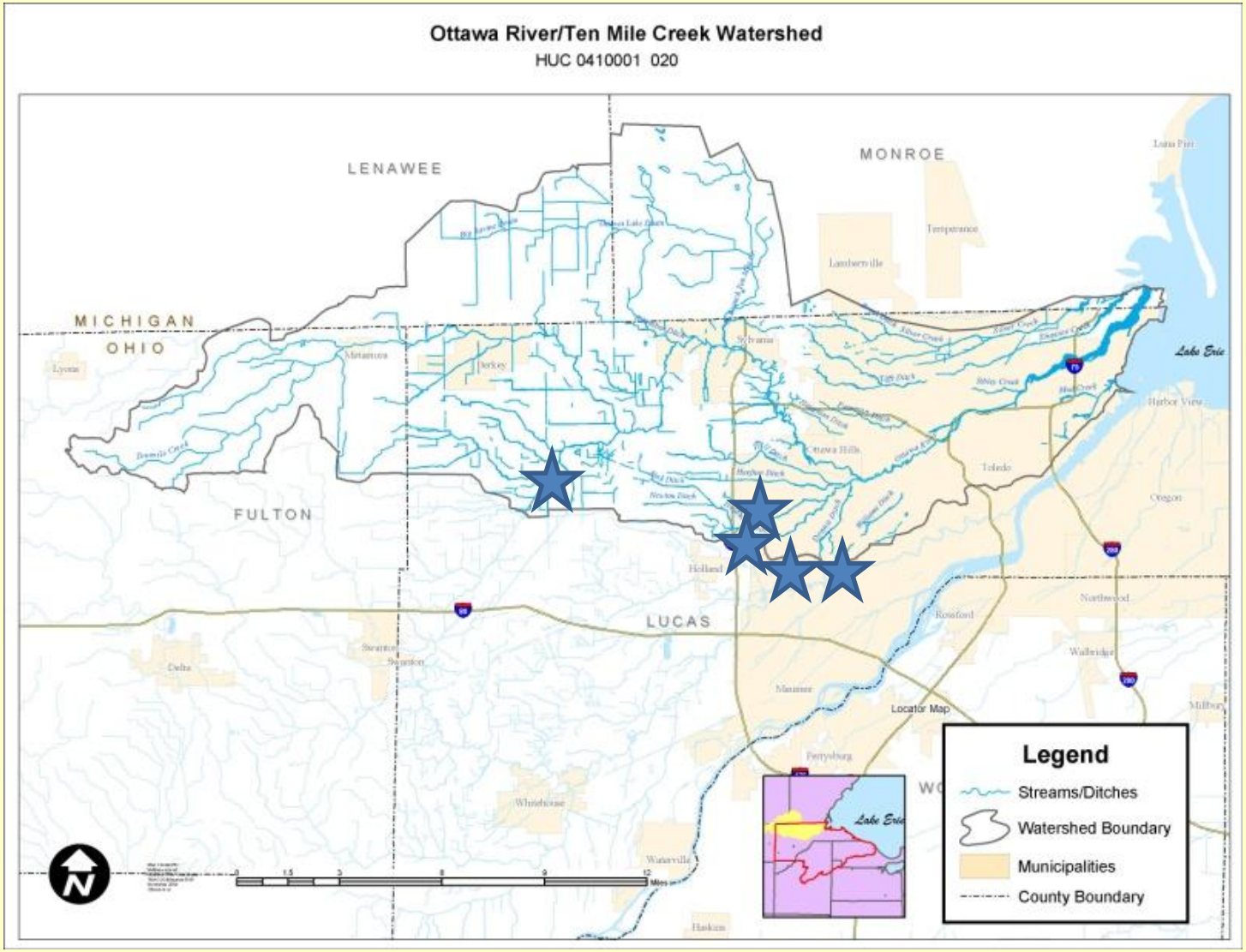
In addition, under a legal consent agreement with USEPA, the City of Toledo is currently undertaken major upgrades to the municipal sewer collection and treatment facilities to reduce the frequency and flow of SO and CSO discharges into local water bodies including the Ottawa River, addressing the most significant remaining point source of water quality concerns





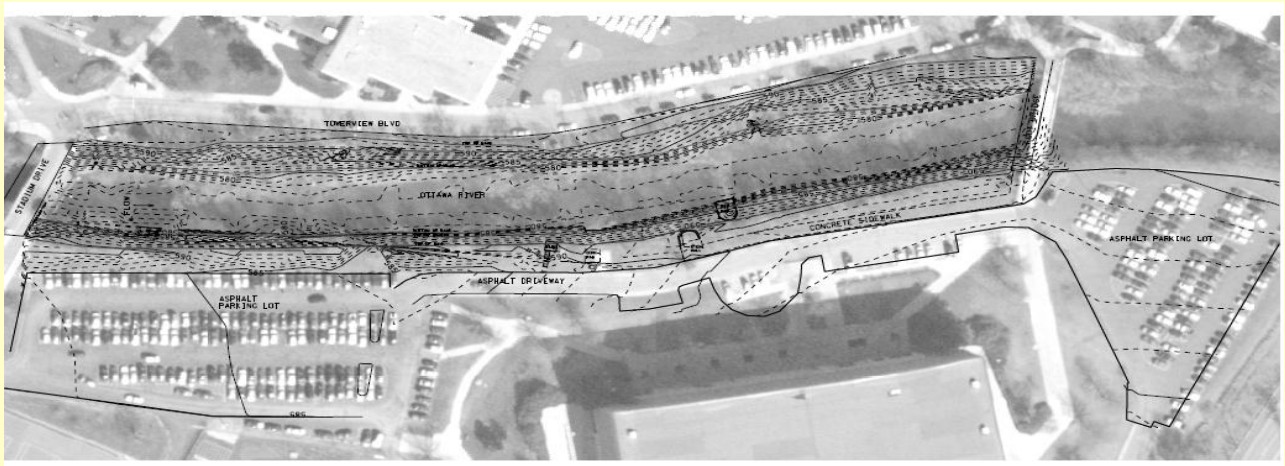
The Ottawa River within the City of Toledo was posted in 1991 by the local and state health departments under a contact advisory due to concerns related to fish consumption and sediment contamination. With improving conditions, better data and reassessments of the water quality, the postings were revised in 2012 by Ohio EPA resulting in elimination and reductions of the contract advisories including at the University of Toledo river sites.

Ottawa River Restoration Projects



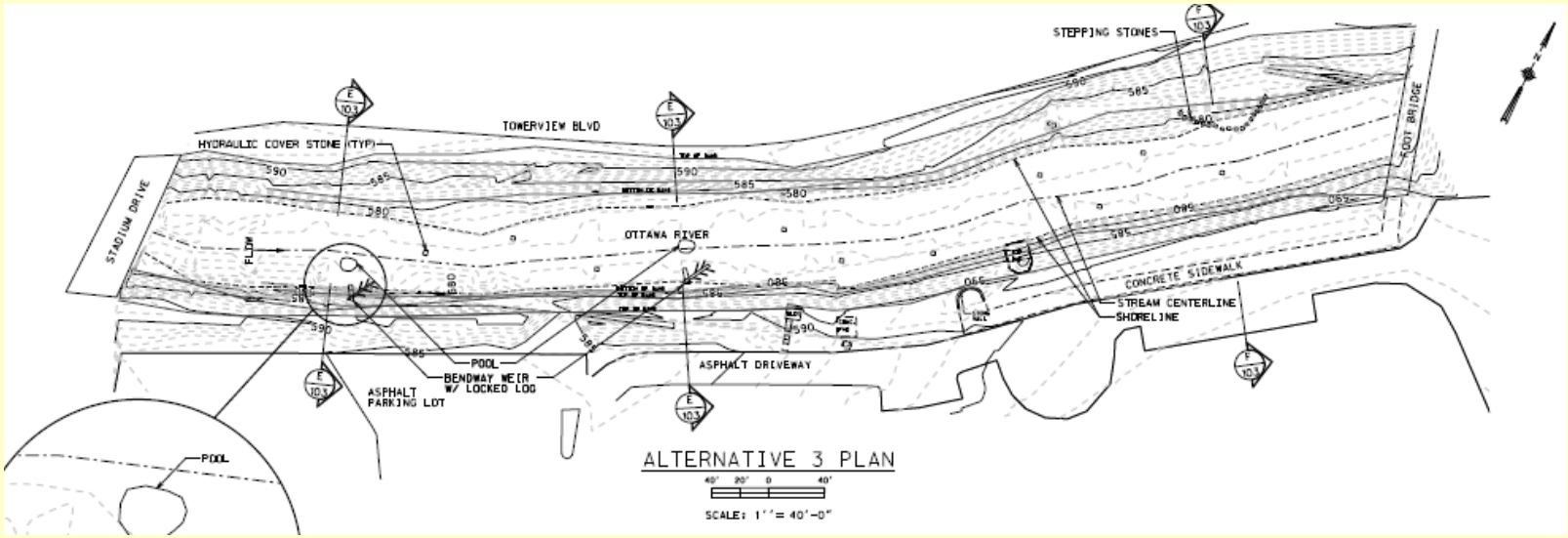
With progress and success in addressing contaminated sediments and combined sewer overflows, since 2007 five major habitat restoration projects (including at UT) have been undertaken along the Ottawa River and tributaries with the Toledo area

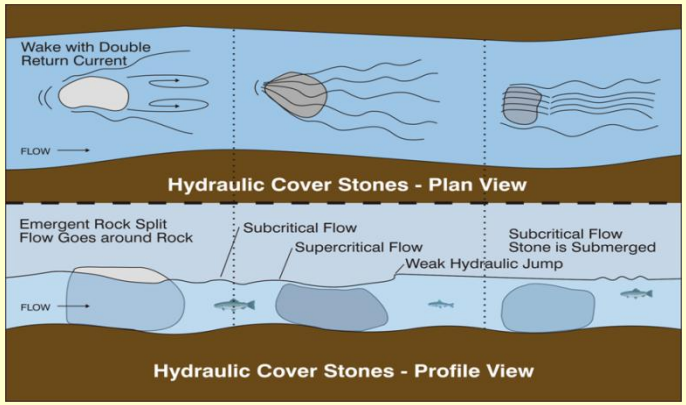
Ottawa River Project Site at the University of Toledo main campus, with 3,700 linear feet of main channel, including extensive straightening, infill and dykes built in late 1950s for flood control purposes

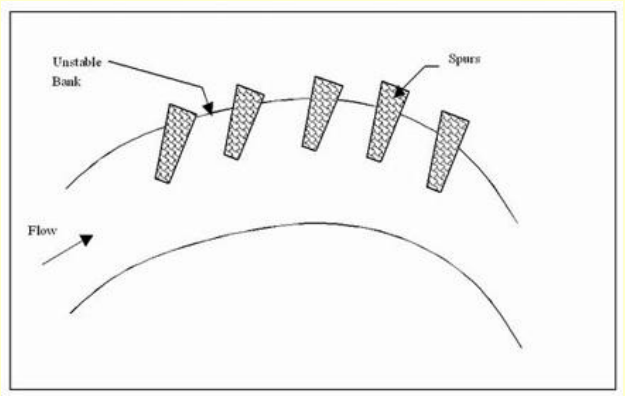


With funding secured from Stranahan Foundation in 2009 for an environmental education grant project with UT and Toledo Public School Early High School, planning started on proposed in-stream and bank restoration for selected reach on UT campus, 900 feet adjacent to Savage Area.

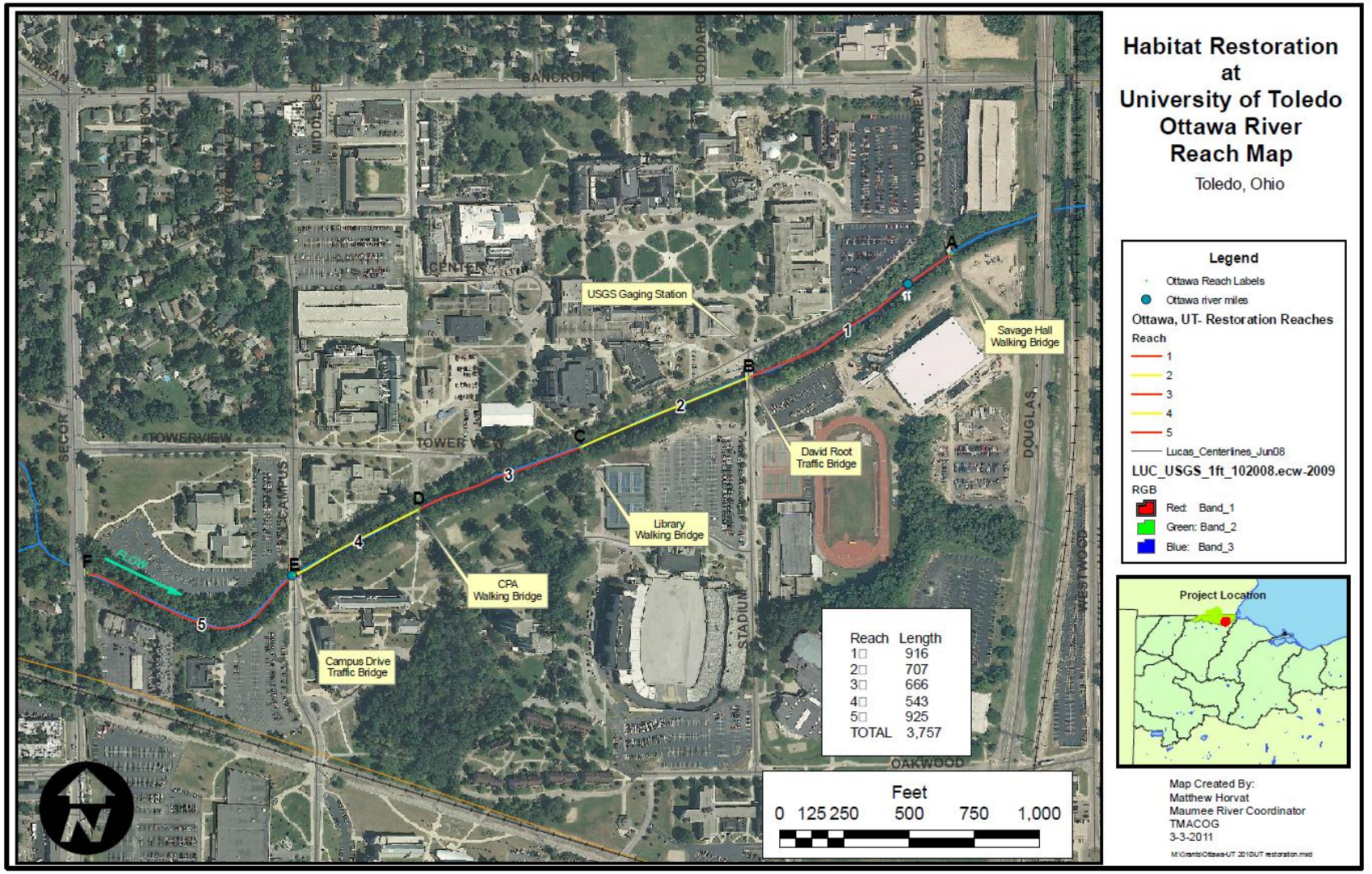
UT entered into agreement with ACOE Buffalo in FY11 to complete necessary survey, hydrological modeling and draft concept plans







Initial concept plans for in-stream habitat restoration of river reach 5 (900 feet adjacent to Savage Arena) as presented by ACOE Buffalo at March 2011 workshop



