

# **KEEP Final Report Appendix A: MASTER FILE INDEX**

## **Kiwanis Environmental Education Preserve (KEEP) Master's Project**

### **1 Progress Documents**

---

#### 1.1 KEEP Prospectus

*One page summary of the KEEP project created in February of 2019. This document was created at the start of the project detailing team members, client, advisor, the problem, project goals, deliverables, research approach, and resources needed.*

#### 1.2. KEEP Final Proposal.pdf

*Proposal submitted to the University of Michigan School for Environment and Sustainability at the end of the winter project course that outlines the background, goals, future research, deliverables, and timeline for the master's project.*

#### 1.3 UM SEAS KEEP Project Summary.pdf

*Summary of the final project proposal provided to the clients in June of 2019*

#### 1.4 EAS447\_Forest Management Plan

*A forest management and recommendation report for the KEEP property created by Katherine Ferran for EAS 447: Forest Ecology and Management Fall 2019 course.*

#### 1.5 EAS540\_Land Cover and Stormwater

*A presentation of an analysis of land cover change and stormwater flow completed in ArcMap by Sarah Brannon for EAS 540: GIS and Natural Resource Applications Fall 2019.*

#### 1.6 KEEP Summary as of October

*A progress report provided to the Kiwanis Club of Ann Arbor Foundation Inc. in October of 2019 detailing completed components of the project up to the date and a timeline for future completion of the project.*

#### 1.61 Summary\_Appendix\_A

*Images related to progress made on the game camera survey for summer 2019 including a map of survey locations, timeline of survey, and a sample of images from the game cameras.*

#### 1.62 Summary\_Appendix\_B

*A map of frog survey locations for the summer of 2019.*

#### 1.63 Summary\_Appendix\_C

*An image and tables related to progress made on the vegetation survey for summer of 2019 including a map of proposed microhabitats and sampling plots and tables containing summary statistics of all species in overstory, understory, and all stratum in all of the plots.*

#### 1.64 Summary\_Appendix\_D

*A map of water sampling points for summer of 2019 including water characteristics readings, ekman samples, chemical samples, macroinvertebrate samples, and stream gauge readings.*

#### 1.7 KEEP SEAS Final Report

*Final report of the 2019 - 2020 University of Michigan School for Environment and Sustainability (SEAS) KEEP master's project team outlining all components of the project: background, methods, results, recommendations, and conclusions. Report was submitted to SEAS in April of 2020.*

#### 1.8 KEEP SEAS Final Presentation

*Final presentation of the 2019 - 2020 University of Michigan School for Environment and Sustainability (SEAS) KEEP master's project team outlining all components of the project: background, methods, results, recommendations, and conclusions. Presentation will be given to Kiwanis Club of Ann Arbor in June of 2020 and a recording of the presentation will be given to SEAS.*

---

## 2 Wildlife Survey

### 2.1 Camera Trap Data

*All data collected from camera trap survey in the summer of 2019 including location information and summary calculations by location and habitat. Methods for the game camera survey can be found in KEEP SEAS Final Report Section 3.2.*

### 2.2 Camera Photos/Videos

*All photos and videos containing sightings of wildlife from the game camera survey in the summer of 2019. Methods for the game camera survey can be found in KEEP SEAS Final Report Section 3.2.*

---

## 3 Frog Survey

### 3.1 Frog Notes

*Summary of frog calls heard in recordings throughout the spring/summer of 2019.*

### 3.2 Recordings

*Recordings for the frog call survey in the spring/summer of 2019. Recordings are named based on the date and sight of the recording. For methods of the frog survey, see KEEP SEAS Final Report Chapter 4.*

---

## 4 Vegetation Survey

### 4.1 Overstory\_Understory\_Biomass.xlsx

*Calculations of aboveground biomass per square meter of forest for all summer 2019 vegetation survey plots. See KEEP SEAS Final Report Section 3.3 for methods.*

