

Texas Foundation for Identifying Species Habitats

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Prepared by Tx FISH

Project Background/Problem Statement





Background

• Fishes of Texas project



Image from www.utexas.edu/tmm/tnhc/

Texas Natural History Collections



Image from www.tpwd.state.tx.us/

Texas Parks and Wildlife



• Ben Labay, Tx FISH client from TNHC

- Received a Bachelor's degree in biology at the University of Texas at Austin in 2002
- Recently received his Master's degree in ? from Texas State University



PROBLEM STATEMENT

- Convert massive amounts of data (8 GB) to raster files
- Place all rasterized layers into a geodatabase
- Run suitability models with layers and fish location data points





HYDROLOGIC DATA

• Horizon Systems Corporation's National Hydrography Dataset Plus website (NHDPlus).

- Shapefiles for 3 regions:
 - Region 11 Mississippi Region
 - Region 12 Texas Gulf Region
 - Region 13 Rio Grande Region





- The three main regions of data Tx FISH collects will have to be merged into one database.
- Raster files will be created for each attribute of interest.
- Set up a geodatabase.

Features to Raster							
Input features:	domeout 💽 🖻						
Field:	Value						
Output cell size:	10						
Output raster:	F:\dgndata\maximum\kriging\k						
	OK Cancel						

Image from www.geo.mtu.edu

FISH LOCATION DATA

Collected from Ben Labay at TNHC

- 3 fish species
- Known latitude and longitude point locations throughout the 3 regions
 - Scientists catch the fish, mark their location through GPS, release the fish back into their habitat
- Used along with hydrologic data to create Suitability Model for identified species.



Allow better prediction of fish locations Allow better protection of endangered fish species



Image from www.bio.txstate.edu



Image from www.bio.txstate.edu



Image from www.tpwd.state.tx.us







Regional Data

- Over 320,000 features spanning 3 regions, covering all or parts of 8 states
 - Features joined with those in 4 other databases, also from NHDplus:
 - Catchment Attributes NLCD
 - Catchment Attributes Temperature Precipitation
 - Flowline Attributes Flow
 - Flowline Attributes Temperature Precipitation



Individual Layer Data

- Use the data collected and rasterize layers for each group of attributes
 - Slope
 - Temperature
 - Precipitation
 - Flow
 - Urban
 - Forest
 - Agriculture
 - Wetlands
- Resulted in 28 individual layers to reclassify



















Pasture/Hay Map for Regions 11,12, and 13







Suitability Models

- Take point locations provided by Ben Labay and run model in ArcGIS
 - Pugnose minnow, Channel Catfish, Guadalupe Bass





Criteria

Urban	Forest	Agriculture	Flow
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Criteria



Creating Point Layer of Fish Occurrences





map by TxFISH created April 26, 2010

Extract Values to Points



Extract Values to Points

Obtain max/min value from attribute table

 Attrib	utes of tmp	pt						×	
FID	Shape *	NAME	LONG	LAT	RASTERVALU			*	
144	Point	Micropterus treculii	-99.421782	29.986074	174.920807			=	
143	Point	Micropterus treculii	-99.397971	30.005144	175.304504			-	
28	Point	Micropterus treculii	-99.78189	29.835618	175.930695				
118	Point	Micropterus treculii	-99.35531	30.077701	175.996597				
117	Point	Micropterus treculii	-99.34572	30.081181	176.148193				
20	Point	Micropterus treculii	-99.169385	30.059292	176.708603				
5	Point	Micropterus treculii	-99.175105	29.961426	176.781494				
166	Point	Micropterus treculii	-99.123584	30.019084	176.985901				
35	Point	Micropterus treculii	-99.120464	30.014094	177.673599				
122	Point	Micropterus treculii	-99.118204	30.011804	177.673599				
138	Point	Micropterus treculii	-99.118204	30.011804	177.673599				
155	Point	Micropterus treculii	-99.118204	30.011804	177.673599				
126	Point	Micropterus treculii	-99.108744	29.984735	177.699997				
163	Point	Micropterus treculii	-100.752799	31.155894	179.278793				
12	Point	Micropterus treculii	-100.450052	31.467145	179.631607				
6	Point	Micropterus treculii	-99.024981	29.934087	179.720993				
7	Point	Micropterus treculii	-99.049232	29.924657	179.720993				
14	Point	Micropterus treculii	-99.291298	29.797751	179.869705				
34	Point	Micropterus treculii	-99.036492	29.947106	179.925995				
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Repeat for each of the 16 rasters

Reclassify Rasters



created April 26, 2010



Suitability Model







Final Products

Geodatabase



Suitability Models











Questions?