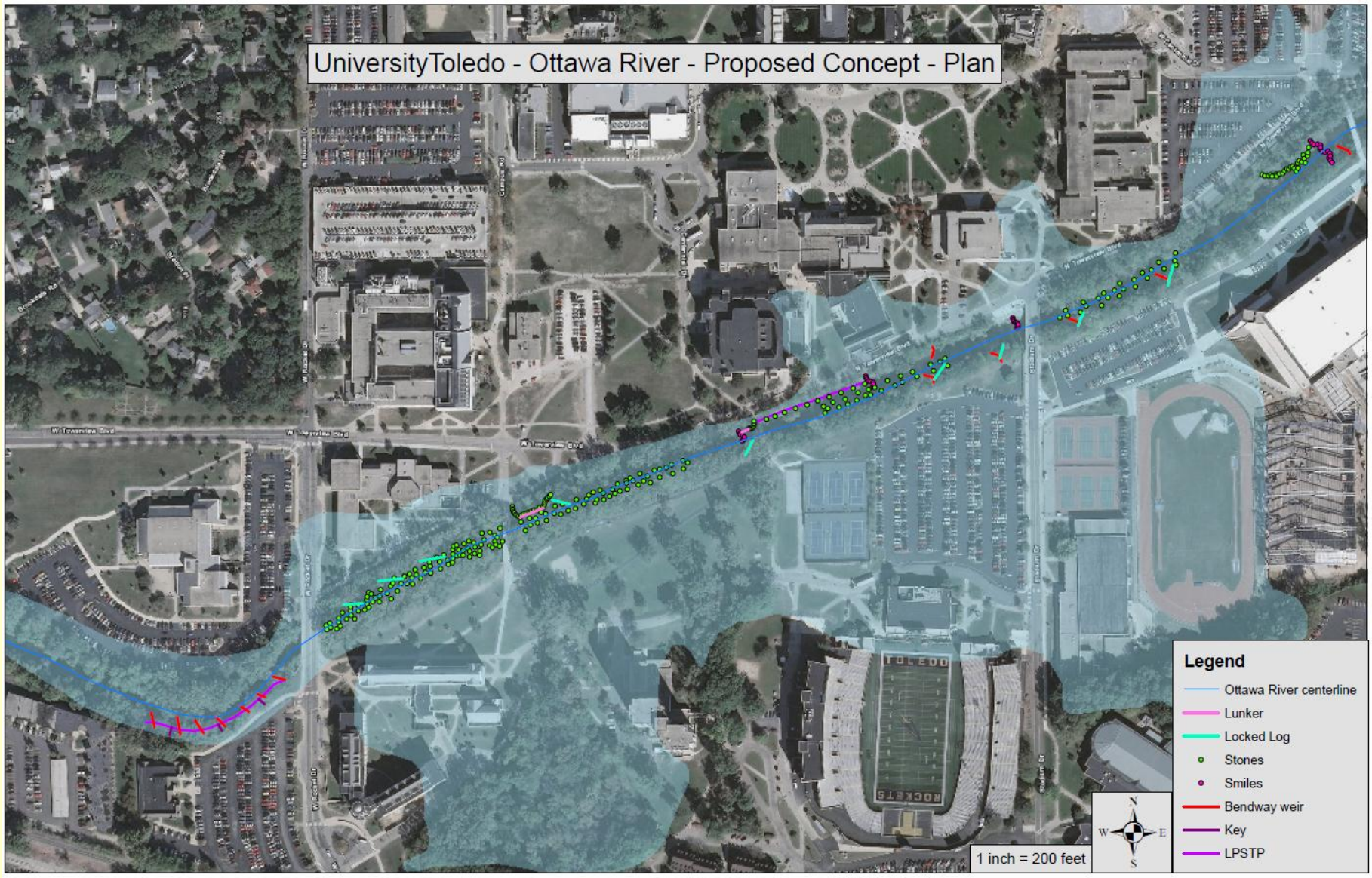
2011: Additional funding secured from Ohio EPA ($235,195) and U.S. Fish and Wildlife Service ($114,132) in 2011 allowed for expansion of river restoration to include entire length of Ottawa River on the main campus of the University of Toledo, ACOE Buffalo District under agreement with University of Toledo for FY 2012 to complete design concepts and final plans for entire river length of 3,700 feet on campus.

In order to determine the best choice of aquatic and bank plant species to install at the UT river restoration site, a series of test plantings were installed at a selected sample site with a mix of species including live stakes and plants placed in May/June 2011 with monitoring of their growth success ongoing from the Summer of 2011 to Summer 2012

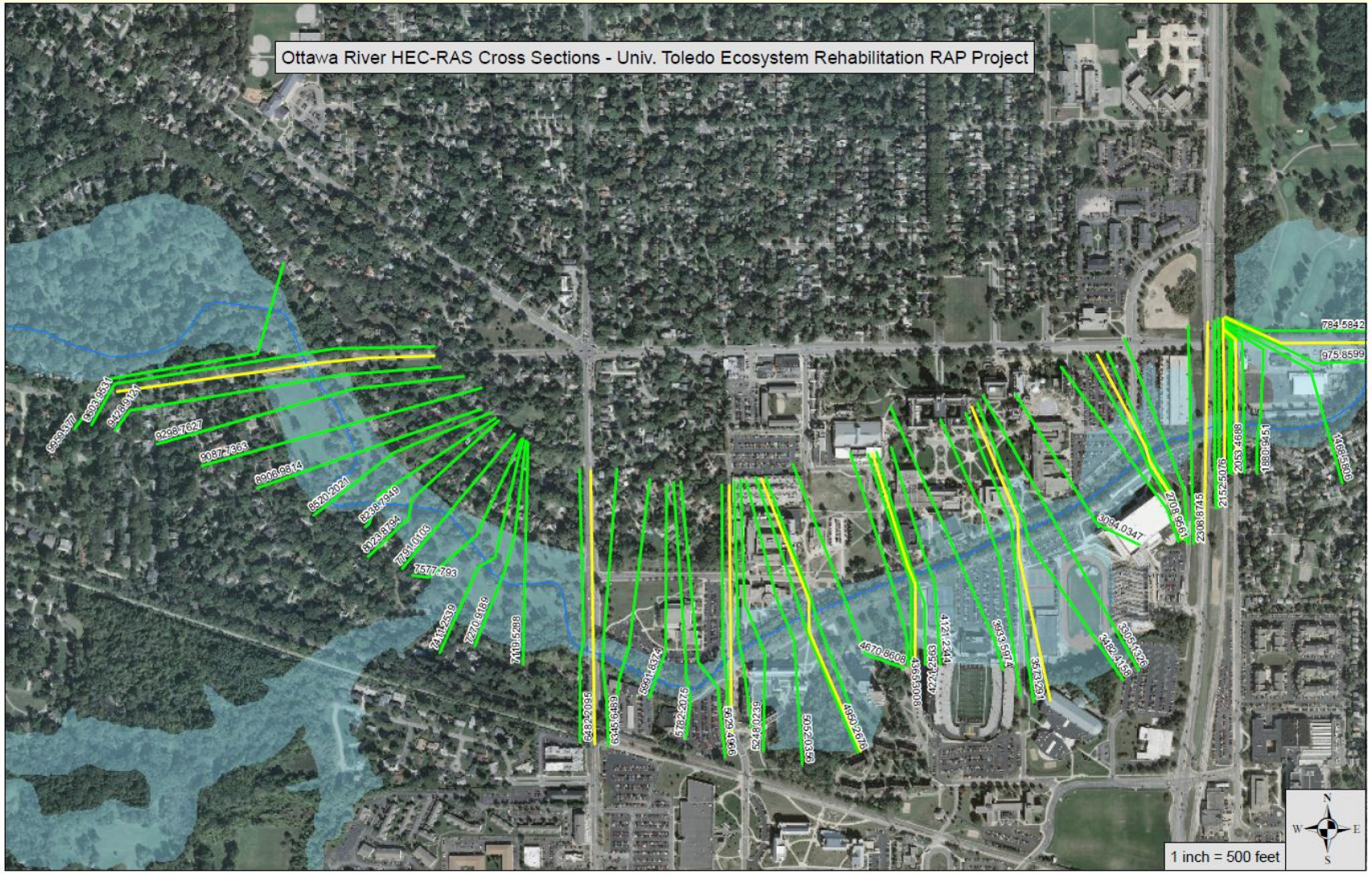
Species planted included Button Bush, Dogwood, Sycamore, Pin Oak and River Bank Wild Rye

In the summer of 2011 OEPA conducts sampling within the Ten mile/Ottawa River watershed including on the UT campus and for pre-assessment of existing aquatic ecosystem conditions at the UT 319 river restoration project

Proposed In-stream habitat design concepts and plans (January 2012)



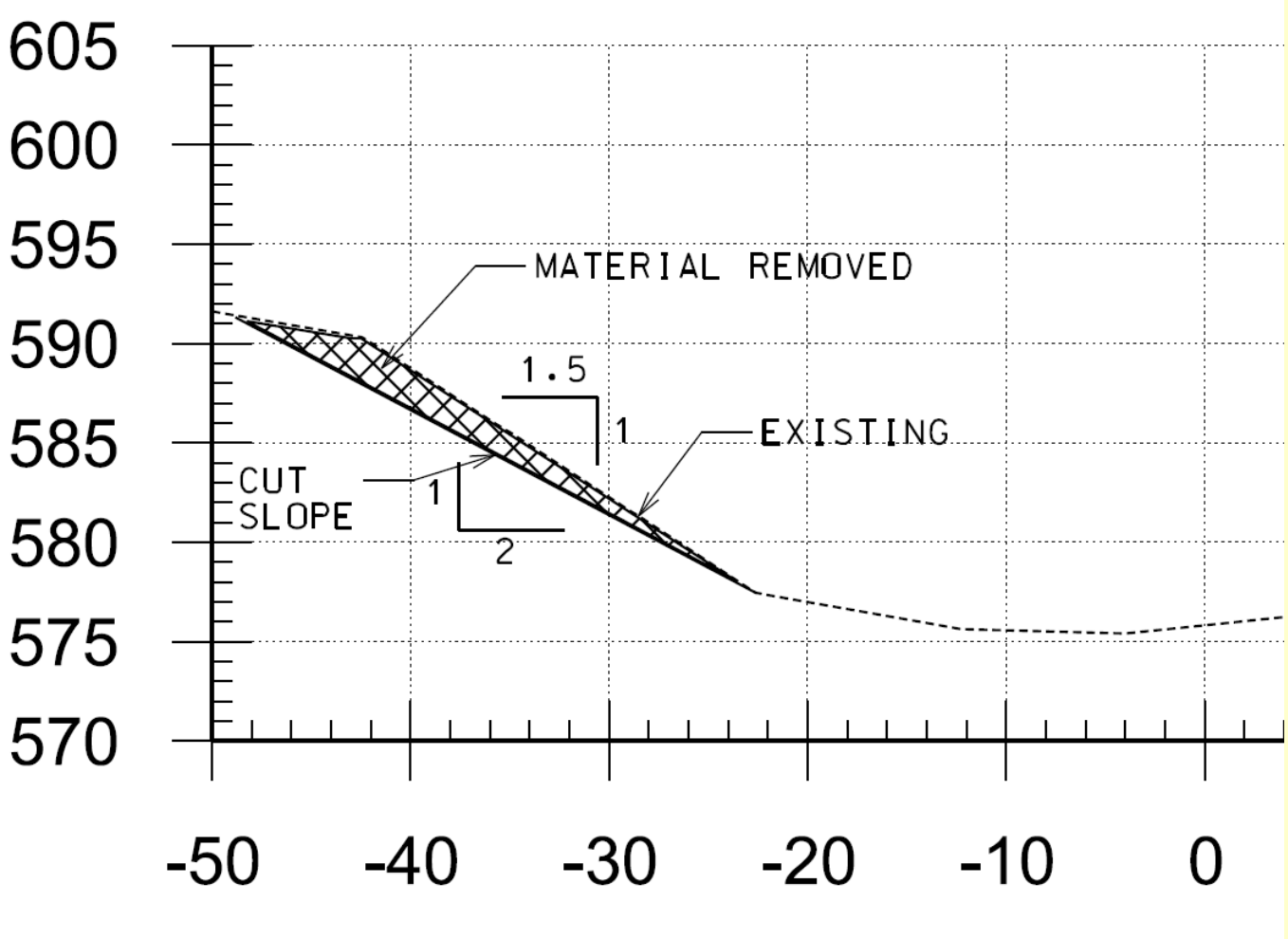
In February 2012 ACOE Buffalo conducts hydrological modeling of stream flow conditions with proposed in-stream restoration features in place following Reach 1-5 concept plans

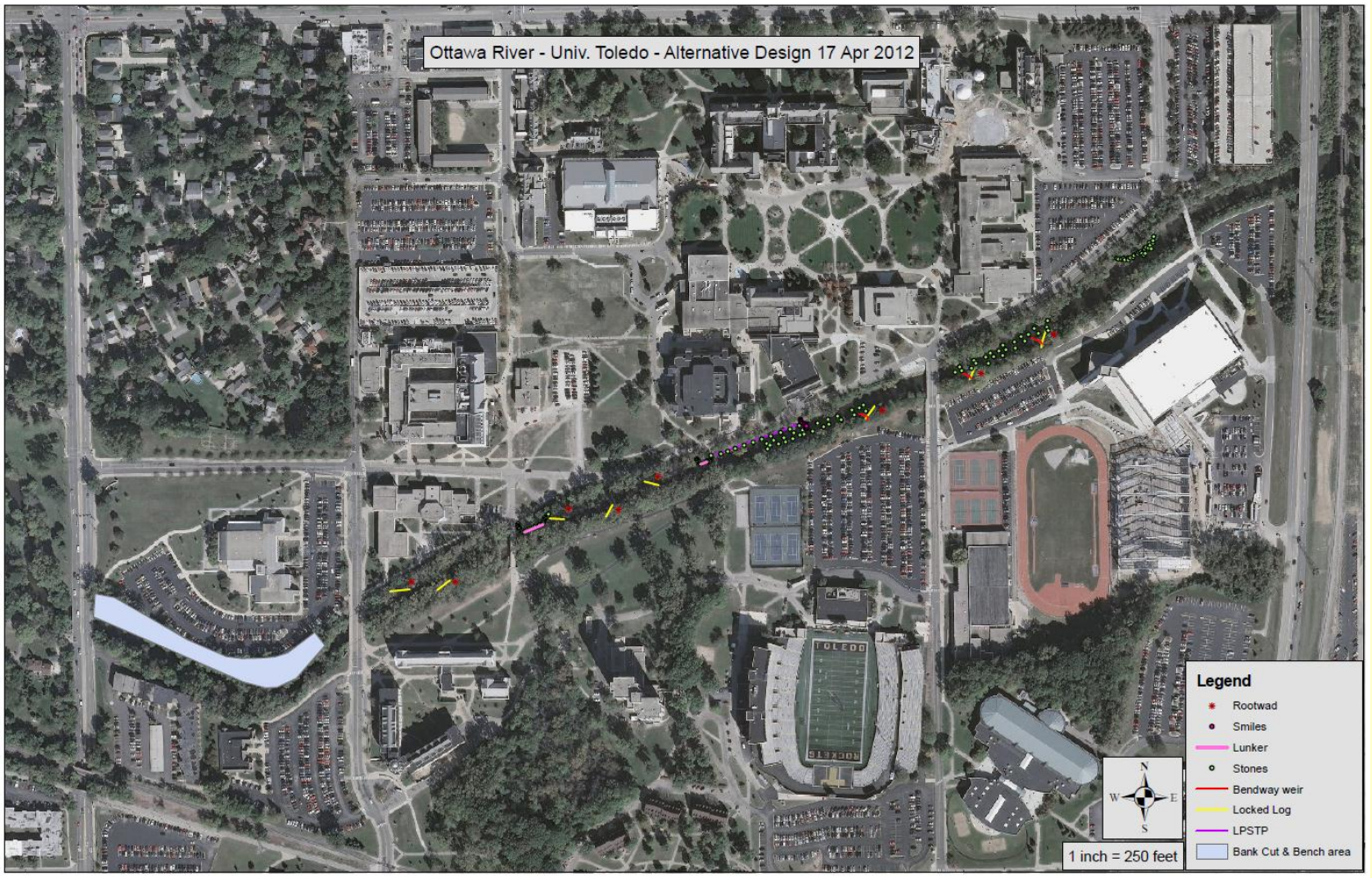


Reach	Existing	Original Concept	W.S.E. rise
	(ft NAVD88)	(ft NAVD88)	(ft)
1	594.88	595.12	0.24
	594.48	594.71	0.23
2	594.18	594.31	0.13
	594.11	594.24	0.13
3	593.76	593.87	0.11
	593.46	593.55	0.09
4	593.21	593.28	0.07
	593.16	593.22	0.06
5	593.08	593.14	0.06
	592.69	592.68	-0.01