### 4.2 KEEP.vegetation.all.info.xlsx

*All vegetation data from summer 2019 vegetation survey plots as well as calculations of Shannon diversity index, density, total basal area, and FQA from this data. See KEEP SEAS Final Report Section 3.3 for methods.*

### 4.3 Ground\_Cover\_Vegetation.xlsx

*Ground cover data collected with a 1m<sup>2</sup> quadrat in summer 2019 vegetation survey plots. See KEEP SEAS Final Report Section 3.3 for methods.*

### 4.4 FQA.all.xlsx

*Calculations of floristic quality assessment (FQA) for all summer 2019 vegetation survey plots. See KEEP SEAS Final Report Section 3.3 for methods.*

## 5 Water Quality

---

### 5.1 WaterQuality.xlsx

*Water quality (SPC, pH, ORP, DO, and Temperature) data collected on June 15, 2019 at various locations on the KEEP. See KEEP SEAS Final Report Chapter 5 for methods and interpretation of data.*

### 5.2 Water\_Ekman\_Benthic\_Samples.xlsx

*Sampling locations for water, ekman, stormwater, and benthic samples in the 2019 field season. See KEEP SEAS Final Report Chapter 5 for methods and interpretation of sample data.*

### 5.3 StreamGauge.xlsx

*Stream gauge readings for Honey Creek in the 2019 field season. See KEEP SEAS Final Report Chapter 5 for methods and interpretation of data.*

### 5.4 KEEP\_Benthos.xlsx

*Benthos data collected from the north pond (Half Moon Pond), South Pond (Bird Song Pond), and Honey Creek in the 2019 field season. See KEEP SEAS Final Report Chapter 5 for methods and interpretation of data.*

### 5.5 ICPMS.metals.analysis.xlsx

*Chemical analysis data from water, ekman, and stormwater samples of the 2019 field season. See KEEP SEAS Final Report Chapter 5 for methods and interpretation of data.*

## 6 Stormwater Modeling

---

### 6.1 KEEP.model.technical.document.html

*Code written for R to model stormwater drainage on the KEEP. See KEEP SEAS Final Report Chapter 6 for methods and interpretation of model results.*

### 6.2 KEEP\_TankDrainage.pdf

*Maps created in ArcMap displaying flow accumulation (on a log scale) throughout the KEEP property, drainage watershed into the proposed parking lot tank, and drainage watershed into the north pond. These watershed areas were used along with SSURGO soil data in the stormwater modeling of the KEEP property. See KEEP SEAS Final Report Chapter 6 for methods and interpretation of model results.*

## 7 KEEP Photos

---

### 7.1 Observation Photos

*Observations of wildlife, evidence of wildlife, insects, plants, and fungi throughout the KEEP recorded with photos in the 2019 field season.*

### 7.2 KEEP General Photos

*General photos of the KEEP landscape collected during the 2019 field season.*

### 7.3 Field Work Photos

*Photos of field work completed during the 2019 field season.*

## 8 GIS Files

---

### 8.1 KEEP\_Boundary.shp

*The property boundary for the KEEP. This polygon shapefile was created from a ground control point (gcp) georeferenced Washtenaw County GIS Program tax parcel viewer image to a 2015 SEMCOG aerial image.*

#### 8.2 Soils.shp

*SSURGO soils data for the KEEP property downloaded from their Web Soil Survey using and Area of Interest (AOI).*

#### 8.3 Hydrology.mdb

*Line shapefiles of hydrologic features on the KEEP property over time. The feature types include river (a naturally flowing body of water) and drain (a man-made flowing body of water).*

##### 8.3.1 KEEP\_Hydrology1960.shp

*Hydrologic feature on the KEEP in 1960. Manually classified from Washtenaw County GIS Program 1960 aerial image.*

##### 8.3.2 KEEP\_Hydrology1984.shp

*Hydrologic feature on the KEEP in 1984. Manually classified from Washtenaw County GIS Program 1984 aerial image.*

##### 8.3.3 KEEP\_Hydrology1990.shp

*Hydrologic feature on the KEEP in 1990. Manually classified from Washtenaw County GIS Program 1990 aerial image.*

