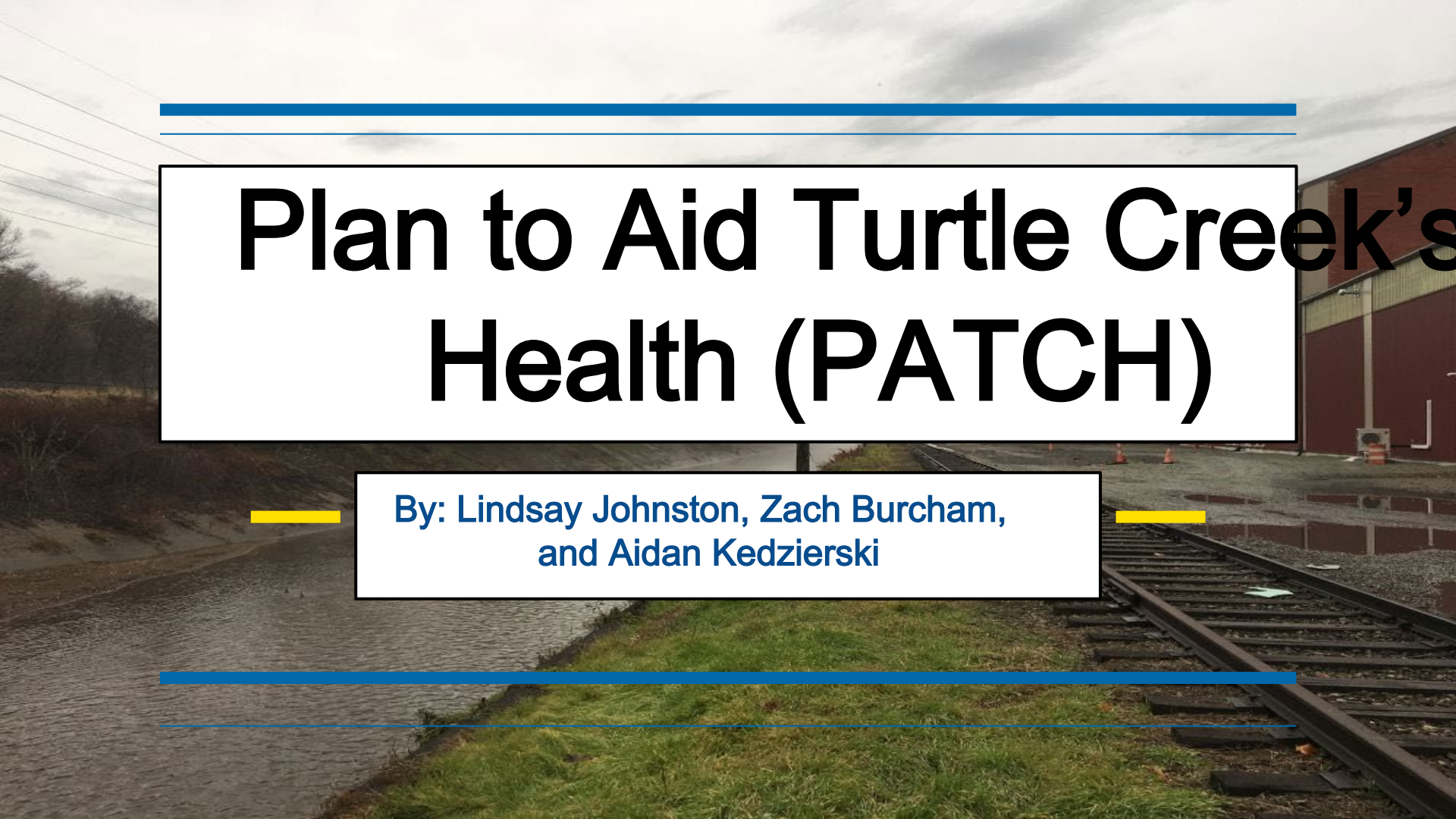