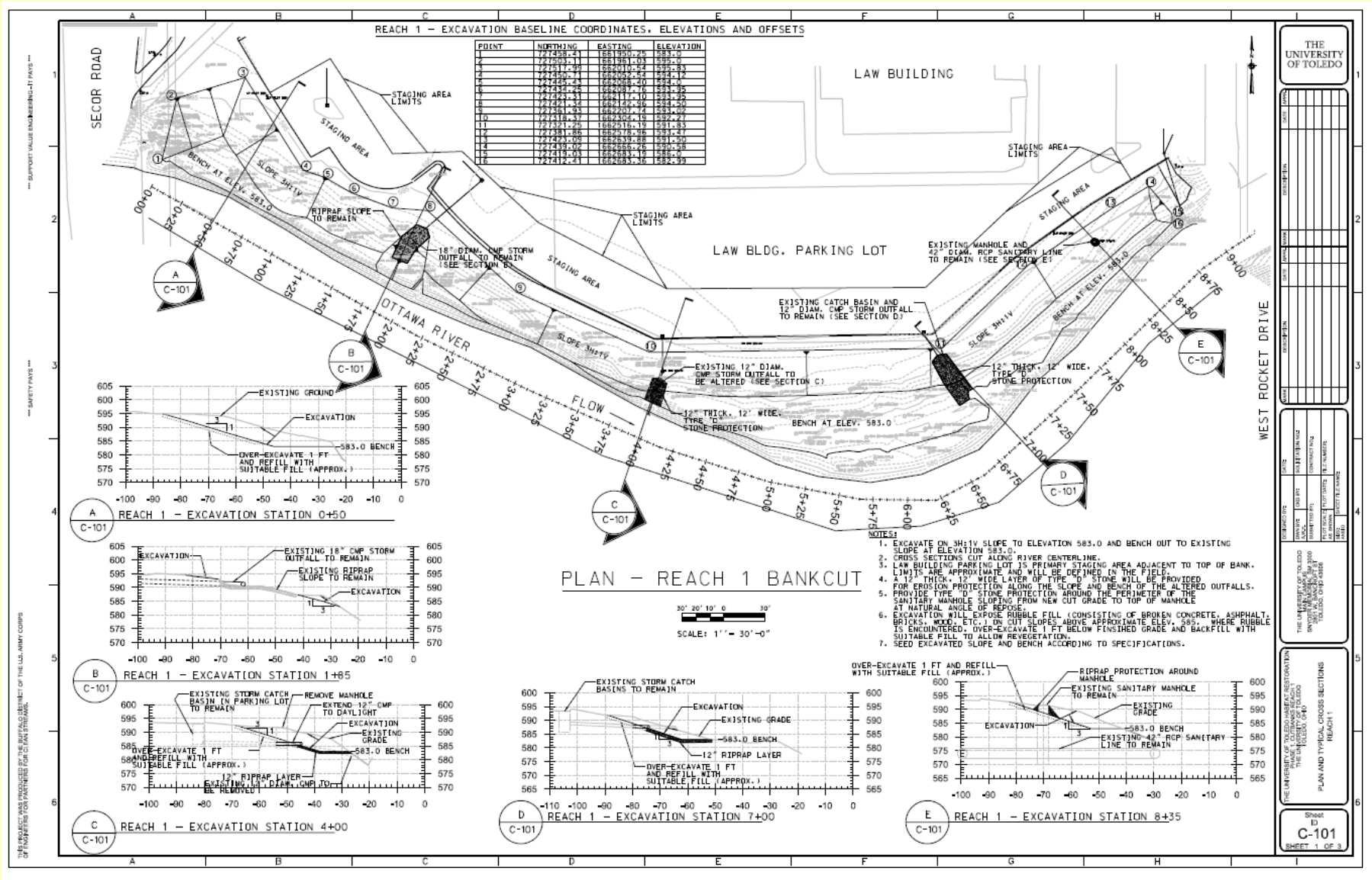
Results of initial HEC-RAS with proposed in-stream structures in place indicates rise in 100 year flood levels, not permissible by FEMA regulations

Another approach is proposed by ACOE Buffalo to create a series of cut bank features (see concept below) in Reaches 1-3 to provide for additional excess flood capacity storage in addition to reduction in the number, type and size of in-stream structures especially in reaches 1-3.

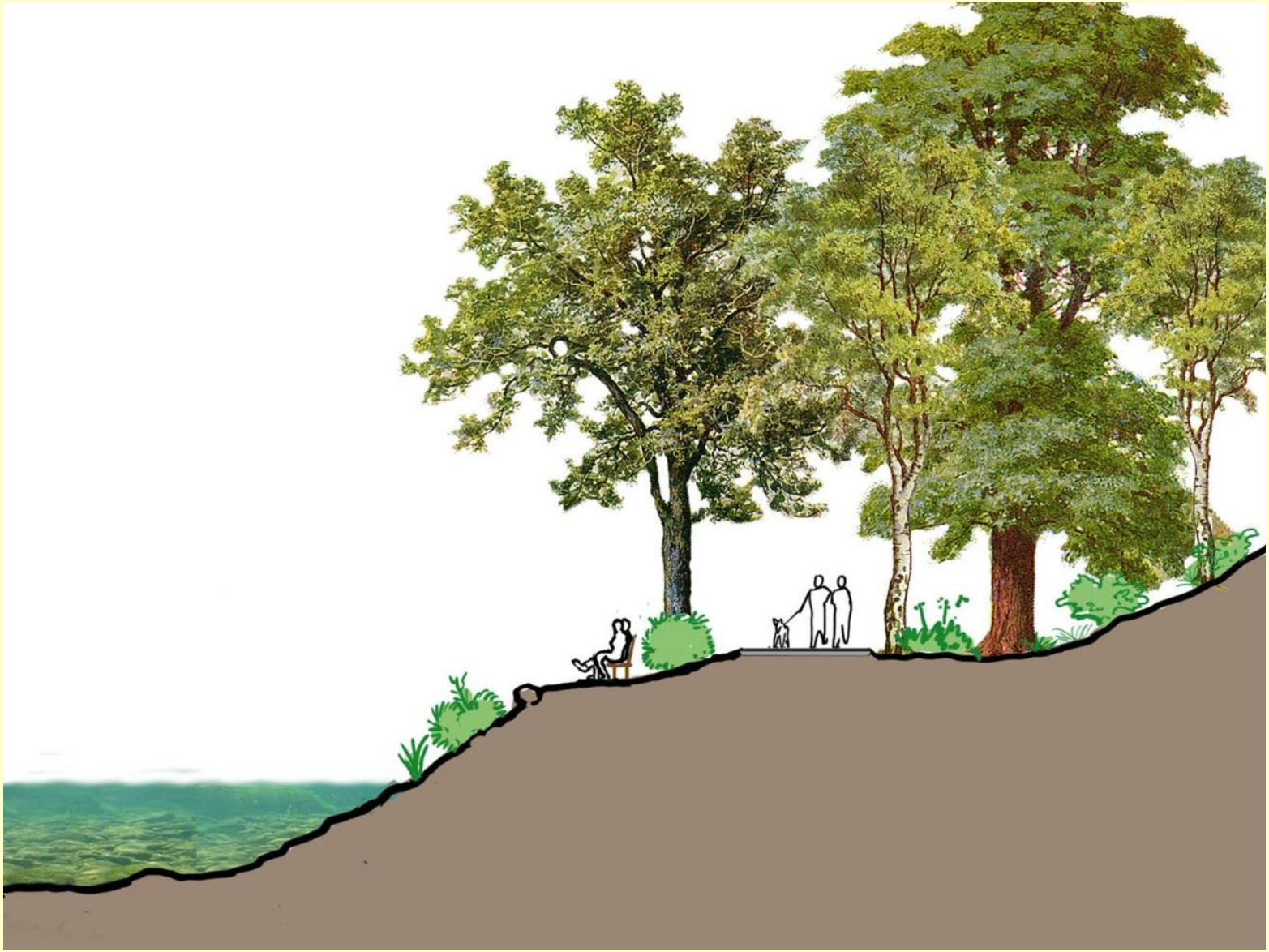




- In April 2012 ACOE Buffalo completes final analysis and proposes a 900 foot cut bank in Reach 1 along with alternative plan for fewer in-stream restoration structures in reaches 2-5.
- USFWS provides an additional $47,000 in funding support, bringing their total support to $161,132
- Draft design plans for Phase II: In-Stream Restoration features, developed and reviewed in early 2013, scheduled construction on in-stream features in August 2013



Final design for Phase I of the UT Ottawa River Restoration Project: construction of a cut bank in reach 1, north bank adjacent to the UT Law School (June 2012)

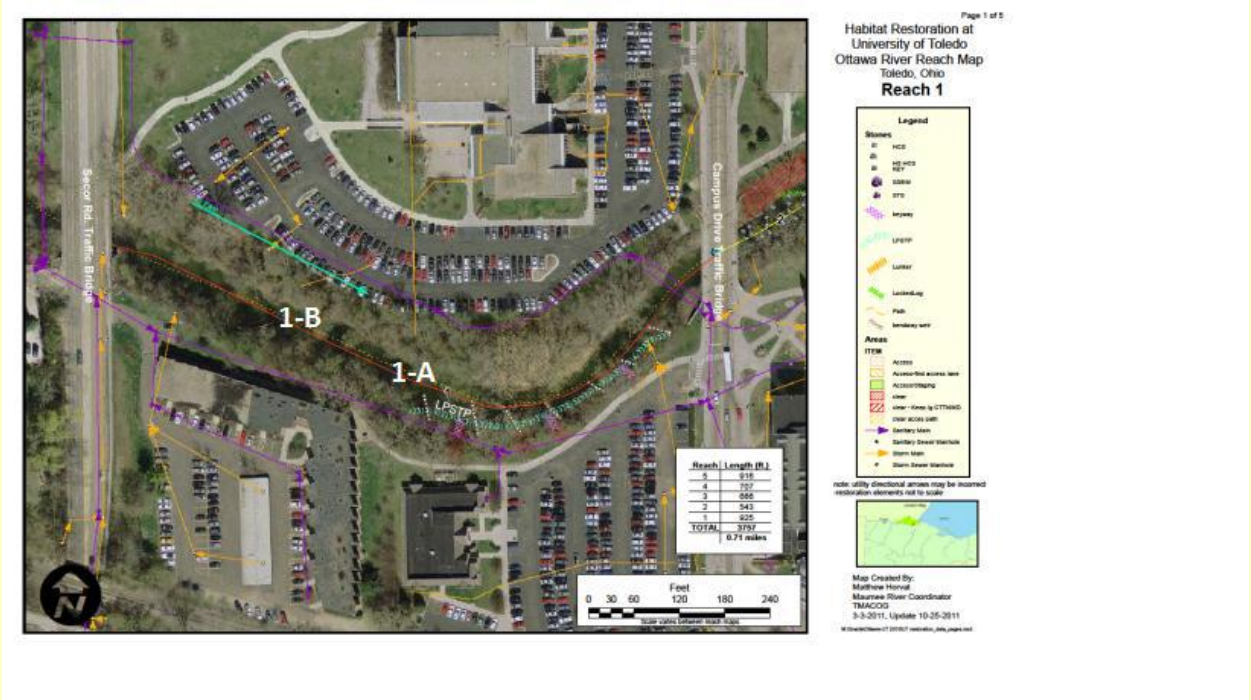


Artistic rendering of the cut bank feature

Site of Cutbank feature (April 2012)

In advance of the proposed tree removal, necessary as the first step in construction of the cut bank in Reach 1, USFWS required a survey for Indiana Bat (federally endangered species) at the site.

Field survey and collection was completed on two nights at the site (June 7-8, 2012) revealing no presence of the species

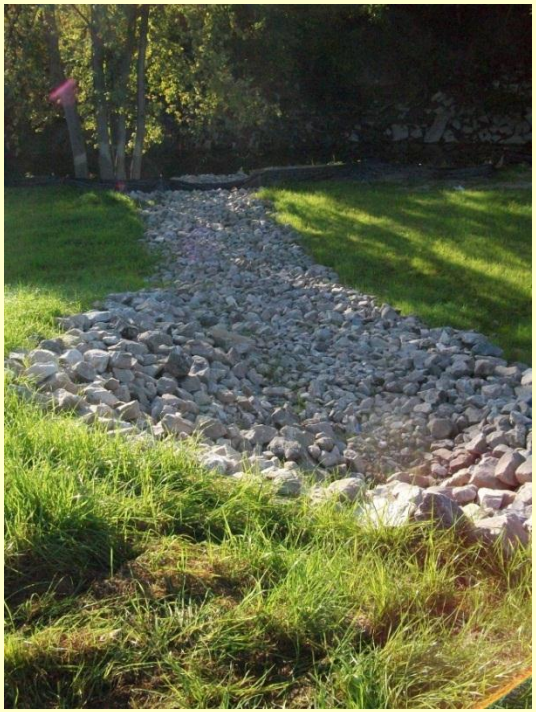


Removal of 130+ trees completed at the cut bank site (Reach 1) June 2012

Stages of the Construction of the Cutbank (June to August 2012) photos below




Approximately 4,700 cubic yards of concrete fill (placed in late 1950s) was removed, screened on site with all concrete, woody debris recycled; clean sediment re-used on site as topsoil



An additional benefit to the project were improvements to two existing storm water outfalls

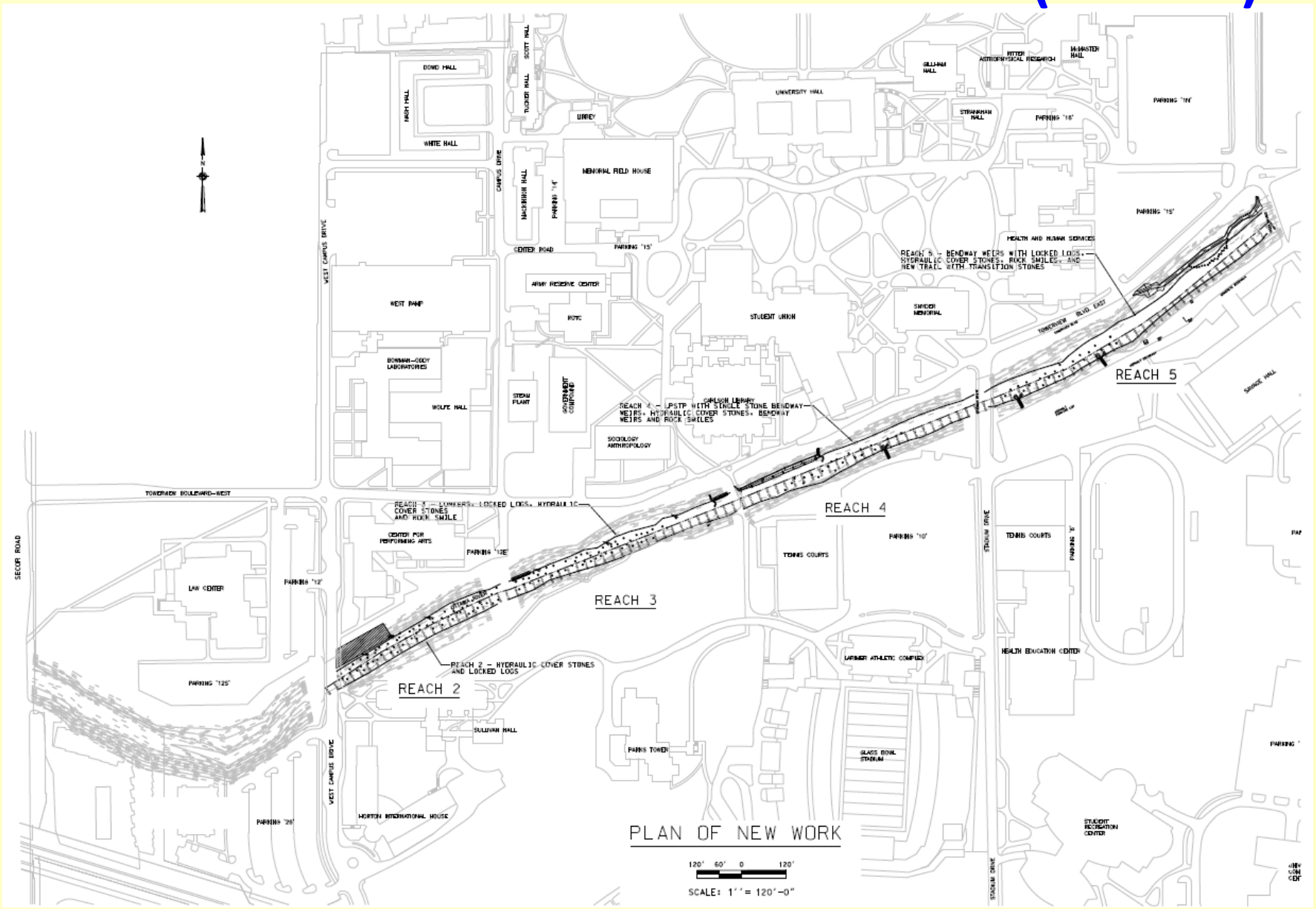
On October 1st, 2012 volunteers planted 317 new native trees and shrubs.

Species included Indigo Bush, Chokeberry, Hornbeam, Hackberry, Buttonbush, Redbud, Dogwood, Winterberry, Spicebush, Tulip Poplar, Sycamore, Black Cherry, several Oak species, Sumac, Rose, Sassafras, and Viburnum.
Deer repellent was applied to prevent deer rub and browsing .

