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DATABASE DEVELOPMENT FOR EVALUATION OF HISTORICAL TRENDS IN FISH COMMUNITIES OF THE TRINITY RIVER, TX.

George Guillen, Dianna Ramirez, and Danielle Crossen

Environmental Institute of Houston and School of Science and Computer Engineering, University of Houston Clear Lake, Houston, Texas 77058

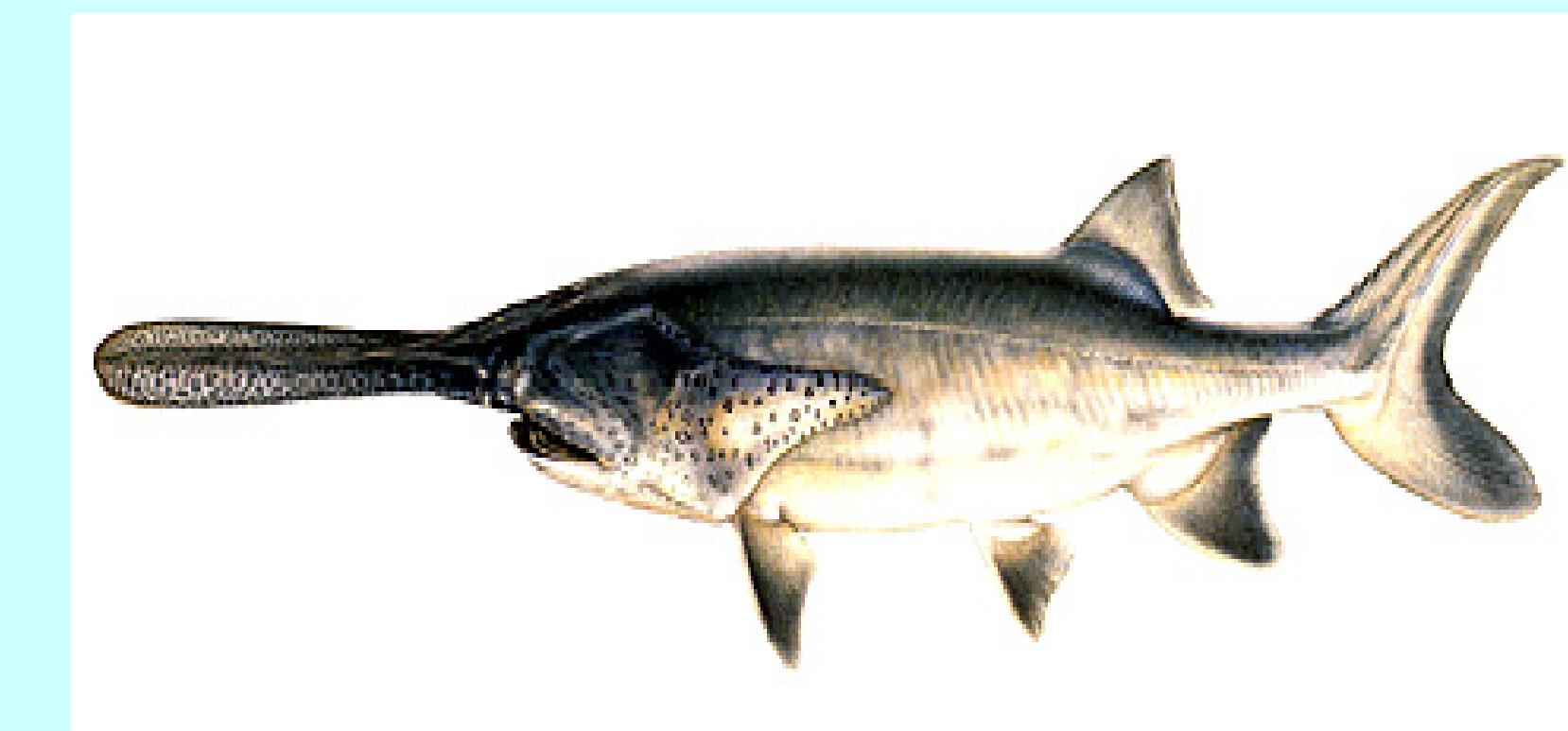
Abstract

During 2007 we initiated a multi-year project funded by the Trinity River Authority (TRA) and Texas Commission on Environmental Quality (TCEQ) Clean Rivers Program (CRP) to evaluate trends in Trinity River fish populations and communities. Our goal during the first year of the project was to develop a comprehensive database that could be used to evaluate historical trends in fish communities in the Trinity River. During the first year of this project we combined and analyzed existing government and published data sets in Trinity River fish populations. An Access® ODBC compliant database and EndNote® annotated bibliography were created. After extensive review of academic, government and published literature we were able to identify a total of 88 references including 68 government publications, 15 Journal articles and 5 dissertations and theses. All major university libraries in Texas were searched. Extensive interviews with regional and headquarter biologists from both the TCEQ and TPWD were conducted. All 88 publications were scanned into PDF format files. A total of 103 species were identified. The database contains location and time of collection, gear used, effort, species collected or observed, catch or catch per unit effort, and numbers of species/taxa. Future revisions will include water quality and hydrological data. This database and annotated bibliography will facilitate future studies of Trinity River fish communities. Future revisions are likely as new studies are published and/or past reports discovered and located.