##### 8.3.4 KEEP\_Hydrology2005.shp

*Hydrologic feature on the KEEP in 2005. Manually classified from SEMCOG 2005 aerial image.*

##### 8.3.5 KEEP\_Hydrology2015.shp

*Hydrologic feature on the KEEP in 2015. Manually classified from SEMCOG 2015 aerial image.*

#### 8.4 Land Cover.mdb

*Polygon shapefiles of land cover on the KEEP property over time. Land covers were developed using a modified version of Anderson 1976.*

##### 8.4.1 KEEP\_LC1800.shp

*Land cover of the KEEP provided by State of Michigan surveys in the 1800s.*

##### 8.4.2 KEEP\_LC1960.shp

*Land cover of the KEEP in 1960 manually classified from Washtenaw County GIS Program 1960 aerial image using a minimum mapping unit of 700m<sup>2</sup> and ancillary SSURGO soil data and current day vegetation surveys.*

##### 8.4.3 KEEP\_LC1984.shp

*Land cover of the KEEP in 1984 manually classified from Washtenaw County GIS Program 1984 aerial image using a minimum mapping unit of 700m<sup>2</sup> and ancillary SSURGO soil data and current day vegetation surveys.*

##### 8.4.4 KEEP\_LC1990.shp

*Land cover of the KEEP in 1990 manually classified from Washtenaw County GIS Program 1990 aerial image using a minimum mapping unit of 700m<sup>2</sup> and ancillary SSURGO soil data and current day vegetation surveys.*

##### 8.4.5 KEEP\_LC2005.shp

*Land cover of the KEEP in 2005 manually classified from SEMCOG 2005 aerial image using a minimum mapping unit of 700m<sup>2</sup> and ancillary SSURGO soil data and current day vegetation surveys.*

##### 8.4.6 KEEP\_Hydrology2015.shp

*Land cover of the KEEP in 2015 manually classified from SEMCOG 2015 aerial image using a minimum mapping unit of 700m<sup>2</sup> and ancillary SSURGO soil data and current day vegetation surveys.*

#### 8.5 Aerial Images.gdb

- 8.5.1 Aerial\_1960
  - Aerial image from 1960 provided by Washtenaw County GIS Program. Before any future use of the aerial image, Washtenaw County GIS Program should be contacted to check use restrictions and appropriate citations.*
- 8.5.2 Aerial\_1984
  - Aerial image from 1984 provided by Washtenaw County GIS Program. Before any future use of the aerial image, Washtenaw County GIS Program should be contacted to check use restrictions and appropriate citations.*
- 8.5.3 Aerial\_1990
  - Aerial image from 1990 provided by Washtenaw County GIS Program. Before any future use of the aerial image, Washtenaw County GIS Program should be contacted to check use restrictions and appropriate citations.*
- 8.5.4 Aerial\_2005
  - Aerial image from 2005 clipped and projected from SEMCOG Washtenaw County aerial image.*
- 8.5.5 Aerial\_2015
  - Aerial image from 2015 clipped and projected from SEMCOG Washtenaw County aerial image.*
- 8.6 Survey Points.gdb
  - 8.6.1 FrogSurvey.shp
    - Data points of locations for 2019 frog surveys collected using Survey123.*
  - 8.6.2 GameCamera.shp
    - Data points of locations for 2019 game camera surveys collected using Survey123.*
  - 8.6.3 GeneralObservations.shp
    - General observations of insects, fungi, animal tracks, and animal scat made throughout the KEEP in the 2019 field season.*
  - 8.6.4 KEEP\_LCVegHabitats.shp
    - Results of vegetation surveys displayed in manually classified land cover plots from KEEP\_LC2015.shp.*
  - 8.6.5 Veg\_Field\_Plots
    - Circumference of each vegetation plot in the 2019 field season created from buffers of the Veg\_Plot\_Centers.shp related to the size of each plot.*
  - 8.6.6 Veg\_Plot\_Centers
    - Center of each vegetation plot in the 2019 field season collected using a TrimbleR1 receiver and Collector app.*
  - 8.6.7 Water\_Ekman\_Benthic\_Samples.shp
    - Sampling locations from 2019 water, benthos, and ekman samples recorded using Survey123.*
- 8.7 Stormwater
  - 8.7.1 Contours\_200.shp
    - 1 foot contours clipped to 200 m buffer around KEEP and projected from SEMCOG contour data for Washtenaw County.*
  - 8.7.2 KEEP\_LC2015\_Mask\_Final\_200.shp
    - Mask used to remove the building from the surface raster of property and 200m buffer created using the KEEP\_LC2015 file and a 200m buffer.*
  - 8.7.3 topotor\_fm\_200
    - A surface raster of the property created from the Contours\_200.shp using the Topo to Raster ArcGIS tool. The raster was filled using the ArcGIS fill tool and the building was masked using the ArcGIS extract by mask tool and KEEP\_LC2015\_Mask\_Final\_200.shp file.*

