2002 Annual Meeting
and
National Fish and Wildlife Data Summit

November 1-5, 2002
Baltimore, Maryland

Identifying the data needs of fish and wildlife managers.

Organization of Fish and Wildlife Information Managers
website: www.ofwim.org
email: ofwim_2K@dgif.state.va.us

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The Organization of Fish and Wildlife Information Managers
National Biological Information Infrastructure
U.S. Fish and Wildlife Service
Proceedings of the
OFWIM 2002 Annual Meeting
and
National Fish and Wildlife Data
Summit

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Sponsored by:
The Organization of Fish and Wildlife Information Managers
National Biological Information Infrastructure
U.S. Fish and Wildlife Service

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OFWIM 2002 Annual Meeting  
and  
National Fish and Wildlife Data Summit

Friday, November 1, 2002

10:00 a.m.-5:00 p.m.   Registration

1:00 p.m.-1:45 p.m.   Opening Session

- Stan Allen, President, Organization of Fish and Wildlife Information Managers (OFWIM)
- Janet Irwin, Chief, Interior Branch, Office of Management and Budget
- Dr. John “Jack” Hill, Houston Advanced Research Center and the National Biological Information Infrastructure (USGS/NBII)
- Bob Miles, International Association of Fish and Wildlife Agencies (IAFWA)

1:45 p.m.-5:00 p.m.   Keynote Session

- Steve Williams, Director, U.S. Fish and Wildlife Service – Keynote Address
- Jacob Faibisch, IAFWA / NBII Coordinator – NBII and States: Meeting the Data Needs of the State Fish and Wildlife Agencies and the Conservation Community
- Andy Loftus, MARIS Coordinator – Summit History and Expectations

5:30 p.m. - 8:00 p.m.   Evening Excursion

Join the Organizing Committee for a visit to the nearby internationally acclaimed National Aquarium in Baltimore for only $5.00. There will be many opportunities for dinner on your own at Baltimore’s renowned Inner Harbor eateries. Meet in the hotel lobby at 5:30 p.m. for a 2-block walk to the Aquarium.

Evening   Dinner (on your own)
Saturday, November 2, 2002

7:30 a.m.-3:00 p.m. Registration

9:00 a.m.-Noon **Plenary Session: Regional Focus – facilitated by Jacob Faibisch**

9:00 WRIS/GAP/NDIS and ReGAP: Evolving Information Systems, State, Federal, NGO Data Sharing and the Future (a State Perspective) – Don Schrupp, Colorado Division of Wildlife

9:30 Integrating Automated License Systems and Biological Data - Len Singel, International Association of Fish and Wildlife Agencies

10:00 Bird Conservation: A Vision for Getting Data to Wildlife Managers – Byron Ken Williams, USGS/BRD Cooperative Research Units –

10:30 BREAK

10:45 Agency Planning and Information Sharing – Dwight Guynn, U.S. Fish and Wildlife Service, National Conservation Training Center, Management Assistance Team


Noon -1:00 p.m. Lunch (on your own)

1:00 p.m. - 5:00 p.m. **Breakout Session I: Interstate Data Management**

1:00-1:45 Breakout Groups identify current situation of Intra-agency Data Management

- 5-6 Breakout Groups, break Administrative, Fisheries and Wildlife as follows:
  - Infrastructure
  - Standards and Policies

1:45-2:30 Breakout Groups identify desired situation of Intra-agency Data Management

2:30-3:00 Break

3:00-3:30 Breakout Groups define barriers to success

3:30-4:00 Breakout Groups define proposals to achieve better situation

4:00-5:00 Individual Administrative, Fisheries and Wildlife groups develop action steps

- Group reports first, then action steps

Evening Local restaurants and free time (on your own)
Sunday, November 3, 2002

8:00 a.m.-3:00 p.m.  Registration
9:00 a.m.-Noon  **OFWIM Annual Business Meeting**
Noon-1:00 p.m.  Lunch (on your own)
1:00 p.m. - 5:00 p.m.  **Breakout Session II: Multi-State and Federal-State Data Sharing**

1:00-1:45  Breakout Groups identify current situation of Interagency Data Management

- 5-6 Breakout Groups, break Administrative, Fisheries and Wildlife
- Each group should address the following:
  - Infrastructure
  - Standards and Policies

1:45-2:30  Breakout Groups identify desired situation of Interagency Data Management
2:30-3:00  Break
3:00-3:30  Breakout Groups define barriers to success
3:30-4:00  Breakout Groups define proposals to achieve better situation
4:00-5:00  Individual Administrative, Fisheries and Wildlife groups develop action steps

- Group reports first, then action steps

6:00 p.m.  **Hacker’s Ball and Poster Session**
Monday, November 4, 2002

8:00 a.m.-3:00 p.m.  Registration

8:00 a.m.- Noon  **Paper Session: Regional Systems and Technical Tools & Applications**

