Appendix: Database Descriptions

For specific information regarding database structure and system requirements, please link to "Database
Descriptions and Metadata" from the Virginia Fish and Wildlife Information Service online at
www.vafwis.org.

Anadromous Fish Use Reaches

Description

Anadromous fish have an interesting life history. They spend much of their lives in saltwater, migrate to freshwater to spawn, and after hatching live for a brief period in fresh water before moving out into the oceans. The anadromous fish species in Virginia are typically repeat spawners. They may swim upstream, spawn, and return to sea for several consecutive years. Stocks of anadromous fish have declined dramatically in recent decades. Many efforts are underway to conserve and to restore these species. This dataset is intended as a tool to assist in those efforts.

This dataset identifies stream reaches that are confirmed or potential migration pathways, spawning grounds, or nursery areas for anadromous fish. The species included in this assessment are alewife, blueback herring (*Alosa aestivalis*), American shad (*A. sapidissima*), hickory shad (*A. mediocris*), striped bass (*Morone americana*), and some populations of yellow perch (*Perca flavescens*). Certain time-of-year restrictions apply to areas used by anadromous fish. Data associated with each reach include stream name, reach length, species confirmed in the reach (if applicable), watershed, and upstream boundary. Upstream boundaries were established at impediments or where habitat became unsuitable.

References Cited:

McIninch, S.P. and G.C. Garman. 1999. The anadromous clupeid fishers of the Chesapeake Bay. An evaluation of essential habitat and barriers to migration in the Rappahannock River basin. Final Project Report to VA Dept. Game & Inland Fisheries, Richmond, VA.

Personal communications with Virginia Department of Game and Inland Fisheries biologists and staff, 2000-2002.

Virginia Department of Game and Inland Fisheries. Collections database from VA Fish and Wildlife Information Service.

Breeding Bird Atlas

Description

The Virginia Breeding Bird Atlas Project (BBA) was conducted between 1984 and 1989 as a 5-year cooperative survey between the Virginia Department of Game and Inland Fisheries (VDGIF) and the Virginia Society of Ornithology (VSO), and funded by VDGIF. The purpose of the Atlas was to evaluate the status and distribution of breeding birds across the state. The Virginia BBA followed standard protocols of Atlas projects conducted in other states. Each quadrangle was divided into 6 blocks: NW, NE, CW, CE, SW, and SE. At least one block (the "priority" block, usually the southeast block) of every quadrangle was inventoried at least once during the 5-year project period.

Volunteers recorded all species observed during an inventory, as well as the breeding activities they were observed engaging in. The numerous breeding codes were categorized into four classes: observed, possible, probable, and confirmed. Species observations that occurred outside of the species' known range were verified by Atlas Regional Coordinators or Atlas Project Coordinators. Species initially noted as confirmed breeders outside of traditionally accepted "safe dates" were also verified by Atlas Regional Coordinators or Atlas Project Coordinators.

After the observation data were entered into the BBA database, the Atlasers were asked to verify the entries, and their records, through a verification mail-out. Database corrections were then made by Atlas Project staff. Upon completion of the project, an independent committee of VSO members reviewed and evaluated the species records, making some modifications as supported by team members.

Breeding Bird Survey

Description

The Breeding Bird Survey (BBS) is an ongoing cooperative program sponsored jointly by the U.S.GS Patuxent Wildlife Research Center and the Canadian Wildlife Service. Its main purpose is to estimate population trends of the many species of birds that nest in North America north of Mexico and that migrate across international boundaries. This survey provides information, both locally by ecological or political regions and on a continental scale, on (1) short-term population changes that can be correlated with specific weather incidents, (2) recovery periods following catastrophic declines, (3) normal year-to-year variations, (4) long-term population trends, and (5) invasions of exotics. The BBS data may also be used for detailed computer mapping of relative abundance of each species, either year by year, to show changes in distribution and relative abundance, or over a period of years to show average abundance by region. The BBS provides base-line data with which more intensive local studies can be compared.

The data found in this system have been provided by the National Biological Service (formerly U.S. Fish and Wildlife Service) Office of Migratory Birds in Patuxent, Maryland. This system is updated annually as data are made available from the national program.

Biota of Virginia (BOVA)

Description

     This database was created through a review of the peer-reviewed literature, taxonomic expert communications, and database records for all native and naturalized species of Virginia. Included in the literature review is information on the taxonomy, life history, distribution, management practices, food habits and habitat associations for each species in our database. You will notice that all of the referenced literature is cited using a system of numbers encapsulated in asterisks. You may view all of this information for a particular species by using the "species information" function, or by clicking on the hyperlinks provided on each report. These hyperlinks (blue species common name) will direct you to the species information.

