

Category: Ecosystem Health

Indicator: Invasive Species Assessment

Methodology

Invasive Species Assessment is an indicator of the potential impact of invasive aquatic species on aquatic ecosystems and ecosystem services. We measured this indicator by identifying and mapping the locations of occurrence across the state of the invasive aquatic species with the most potential impact to aquatic ecosystems. This indicator began with selection of a set of invasive species that represent the greatest threats to aquatic ecosystems and ecosystem services in Texas. The selected species include eight fishes, four invertebrates (mollusks and crustaceans) and eight plants (Table 1). Species were selected by TNC based on input from advisory council members and other experts from Texas Parks and Wildlife Department, the University of Texas and others. Selections focused on species that have been introduced to Texas or introduced from a native range in Texas into other river basins. The list does not include all invasive species in Texas and may exclude some with localized impact to individual ecosystems. List also excludes some wide-ranging exotic species (e.g., common carp, Asian clam) that are judged to generally not be highly impactful to ecosystems.

Table 1. Invasive species included in the Invasive Species Assessment

Taxonomic Group	Common Name	Scientific Name
Fishes	grass carp	<i>Ctenopharyngodon idella</i>
	sheepshead minnow	<i>Cyprinodon variegatus</i>
	bighead carp	<i>Hypophthalmichthys nobilis</i>
	suckermouth catfish	<i>Hypostomus plecostomus</i>
	suckermouth catfish	<i>Hypostomus</i> sp.
	redbreast sunfish	<i>Lepomis auritus</i>
	smallmouth bass	<i>Micropterus dolomieu</i>
	blue tilapia	<i>Oreochromis aureus</i>
	Invertebrates	zebra mussel
red-rim melania		<i>Melanoides tuberculatus</i>
giant applesnail		<i>Pomacea maculata</i>
Asian clam		<i>Corbicula fluminea</i>
Plants	hydrilla	<i>Hydrilla verticillata</i>
	giant salvinia	<i>Salvinia molesta</i>
	water lettuce	<i>Pistia stratiotes</i>
	water hyacinth	<i>Eichornia crassipes</i>
	alligatorweed	<i>Alternanthera philoxeroides</i>
	giant reed	<i>Arundo donax</i>
	saltcedar	<i>Tamarix</i> spp.
	elephant ear	<i>Colocasia esculenta</i>

The data for the invasives assessment were gathered from a variety of datasets at several scales of resolution and summarized to the USGS sub-basin level. Databases utilized were the US

Texas Water Explorer

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Geological Survey Nuisance Aquatic Species (NAS) database (for fishes and other animals), the University of Texas Fishes of Texas (FOTX) database (fishes), Texasinvasives.org (plants), the TPWD invasives plants database (plants) and the Early Detection and Distribution Mapping System (EDDMapS) database (plants). Data were downloaded for each selected species then localities were assigned to HUC8's in a GIS using spatial join.

Occurrence of each species is noted in the GIS data for the maps. Data is summarized into 3 maps: total number of selected invasives, number of selected invasive animals and number of selected invasive plants.

Data Sources

U.S. Geological Survey. Nonindigenous Aquatic Species database. <http://nas.er.usgs.gov/>

University of Texas. Fishes of Texas database. Data provided to TNC on October 29, 2014. <http://www.fishesoftexas.org/home/>

Texasinvasives.org partnership. <http://texasinvasives.org/>

Texas Parks and Wildlife Department invasive plants database. Provided to TNC on September 23, 2014.

Early Detection and Distribution Mapping System. <http://www.eddmaps.org/>