**Concurrent Session – Track A: Regional Systems**

*Aquatic – facilitated by Stan Allen*

8:00  Managing Data Across Multiple Agencies Using a Regionally Consistent Data Exchange Format (DEF): The StreamNet Example – Bruce Schmidt, Pacific States Marine Fisheries Commission

8:30  The MARIS Partnership: The Good, the Bad, and the Ugly – Steve Sobaski, Illinois Department of Natural Resources; and Andy Loftus, Conservation Management Institute

9:00  Atlantic Coastwide Cooperative Data Collection and Data Management – Maury Osborn, Mike Cahall, and Abbey Compton, Atlantic States Marine Fisheries Commission

9:30-10:00 Break

*Terrestrial – facilitated by Jacob Faibisch*

10:00  SAGEMAP: A Web-based Model for Data-sharing among Federal, State, and Private Entities – Linda Schueck, USGS/BRD Forest and Rangeland Ecosystem Science Center

10:30  Chronic Wasting Disease Data Integration through the NBII Wildlife Disease Information Node – Josh Dein, USGS/BRD National Wildlife Health Center

11:00  State Biological Resource Databases – Jeff Waldon, Conservation Management Institute

**Concurrent Session – Track B: Technical Tools & Applications – facilitated by Kirk Keller**

8:00  The Use of ArcIMS to Assemble and Deliver California’s Fish and Wildlife Information – Eric Haney, California Department of Fish and Game

9:00  XML Overview and Capabilities – Ken Sall, XML Consultant/Author
11:00  **Government Without Boundaries and Recreation One Stop: Using the Recreation Markup Language** – John Clark, Office of Intergovernmental Solutions, General Services Administration


Noon-1:00 p.m.  Lunch (on your own)

1:00 – 5:00 p.m.  **Breakout Session III – How Can National Coordination Help?**

1:00-3:00  Fisheries and Wildlife Subgroups Craft Action Plan
- Prioritize Steps
- What’s Missing
- National Leadership
- What Do We Need for Coordination
- Security Issues
- Other Issues

3:00-3:30  Break

3:30-5:00  Administrative, Fisheries and Wildlife Group Reports (group as a whole)
- Putting it together - One Big Plan
- Other Issues

5:00  Declare Victory!!

6:00 p.m.  **Banquet and Awards**

Speaker: Bruce Stein, VP of Programs, NatureServe – **Our Precious Heritage**

**Tuesday, November 5, 2002**

9:00 a.m.-Noon  **Closing Session – facilitated by Art Smith**

Andy Loftus - Wrap-up of Breakout Sessions

OFWIM New Officer and Regional Representative Introductions

Art Smith – OFWIM 2003 Meeting, Rapid City, SD

Noon  **Adjournment**
Opening Session

Remarks by:

Stan Allen, President, Organization of Fish and Wildlife Information Managers (OFWIM)

Janet Irwin, Chief, Interior Branch, Office of Management and Budget

Dr. John “Jack” Hill, Houston Advanced Research Center and the National Biological Information Infrastructure (USGS/NBII)

Bob Miles, International Association of Fish and Wildlife Agencies (IAFWA)

Keynote Session

Steve Williams, Director, U.S. Fish and Wildlife Service
Keynote Address

Jacob Faibisch, IAFWA/NBII Coordinator

NBII and States: Meeting the Data Needs of the State Fish and Wildlife Agencies and the Conservation Community

Andy Loftus, MARIS Coordinator
Summit History and Expectations
Plenary Session: Regional Focus

Facilitated by Jacob Faibisch

Donald L. Schrupp, Colorado Division of Wildlife
Len Singel, International Association of Fish and Wildlife Agencies
Byron Ken Williams, USGS/BRD Cooperative Research Units
Dwight Guynn, U. S. Fish and Wildlife Service
Mary Klein, NatureServe/Natural Heritage Program
The Colorado Division of Wildlife (CDOW) and other state agencies, charged with statutory responsibilities to manage and protect the wildlife of the state, have long traditions of collecting scientifically based information for use in managing the resource. The geographically dispersed staff of professional, biologically trained field personnel (Area and District Wildlife Managers, Habitat, Terrestrial and Aquatic Biologists, and Wildlife Researchers) have provided institutional opportunities to collect important observational information. Early development of the Division's Wildlife Resource Information System (WRIS) provided the people, hardware and software for the collection, storage, retrieval and analysis of data on the States wildlife resources. Much of this information has been delivered back to the scientific community and our publics via web-based technologies like the Natural Diversity Information Source (NDIS: http://ndis.nrel.colostate.edu).

Federal agencies have similarly mandated responsibilities for the protection of our wildlife resources, vested in many management and regulatory agencies (USFWS, USFS, BLM, EPA, ACE, etc.) that have developed there own institutional information resources, with many of these evolving to web-based resources. Much of this work is being catalyzed by the National Biological Information Infrastructure (NBII) endeavors. Additionally, universities and non-governmental organizations have programmatic interests in the wise stewardship of our wildlife resources and there own pools of expertise for collection, analysis and dissemination of scientific information.