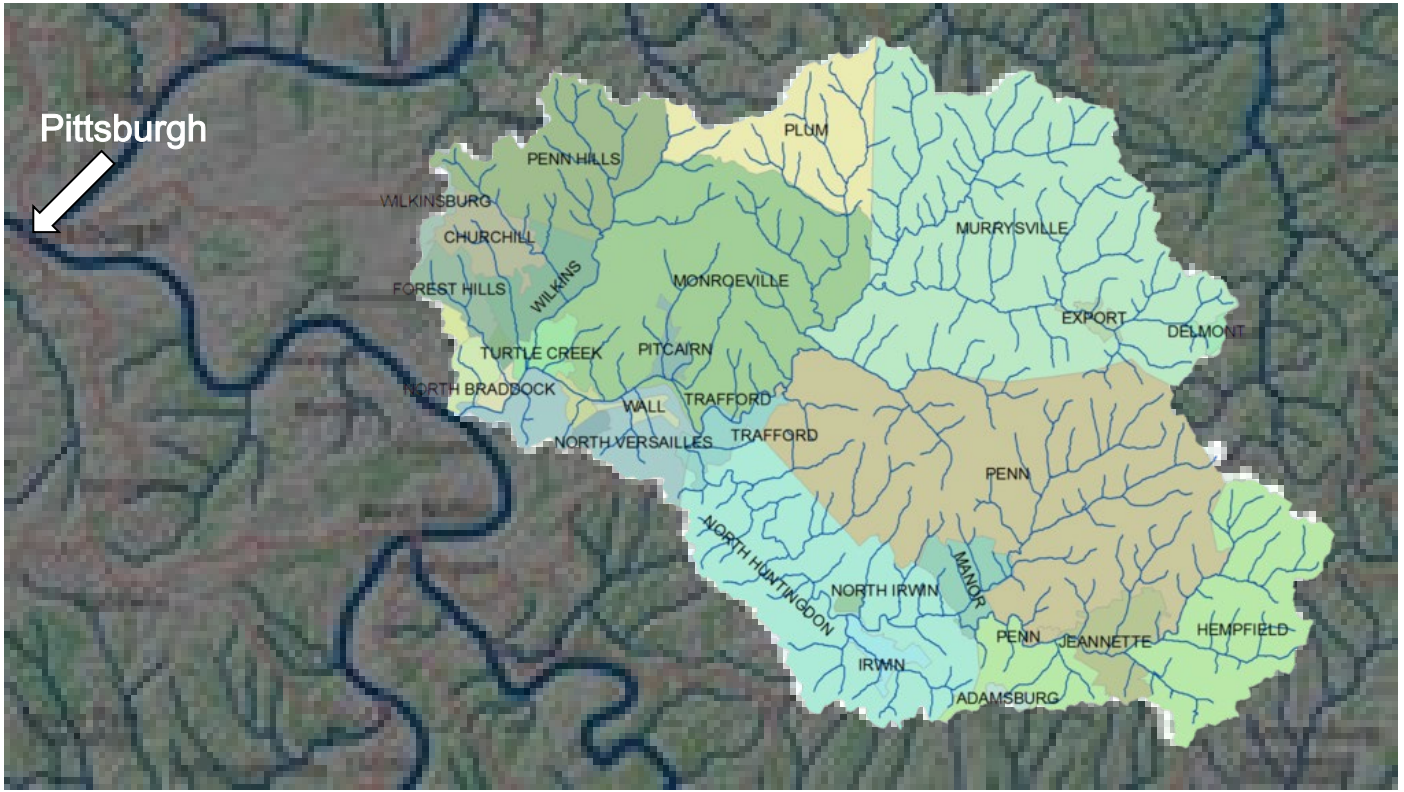