     Initial support for developing the system was provided by the Office of Surface Mining, the Bureau of Land Management and Virginia Polytechnic Institute and State University. Development of BOVA followed "A Procedure for Describing Fish and Wildlife" developed with the U.S. Fish and Wildlife Service's Eastern Energy and Land Use Team. The Virginia Department of Game and Inland Fisheries is the lead agency in developing the faunal database. Because this is the database of information that is used to determine where in Virginia the species is known or likely to occur, you will often see it referenced on reports generated in the Virginia Fish and Wildlife Information Service.

Chapter Descriptions

(for information on the codes used in each chapter, please refer to the "data descriptions and metadata" section of the Virginia Fish and Wildlife Information Service at www.vafwis.org or contact Amy Martin, Online Service Coordinator at 804-367-2211 or by email at amartin@dgif.state.va.us)

Taxonomy: This chapter of the booklet contains, for each species, the taxonomic information from Phylum to Subspecies (if applicable). It also includes the taxonomic authority for this information, comments about the taxonomy, references used to compile taxonomic information and the BOVA number assigned to the species.

Status: This chapter contains, for each species, its given legal, economic and biological status. Included in this chapter are comments about the status as well as the references used to compile information about the status.

Life History: This chapter contains, for each species, information about its physical description, reproduction, behavior, origin, limiting factors, population parameters, and aquatic and terrestrial associations. Also contained here are any comments about the life history, and the references used to compile the life history information.

County Occurrence: This chapter contains, for each species, information about its county level occurrence within Virginia. This chapter displays information about the species general occurrence (known or likely), resident occurrence (known or likely) and seasonal occurrence (year round or per season). Also included in this chapter are comments about the general, resident and seasonal occurrence for the species and the references used to compile this information.

County Abundance: This chapter contains, for each species, information about the relative abundance of the species within the above counties in Virginia. Abundance is coded as "abundant", rare/accidental, or unknown. This chapter also includes comments about the species abundance and the references used to compile the information about abundance.

Distribution within Administrative Units: This chapter contains, for each species, its distribution within various administrative units (refuges, districts, parks, wildlife management areas, 7.5' quadrangles, physiographic provinces, ecoregions) in Virginia. If the unit is included in the chapter, it means that the species in known or likely to occur within that unit.

Management Practices: This chapter contains, for each species, a list of existing, adverse and beneficial management practices. This chapter also includes comments about these management practices as well as a list of the references that were used to compile these lists.

Food Habits: This chapter contains, for each species, a description of the trophic level of the species, general comments about the food habits at various life stages of the species and the references used to compile this information.

Habitat: This chapter contains, for each species, information about the habitat utilized by the species both generally and at various life stages. The information in this chapter includes preferred land use, Society of American Foresters (SAF) forest classifications, general habitat preferences, National Wetland Inventory (NWI) classifications preferred by the species and its associations with other animals and plants. Also included in this chapter are comments about

the habitat(s) utilized by the species and the references used to compile information about the habitat preferred by the species.

Environmental Associations: This chapter contains, for each species, associations found between it and the environment (water flow, soil properties, aspect, wetlands, vegetation, humans. etc.) at various life stages. Also contained in this chapter are the comments and references associated with this information about the species environmental associations.

References: This chapter includes a list of all references used to compile the information found in each chapter of the booklet for the species.

The Christmas Bird Count (CBC)

The Christmas Bird Count (CBC) is an early-winter bird survey conducted throughout North America, and in parts of Central and South America. The survey is sponsored by the National Audubon Society, which publishes the results in <u>American Birds</u>. The CBC survey dates refer to the year they were published, which is in January of the count period. The sample area for each count is a circle with a diameter of 15 miles. Varying numbers of volunteers count the birds seen within the circle during a single day within 2 weeks of December 25. There are over 1,500 CBC circles and 40,000 participants in the survey. Although the CBC was started in 1900, this database contains CBC records collected during the period from 1959 though the present. The data, as well as trend analysis and relative abundance information, are also available from the Audubon Christmas Bird Count web site at <u>http://www.mbr.nbs.gov/bbs/cbc.html</u> (Sauer et al., 1996).

The data for survey years 1963 through 1972 were computerized by Carl Bock of the University of Colorado. These records are different from the remainder because (1) they include weather information and (2) numbers greater than 99 were truncated to aid in data storage (e.g., 109 was stored as 100, 199 was stored as 190, 1099 was stored as 1000, 1250 was stored as 1200, and 10,999 was stored as 10,000). The remaining records were computerized by John Shipman of Zoological Data Processing in Socorro, New Mexico. These records include data on owling and feeder watches, but do not include weather observations (Hoover, undated).