Given the mosaicked nature of public and private lands on which to manage these resources, all parties have acknowledged the need to manage our resources on an ecological unit basis. The Gap Analysis Program (GAP) efforts [and more recently, Regional Gap Analysis (ReGAP) endeavors] have provided an effective method for integrating, encapsulating, and evaluating information from these varied sources. As with any evolving technology, limitations encountered in its implementation have suggested new opportunities for developing new information, models, tools and capabilities We will review these and discuss the multi-institutional benefits that await our collaborative efforts.

Biography:

Don is a Wildlife Ecologist with the Colorado Division of Wildlife, Habitat Section in Denver, Colorado. He has Bachelors and Masters degrees in Wildlife Biology from Colorado State University. His work has immersed him in information management projects from development of the Colorado Wildlife Species Database and WRIS geographic information system datasets, to
the remote sensing based Basin wide Classification Project, the Colorado Gap Analysis Project and development of intranet based information systems.
State fish and wildlife agencies are increasingly automating sales of hunting and fishing licenses using Point-of-Sale (POS), telephone, and Internet technologies. The benefits of license automation outweigh any startup costs, if any are applied. Many private industries have the ability to automate a state’s licensing system for no up-front costs. This is making these technologies and customer service tools available to every state, even those with small budgets. Fish and wildlife agencies are just beginning to realize the value their central database can hold. Is it appropriate to extend the data management capabilities inherent in automated licensing to resource management? The next generation of information management in state fish and wildlife agencies should include seamless integration of biological and administrative data such as license information. Biologists could more efficiently make resource management decisions by applying license data to management data. Some states are already starting to apply this concept in a first generation of data integration; moreover, administrators can use marketing principles to influence the retention of customers to increase revenue for agency programs and resource management.

**Biography:**

*Having completed a graduate research project on Pennsylvania deer hunter perceptions at Penn State, Len accepted a position with the International Association of Fish and Wildlife Agencies in June 2001 as their Automated Wildlife Data Systems Coordinator. In this capacity, Len maintains a network of licensing professionals, shares agency experience regarding license automation, and instructs fish and wildlife agencies on license automation and data utilization.*
The data management needs of the bird conservation community are immense. With dozens of groups from all sectors involved in bird conservation and population monitoring, the need to develop easily accessible databases that all of the partners can access is paramount to the success of bird conservation. Likewise, bird conservation is an important starting place for conservation agencies to build meaningful data systems that address the needs of wildlife managers at the ground level. The vision for successful wildlife management must include successful data management. The question remains, how do we coordinate the information needs of state, federal, and NGO partners who all share a significant stake in successful bird conservation? This presentation will offer vision of how partners can overcome the obstacles to sharing the information critical to conservation success.

Biography:

Dr. Williams is the Chief, USGS Cooperative Research Units. He has played an active role in bird conservation at national and international levels, and he is the USGS representative to the North American Bird Conservation Initiative Federal Subcommittee.
Digital information management is an ever-increasing reality for fish and wildlife agencies. Although biological and administrative data have traditionally been managed separately from each other in fish and wildlife agencies, is there a place for integrating these diverse types of information to give agencies more robust tools to make decisions? Do fish and wildlife agencies miss opportunities because the analytical tools to make decisions based on integrated biological and administrative data have not yet been developed? What are the links between natural resources management and organizational management? This discussion will explore the role of data and data systems in agency administration and planning.

Biography:

Dr. Dwight Guynn is a senior project leader with the Management Assistance Team (MAT). He has over twenty years of experience in the field of fish and wildlife management. Dwight has served as a senior-level consultant, lecturer, author, researcher, facilitator, and manager, with specific attention to senior management consultation and coaching, and the facilitation of organizational efforts related to CMS, leadership, management development, employee buy-in, high performance work teams and comprehensive management systems. Dwight has ten years experience in administration of state fish and wildlife agencies on Comprehensive Management Systems Dwight was coordinator for the Responsive Management Unit of the Montana Department of Fish, Wildlife and Parks and dealt with issues such as bison and grey wolves, hunting access and private landowner rights as well as agency administrative issues including management system development and implementation, public involvement and performance measures. Dwight received his B.S and M.S. in Wildlife Biology from Virginia Tech and his Ph.D. in wildlife management from Colorado State University.
NatureServe: Harnessing the Potential of Multi-State Collaboration

Mary Klein  
NatureServe  
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Arlington, VA 22209  
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mary_klien@natureserve.org

All US states have current capacity to share information about biological resources and address multi-state wildlife conservation issues. As members of the NatureServe Network, the natural heritage programs have been collaborating for more than 25 years using standard methods and database systems. The network itself is highly diverse, including 76 independent organizations with 1/3 in state, tribal or provincial fish and wildlife agencies, and the remainder in universities, other state agencies, and private non-profits. The standardized Natural Heritage Methodology ensures interoperability of systems including species taxonomy, vegetation classification, ranking (for extinction risk, population viability, and other factors), data collection, data management, and information sharing. The presentation will cover the specifics of NatureServe’s standards and protocols, the mechanisms for data exchange, examples of multi-state products, and future developments in the network’s data systems.