Plan to Aid Turtle Creek's Health (PATCH)

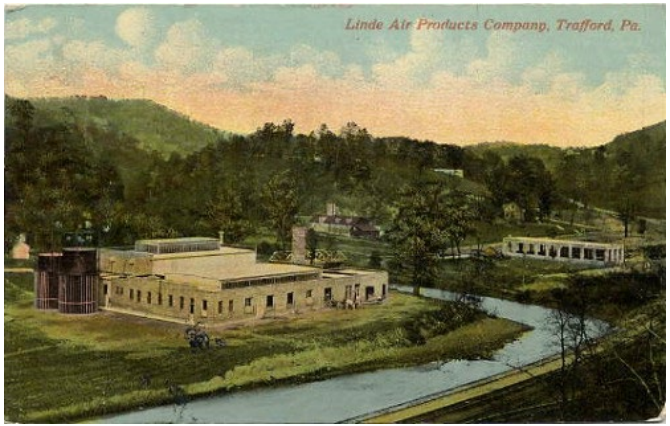
By: Lindsay Johnston, Zach Burcham, and Aidan Kedzierski

Turtle Creek Watershed



Background

- 21.1 mi long tributary of Monongahela River, drains 147.71 mi^2
- 2 cities, 8 townships, 23 boroughs
- Major highways (US Route 22, US Route 30)
- 14 species of concern
- Largely urban and suburban land use
- Fishing occurs, but no trout
- Heavy mining along four coal seams
- Dam just downstream of mouth

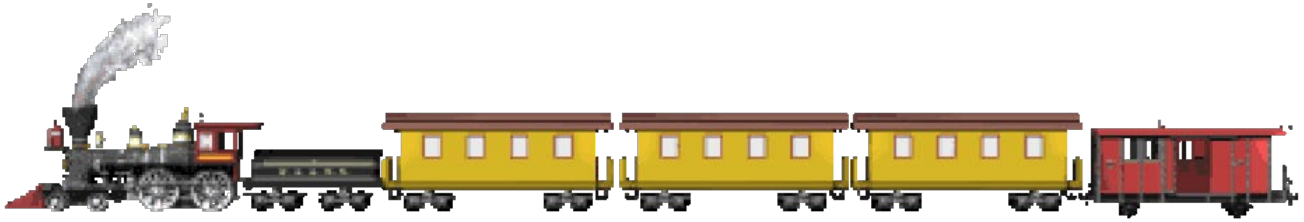


History

- First inhabitants appeared over 10,000 years ago and occupied at least 200 sites in the area
- Indigenous occupants include Monongahela, Haudenosaunee, and Lenae Lenape
  - Named “Tulpewisipu”, or Turtle River by Lenae Lenape
- European settlement began in 1600s
- Site of important battles in French & Indian War
  - Braddock’s Defeat in 1755

History

- Coal mining emerged in late 19th century
  - Also has first natural gas well in the United States
- Many railroads were built to transport coal across the country
- Like the rest of the region, was host to many steel mills in the 20th century
  - Many closed in the 80s but Thompson Steel Works still open today
- Original headquarters of WABCO and Westinghouse Electric

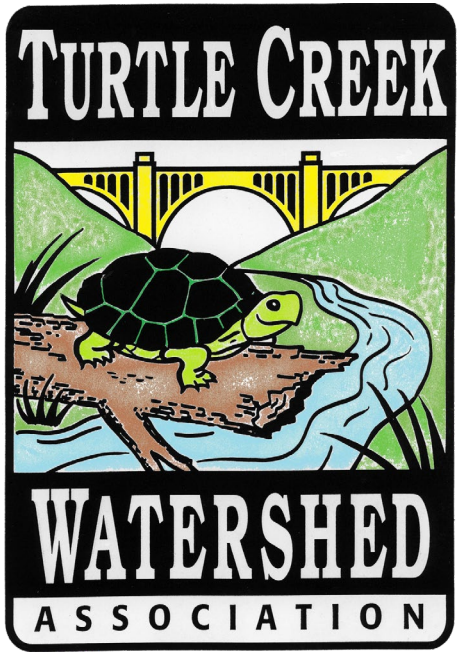


Mission Statement

The goal of PATCH is to reduce flooding conditions and to reach state standard concentrations in the Turtle Creek Watershed in Southwestern Pennsylvania by the year 2040

Turtle Creek Watershed Associa

- The Turtle Creek Watershed Association works to promote the conservation of natural resources of the watershed
  - Aims to conduct research and develop management plans based on the study
  - Works to educate the public on watershed needs and concerns
  - Advocates to secure governmental funding for watershed projects



TCWA Current Projects

- TCWA is currently working on educating the public about watershed BMPs
  a. Hosting public meetings and conducting surveys
- Identifying major issues in the watershed:
  a. Assessing current water quality of streams
  b. Reduce further quality degradation
  c. Increase public involvement
  d. Endorse outdoor recreation
  e. Inventory potential habitats for endangered species
  f. Protect floodplains
  g. Restore riparian habitats

TCWA Current Projects

- Various discharge studies in vulnerable sections of the stream
- Proposal for Lower Turtle Creek Flood Study
- Annual Turtle Creek Clean Up
- Annual Trout Stocking
- Recreation Area Study