8.7.4 flowdir\_200

*Flow direction throughout the KEEP property and 200m buffer created from the topotor\_fm\_200 file using the flow direction ArcGIS tool.*

8.7.5 flowacc\_200

*Flow accumulation throughout the KEEP property and 200m buffer created from the flowdir\_200 file using the flow accumulation ArcGIS tool.*

8.7.6 flowacc\_lg\_200

*Log base 10 calculation of the flowacc\_200 file using raster calculator to visualize the flow throughout the property better.*

8.7.7 basin\_200

*Draining basins throughout the KEEP property and 200m buffer created from the flowdir\_200 file using the basin ArcGIS tool.*

8.7.8 ParkingLot\_PourPoints

*Point shapefiles created to represent one 1 sq. ft. collection area for the parking lot tank scenario.*

8.7.9 watershed\_union\_PL

*Watershed of the parking lot created using the watershed ArcGIS tools with the ParkingLot\_PourPoints, and flowdir\_200 raster as inputs. Each individual watershed for each pour point was then combined using the union ArcGIS tool and merged into one feature.*

8.7.10 Contours\_300.shp

*1 foot contours clipped to 300 m buffer around KEEP and projected from SEMCOG contour data for Washtenaw County.*

8.7.11 KEEP\_LC2015\_Mask\_Final\_300.shp

*Mask used to remove the building from the surface raster of property and 300m buffer created using the KEEP\_LC2015 file and a 300m buffer.*

8.7.12 topotor\_fm\_300

*A surface raster of the property created from the Contours\_300.shp using the Topo to Raster ArcGIS tool. The raster was filled using the ArcGIS fill tool and the building was masked using the ArcGIS extract by mask tool and KEEP\_LC2015\_Mask\_Final\_300.shp file.*

8.7.13 flowdir\_300

*Flow direction throughout the KEEP property and 300m buffer created from the topotor\_fm\_300 file using the flow direction ArcGIS tool.*

8.7.14 flowacc\_300

*Flow accumulation throughout the KEEP property and 300m buffer created from the flowdir\_300 file using the flow accumulation ArcGIS tool.*

8.7.15 flowacc\_lg\_300

*Log base 10 calculation of the flowacc\_300 file using raster calculator to visualize the flow throughout the property better.*

8.7.16 basin\_300

*Draining basins throughout the KEEP property and 300m buffer created from the flowdir\_300 file using the basin ArcGIS tool.*

8.7.17 NorthPond\_PourPoints

*Point shapefiles created to represent one 1 sq. ft. collection area for the north pond tank scenario.*

8.7.18 watershed\_soils\_union\_NP

*Watershed of the north pond created using the watershed ArcGIS tools with the NorthPond\_PourPoints, and flowdir\_300 raster as inputs. Each individual watershed for each pour point was then combined using the union ArcGIS tool*

*and merged into one feature. The watershed was then combined with the SSURGO soils file using the Union ArcGIS tool.*