Biography:

After earning her MS in Wildlife Biology, Mary started work with The Nature Conservancy in Michigan. From there, she moved to the Conservancy’s Western Region where she provided support to the Natural Heritage Network, building partnerships with US federal agencies. Following that, Mary served as the director of the Colorado Natural Heritage Program. In July 2000, Mary became the VP of the Natural Heritage Network for NatureServe in Arlington, VA. She provides leadership, oversight, and membership services for the 76 institutional partners in state/provincial/tribal governments and private non-profits throughout the western hemisphere.
Paper Session:
Regional Systems and Technical Tools and Applications

Concurrent Session - Track A: Regional Systems

Aquatic - Facilitated by Stan Allen

Bruce Schmidt, Pacific States Marine Fisheries Commission

Steve Sobaski, Illinois Department of Natural Resources
Andrew J. Loftus, Conservation Management Institute

Maury Osborn, Mike Cahall, and Abbey Compton,
Atlantic States Marine Fisheries Commission
Managing Data Across Multiple Agencies Using a Regionally Consistent Data Exchange Format (DEF): The StreamNet Example

Bruce Schmidt
Pacific States Marine Fisheries Commission (StreamNet)
45 SE 82nd Drive, Suite 100
Gladstone, OR 97027-2522
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Multiple state, tribal and federal fish and wildlife management agencies in the four-state Columbia River Basin collect fisheries related data. Even though the agencies collect similar kinds of information, there is no standardization among (and sometimes within) agencies for data collection methodology or for subsequent data management and dissemination, and the data are not made available regionally by the individual agencies. The agencies are independent, serve different missions, and until only recently have been unconcerned about sharing data on a regional basis. The need for regionally consistent information has become apparent due to various mandates, including the 1980 Power Act and recent listings under the Endangered Species Act, leading to formation of a regional data collection, standardization and dissemination project. Known as StreamNet, it is a cooperative project among the four state fish and wildlife agencies, the Columbia River Intertribal Fish Commission and the US Fish and Wildlife Service, funded by Bonneville Power Administration through the NW Power Planning Council. The approach is based on development of regionally agreed to ‘data exchange formats’ (DEF). These represent the core variables for each specific type of data. Data are obtained from each of the agencies in the regionally consistent DEF and then made available on-line through a query database and interactive mapper applications. Because the agencies have not been able to invest significantly in data management within their agencies, StreamNet staff are placed directly within the agencies to collect and standardize the data. The project thus shoulders much of each agency’s load for data management and responses to data requests and makes data readily available in a regionally consistent and georeferenced format.

Biography:

Bruce is the Program Manager for the StreamNet regional data management project. He brings the perspective of a fisheries biologist to the project, with an emphasis on serving the needs of the data user, not just meeting the needs of data managers. Bruce has a BS in Fishery Management from Utah State University and an MS in Fish and Wildlife Science from South Dakota State, which included Fortran programming for managing large amounts of angler use data. He comes to the project from the Oregon Department of Fish and Wildlife, where he served as Fish Research and Development Program Director and Science and Technology Program Director. Previous experience included Research Project Leader, Fish Division Planner and Chief of Fisheries for the Utah Division of Wildlife Resources.
THE MARIS PARTNERSHIP:
THE GOOD, THE BAD, AND THE UGLY

Steve Sobaski
Illinois Department of Natural Resources
Office of Resource Conservation-Technical Support Division
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For the past eight years, several federal and state agencies have been collaborating to implement a distributed database system for sharing state-based aquatic species information. The resulting Multi-State Aquatic Resources Information System (MARIS) allows users to access quantitative information on aquatic species from multiple states through an Internet-based query system. Providers of the data (states) maintain the control over, and integrity of, their internal data systems while allowing a single point of access for end users. A prototype of the full working model for lake-based data has been implemented and initial evaluations of the data have demonstrated this system’s applicability to answering research questions requiring multi-state data. The conceptual model for a component to handle stream-based data has been developed and will be implemented in 2002-2003. Over the course of development, several technical, administrative, and political challenges have been encountered, some of which have successfully been addressed and some of which remain. Lessons learned from these challenges will be discussed, which can be very instructive to the future development of MARIS and to similar interagency information sharing efforts.

Biographies

Stephen Sobaski has served as one of Illinois representatives to the MARIS initiative since 1995. His present position is that of supervisor of information managers for the Illinois Department of Natural Resources Office of Resources Conservation. In his seven years with IDNR, Steve has also served as the Lake Information Analyst for IDNR's Division of Fisheries and as a Watershed Information Analyst for IDNR's Watershed Management Section. In his previous 17 years as a research scientist at the Illinois Natural History Survey, Steve was part of the team, under Dr. Peter Bayley, who developed IDNR's Fisheries Analysis System for Lakes, Streams, and Creels as well as Illinois' statewide creel program and a GIS data base of bathymetric and habitat information for state managed lakes. Steve has a Bachelor of Science from the University of Illinois with an emphasis in ecology.