Reach 1 Cutbank, Spring 2013

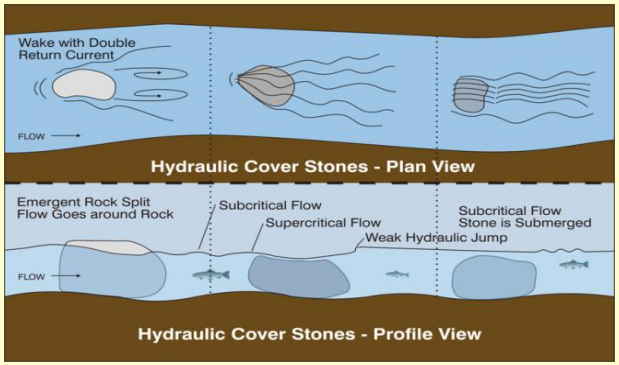
Fall 2012

Phase II: In-stream Restoration Plans (revised)

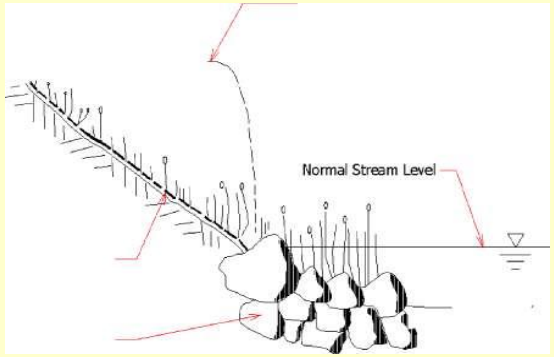


In-stream habitat restoration structures

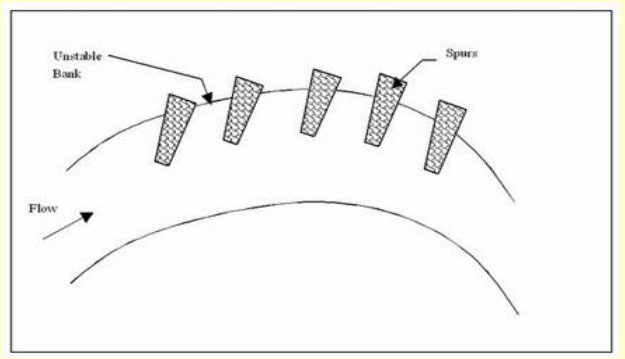
Hydraulic Cover Stones



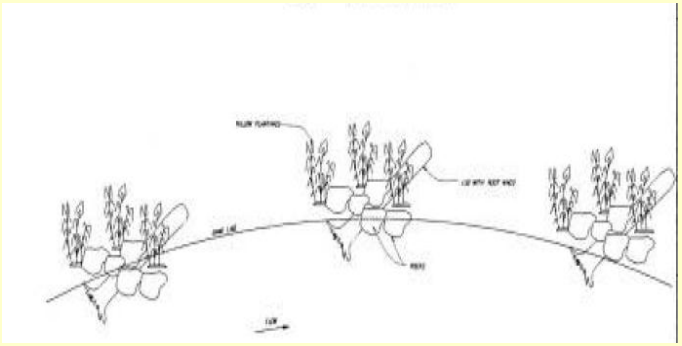
Longitudinal Peaked Stone Toe Protection (LPSTP)



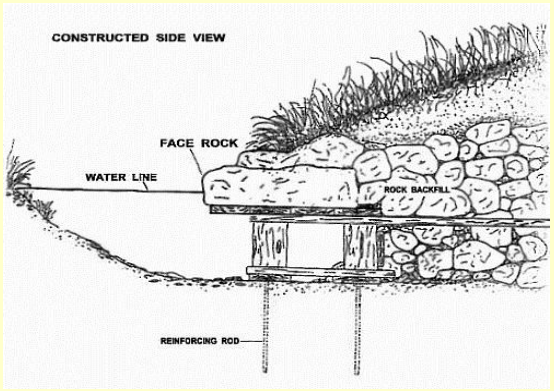
Bendway Weirs



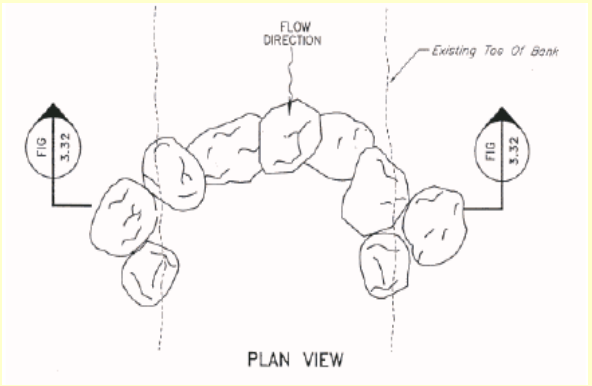
LUNKERS

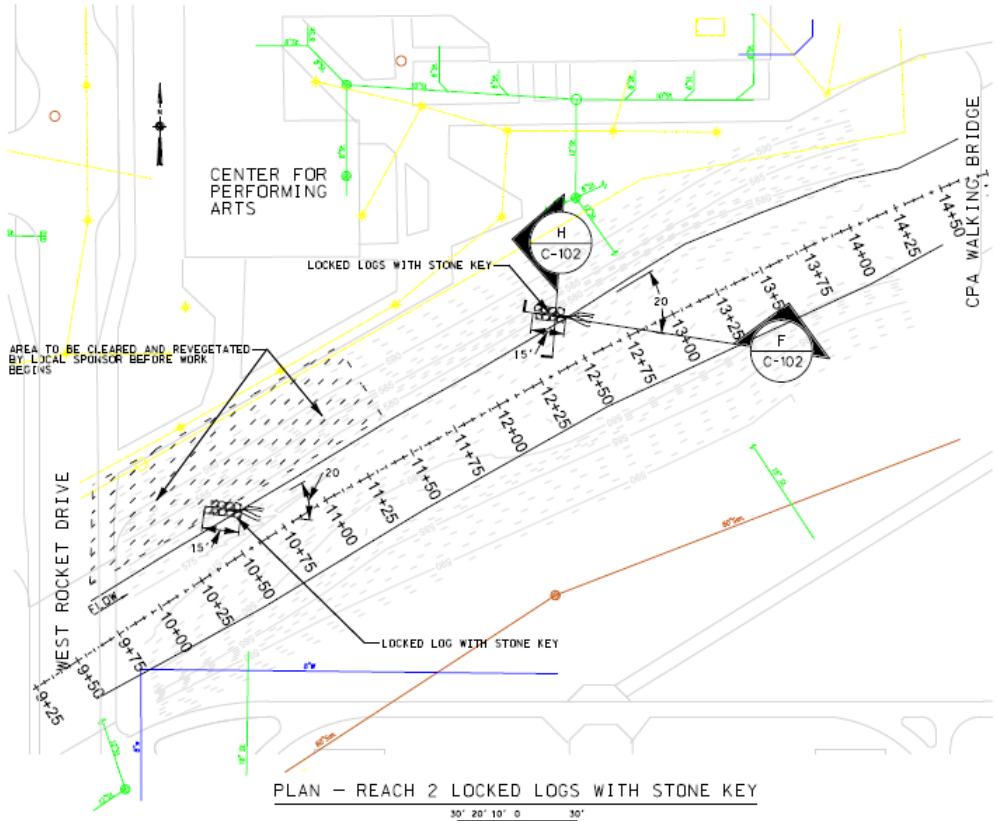


Locked Logs



Smiles and Frowns

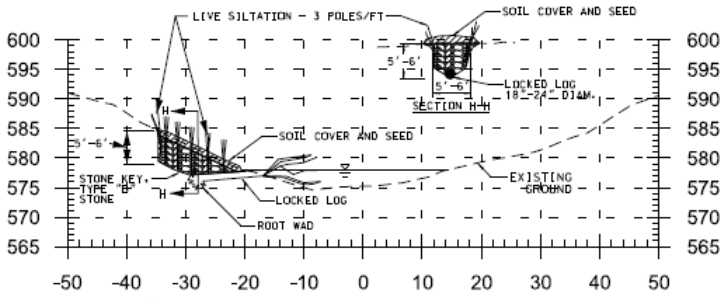




PLAN – REACH 2 LOCKED LOGS WITH STONE KEY

30' 20' 10' 0 30'

SCALE: 1'' = 30'–0"



F & H C-102 REACH 2 – TYPICAL LOCKED LOG WITH STONE KEY

NOTES:

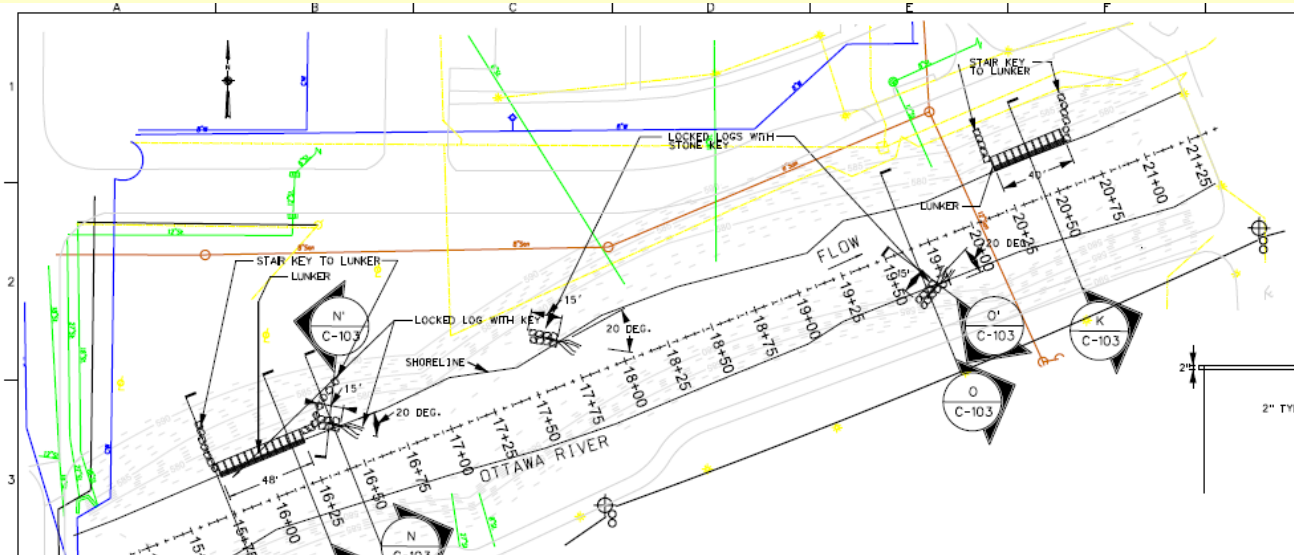
1. LOCKED LOGS TO BE SUPPLIED BY LOCAL SPONSOR.
2. ALL STREAMBANK PROTECTION IS APPROXIMATE AND THE LOCATION AND ORIENTATION MAY CHANGE UNDER DIRECTION OF UNIVERSITY OF TOLEDO CONSTRUCTION REPRESENTATIVE.
3. MAIN TRUNK OF LOCKED LOGS TO BE PLACED JUST BELOW BASE FLOW ELEVATION WHICH IS ELEV. 578.0 (NAVD88) IN REACH 2.
4. STONE KEYS FOR LOCKED LOGS SHOULD BE APPROXIMATELY 15' LONG AND APPROXIMATELY 5'-6" WIDE AND DEEP AND COVERED WITH APPROXIMATELY 12" OF SOIL AND THEN SEEDED. APPROXIMATELY HALF THE LENGTH OF LOG SHOULD BE BURIED IN THE STONE KEY.
5. THE RIVERBANKS HAVE EXISTING VEGETATION THAT SHOULD BE MINIMALLY IMPACTED DURING CONSTRUCTION. COORDINATE WITH UNIVERSITY OF TOLEDO CONSTRUCTION REPRESENTATIVE BEFORE ANY CLEARING.
6. ALL KEY LENGTHS ARE APPROXIMATE AND MAY LENGTHEN OR SHORTEN DEPENDING ON CONDITIONS IN THE FIELD.

THE UNIVERSITY OF TOLEDO

THE UNIVERSITY OF TOLEDO HABITAT RESTORATION
THE UNIVERSITY OF TOLEDO
TOLEDO, OHIO

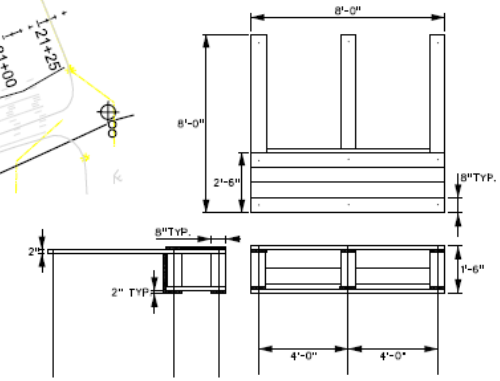
PLAN AND TYPICAL SECTIONS REACH 2

Sheet ID C-102
SHEET 5 OF 8

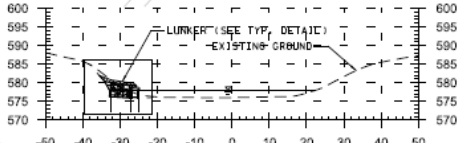


PLAN – REACH 3 LUNKERS AND LOCKED LOGS

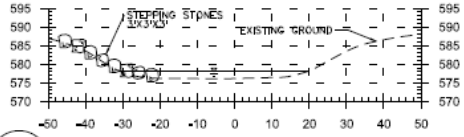
SCALE: 1'' = 30'-0"



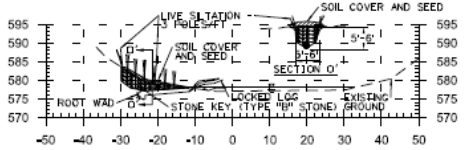
LUNKER DETAIL



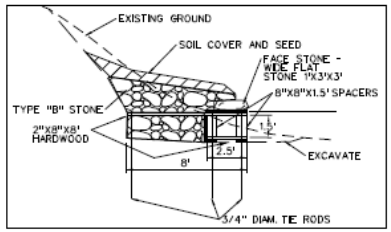
I & K C-103 REACH 3 – LUNKER



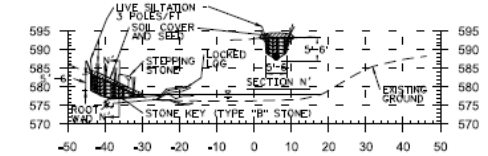
M C-103 REACH 3 – STAIR KEY TO LUNKER



O & O' C-103 REACH 3 – LOCKED LOG WITH STONE KEY



LUNKER DETAIL I& K INSET



N & N' C-103 REACH 3 – STAIR KEY TO LUNKER AND LOCKED LOG WITH STONE KEY

NOTES:

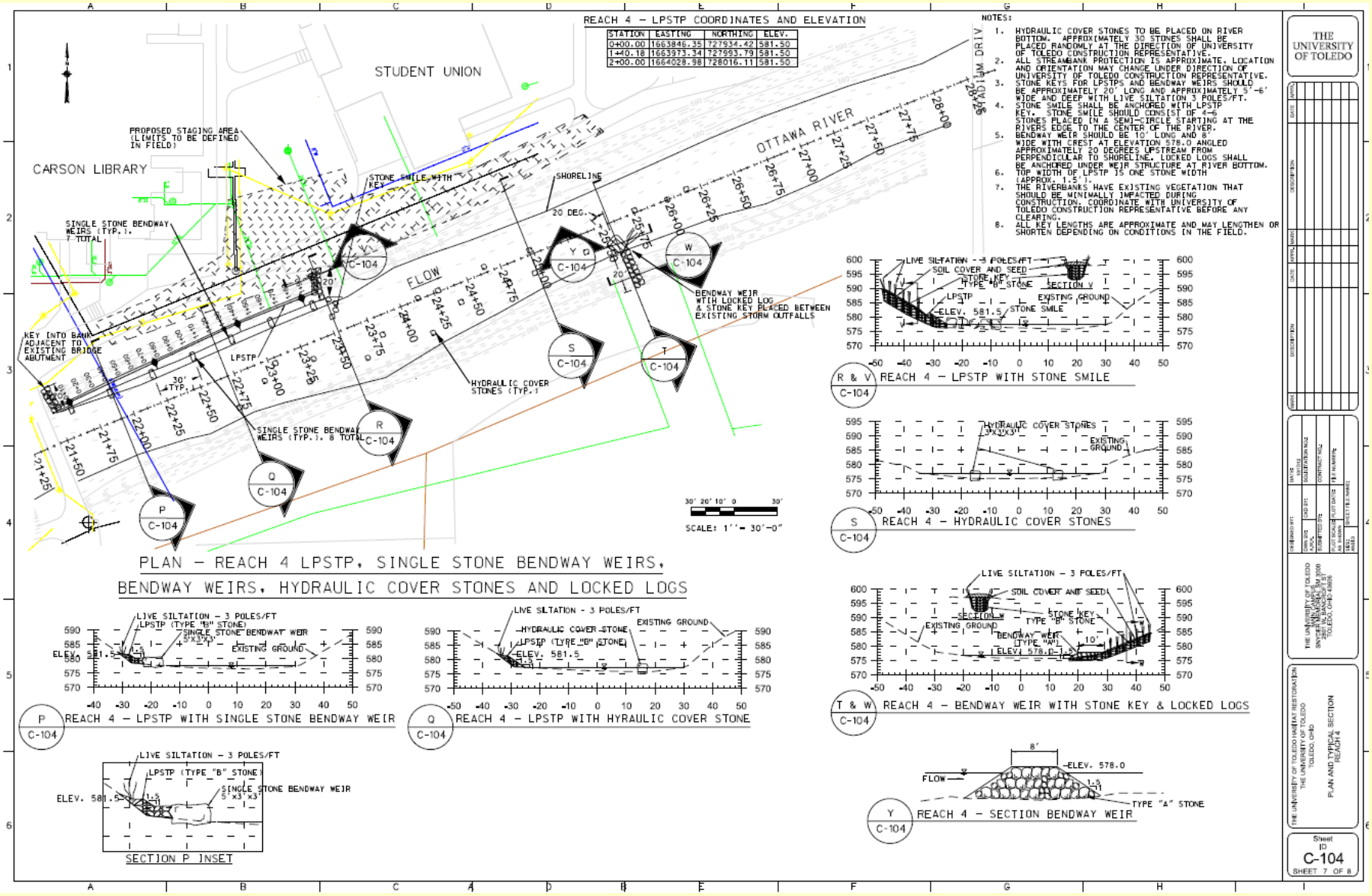
1. ALL STREAMBANK PROTECTION IS APPROXIMATE AND THE LOCATION AND ORIENTATION OF FEATURES MAY CHANGE UNDER DIRECTION OF UNIVERSITY OF TOLEDO CONSTRUCTION REPRESENTATIVE.
2. STONE KEYS FOR LOCKED LOGS SHOULD BE 15' LONG AND APPROXIMATELY 5'-6' WIDE AND DEEP AND COVERED WITH APPROXIMATELY 12" OF SOIL AND THEN SEEDED. APPROXIMATELY HALF THE LENGTH OF LOG SHOULD BE BURIED IN THE STONE KEY.
3. LUNKERS SHALL BE MADE OUT OF HARDWOOD/ROUGH CUT TIMBER.
4. STEPPING STONES AT LUNKER STRUCTURES TO BE PLACED AT GRADE ALONG THE SLOPE TO ALLOW ACCESS FROM TOP OF BANK TO RIVERS EDGE.
5. FRONT FACE OF LUNKER IS APPROXIMATELY AT THE EXISTING RIVERBANK TOE.
6. THE RIVERBANKS HAVE EXISTING VEGETATION THAT SHOULD BE MINIMALLY IMPACTED DURING CONSTRUCTION. COORDINATE WITH UNIVERSITY OF TOLEDO CONSTRUCTION REPRESENTATIVE BEFORE ANY CLEARING.
7. ALL KEY LENGTHS ARE APPROXIMATE AND MAY LENGTHEN OR SHORTEN DEPENDING ON CONDITIONS IN THE FIELD.