Current Policies

- Clean Water Act (CWA)
  - Fishable, swimmable water
  - Needs remediation due to severe conditions
- PADEP Total Maximum Daily Loads
  - 26 miles of stream are designated as impaired

Problem 1: Backwater Conditions

- Lock and Dam No. 2 is located shortly downstream of the mouth of Turtle Creek in the Monongahela River
- When there is an excess of river water, it cannot flow quickly downstream and causes a backup to occur at the mouth of the Turtle Creek
- Normal flow is disrupted and river water takes a longer time to flow downstream, toxins linger for a much longer time than in normal river flow
- The dam prevents native fish from swimming upstream to lay their eggs

Lock & Dam No. 2

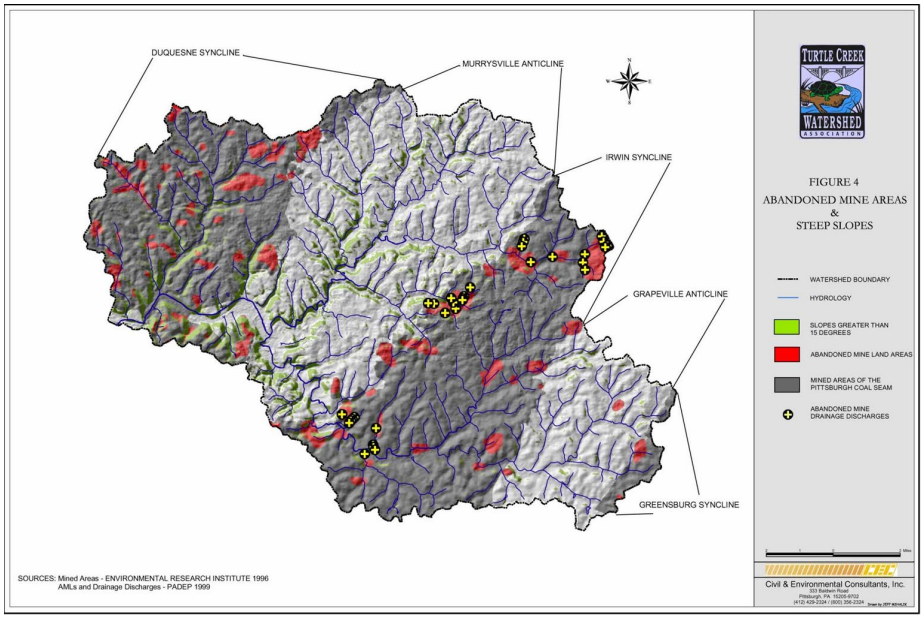
Goal 1: Remove Lock No. 2 from Mon

- Reduce backwater flooding in the Lower Turtle Creek
- Reduce toxin levels in the Lower Turtle Creek and Upper Monongahela
- Increase native fish population in upstream of Lock & Dam No. 2

Problem 2: Low pH and High Al & Fe N

- Many abandoned mines in the Turtle Creek Watershed and acid mine drainage is a persistent issue
- Drainage leads decreased pH levels that cannot support aquatic life
- Increased levels of iron and aluminum in the water
- Delmont section have an aluminum concentration of .67 mg/L and an iron concentration of 27.08 mg/L