Andrew Loftus has coordinated the MARIS effort for the past eight years. He is a natural resources consultant specializing in policy, communication, and information exchange. From 1990-96, he was the Director for Science with the American Sportfishing Association and predecessor organization, the Sport Fishing Institute. In this capacity, he was actively involved
with resource-oriented and government relations activities to fulfill the organization’s priority mission of ensuring a healthy and sustainable fishery resource. Concurrently, he was Managing Director of the Fish America Foundation, a nonprofit international grants program. His previous experience also includes serving as a stock assessment biologist for the Chesapeake Bay with the Maryland Department of Natural Resources Estuarine and Marine Fisheries Program. He has Bachelor and Master of Science degrees in Fisheries and Wildlife from Michigan State University, specializing in population dynamics with a focus on Great Lakes fisheries.
Atlantic Coastwide Cooperative Data Collection and Data Management

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The Atlantic Coastal Cooperative Statistics Program (ACCSP) is a cooperative state-federal program to design, implement, and conduct marine fisheries statistics data collection programs and to integrate those data into a single data management system that will meet the needs of fishery managers, scientists, and fishermen. Initially focusing on fishery-dependent data, program partners have examined the data collection needs for commercial, recreational and for-hire fisheries coastwide, and set minimum standards for collecting relevant data from each. Planning began with establishment of an MOU in 1995 and implementation has been progressing rapidly since the late 1990s.

The budget of the ACCSP has grown to $3.5 million in 2002, funding over 40 projects to implement the system since 1999. The ACCSP’s online data management system uses state-of-the-art technology and currently offers commercial and recreational catch and effort data. The ACCSP’s recreational data are collected through the Marine Recreational Fisheries Statistics Survey (MRFSS). Commercial catch and effort data are currently available from five of the 17 ACCSP partners charged with collecting coastal fishery data. The remaining partners’ data are being added as they meet the ACCSP’s minimum standards. Confidentiality rules control access to trip-level commercial data.

Since its 1995 inception, the ACCSP’s success has depended on participation from its 23 partners. As online availability of catch and effort data grows, and collection standards for catch, socioeconomic and fishery-independent data are established, and programs implemented, the ACCSP will provide standardized and timely data needed for responsible resource management.

Biographies:

Maury is the Director of the ACCSP. A veteran of marine fisheries data collection and data management, Maury has been active in the planning and development of the ACCSP since its inception, participating in many of the Program’s early planning discussions and co-drafting white papers addressing its scope. From 1995 to 1999, Maury served on the ACCSP Operations Committee. Five years after beginning as a fishery biologist with the Marine Recreational Fisheries Statistics Survey, (MRFSS) Maury was promoted to Program Manager. In that role,
she re-established the MRFSS in both Puerto Rico and Hawaii, managed a staff of biologists and statisticians, oversaw two major contracts and three cooperative agreements and led methodological research projects and survey improvements. Prior to her federal post, Maury worked for the Texas Parks and Wildlife Department for 14 years. Her experience began with fieldwork, including implementing the state’s commercial trip ticket system in the Galveston Bay area. As the leader of the Coastal Fisheries Research Analysts, she had scientific oversight of all field data collection programs and the development and operation of the branch’s data management systems. Maury has authored/co-authored three Texas Parks and Wildlife Magazine articles and over 30 scientific papers and manuals, including an analysis of commercial fishermen using trip ticket data. She followed her Bachelor’s degree in Wildlife and Fisheries Science from Texas A&M University with a Masters of Science in Aquaculture from Auburn University.

Mike is the Information Systems Program Manager for ACCSP. Mike came to the ACCSP with nearly 15 years of information systems experience, primarily with Oracle database systems and local area networking. Mike had previously served in a variety of government and healthcare information technology positions. Most recently, Mike served as Database Administrator and Data Warehouse Architect for American Radiology Services. During his tenure there, he also functioned as the Local and Wide-area Network Administrator and Architect during a period of significant expansion. While at the University of Maryland Medical Center, Mike served first as database administrator for the Center's Oracle-based systems. Within a year, he was promoted to Project Manager, overseeing development of new clinical and communications systems. Mike is familiar the National Marine Fisheries Service, as he worked for eight years in Silver Spring at the National Weather Service Headquarters Office of Systems Operations next door. Rising from GS-7 to GS-13 in only six years, Mike participated in or managed the development of numerous information systems, and managed the local and wide-area networks for his division. Acquiring expertise in Federal Logistics Systems, Mike sat on numerous intergovernmental committees, and represented the NWS on the Department of Defense Logistics Review Board. One of his most notable projects was his design and implementation of the Logistics Implementation and Integration System that connected the NWS logistics management to the Department of Defense, a first for a civilian agency.