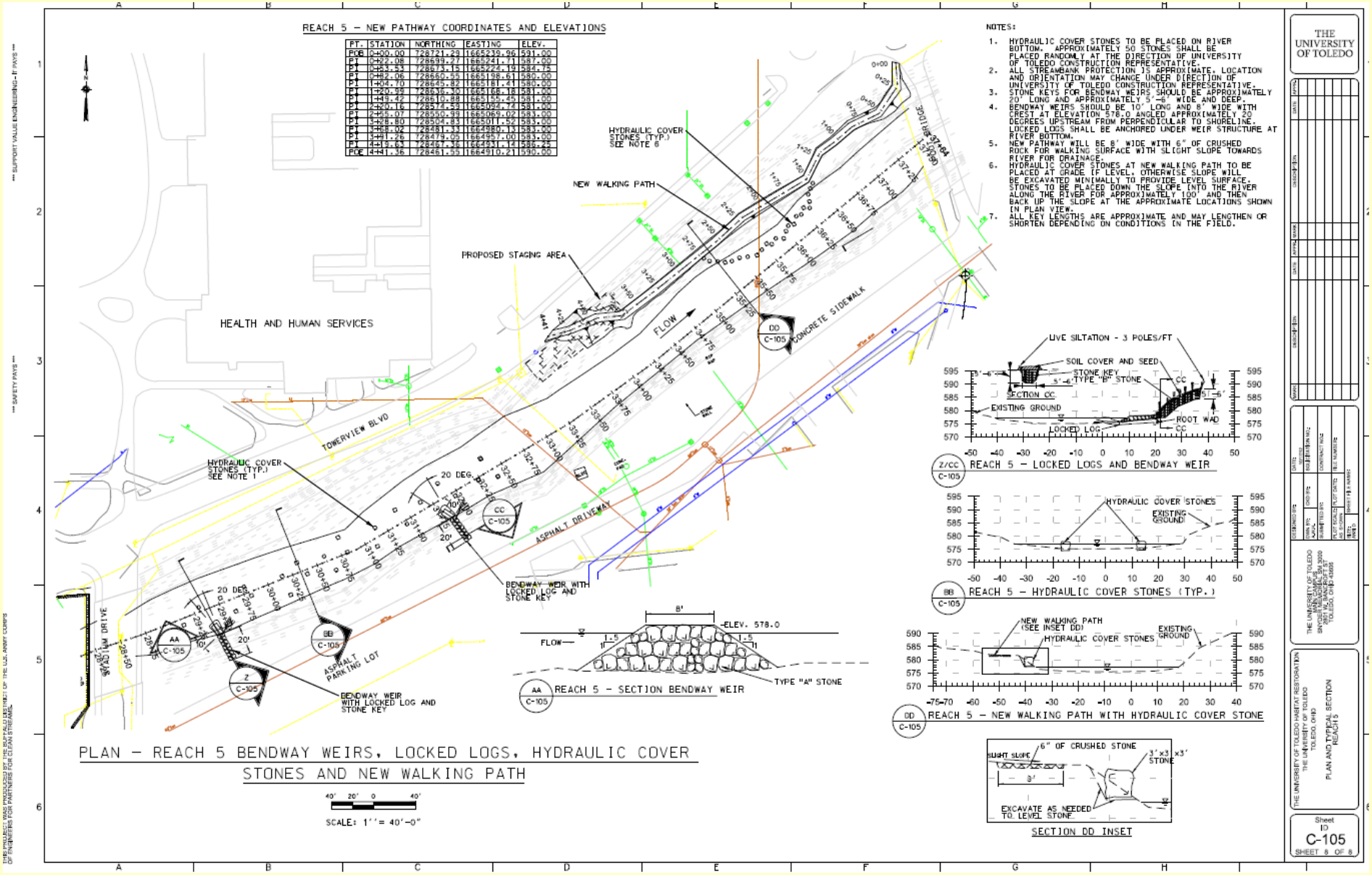
THE UNIVERSITY OF TOLEDO

THE UNIVERSITY OF TOLEDO HABITAT RESTORATION
THE UNIVERSITY OF TOLEDO
TOLEDO, OHIO

PLAN AND TYPICAL SECTIONS REACH 3

Sheet ID C-103
SHEET 6 OF 8


REACH 4 – LPSTP COORDINATES AND ELEVATION
STATION | EASTING | NORTHING | ELEV.
0+00.00 | 1663846.35 | 727934.42 | 581.50
1+40.18 | 1663973.34 | 727993.79 | 581.50
2+00.00 | 1664028.98 | 728016.11 | 581.50
NOTES:
1. HYDRAULIC COVER STONES TO BE PLACED ON RIVER BOTTOM. APPROXIMATELY 30 STONES SHALL BE PLACED RANDOMLY AT THE DIRECTION OF UNIVERSITY OF TOLEDO CONSTRUCTION REPRESENTATIVE.
2. ALL STREAMBANK PROTECTION IS APPROXIMATE. LOCATION AND ORIENTATION MAY CHANGE UNDER DIRECTION OF UNIVERSITY OF TOLEDO CONSTRUCTION REPRESENTATIVE.
3. STONE KEYS FOR LPSTPS AND BENDWAY WEIRS SHOULD BE APPROXIMATELY 20' LONG AND APPROXIMATELY 5'-6' WIDE AND DEEP WITH LIVE SILTATION 3 POLES/FT.
4. STONE SMILE SHALL BE ANCHORED WITH LPSTP KEY. STONE SMILE SHOULD CONSIST OF 4-6 STONES PLACED IN A SEMI-CIRCLE STARTING AT THE RIVERS EDGE TO THE CENTER OF THE RIVER.
5. BENDWAY WEIR SHOULD BE 10' LONG AND 8' WIDE WITH CREST AT ELEVATION 578.0 ANGLED APPROXIMATELY 20 DEGREES UPSTREAM FROM PERPENDICULAR TO SHORELINE. LOCKED LOGS SHALL BE ANCHORED UNDER WEIR STRUCTURE AT RIVER BOTTOM.
6. TOP WIDTH OF LPSTP IS ONE STONE WIDTH (APPROX. 1.5').
7. THE RIVERBANKS HAVE EXISTING VEGETATION THAT SHOULD BE MINIMALLY IMPACTED DURING CONSTRUCTION. COORDINATE WITH UNIVERSITY OF TOLEDO CONSTRUCTION REPRESENTATIVE BEFORE ANY CLEARING.
8. ALL KEY LENGTHS ARE APPROXIMATE AND MAY LENGTHEN OR SHORTEN DEPENDING ON CONDITIONS IN THE FIELD.
STUDENT UNION
CARSON LIBRARY
PROPOSED STAGING AREA (LIMITS TO BE DEFINED IN FIELD)
SINGLE STONE BENDWAY WEIRS (TYP.), 7 TOTAL
STONE SMILE WITH KEY
SHORELINE
20 DEG.
OTTAWA RIVER
FLOW
BENDWAY WEIR WITH LOCKED LOG & STONE KEY PLACED BETWEEN EXISTING STORM OUTFALLS
KEY INTO BANK ADJACENT TO EXISTING BRIDGE ABUTMENT
LPSTP
HYDRAULIC COVER STONES (TYP.)
SINGLE STONE BENDWAY WEIRS (TYP.), 8 TOTAL
30' TYP.
P C-104
Q C-104
R C-104
S C-104
T C-104
W C-104
Y C-104
SCALE: 1" = 30'-0"
PLAN – REACH 4 LPSTP, SINGLE STONE BENDWAY WEIRS, BENDWAY WEIRS, HYDRAULIC COVER STONES AND LOCKED LOGS
LIVE SILTATION – 3 POLES/FT
LPSTP (TYPE "B" STONE)
SINGLE STONE BENDWAY WEIR
5'x3'x3'
EXISTING GROUND
ELEV. 581.5
P C-104 REACH 4 – LPSTP WITH SINGLE STONE BENDWAY WEIR
HYDRAULIC COVER STONE
Q C-104 REACH 4 – LPSTP WITH HYRAULIC COVER STONE
SECTION P INSET
SOIL COVER AND SEED
KEY STONE
TYPE "B" STONE
SECTION V
STONE SMILE
R & V C-104 REACH 4 – LPSTP WITH STONE SMILE
HYDRAULIC COVER STONES 3'x3'x3'
S C-104 REACH 4 – HYDRAULIC COVER STONES
SECTION W
BENDWAY WEIR (TYPE "W")
ELEV. 578.0
T & W C-104 REACH 4 – BENDWAY WEIR WITH STONE KEY & LOCKED LOGS
8'
TYPE "A" STONE
Y C-104 REACH 4 – SECTION BENDWAY WEIR
THE UNIVERSITY OF TOLEDO
PLAN AND TYPICAL SECTION REACH 4
Sheet ID C-104
SHEET 7 OF 8


REACH 5 – NEW PATHWAY COORDINATES AND ELEVATIONS
PT. STATION NORTHING EASTING ELEV.
PCB 0+00.00 728721.23 1665239.96 581.00
PT 0+22.08 728699.21 1665241.11 580.00
PT 0+83.53 728613.15 1665224.19 584.75
PT 0+82.06 728660.55 1665198.61 580.00
PT 1+04.70 728645.82 1665181.41 580.00
PT 1+20.59 728636.30 1665168.18 581.00
PT 1+49.42 728610.88 1665155.45 581.00
PT 2+20.16 728574.53 1665094.74 581.00
PT 2+55.07 728550.95 1665069.02 583.00
PT 3+25.80 728504.81 1665011.52 583.00
PT 3+68.02 728481.33 1664980.13 583.00
PT 3+91.26 728479.05 1664957.00 583.00
PT 4+19.63 728467.36 1664931.14 586.23
PCE 4+41.36 728481.55 1664910.21 590.00
NOTES:
1. HYDRAULIC COVER STONES TO BE PLACED ON RIVER BOTTOM. APPROXIMATELY 50 STONES SHALL BE PLACED RANDOMLY AT THE DIRECTION OF UNIVERSITY OF TOLEDO CONSTRUCTION REPRESENTATIVE.
2. ALL STREAMBANK PROTECTION IS APPROXIMATE. LOCATION AND ORIENTATION MAY CHANGE UNDER DIRECTION OF UNIVERSITY OF TOLEDO CONSTRUCTION REPRESENTATIVE.
3. STONE KEYS FOR BENDWAY WEIRS SHOULD BE APPROXIMATELY 20' LONG AND APPROXIMATELY 5'-6" WIDE AND DEEP.
4. BENDWAY WEIRS SHOULD BE 10' LONG AND 8' WIDE WITH CREST AT ELEVATION 578.0 ANGLED APPROXIMATELY 20 DEGREES UPSTREAM FROM PERPENDICULAR TO SHORELINE. LOCKED LOGS SHALL BE ANCHORED UNDER WEIR STRUCTURE AT RIVER BOTTOM.
5. NEW PATHWAY WILL BE 8' WIDE WITH 6" OF CRUSHED ROCK FOR WALKING SURFACE WITH SLIGHT SLOPE TOWARDS RIVER FOR DRAINAGE.
6. HYDRAULIC COVER STONES AT NEW WALKING PATH TO BE PLACED AT GRADE IF LEVEL. OTHERWISE SLOPE WILL BE EXCAVATED MINIMALLY TO PROVIDE LEVEL SURFACE. STONES TO BE PLACED DOWN THE SLOPE INTO THE RIVER ALONG THE RIVER FOR APPROXIMATELY 100' AND THEN BACK UP THE SLOPE AT THE APPROXIMATE LOCATIONS SHOWN IN PLAN VIEW.
7. ALL KEY LENGTHS ARE APPROXIMATE AND MAY LENGTHEN OR SHORTEN DEPENDING ON CONDITIONS IN THE FIELD.
HYDRAULIC COVER STONES (TYP.) SEE NOTE 6
NEW WALKING PATH
PROPOSED STAGING AREA
HEALTH AND HUMAN SERVICES
FLOW
CONCRETE SIDEWALK
TOWERVIEW BLVD
HYDRAULIC COVER STONES (TYP.) SEE NOTE 1
20 DEG.
ASPHALT DRIVEWAY
BENDWAY WEIR WITH LOCKED LOG AND STONE KEY
ASPHALT PARKING LOT
BENDWAY WEIR WITH LOCKED LOG AND STONE KEY
8'
ELEV. 578.0
FLOW
TYPE "A" STONE
AA C-105 REACH 5 – SECTION BENDWAY WEIR
LIVE SILTATION - 3 POLES/FT
SOIL COVER AND SEED
STONE KEY
TYPE "B" STONE
SECTION CC
EXISTING GROUND
ROOT WAD
LOCKED LOG
Z/CC C-105 REACH 5 – LOCKED LOGS AND BENDWAY WEIR
HYDRAULIC COVER STONES
EXISTING GROUND
BB C-105 REACH 5 – HYDRAULIC COVER STONES (TYP.)
NEW WALKING PATH (SEE INSET DD)
HYDRAULIC COVER STONES
EXISTING GROUND
DD C-105 REACH 5 – NEW WALKING PATH WITH HYDRAULIC COVER STONE
SLIGHT SLOPE
6" OF CRUSHED STONE
3'x3'x3' STONE
EXCAVATE AS NEEDED TO LEVEL STONE
SECTION DD INSET
PLAN – REACH 5 BENDWAY WEIRS, LOCKED LOGS, HYDRAULIC COVER STONES AND NEW WALKING PATH
40' 20' 0 40'
SCALE: 1''= 40'-0"
THE UNIVERSITY OF TOLEDO
THE UNIVERSITY OF TOLEDO HABITAT RESTORATION
THE UNIVERSITY OF TOLEDO
TOLEDO, OHIO
PLAN AND TYPICAL SECTION REACH 5
Sheet ID C-105
SHEET 8 OF 8

Public Meeting

University of Toledo
Ottawa River Restoration Project
Phase II: In-Stream Restoration

Tuesday October 30th

4:00 – 6:00 pm

Snyder Memorial 3066

Drinks and light refreshments provided

Parking available in Lot 10

For more information please contact:

Dr. Patrick Lawrence

Chair, UT Presidents Commission on the River

(patrick.lawrence@utoledo.edu)

Project Timeline 2013

Early 2013: Submission of Applications for federal and state permits
(secured May 2013; OEPA NPDES storm water permit + USACOE Nationwide permit)