Abandoned Mine Drainage



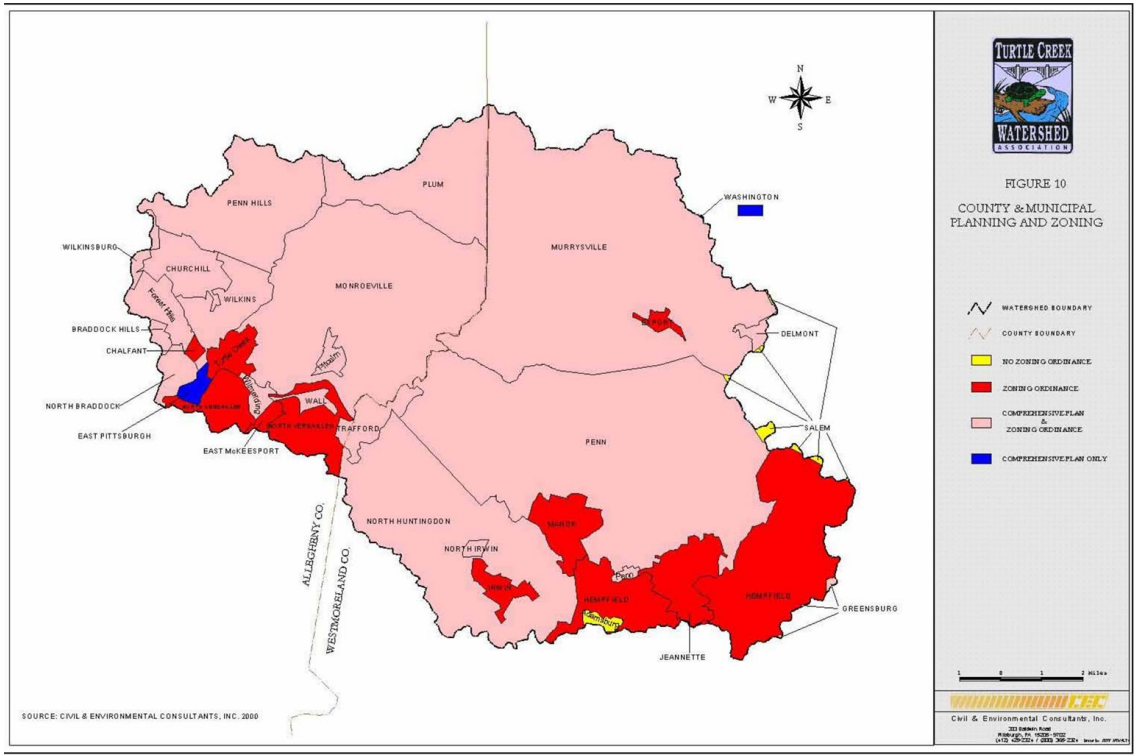
Goal 2: Bring pH, Al, and Fe Concentrations to PA S

- Want to meet PA state water quality standards
- Reduce acidity concentration by:
  - Acidity by 93%
  - Aluminum concentration by 59%
  - Iron concentrations by 98%.
- Options:
  - Adding alkaline materials to reduce the acidity of the stream
  - Filling abandoned mines with water or other materials to prevent further leakage

Problem 3: Erosion

- Turtle Creek is registered as an impacted stream, which means that there is impervious cover over 11 -25%
- Increase in impervious cover has led to severe erosion and degradation of streambanks
- Steep slopes makeup 6.2% of the watershed area and host numerous microhabitats essential for ecological diversity
- Erosion has damaged many of these steep slopes

Zoning Laws


TURTLE CREEK WATERSHED ASSOCIATION
FIGURE 10
COUNTY & MUNICIPAL PLANNING AND ZONING
WATERSHED BOUNDARY
COUNTY BOUNDARY
NO ZONING ORDINANCE
ZONING ORDINANCE
COMPREHENSIVE PLAN & ZONING ORDINANCE
COMPREHENSIVE PLAN ONLY
Civil & Environmental Consultants, Inc.
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PLUM
WASHINGTON
WILKINSBURG
CHURCHILL
MONROEVILLE
MURRYSVILLE
WILKINS
BRADDOCK HILLS
DELMONT
CHALFANT
NORTH BRADDOCK
EAST PITTSBURGH
EAST McKEESPORT
TRAFFORD
SALEM
PENN
NORTH HUNTINGDON
NORTH IRWIN
HEMPFIELD
GREENSBURG
JEANNETTE
ALLEGHENY CO.
WESTMORELAND CO.
SOURCE: CIVIL & ENVIRONMENTAL CONSULTANTS, INC. 2000

Goal 3: Preserve and Protect Steep Hil

- Create zoning laws that protect vulnerable hillside ecosystems
  - Much of the watershed is zoned for residential and commercial usage
  - Forest zones must be upheld in order to protect the banks of the Turtle Creek
- Encourage residents to use Best Management Practices
  - Reduce the amount of pollutants going into a stream and overland flow into the stream

Conclusion and Recommendatio

- Remove Lock & Dam No. 2 from the Mon River to prevent backwater flooding, reduce toxin levels, and increase native fish population
- Bring pH, Al, and Fe levels to PA standards by treating water directly or packing abandoned mines to prevent further leakage
- Prevent severe erosion by enacting zoning laws and encouraging citizens to use BMPs