While there are a lot of observers and a lot of CBC circles, the observers vary greatly in skill level. In addition, the circles are not randomly distributed across North America, so the data may be biased by higher sample sizes in some areas. However, the CBC provides valuable wintering data that compliments the breeding season data collected in the Breeding Bird Survey and the Breeding Bird Atlas.

<u>References Cited</u>

Hoover, Brett A. Undated. Handout entitled <u>Christmas Bird Count Database.</u> National Biological Survey, Inventory & Monitoring, Laurel, MD.

Sauer, J. R., S. Schwartz, and B. Hoover. 1996. <u>The Christmas Bird Count Home Page</u>. Version 95.1. Patuxent Wildlife Research Center, Laurel, MD.

Collections

Description

      The Virginia Department of Game and Inland Fisheries' Collections Database was originally developed in 1991 as a means of storing information reported annually by researchers under the Commonwealth's Scientific Collection Permit program. These permits are issued to any person performing research activities, whether the species is actually being collected or not. After the first year, the information in the database was expanded to include location data from miscellaneous reports, staff field activities, and more detailed locations from a follow-up of the Breeding Bird Atlas project. Records from the Agency's warmwater stream survey, JFISH fish collection, and HERPS databases, as well as observations reported in peer-reviewed journals and museum records, were also added.

      This system is used in conjunction with the Agency's Geographic Information System (GIS) activities. Because this database is organized by the locations of specific collections, some of Virginia's wildlife species will not be represented in this database until specific locations can be identified. Therefore, this system is not intended for use as a sole source of information on the State's wildlife species. It is a tool for educators, planners, biologists, and ecologists who need quick, concise information on the distribution of species collected in Virginia. The collections database is updated on a monthly basis to incorporate new collection reports.

Coldwater Stream Survey

Description

The Coldwater Stream Survey (CWSS), or Trout Stream Survey, was originally developed in 1981 by staff of the Department of Game & Inland Fisheries (DGIF) and by John Coyle, Alan Tipton and Garland Pardue at Virginia Polytechnic Institute and State University (VPI&SU). This system was developed as a mechanism for storing and retrieving data collected by DGIF staff at over 800 stations on Virginia's trout streams between 1976 and 1979. The files were originally maintained on the mainframe computer at VPI&SU, with data requests and output being processed through the Virginia Cooperative Fishery Research Unit. In 1987, the CWSS system was transferred from the mainframe computer to a microcomputer application by DGIF staff. The application was developed using the Advanced Revelation (Revelation Technologies, Inc.) database management system. The latest updating effort began in 2000 and involved a thorough data inspection and system update.

The current Coldwater Stream Survey Database consists of two datasets. One contains a list of the classified stream reaches. These are sections of streams that have been identified for management as trout waters. Each reach has been tagged as one of six classes. Classes I-IV are considered wild trout streams. Classes V and VI are considered stockable trout streams. Both wild and stockable streams have a set of recommendations that affords different levels of protection and management. In addition to the assigned classification, the database also contains the following fields for each reach: stream name, upstream and downstream boundaries, reach length, county(s), and 7.5' topographic quadrangle(s). There are also significant amounts of data related to ownership, land use, and access to these reaches.

Department biologists sample a subset of all trout streams annually to monitor fish populations and assist with management decisions. Standardized data of this type have been collected since 1976. These data are stored in the second dataset associated with the Coldwater Stream Survey. Most individual records contain abundant biological and physical data about the date-specific collection including a list of all fish species collected in a reach, water temperature, pH, etc.

These datasets are used in environmental impact assessments, permit reviews, fisheries management, and public relations. Many requests for trout stream locations and classifications come from federal and state agencies, as well as conservation/sportsmen groups and individuals.
.

Trout Stream Classifications

<u>Wild Trout Streams</u>:

Class I   Stream of outstanding natural beauty possessing wilderness or at least remote characteristics, an abundance of large, deep pools, and excellent fish cover. Substrate is variable with an abundance of coarse gravel and rubble. Stream contains a good population of wild trout or has the potential for such. Would be considered an exceptional wild trout stream.

Class II   Stream contains a good wild trout population or the potential for one but is lacking in aesthetic quality, productivity, and/or in some structural characteristic. Stream maintains good water quality and temperature, maintains at least a fair summer flow, and adjacent land is not extensively developed. Stream would be considered a good wild trout stream and would represent a major portion of Virginia's wild trout waters.