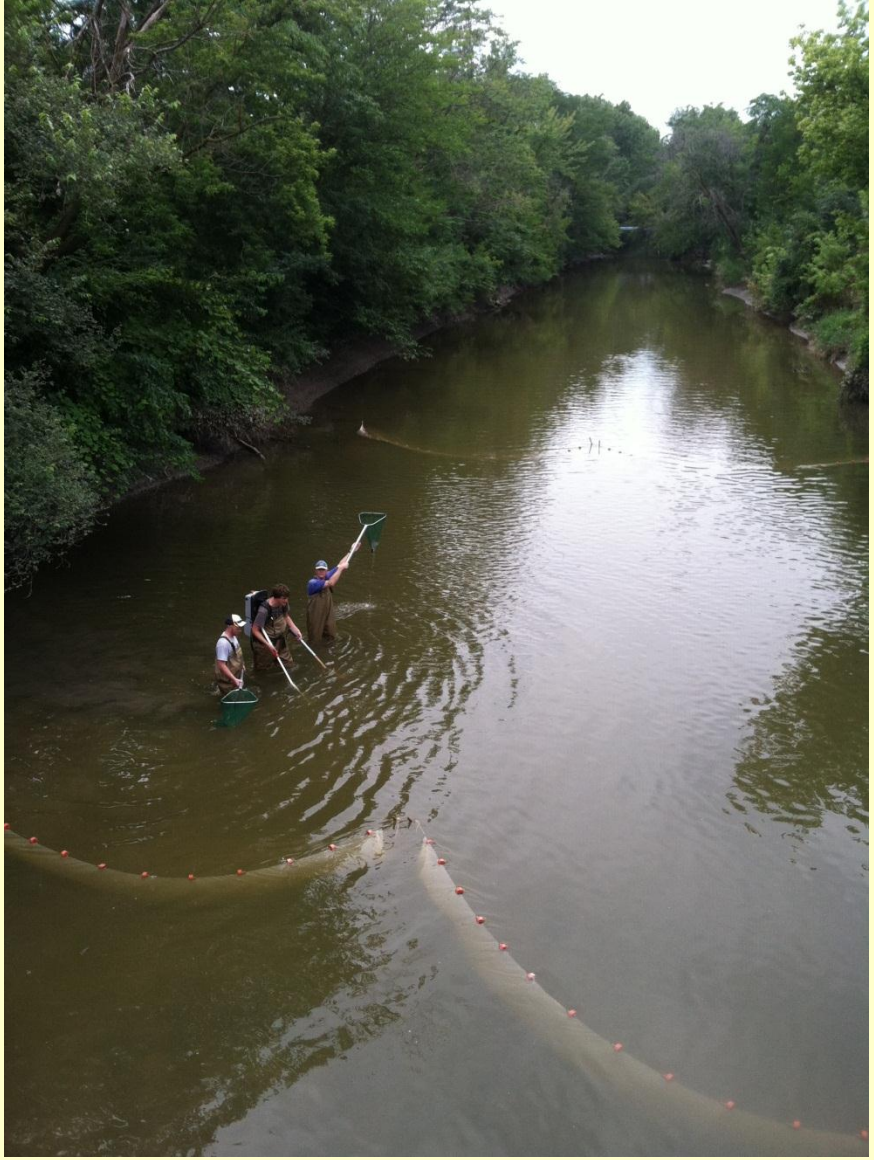
Spring 2013: UT issues call for construction bids
(completed May/June 2013; RFP sent to 8 pre-qualified bidders, contractor selected

Spring/early Summer 2013: Site preparation/monitoring
(July 2013: signage, materials, media, pre construction in-stream assessment, bank clearing of invasives and access/staging areas)

August 2013: Construction of In-stream restoration features construction
(completed July 29-August 14, 2013)

Fall 2013: Additional bank and in-stream native plantings
(completed September/October)

2014: Post project monitoring + install permanent information signage



Additional grant from USFWS and Lake Erie Commission (both to Dr. H. Gottgens, UT DES) funds pre and post construction monitoring of fish populations and habitat conditions

Pre-construction visit by contractor (May 2013)

Harvesting of hardwood trees to use for locked logs; donated by local landowner

Pre-fabrication of LUNKERS by local saw mill

Install of information signs on site pre-construction (July 2013)

UNDER CONSTRUCTION

River Habitat Restoration in Progress

THE UNIVERSITY OF TOLEDO 1872

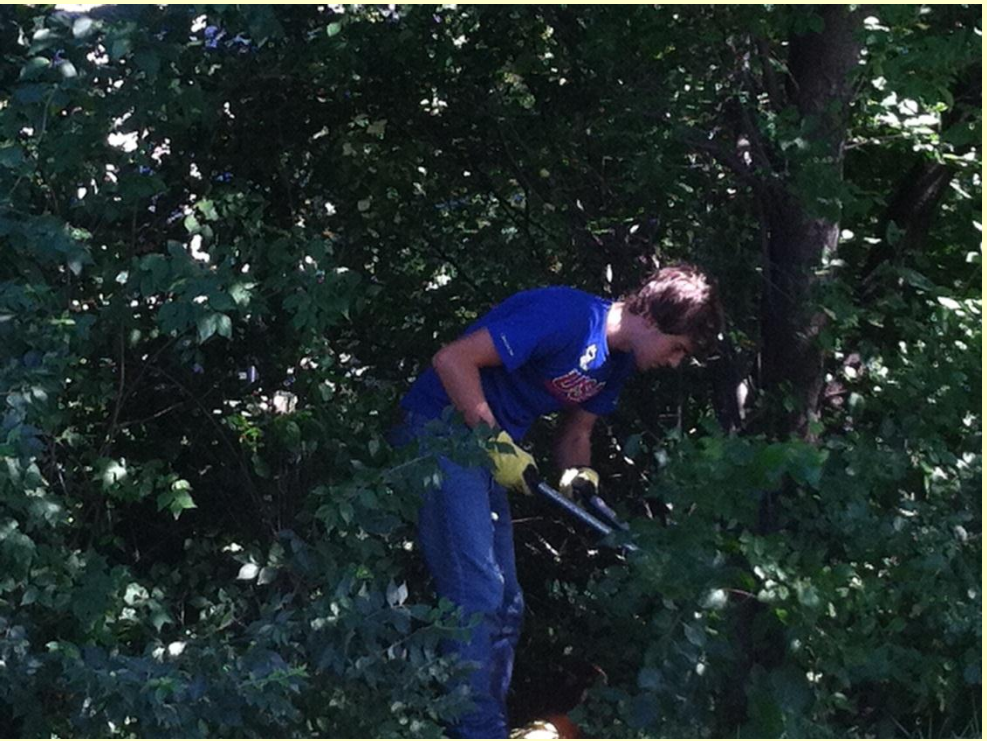
Work is currently underway along the 3,700 feet of the Ottawa River on the main campus of UT with the installation of several in-stream structures to improve aquatic habitat.

These various features use stone, wood and native plantings to provide enhanced sites for the feeding, spawning, and shelter for fish and many other natural organisms found within the river. In addition, along the river banks non-native exotic plants will be removed and replaced with native species

For more information on this project refer to:
www.utoledo.edu/commissions/river
or contact:
Dr Patrick Lawrence
UT Presidents Commission on the River
patrick.lawrence@utoledo.edu

NOAA GLRI grant to Partners for Cleans Streams Inc. for establishment of Maumee Corp – Eight student workers were hired by PCS to assist with local restoration projects, including removal of invasive species at UT project site (June-July 2013)

Buckthorn, Honeysuckle, Tree of Heaven removal



Pre-construction media attention

Final phase of Ottawa River restoration to begin July 29

By Meghan Cunningham

The restoration of the portion of the Ottawa River flowing through The University of Toledo Main Campus soon will be complete with the final phase of in-stream work to begin this month.

Student workers of the Maumee Conservation Corps from Partners for Clean Streams already have begun some clearing of the riverbanks to prepare for the major in-stream construction work that is scheduled to begin Monday, July 29. The clearing will remove non-native invasive plants along the riverbank with no extensive removal of trees planned, and replanting of native species will take place later this summer.

"This phase will focus on aquatic improvements, including adding large rocks and logs to mimic natural water flow and get a ripple effect in the water," said Dr. Patrick Lawrence, professor and chair of the Department of Geography and Planning, and chair of the President's Commission on the River. "Right now the river is essentially uniform with very limited ripples or turbulence. Adding these natural materials will make for more diversity to the aquatic habitat giving fish and other aquatic organisms more places for nesting, spawning, food and shelter."

The President's Commission on the River in 2009 started the habitat restoration efforts for the 3,700 feet of the waterway that runs through Main Campus. This current work is funded with a $235,000 grant from the Ohio Environmental Protection Agency and a $151,000 grant from the U.S. Fish and Wildlife Service and represents the largest project undertaken to date by the commission. The restoration project also involves the assistance of Toledo Metropolitan Area Council of Governments, EnviroScience, Partners for Clean Streams, Ohio EPA and the U.S. Army Corps of Engineers.

Ecological Restoration Inc. has been hired for the final in-stream restoration phase, which is scheduled to be complete Aug. 16. Signs will be placed along the river to inform the community of the work being done; however, no bridges or roads will be closed during the restoration, and disruptions to the University community will be kept to a minimum, Lawrence said. A workshop and public tour about the project are being planned for early August.

Summer is the best time to complete the project because there are fewer people on campus, the river water is at its lowest levels, and it is after the fish-spawning season during the spring, reducing impacts to the natural habitats, Lawrence said.

The in-stream work is the final phase of the project that has included adding more than 300 native plants and trees along the banks of the river and creating a cut bank area near the Law Center last summer that will allow for more water storage during higher river levels.

Photo by Dr. Patrick Lawrence

DOWN BY THE RIVER: Restoration work on the Ottawa River started last week as non-native plants were cleared from the river bank. Major in-stream construction work is scheduled to begin Monday, July 29.

Another related milestone for the Ottawa River on Main Campus was achieved in February 2012 when the fish consumption advisory, with the exception of carp, was lifted for the river by the Ohio Department of Health and the Toledo-Lucas County Health Department. The advisory had dated back to 1991 when it was issued by the Ohio Department of Health as a result of the decades of manufacturing activity and improper waste disposal of hazardous substances in the Ottawa River and its watershed.

"We have more than 40 fish species in the river, and we've noticed additional wildlife such as small mammals, birds, turtles, frogs, mallard ducks and Canada geese," Lawrence said. "We look forward to the completion of the restoration that will further enhance the river and add more wildlife diversity."

THE BLADE
One of America's Great Newspapers

UT summer interns fighting against nature's leafy invaders

BY KELLY McLENDON
BLADE STAFF WRITER

Removing invasive plants from the University of Toledo campus has its challenges.

Just ask the four seasonal interns who spent this week there, working to remove aggressive, meddlesome plants such as the invasive form of honeysuckle and buckthorn. Mike Griswold, a graduate student at the university, said the interns have also all encountered another common intrusive plant — poison ivy.

"We've all suffered a little bit," he said.

The work the interns will complete this summer is part of a grant that was secured by Partners for Clean Streams, a nonprofit organization that strives to improve water quality in northwest Ohio.

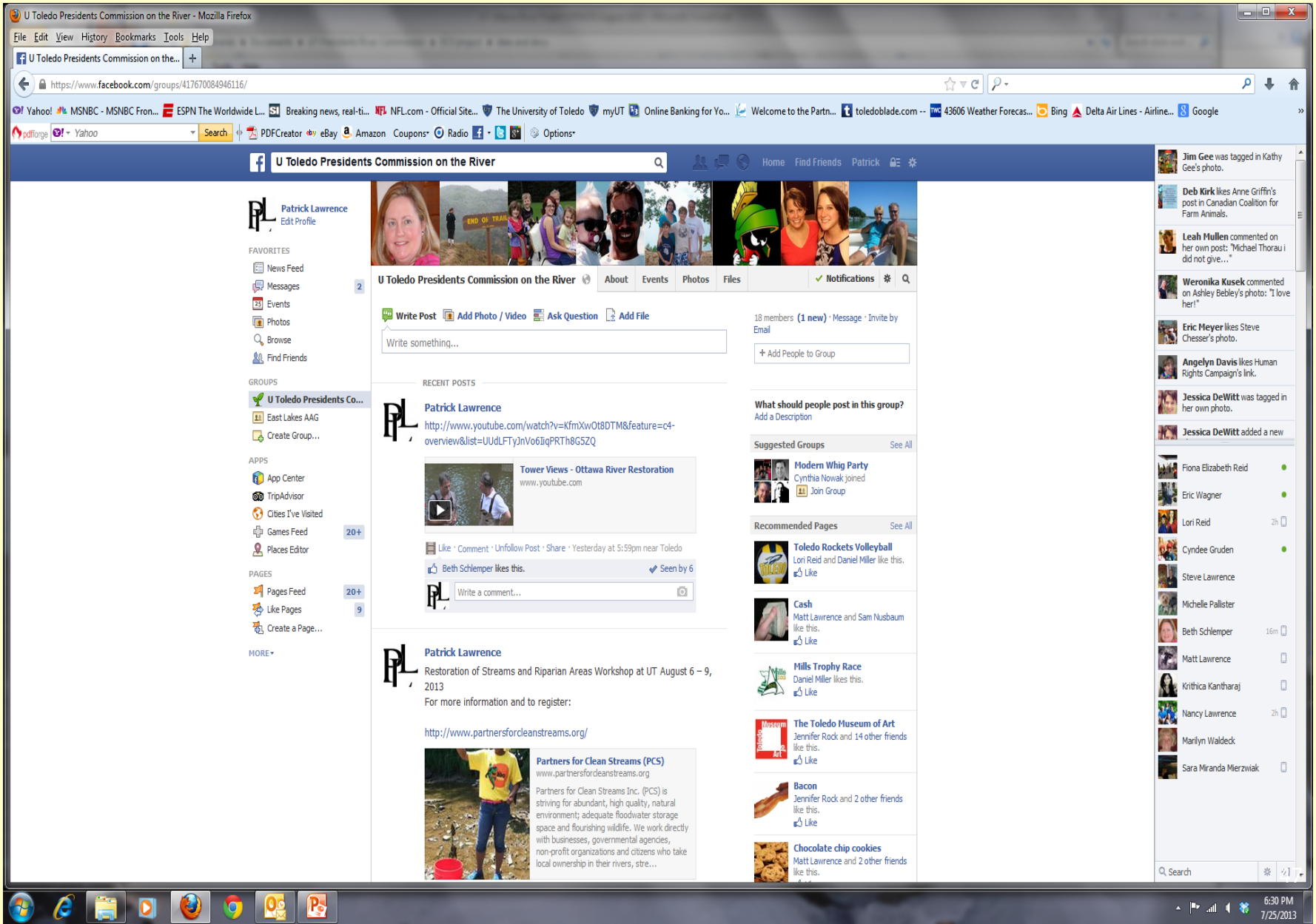
University of Toledo graduate student Mike Griswold removes invasive species on campus, along the Ottawa River. It's part of a summer internship to clean up an estimated 1,000 acres of habitat. *THE BLADE/JEFFREY SMITH*

Enlarge | Buy This Photo

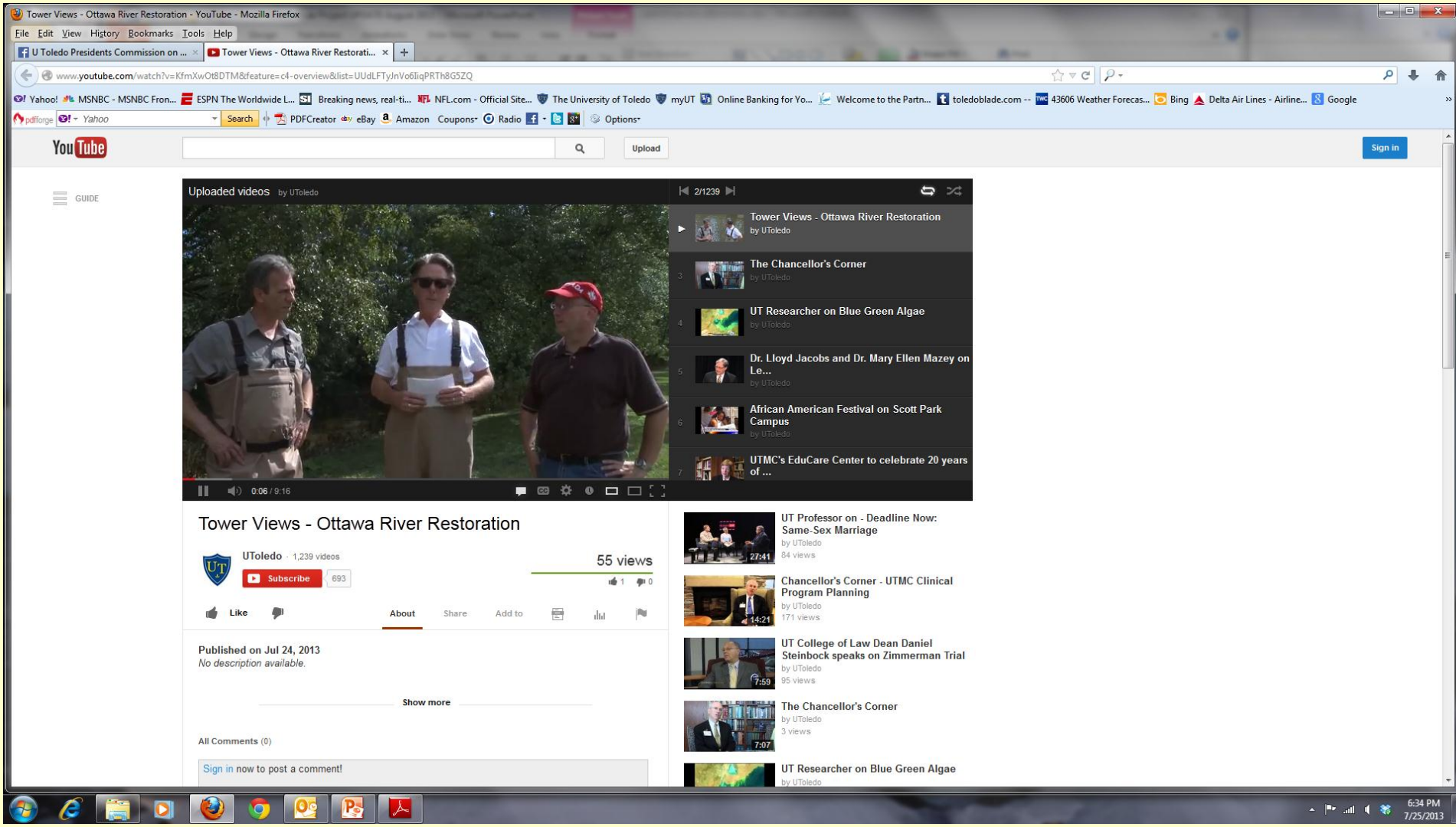
Awarded an $800,000 grant from the National Oceanic and Atmospheric Administration to focus on habitat restoration, the nonprofit hired eight Maumee Corps interns this summer to clean up an estimated 1,000 acres of habitat along the Ottawa River and Swan Creek watersheds.