Table 1: List of fish collected from the Trinity River according to references cited in our database

Species Name	Species Name
POLYODON SPATHULA	ICTALURUS FURCATUS
ATRACTOSTEUS SPATULA	ICTALURUS PUNCTATUS
LEPISOSTEUS OCULATUS	NOTURUS GYRINUS
LEPISOSTEUS OSSEUS	NOTURUS NOCTURNUS
LEPISOSTEUS PLATOSTOMUS	PYLODICTIS OLIVARIS
AMIA CALVA	ESOX AMERICANUS
ANGUILLA ROSTRATA	APHREDODERUS SAYANUS
ANCHOA MITCHILLI	MUGIL CEPHALUS
ALOSA CHRYSOCHLORIS	LABIDESTHES SICCULUS
BREVOORTIA GUNTERI	MENIDIA BERYLLINA
BREVOORTIA PATRONUS	MENIDIA PENINSULAE
DOROSOMA CEPEDIANUM	FUNDULUS CHRYSOTUS
DOROSOMA PETENENSE	FUNDULUS DISPAR
CAMPOSTOMA ANOMALUM	FUNDULUS NOTATUS
CARASSIUS AURATUS	FUNDULUS OLIVACEUS
CYPRINELLA LUTRENSIS	GAMBUSIA AFFINIS
CYPRINELLA VENUSTA	CYPRINODON VARIEGATUS
CYPRINUS CARPIO	MORONE CHRYSOPS
HYBOGNATHUS NUCHALIS	MORONE MISSISSIPPIENSIS
HYBOGNATHUS PLACITUS	MORONE SAXATILIS
LYTHRURUS FUMEUS	MORONE SAXATILIS X CHRYSOPS
LYTHRURUS UMBRATILIS	AMBLOPLITES RUPESTRIS
NOTEMIGONUS CRYSOLEUCAS	LEPOMIS AURITUS
NOTROPIS AMABILIS	LEPOMIS CYANELLUS
NOTROPIS ATHERINOIDES	LEPOMIS GULOSUS
NOTROPIS ATROCAUDALIS	LEPOMIS HUMILIS
NOTROPIS BLENNIUS	LEPOMIS MACROCHIRUS
NOTROPIS BUCHANANI	LEPOMIS MARGINATUS
NOTROPIS FUMEUS	LEPOMIS MEGALOTIS
NOTROPIS SABINAE	LEPOMIS MICROLOPHUS
NOTROPIS SHUMARDI	LEPOMIS MINIATUS
NOTROPIS STRAMINEUS	LEPOMIS SYMMETRICUS
NOTROPIS TEXANUS	MICROPTERUS DOLOMIEU
NOTROPIS UMBRATILIS	MICROPTERUS PUNCTULATUS
NOTROPIS VOLUCELLUS	MICROPTERUS SALMOIDES
OPSOPOEODUS EMILIAE	MICROPTERUS SALMOIDES (FLORIDA)
PHENACOBIVUS MIRABILIS	POMOXIS ANNULARIS
PIMEPHALES PROMELAS	POMOXIS NIGROMACULATUS
PIMEPHALES VIGILAX	ETHEOSTOMA CHLOROSOMA
SEMOTILUS ATROMACULATUS	ETHEOSTOMA GRACILE
CARPIODES CARPIO	ETHEOSTOMA PROELIARE
ERIMYZON OBLONGUS	ETHEOSTOMA SPECTABILE
ERIMYZON SUCETTA	PERCINA CAPRODES
ICTIOBUS BUBALUS	PERCINA SCIERA
ICTIOBUS CYPRINELLUS	PERCINA MACROLEPIDA
ICTIOBUS NIGER	SANDER VITREUS
MINYTREMA MELANOPS	APLODINOTUS GRUNNIENS
MOXOSTOMA CONGESTUM	LEIOSTOMUS XANTHURUS
ASTYANAX MEXICANUS	OREOCHROMIS AUREUS
AMEIURUS MELAS	PARALICHTHYS LETHOSTIGMA
AMEIURUS NATALIS	TRINECTES MACULATUS
AMEIURUS NEBULOSUS	

TRINITY RIVER FISH STUDY DATABASE ENTRY V.1



Record Number: Lat:

Literature Citation: Long:

Reservoir Y/N:

Year Started: Duration (yr): Estimated river mile:

Species Name: Waterbody Name:

Catch: CPUE: Waterbody Code:

Number of Species: County:

Collection Method: Comments:

Effort:

Temp. (C): Sp. cond. (uS):

pH: DL DO: DO (mg/l): DL SD: Secchi (cm):

DL Vel: Velocity (f/s): DL Flow: Flow (cfs):

Figure 2: Example of Trinity River database data entry screen including variables included in the database.