Class III   Stream contains a fair population of wild trout with carrying capacity depressed by natural factors or more commonly man-related land use practices. Land use activities may result in heavy siltation of the stream, destruction of banks and fish cover, water quality degradation, increased water temperature, etc. Most streams would be considered to be in the active state of degradation or recovery from degradation. Alteration in land use practices would generally improve carry capacity of the stream.

Class IV   Stream contains an adequate reproducing wild trout population but has severely reduced summer flow characteristics. Fish are trapped in isolated pools where they are highly susceptible to predators and fishermen. Such streams could quickly be over-exploited and, therefore, provide difficult management problems.

<u>Stockable Trout Streams</u>

Class V   Stream does not contain an adequately reproducing wild trout population nor does it have the potential for such. However, water quality is adequate, water temperature is good, and invertebrate productivity is exceptional. Pools are abundant with good size and depth and fish cover is excellent. Stream would be good for stocking trout but may offer more potential for a fingerling stocking program.

Class VI   Stream does not contain a significant number of trout nor a significant population of warmwater game fish. Water quality is adequate and water temperature is good for summer carryover of stocked trout. Summer flow remains fair and adjacent land is not extensively developed. All streams in this class would be considered good put-and-take trout stocking water.

Colonial Waterbirds

Description

Virginia's Colonial Waterbird Database contains information on Virginia's breeding waterbird species. This application was developed in 1989 to continue data compilation activities discontinued by the Cornell Ornithological Laboratory. All Virginia-specific data compiled by Cornell were read into this application. Subsequent State-collected colonial bird monitoring data are entered annually or as received. Refinement of colony location coordinates is ongoing.

This application is a tool for educators, planners, biologists, and ecologists who need quick, complete, and concise information on the distribution, abundance, and habitat of colonial waterbirds. Descriptions of habitat, substrate, vegetation cover, potential disturbances, weather, and species counts are included.

Impediments

Description

Impediments in this application refer to blockages to fish movement. Impediments are considered to be one factor in the decline of stocks of anadromous, or migratory, fish in the Chesapeake Bay region and play a role in determining species distributions and habitat quality. Therefore, knowing the location, size, and purpose of existing impediments is important to effectively managing aquatic resources. Impediments can be artificial or naturally occurring and include dams, some raised culverts, some bridges, beaver dams, waterfalls, etc. Only artificial impediments are included in this dataset.

This database contains information on the impediments in the Atlantic Slope drainages in Virginia (Potomac, Rappahannock, James, York, and Chowan). Data were gathered from a variety of sources including this agency, USEPA, and Virginia Commonwealth University. Each impediment has several descriptive fields including impediment name, the name of the impeded stream, dam height, purpose of the dam, date constructed, etc.

References Cited:

McIninch, S.P. and G.C. Garman. 1999. The anadromous clupeid fishers of the Chesapeake Bay. An evaluation of essential habitat and barriers to migration in the Rappahannock River basin. Final Project Report to VA Dept. Game & Inland Fisheries, Richmond, VA.

Personal communications with Virginia Department of Game and Inland Fisheries biologists and staff, 2000-2002.

Rockfish Corporation. 1981. Virginia Hydro Dam Inventory, Volume II, South Atlantic Slope. Prepared for U.S. Department of Energy, Region III and VA State Office fo Emergency & Energy Services.

U.S. Environmental Protection Agency, Office of Water. 1998. Dam Locations from BASINS, Version 2.0, EPA-823-B-98-006.

Threatened and Endangered Species Waters

Description

The Virginia Department of Game and Inland Fisheries is one of the agencies responsible for the management of threatened and endangered species in the Commonwealth. The animals that live in our rivers and streams are particularly vulnerable. It has been estimated that approximately 50% of the crayfish species in North America are imperiled and that approximately 75% of the mussel species are in decline. The Department has taken a variety of approaches to solving the problem of species loss. An important part of any approach is identifying where the remaining examples of the imperiled species are found. This dataset does just that. It identifies streams and rivers that contain documented occurrences of federal/state- or state-listed threatened or endangered species and their associated habitat. Each reach contains descriptive fields including stream name, upstream and downstream boundaries, status ("federal/state" or "state"), and length.

The Department has developed this dataset as a tool for ourselves, other government agencies, conservation organizations, consultants, etc. to better manage the Commonwealth's aquatic resources. The data are intended as a tool for planning efforts to reduce impacts and also improve conservation and protection for these species.