The interns will also help with existing projects in the community through partnerships with other organizations, including Boy Scouts of America, The Nature Conservancy, Metroparks of the Toledo Area, and The Olander Park System. The other organizations have hired more employees, utilizing the grant funding.

Regular project and construction updates on Commission website and Facebook pages, emails to project team and Commission members



UT media office films feature on project before construction on UT Tower Views (July 2013)



http://www.youtube.com/watch?v=KfmXwOt8DTM&feature=c4-overview&list=UUdLFTyJnVo6IiqPRTh8G5ZQ

Ottawa River Restoration Project at the University of Toledo

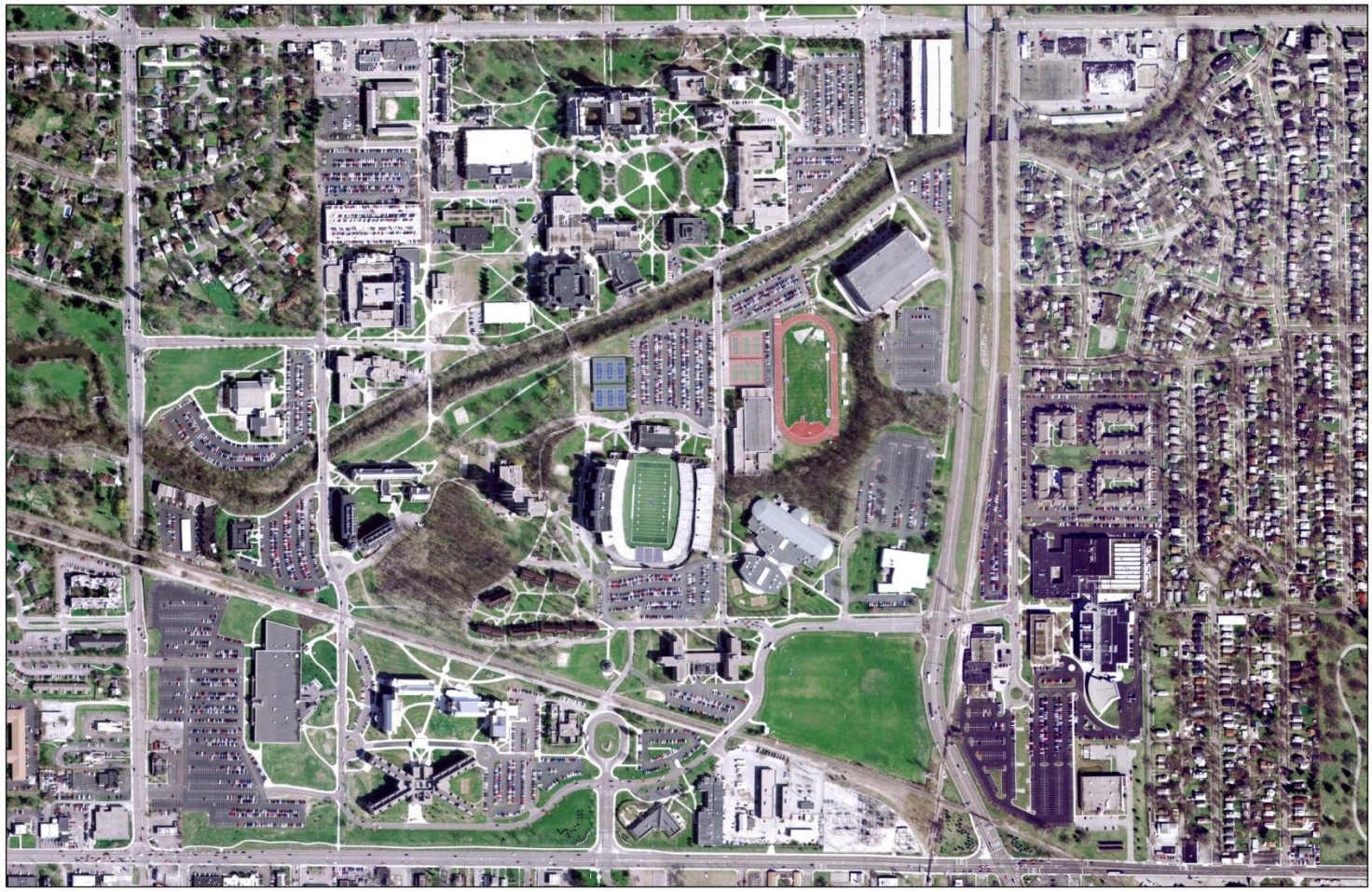
Construction (July 29th – August 13, 2013)

Funded by Ohio EPA 319 Program and USFWS (GLRI)

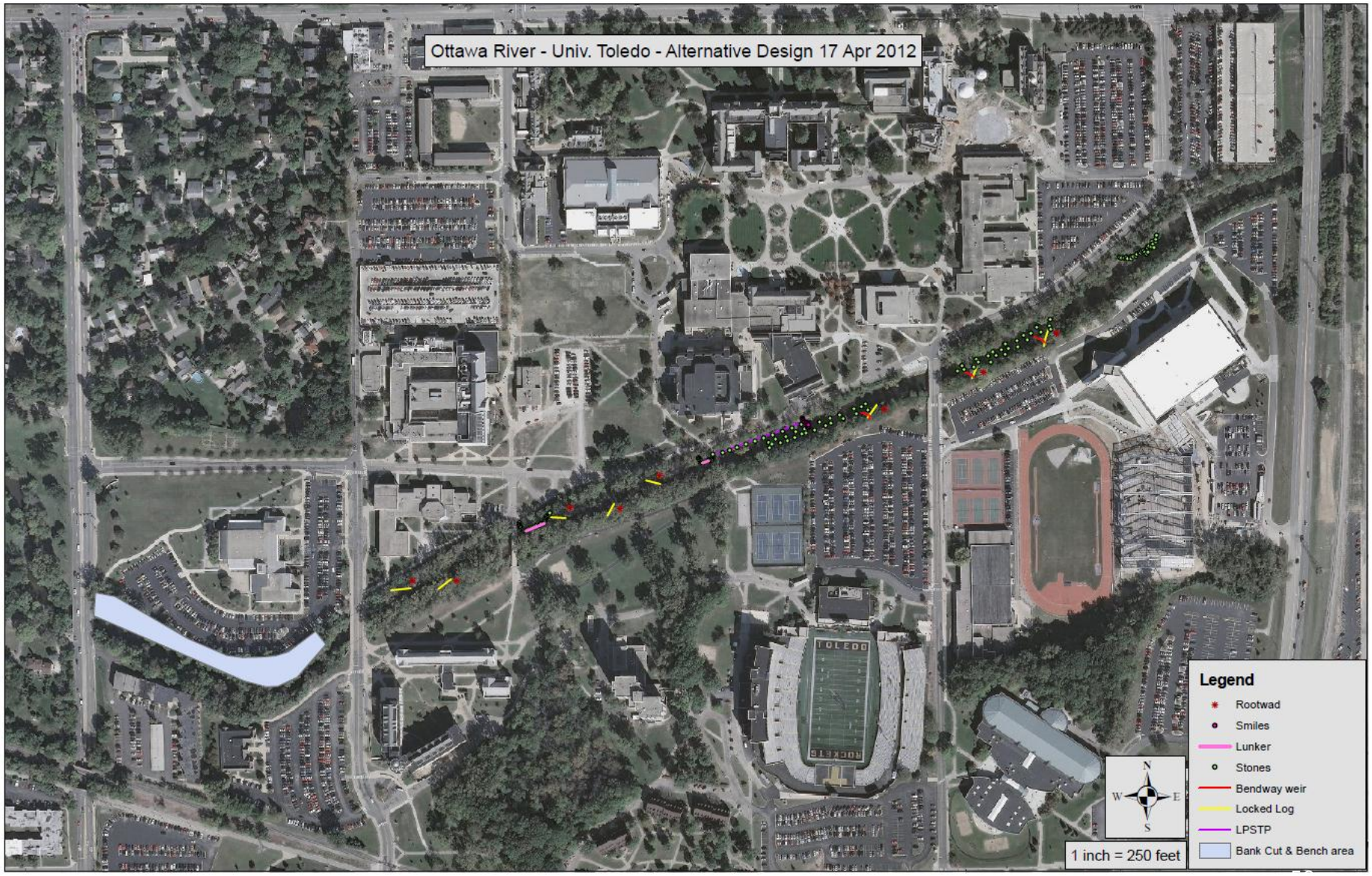
Design by ACOE Buffalo and Dave Derrick (ACOE)

Project Management: Patrick Lawrence (University of Toledo), Matt Horvat (TMACOG)

Contractor: Dave Hails (Ecological Restoration Inc.)

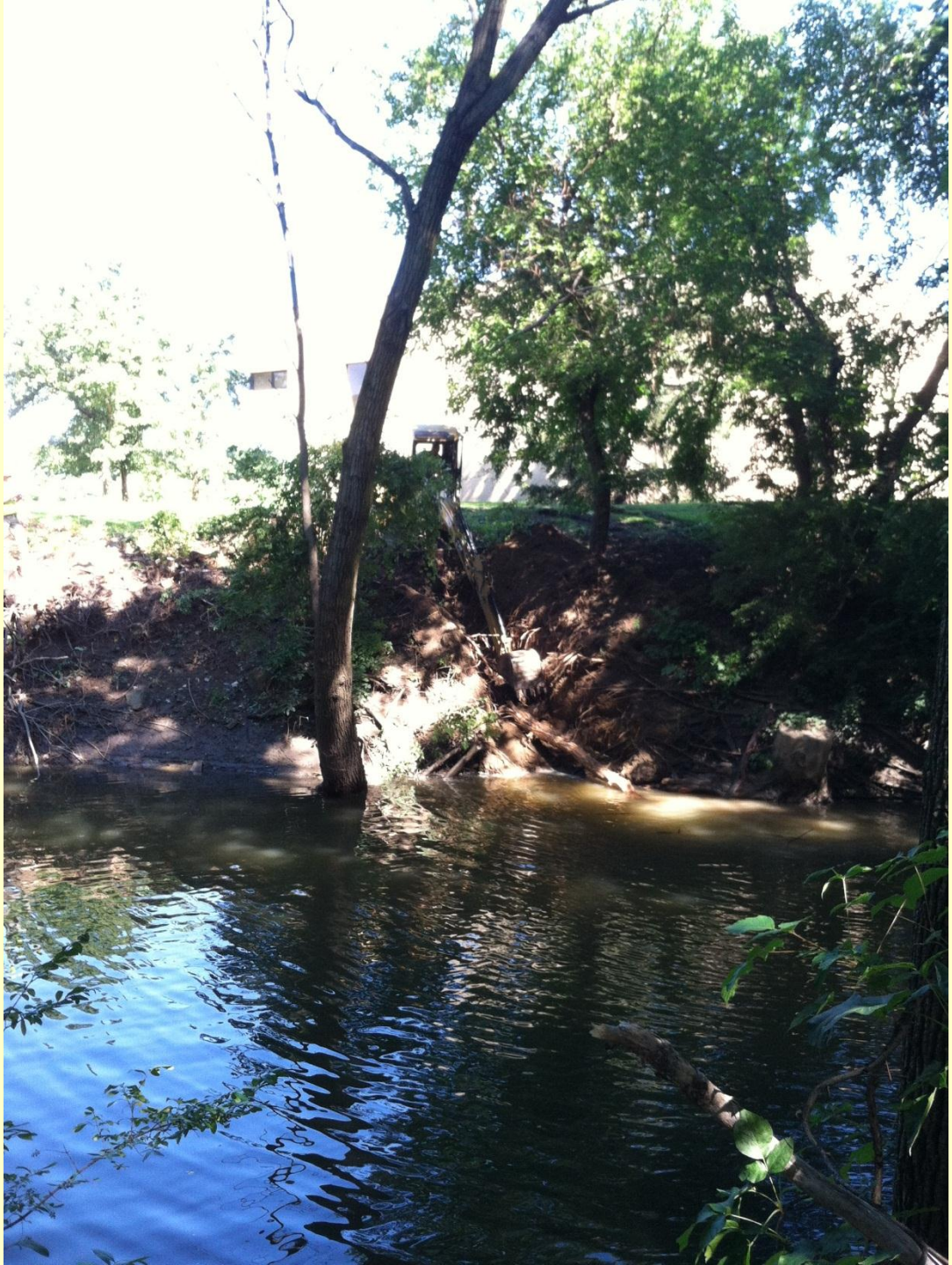


Design Plan


Ottawa River - Univ. Toledo - Alternative Design 17 Apr 2012
TOLEDO
ROCKETS
N
W
E
S
1 inch = 250 feet
Legend
Rootwad
Smiles
Lunker
Stones
Bendway weir
Locked Log
LPSTP
Bank Cut & Bench area

Mobilization (4 days)

Locked Logs (Reach 2)



LUNKERS #1 (Reach 3)

Locked Log #1 (Reach 3)

LUNKERS #2 (Reach 3)

Locked Log with Hydraulic Cover Stones (Reach 3)

Longitudinal Peaked Toe Protection (LPTP) with single stone bendway weirs (Reach 4)


CAT

Hydraulic Cover Stones (Reach 4)