Future Planned Work

During the final phase of the project we will attempt to conduct a time series analysis of various population and community parameters including catch per unit effort, numbers of species, and related community indices. Other available water quality and biological data sets will be incorporated into the database. Published graphical data, not previously available in tabular or digital format, will be extracted using data capture and mining software from scanned images of original reports and queried to develop a more comprehensive data set.

Data will be evaluated on an annual and seasonal basis in addition to analysis of geospatial patterns. This analysis will be used to determine if there is any relationship between observed patterns in water quality/hydrological variables and fish community structure. This will potentially provide resource managers and regulatory agencies a powerful tool for evaluating the impact of past future projected changes in the watershed on native fish populations and community structure.

Acknowledgments

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For further information

Please contact guillen@uhcl.edu. More information on this and related projects can be obtained at <http://sce.uhcl.edu/guilleng>

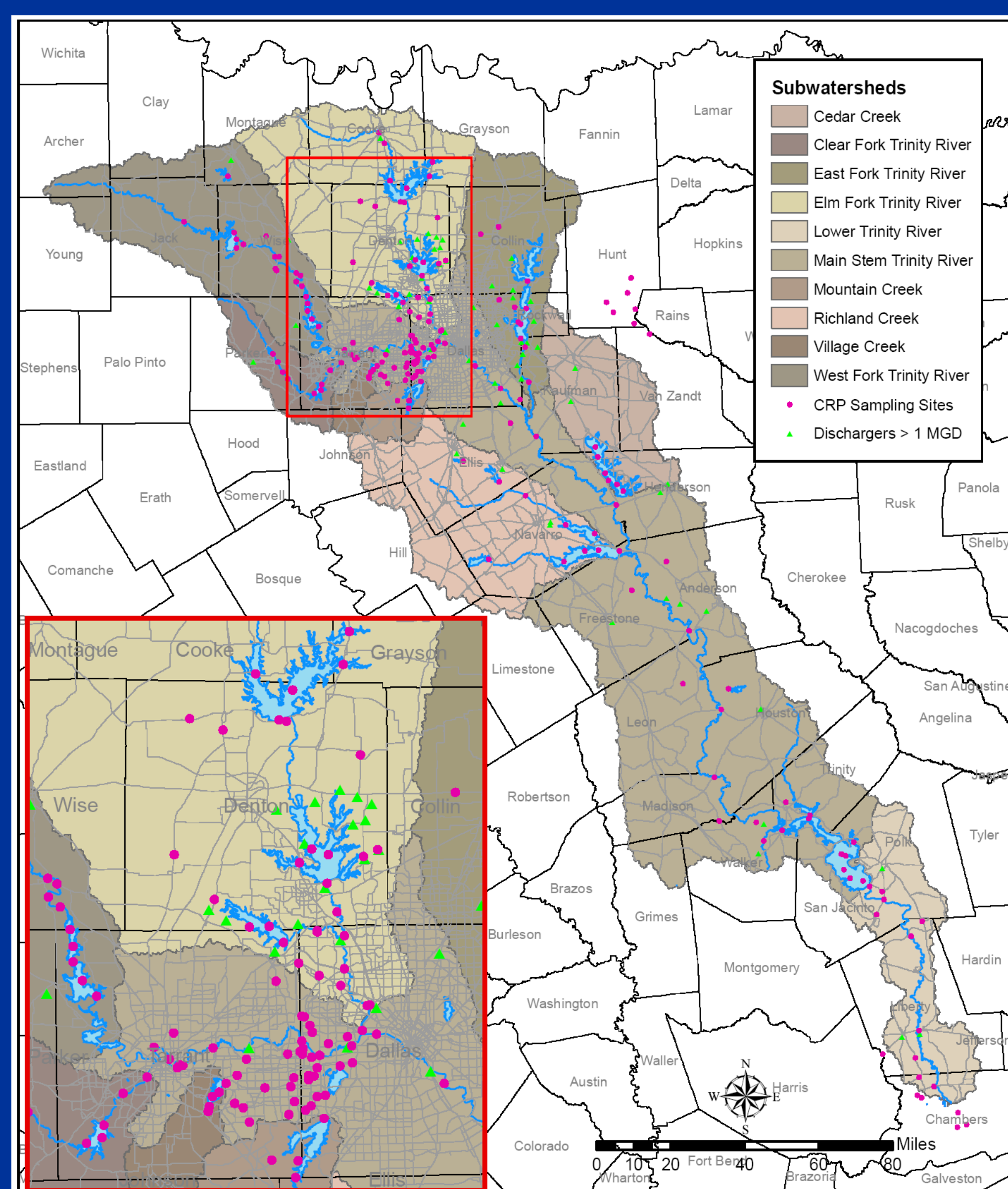


Figure 1: Trinity River Basin. Map courtesy TRA CRP Program