Kansas Aquatic Gap Workshop 16 November 2001
Meeting Summary

Overview of Aquatic Gap Program (Keith Gido, Kansas State University)

Primary objective of Aquatic Gap:
1) Provide a framework for mapping and analyzing aquatic ecosystems in a terrestrial context.
2) Develop methods for categorizing aquatic management and condition from in-stream and terrestrial management influence.
3) Identify at-risk systems and elements.
4) Identify opportunities for cooperative conservation and restoration.
5) Build on existing cooperator activities and serve as an integrating program.

Overview of terrestrial Gap Program in Kansas (Todd Hoernemann, Kansas Cooperative Fish and Wildlife Research Unit)

Relational database (MS Access); organize data; minimize data input error; used land cover vegetation map; model accountability; review model; regionalization; flexible so can be updated.

Habitat associations- land cover data; searchable form, vegetation, habitat, soil.

Used literature to set habitats (i.e., land cover) where all species are found. Access database to search though. Want to create web based accessibility

FISHNET/Species Analyst (Ed Wiley, University of Kansas)

On-line data acquisition from The Species Analyst is the software, used by partners to make FISHNET
FISHNET consortium of 23 natural history museums. Uses z3950 (soon updated to XML) protocols able to access data from a variety of software types and coordinate a variety of data locations. Can be downloaded in a variety of forms.

Fish data available from many museums worldwide, many Kansas data points are in other museums.

Once a collection is on the web, anybody in world can get at data

Modeling species habitat for North American Freshwater Fishes and Mussels (Kris McNyset, University of Kansas)

Genetic Algorithm for Rule-set Predictions (GARP), gives distributional prediction based on ecological variables. GARP gives a series of rules that defines species niche relative to information that you have provided. Can predict occurrence of species based on

known distribution. Worked well for about 10 fish and for mussels several mussel species in Kansas.

What types of data are available?

University of Kansas, Natural History Museum (Ed Wiley)
Fish distributions for Kansas available through Species Analyst
- Species Analyst will search databases for any taxa that a museum has online records (potentially some mussel data?)

Kansas Department of Wildlife and Parks Stream Survey (Chris Mamoliti and Kristen Mitchell)
Stream survey data from 1970s. Data quality is questionable.
Stream survey from 1994 – 2001. 600 sample sites, including Ecoregion reference sites.
Fish collections - Voucher specimens are housed at Ft. Hays and University of Kansas, Natural History Museum
Mussel collections – Distinguished between live and dead (shell only)
Benthic Macroinvertebrates – Identified to family, maybe genera
Physical Habitat –
Fish Tissue for contaminants – Data available in STORET?
All KDWP data is available in MS Acess at the Pratt office

Kansas Department of Health and Environment (Bob Angelo)

Stream Chemistry Monitoring
Various water chemistry variables measured at sites since 1960s. Since 1990, 300 sites have been sampled.
GIS coverage based on RF3 (approx. 200 stream segments > 3rd order streams)

Stream Biological Monitoring
Macroinvertebrates samples at 175 sites
Specimens identified to lowest taxonomic level (approx. 700 taxa)
Reference collection is available, some are archived
Data is online

Unionid Mussel Program
Since 1980s, sampled 200 – 250 sites
Approx. 5500 Voucher specimens
Abundance and qualitative data available. Distinguished between live, recent, and relict specimens based on shell condition.
Data available in Quatro Pro Spreadsheet format.

Fish Tissue
Tissue samples taken up and downstream of cities and analyzed for contaminants (e.g., metals)

Ground water monitoring
Approximately 300 wells in the state

Compliance monitoring for point sources (e.g., feedlot, commercial, industrial, municipal sources). All georeferenced.

Lakes Program
Monitor approximately 300 lake, wetland, and reservoir sites
Same variables as stream chemistry surveys along with added limnological parameters (e.g., phytoplankton, depth profiles).
Samples taken on 3 – 5 year rotation.

Forh Hays University, Museum of Natural History (Bill Stark and Mark Eberle)

Fish and mussels data from 1994-2000 KDWP surveys
Various basin surveys
Fish location data in SPECIFY data base
Most locality data in township/section/range

Kansas Biological Survey. Natural Heritage Inventory (Jennifer Delisle)

Georeferenced data for rare and endangered species that was compiled from other sources.
Historical and current data.
487 locations for mussels, all live specimens
689 locations for fish.
Data has been checked for quality, but only provided at low resolution for public

Emporia State University (Dave Edds)
Wichita State University
Pittsburgh State University (Joe Arruda)

Small collections of fish and invertebrates (e.g., 1960s collection of mussels by Branson)
Likely needs to be entered in a database

Kansas Department of Wildlife and Parks Harves and Creel Data (Tom Mosher)

Harvest and creel data from 1979 to present
Data available in MS Access

EPA non-point source surveys 1980s – 1990s

Sampled Fish and Macroinvertebrates across state (Vernon Tabor worked on this project)

Potential GIS layers that are of importance

       Impoundments
       Points of water diversion
       Wetlands
              Many rare species use wetlands and spring seeps (e.g., Arkansas darter, Flat Floater, snail spp?)
       Geomorphological Data for the state
              Contact Brock Emmert at Kansas Water Office

Potential Uses of GAP

Identify priority watersheds – identify watersheds for conservation efforts
       The Nature Conservancy - Particularly important for headwater species. Need fine scale (e.g., Hydrologic Unit Code (HUC) 14 or valley segments)
       NRCS - Identify priority watersheds for conservation reserve program (CRP).
       U.S. Fish and Wildlife Service – use Gap to identify priority watersheds for reintroduction of Tand E species, define where historically present.
       Land owner incentive programs – Tax credits and Partners for fish and wildlife. Landowners can receive benefits for applying conservation practices on their land to benefit wildlife.
       State Conservation Commission, Buffer Initiative. Identify segments to conserve riparian zones.
       Aquatic Gap can be used to define critical habitat for aquatic organisms
       Kansas Water Office. Identify priority areas.
       Riparian Wetland Alliance. Private conservation organization that promotes the conservation of riparian zones.

Clean Water Act – designate aquatic life support for various water bodies. Could help determine which stream segments need managed.

Predicted Distributions of Biota – When reviewing impact studies can use predicted distributions when it is not possible to visit site. Can filter projects that are in need of conservation.
       Exotic species invasions – Identify potential areas of invasion (e.g., zebra mussel expansion)

Kansas Department of Wildlife and Parks – Stream lease program. Lease stream segments for sport fishing. Could use gap to look at potential distribution of sport fishes.

Integration of physical, chemical, and biotic data from various state agencies and institutions for the common goal of conservation of aquatic resources.

Use species distribution may be used to predict water quality

Education tool -

Easily accessed data can aid in aquatic ecosystem research. Numerous ecological questions dealing with conservation biology, general ecology, or zoogeography can be answered with Gap.

Site selection – Sample locations for new projects can use Gap to help locate areas with particular species diversity, composition, or physical and chemical information.

General Comments and Concerns

Need to be careful about providing locality data to public.
    May attract people to sites with endangered species
    Land-owners may have negative reaction

Placement of a server at Ft. Hayes would allow easy access to KDWP voucher specimens held at the museum.

List of participants and e-mail

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