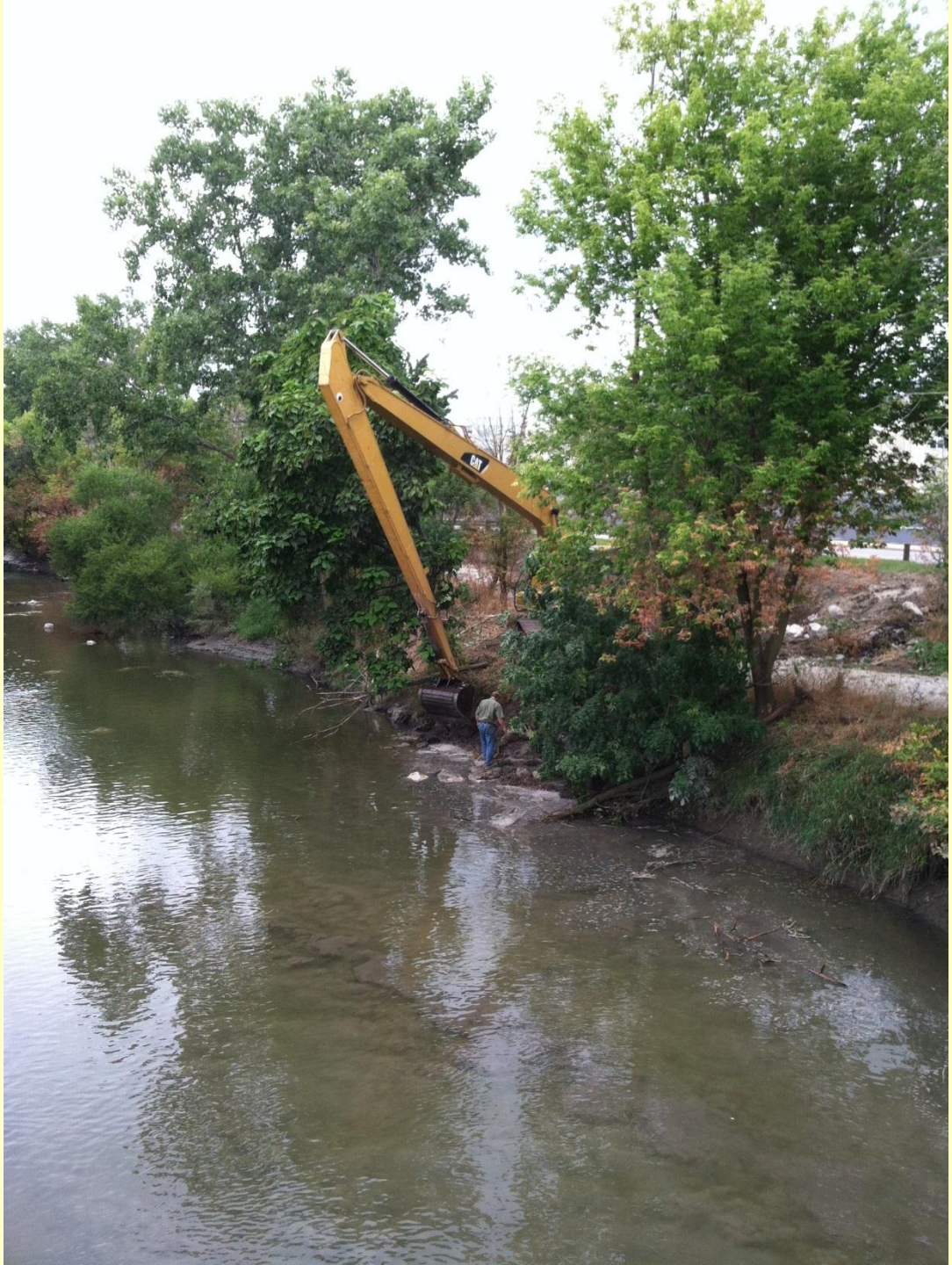
Bendway Weir with locked log (Reach 4)

Bendway Weir with locked log #1 (Reach 5)

Bendway Weir with locked log #2 (Reach 5)

Hydraulic Cover Stones (Reach 5)

Mini Bendway Weir and stepping Stones (Reach 5)



Access Path (Reach 5)

River Restoration Workshop (August 6-9th, 2013)

- Hosted by the UT President's Commission on the River and Partners for Clean Streams Inc.
- Included presentations and daily site visits to local recent restoration projects and to UT site under construction
- 40+ attendees including professionals, federal/state agency staff, citizens and students
- Each attendee left with a flashdrive containing all presentations and project handouts

Project Media Day (August 9th)

- Conducted interviews with media from University, student newspaper, local ABC news, and Toledo Blade (local paper)

LET IT FLOW: Under the close supervision of Dave Derrick from the U.S. Army Corps of Engineers, Dave Hails of Ecological Restoration Inc. carefully placed cover stone for the fish habitat structures installed as part of the recently completed river restoration along the Ottawa River on Main Campus. "This phase focused on aquatic improvements, including adding large rocks and logs to mimic natural water flow and get a ripple effect in the water," said Dr. Patrick Lawrence, professor and chair of the Department of Geography and Planning, and chair of the President's Commission on the River. "Adding these natural materials will also make for more diversity to the aquatic habitat, giving fish and other aquatic organisms more places for nesting, spawning, food and shelter." The restoration work for the 2,700 feet of the waterway that runs through Main Campus was funded with a $235,000 grant from the Ohio Environmental Protection Agency and a $151,000 grant from the U.S. Fish and Wildlife Service. The project also involved the assistance of Toledo Metropolitan Area Council of Governments, EnviroScience and Partners for Clean Streams.

Photo by Daniel Miller

THE BLADE
One of America's Great Newspapers

COMMENTARY

UT proud of new look, new life for Ottawa River

8/18/2013

BY MATT MARKEY
OUTDOORS

Ecological restoration continues to the Ottawa River at the University of Toledo. It has worked to restore all 3,700 feet of the river that runs through campus.

Cross the bridge over the Ottawa River in the heart of the University of Toledo campus less than a decade ago, and you were more likely to see a discarded shopping cart than a smallmouth bass.

Take that same stroll today, and there's no more societal debris littering the waterway, and what you see looks very much like the makings of a good fishing stream.

The short stretch of the Ottawa that makes a diagonal cut across the school's main grounds has had an extreme makeover, habitat edition. Gone are the flotsam and jetsam that were so visually distasteful, and a good share of the invisible trash — industrial pollutants, sewage overflows and excess sediment — that have tainted the river for so long.

The campus waterway is undergoing the final phase of a restoration effort that began back in 2005 with the formation of a university president's commission to address the many concerns associated with river.

"We had a river that, from a lot of people's perception, was just dirty and ugly," said Patrick Lawrence, a UT professor who heads the group that has been restoring the campus stretch of river.

"What they see now is something very different."

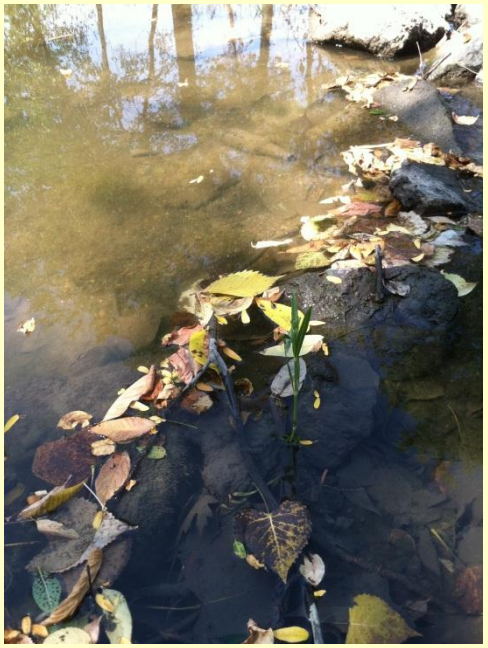
The latest phase of the project called for the placement of logs, large rocks, and other materials in the waterway to bring back some of the character of its original path through campus. Helped by the removal of a dam further upstream, long, flat, shallow stretches are being replaced with minor bends and diversions in the flow that are intended to create a more natural combination of riffles and pools.

De-Mobilization (3 days)

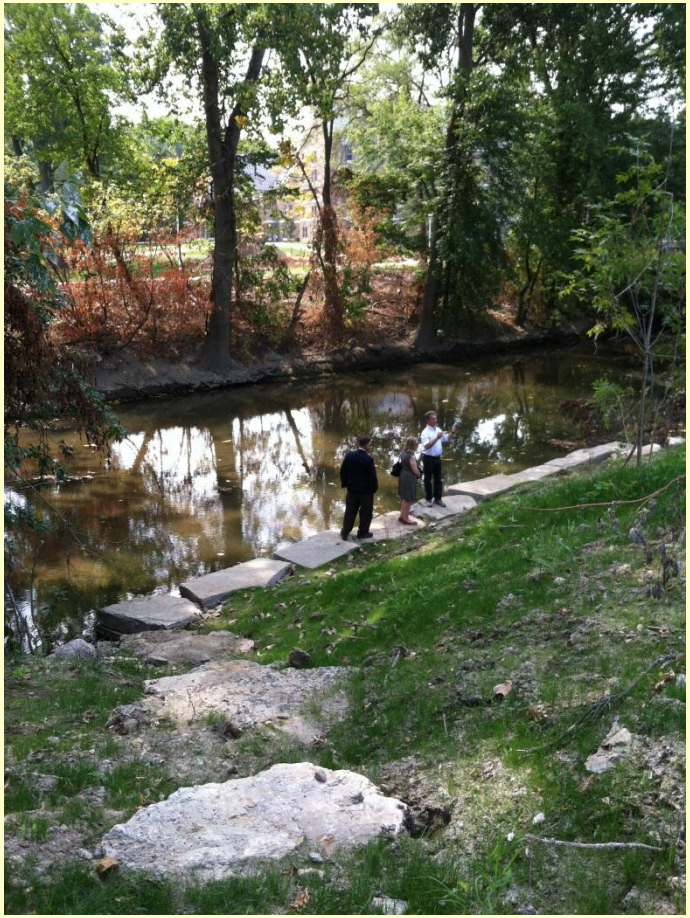

CAT

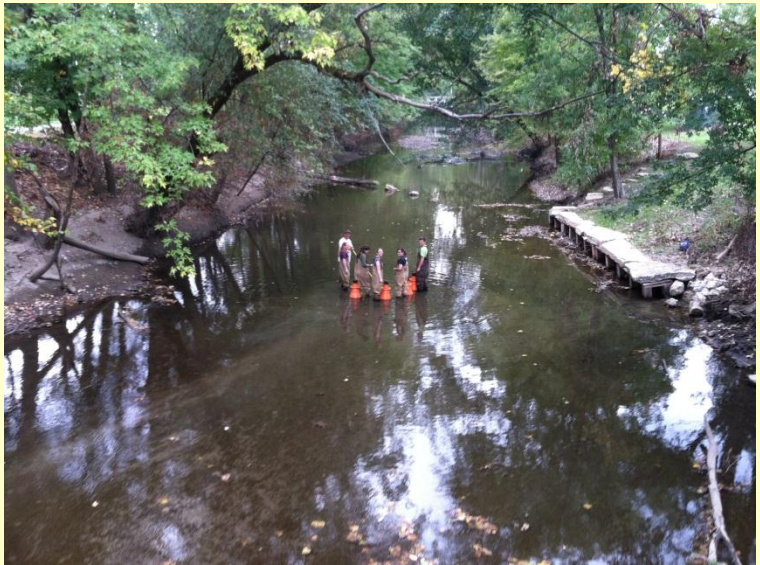
Replanting (September-October 2013)

- 400 water willows in river bed
- 325 native plants along the bank, 25 species including Burt Oak, Dogwood, Indigo Bush, Black Chokeberry, Hazelnut, Black Walnut, Tulip Poplar, Hornbeam, Ninebark, Sycamore, Black Cherry, Sumac



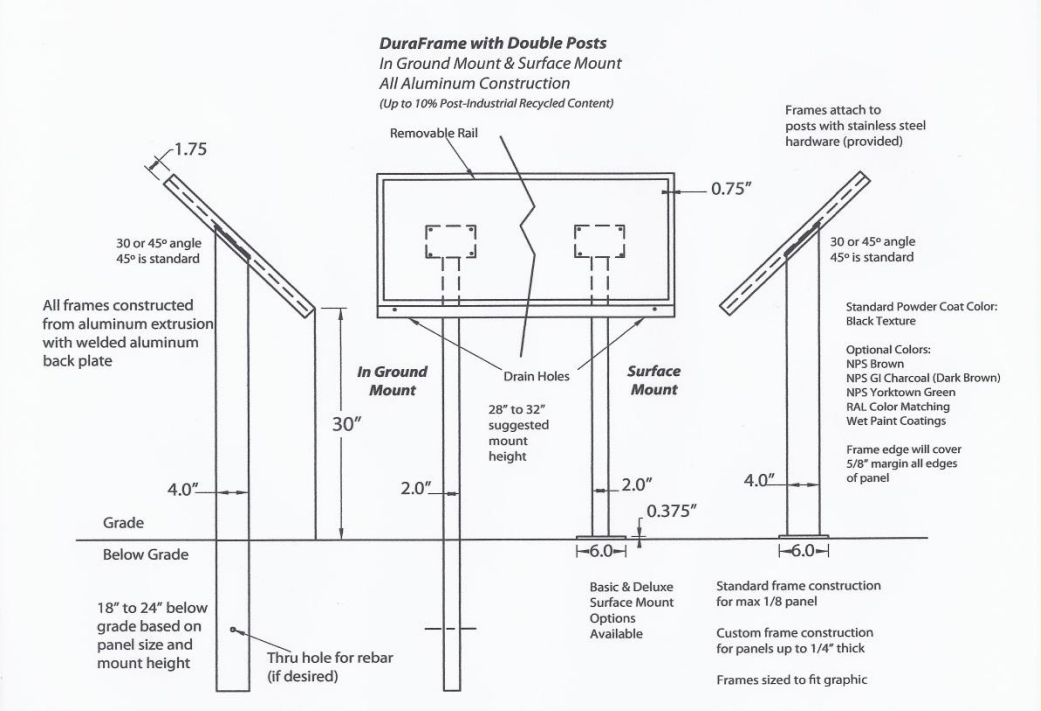

Dedication event (September 20th, 2013)





Information Signs

- 6 signs to be installed along the river at bridge crossings and key sites to educate students and visitors about the river and in-stream restoration structures installed (Spring 2014)



On the Web….

- **UT Tower Views: Ottawa River Restoration Follow-up (October 2013)** http://www.youtube.com/watch?v=iFN157nXPk4

- **Series of Construction Time Lapse Videos**

  Found on YouTube Channel

  "U Toledo Presidents Commission on the River"

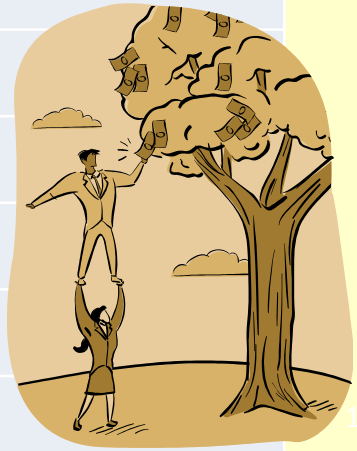
http://www.youtube.com/channel/UCEJ9o7DppXDYqrfmie4Nn9A

- **Archive of all project reports and presentations can also be found at:**

  http://www.utoledo.edu/commissions/river/index.html#top

Summary Project Budget

	FUNDING totals		
319+USFWS	$	396,327	cash
stranahan	$	90,000	cash
subtotal cash	$	486,327	cash
US ACOE	$	298,715	cost
TOTAL	$	785,042	
ACOE match	$	103,847	in kind
UT match EC3	$	20,000	in kind
UT match 319	$	135,894	in kind
match total	$	259,741	
TOTALS	$	1,044,783	all



Summary of Expenses

Construction Expenses	$ 311,132	by % of total
$ 2,300	bat survey	1%
$ 33,000	tree removal	11%
$ 21,958	stump removal	7%
$ 86,512	cutbank build	28%
$ 2,935	stormwater pipes	1%
$ 5,653	cutbank plants	2%
$ 138,361	in-stream construction	44%
$ 1,500	tree hauling locked logs	1%
$ 7,500	plants	2%
$ 11,800	signage	4%

Project Outcomes: Restoration efforts

- Clearing of non-native invasive plants from approximately 5,600 linear feet of river bank (both banks), followed by re-planting of over 320 native species on the banks
- Planting of 400+ aquatic native plants (water willows)
- Installation of 12 in-stream restoration structures + 80 hydrologic cover stones along 2,800 liner feet of river (River Reaches 2-5):
  - 6 locked logs
  - 2 sets of LUNKERS (total length 88ft)
  - 1 Longitudinal Peaked Toe Protection (200 liner feet) with 5 single stone bendway weirs + stone smile structure
  - 3 Bendway Weirs
- Addition of 400 feet of access path along river bank
- 900 foot long cutbank feature for flood storage, included removal of 4,000 cubic yards of construction debris and planting of 325 native plants on river bank feature (plus improvements of two storm water outfalls)

Public Education and Outreach: Deliverables

- 3 project public meetings/workshops
- 3 press events, numerous media stories including in local papers and T.V. news stations
- Presentations to University community (leadership and students) and at professional conferences, workshops and meetings
- Numerous field tours and site visits
- 2 featured project stories on UT Tower Views
- Project website and Facebook page
- YouTube channel (with project videos)
- 8 Project Grant funding and information signs
- 6 Permanent Project Information Signs (installed 2014)

Future and Ongoing Work

- Treatment and/or removal of any regrowth or re-establishment of non-native invasive plant species
- Maintenance of native plantings, working with Partners for Clean Streams Inc. for future river bank plantings in Summer 2014 at no cost to this grant
- Monitoring of fish populations and aquatic habitat conditions (under USFWS funding provided to Dr. Hans Gottgens, University of Toledo and by OEPA 319 program)
- Observation and assessment of stability and function of in-stream restoration
- Extension of river restoration work by the UT Presidents Commission on the River under future projects and other funding sources, including storm water mitigation public access

Appreciation is extended to all the project partners and funders: