

Category: Ecosystem Health
Indicator: River Fragmentation

Methodology

River Fragmentation is an indicator of the impact of large dams on river network connectivity in Texas river basins. We measured this indicator by mapping patches of connected river network and portions of river basins that connect downstream to the Gulf of Mexico with no dams.

To create these maps, we used data provided by Arthur Cooper at Michigan State University that was developed in support of the National Fish Habitat Partnership. He analyzed data on dams and river networks throughout the United States to evaluate the degree of river fragmentation (Cooper 2013) using the National Anthropogenic Barrier Dataset (based off of the Army Corps of Engineers' National Inventory of Dams linked to the National Hydrography Dataset Version 1; Cooper et al., in review). He provided TNC selected metrics from his analysis and we include two of these as maps in this indicator. First, we include "river fragment" (or Artificial Habitat Patch) length to identify the areas of intact stream network between large dams. Second, we include distance to downstream mainstem dam because it highlights the areas that have no downstream large dam and are therefore open migration corridors to bays, estuaries and the Gulf of Mexico.

The maps of River Fragmentation in the map viewer were created by joining these data to the NHD Plus medium resolution. We created map legends based on order of magnitude breaks in the range of lengths in both metrics.

Caveats

This analysis is based on the National Inventory of Dams which includes most large dams in the United States, but drastically under-represents smaller dams in some areas. As a result, this indicator reflects the fragmentation of Texas' river network primarily by larger dams and underestimates the effects of smaller dams. It also does not reflect fragmentation of river networks by other features such as improperly designed highway and road crossings.

Nonetheless it does reflect the areas of Texas with the most intact river network and the areas of coastal rivers open to the Gulf of Mexico.

Data Sources

Cooper, A.R. 2013. Effects of dams on streams of the conterminous United States: Characterizing patterns in habitat fragmentation nationally and fluvial fish response in the Midwest. MS Thesis. Michigan State University. 142 pp. Data provided to TNC on May 20, 2014. <http://etd.lib.msu.edu/islandora/object/etd%3A2191>

Texas Water Explorer

Methodology

Dam Metrics Representing Stream Fragmentation and Flow Alteration for the Conterminous United States Linked to the NHDPLUSV1

<https://www.sciencebase.gov/catalog/item/58a60b88e4b057081a24f99d>

National Hydrography Dataset Plus (NHDPlus) Version 1. Medium-resolution 1:100,000.

http://www.horizon-systems.com/NHDPlus/NHDPlusV1_data.php