Abbey is the ACCSP Outreach Coordinator. Abbey comes to the ACCSP with a diverse background. She joined the staff in May of 2001 after working for a northern Virginia e-commerce venture that marketed to small businesses. There she planned corporate events, managed web content and designed publicity material. Prior to that position, she worked in Florida planning special events and practicing media relations for Winn-Dixie Supermarkets and Wild Adventures theme park. While earning a Bachelor of Arts degree in Communications from the University of North Florida, Abbey interned for the Spina Bifida Association of Jacksonville, writing its monthly newsletter and coordinating fundraisers and membership events.
Concurrent Session - Track A: Regional Systems

*Terrestrial* - Facilitated by Jacob Faibisch

Linda Schueck and Steven T. Knick,
USGS/BRD Forest and Rangeland Ecosystem Science Center

Josh Dein, USGS/BRD National Wildlife Health Center

Jeff Waldon, Conservation Management Institute
Sagebrush ecosystems in the Intermountain West recently have undergone radical and rapid changes. Consequently, populations of many wildlife species dependent on sagebrush have declined or now are absent from parts of their historical range. Sage grouse have been petitioned for listing as a Threatened or Endangered Species. Actions to prevent listing include determining the current condition and distribution of sagebrush, monitoring sage grouse populations, and identifying areas for restoration efforts. These efforts and the information required span administrative boundaries and involve federal, state, private land managers. Many sage grouse and sagebrush conservation issues are regional in scale and available data either are limited in the extent of their coverage or are inconsistent across ecological or administrative boundaries. Additionally, many datasets are not accessible via web sites, and therefore are ‘invisible’ to other agencies and the public. We developed the SAGEMAP project to identify and collect spatial data layers needed for research and management of sage grouse and shrubsteppe systems and make common datasets readily available on a web-based site. Success of the project in obtaining spatial data and making it available for distribution depended on the collaboration among federal, state, university, tribal, and non-profit data stewards. We currently have >1,100 datasets available for download from the website. Each data layer has an associated metadata record. We discuss mechanisms and challenges of this data compilation and exchange, and illustrate how researchers, managers, and planners at varied levels are using the information to address conservation issues associated with sagebrush ecosystems.

Biographies

Linda is an Information Technology Specialist at the U.S. Geological Survey’s Forest and Rangeland Ecosystem Science Center, Snake River Field Station, in Boise Id. Her background in using radio-telemetry to study migratory biology of birds led to an interest in database management and geographical information systems. She is combining these interests and applying them to the ecological concerns of sage grouse and shrubsteppe systems.

Steve is a Research Ecologist at the U.S. Geological Survey’s Forest and Rangeland Ecosystem Science Center, Snake River Field Station, in Boise Id. He is interested in the role of disturbance in shaping ecological systems. Most of his work has been conducted in shrubsteppe habitats of the Intermountain West.
Chronic Wasting Disease Data Integration Through the NBII Wildlife Disease Information Node

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The discovery of Chronic Wasting Disease this year in Wisconsin has caused a significant amount of concern for wildlife managers. There are many unanswered questions regarding the leapfrog advance of this disease from its known existence in the west, across the Mississippi River. This fall, many state and federal agencies are planning extensive testing programs to determine the true prevalence of the disease, many in areas where sampling has never before occurred. Assembling results from both free-ranging and captive deer and elk in a centralized location will allow disease ecologists to gain insights into little known aspects of CWD biology, focusing on more accurate geographic prevalence, mode of transmission, age-sex class distribution, and captive-wild relationships. These data will allow better models to be constructed to predict potential disease expansion and the probable success of various management strategies. The NBII Wildlife Disease Information Node (see Poster Session) will serve as a convenient repository for CWD testing data, allowing agencies to either enter sampling information directly into the Web based system, or make file transfers. This secure, centralized system will enable agencies to avoid the expense of developing their own stand-alone systems.

Biography:

Josh currently serves as the Animal Welfare Officer / Captive Wildlife Specialist at the USGS National Wildlife Health Center in Madison, WI. He is also the principle investigator for the NBII Wildlife Disease Information Node, which includes development of a national wildlife disease database system. Josh holds a DVM and MS in Pathology from the University of Pennsylvania, and an MS in Ornithology / Entomology from University of Delaware respectively. Josh has special interest in electronic information resources, care of wildlife as research animals and avian clinical pathology. Additionally he is interested in international wildlife health policy and invasive pathogens and vectors.
State Biological Resource Databases

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State Fish and Wildlife Agencies, Natural History Surveys, and State Natural Heritage Programs all develop state-level biological resource databases for the purpose of informing decision makers, natural resource planning, and education of the public. These systems vary widely in application, programmatic function, and accessibility, and consequently, the personnel and fiscal resources invested in each system also vary widely. Taxonomic breadth and field structure of the systems is highly dependent on the legal framework of each agency and the agency mission.

This presentation will address the current status of the best (in the author’s opinion) state-level biological resource data systems and touch on some efforts to coordinate multi-state systems. This presentation will also lay out a series of needs for state-level biological resource data systems, and propose a vision for these systems into the future.

Biography:

Jeff is the Assistant Director of the Conservation Management Institute, a center within the College of Natural Resources at Virginia Tech. The Conservation Management Institute currently works on projects ranging from field surveys of animals and plants to GIS and remote sensing to web-based decision support systems development for agency land management. Current data management projects include bird point counts in the SE US, chronic wasting disease, aquatic gap analysis, attitudes of the public in the Chesapeake Bay watershed, and many more.

Jeff has been involved in the development of fish and wildlife information systems and databases for states since 1985. His experience covers data management planning, information system design, technology review, database programming and integration, personnel development, training, and policy review.
Concurrent Session - Track B: Technical Tools & Applications

Facilitated by Kirk Keller

Eric Haney, California Department of Fish and Game

Ken Sall, XML Consultant/Author

John Clark, General Services Administration

Owen Ambur, U.S. Fish and Wildlife Service
It is hard to dispute the importance of the spatial component of natural resource information: Depending on the data-type and scope of a given issue, “where” something is may be as important as “what” it is. Unfortunately, collecting, managing, and sharing the spatial component of natural resource data can be a daunting task requiring specialized hardware, software, and skill sets.

This, however, is changing with the advent of web-based GIS software such as ArcIMS. These newer tools can be utilized in such a way as to put the power of GIS into the hands of managers, biologists, and the public without requiring them to have specialized equipment or extensive training. Additionally, these tools offer fish and wildlife information managers a new approach to collecting, managing, and distributing data using the spatial component as an organizational tool. With this in mind, the California Department of Fish and Game (CDFG) has been developing custom applications using ArcIMS to both assemble and deliver fish and wildlife information via the web.

To facilitate the rapid development of geography-based data-delivery applications, CDFG has developed an Active Server Page (ASP) template utilizing the ArcIMS ActiveX connector. Applications developed using the CDFG template are extremely lightweight on the client end and require only that the client have an Internet browser (e.g., Microsoft Internet Explorer, Netscape) and an Internet connection. In addition to bringing the power of GIS to average users, the CDFG template provides an excellent means of providing access to other sources of information (e.g., photos, documents, in-depth data queries etc.).

While the bulk of the development has been toward the delivery of natural resource data, CDFG has also been working to develop tools to more effectively collect the spatial component from its biologists and staff. Several ArcIMS tools have been developed that allow users to digitize spatial features (points, lines, and polygons) and to submit these features to a database along with the rest of their information.

The development, implementation, and use of these tools will be discussed as will an overview of the system architecture. For examples of these tools and more information, please visit CDFG’s Internet Map Services page at [http://imaps.dfg.ca.gov](http://imaps.dfg.ca.gov).
Biography:

Eric is the Information Services Branch Manager for the Northern California – North Coast Region of the California Department of Fish and Game. Eric brings to this position a strong biology background, a firm foot in the technology world, and an avid interest in leadership and management. Eric has a BS in Biology from California State University, Chico, and a MS in Forest Ecosystem Science from the Duke University School of the Environment.
This presentation is geared toward newcomers to XML. It will begin by explaining what XML is and how it differs from HTML. The presentation will be a mixture of lecture and demonstration, serving to illustrate a number of the key benefits of the XML family of specifications. High-level coverage of the following topics will be included:
- XML Syntax and Anatomy
- Parsing and Validation Concepts
- DTDs vs. XML Schema
- Document Object Model (DOM) vs. Simple API for XML (SAX)
- Extensible Stylesheet Language Transformations (XSLT) and XPath
- Scalable Vector Graphics
- Web Services Overview [time permitting]

Biography:

Kenneth B. Sall, principal of Ken Sall Consulting (http://KenSall.com), is an affiliate of SiloSmashers, Inc. (http://SiloSmashers.com). He has over seventeen years of experience, with concentrations in Web technology and GUI development. He holds dual Masters degrees in Computer Science (Temple University) and Special Education (also Temple University), as well as eight years of Web development experience. He has been closely tracking XML developments since July 1997. He has given conference presentations at XML World, JavaOne, the Eighth International World Wide Web Conference (WWW8), Web Engineering Workshop, Astronomical Data Analysis Software and Systems VIII, and the Washington Area SGML/XML Users Group. In addition, he presented nearly a dozen XML presentations at NASA/Goddard Space Flight Center in their Technology Education & Assessment Seminars series and to the GSFC Webmasters Group. He has also developed half-day and three-day XML training courses given to nearly 80 NASA civil servants and contractors. He created the extensive XML section of Web Developers Virtual Library (WDVL.Internet.com) and has written many XML articles for the site. Addison-Wesley published Ken's comprehensive book, "XML Family of Specifications: A Practical Guide", in June 2002 (http://wdvl.internet.com/Authoring/Languages/XML/XMLFamily/). Recently, he has been an informal participant in the Federal CIO Council's XML Working Group (http://XML.Gov).
Government Without Boundaries and Recreation One Stop:
Using the Recreation Markup Language

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To assist the Recreation One Stop Project, an eGov initiative of the Office of Management and Budget, the Office of Intergovernmental Solutions (OIS) has partnered with the Department of Interior to expand Recreation One Stop into an Intergovernmental initiative through the use of XML and Web Services.

The U.S. Federal government, the State of New Jersey, the Commonwealth of Virginia, and Fairfax County, Virginia had worked collaboratively to create a “Government Without Boundaries” (GWoB) demonstration program. The GWoB collaborative framework was created to meet the challenges of delivering seamless government in the parks and recreation services’ community of interest.

The framework provides an environment in which communities of interest formed around a given subject area exchange information and support each other in determining unique technical and business solutions to interoperability issues in a manner that preserves the autonomy, branding, and control of participating jurisdictions. This framework stresses guidelines for interoperability built on XML, Web Services and includes a pilot application to demonstrate the use of XML to exchange parks data.

In May 2002, the U.S. Department of Interior leveraged the collaborative framework and facilities of GWoB by including state and local government recreation facilities (the Commonwealth of Virginia and Fairfax County Virginia) in its Recreation.gov portal. This integration of information and services is an example of the emerging government without boundaries and seamless government that we will see in all jurisdictions in the years ahead.

Charlie Grymes, project manager for Recreation One Stop, is inviting additional States and Local government to partner with DOI in a demonstration project under the President's E-government initiative "Recreation One Stop"; and expand the number of States and Local government recreation facilities in Recreation.gov. As of September 28, 2002, Recreation One Stop had included three additional States and Montgomery County Maryland into Recreation.gov.

This GWoB presentation will highlight the role of XML and Web Services to fulfill the vision of seamless citizen-centric information and services.
Biography:

Mr. Clark has over 28 years of experience in the U. S. Government and in the field of information technology, including ten years at the General Services Administration. He is a Program Director with the Office of Intergovernmental Solutions (OIS) within the Office of Citizen Services and Communications. Responsibilities included working with Federal, International, State, and local governments on a wide range of intergovernmental issues. Currently, serving as the project manager for the Government Without Boundaries demonstration project which calls for the aggregation of online government information and services at all levels (local, state, and federal) of government around the needs of the citizen.

Actively supports the Intergovernmental Advisory Board (IAB) to promote electronic government services to the citizen. Publishes IAB technical reports and an annual IAB progress reports. Prepare and publish Federal/State Issue Alerts via OIS’s website. Serves as the Federal focal point with the National Association of State Chief Information Officers (NASCIO). Serves as GSA’s representative in presentations and orientations to other Federal & State agencies, Industry and also Foreign Dignitaries.

Prior to 8/8/96, he was responsible for review of agency procurement requests (over $100 million) for the acquisition of information technology resources for various major Agencies (such as the Department of the Navy, Department of Justice, Department of Health and Human Services and the Department of Transportation).

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The purpose of the XML working group (xmlWG) is to accelerate, facilitate and catalyze the effective and appropriate implementation of XML technology in the information systems and planning of the Federal Government. In coordination with other CIO Council committees and working groups, the xmlWG will:

Identify and, when necessary, develop XML best practices and recommended standards;

Foster partnerships with key industry and public interest groups developing and implementing XML standards and best practices;

Foster partnerships among communities of interest/practice involving agencies at all levels of government to capitalize as rapidly and effectively as possible on the potential benefits of XML to citizens and taxpayers;

Conduct "results-oriented" education and outreach; and propose for consideration by the AIC specific projects and products benefiting stakeholders of multiple Federal agencies.

Biography:

Owen Ambur co-founded and co-chairs the CIO Council's XML Working Group, whose activities are documented at http://xml.gov. He also serves as vice chair of the Federal Information and Records Managers Council (FIRM), a voluntary association of Federal information and records managers. Nearly half of his 29-year career was spent on Capitol Hill, culminating as legislative director and chief of staff to Senator James Abdnor (R-SD). Subsequently, for 7 1/2 years Owen served as Congressional liaison for the U.S. Fish and Wildlife Service, where he implemented an electronic document management system. The success and usefulness of that system led to his current assignment in the Division of Information Resources Management. Owen's undergraduate majors were psychology and sociology. He has done graduate work in psychology and holds a masters degree in computer systems management. Many of his academic pursuits are documented on his personal home page at http://users.erols.com/ambur.
Banquet and Awards

Banquet Presentation

Our Precious Heritage

Bruce Stein

Bruce A. Stein is Vice President for Programs for NatureServe, a leading provider of scientific information about rare and endangered species and ecosystems. As Vice President for Programs Dr. Stein is involved in overseeing an array of activities related to making NatureServe's biodiversity information more accessible and useful to land managers, policy makers, and the general public. Dr. Stein was a senior scientist with The Nature Conservancy for more than a decade where he was involved in the establishment of biological inventories throughout the western hemisphere. A botanist by training, Dr. Stein is a specialist in plant inventory, classification, and conservation, with particular expertise in the botany of the United States and tropical South America. He is a research collaborator at the Smithsonian Institution's National Museum of Natural History, and serves on the steering committee of the World Conservation Union's Species Survival Commission. Dr. Stein is author of numerous scientific reports and articles and his work has been featured extensively in such venues as the New York Times, National Public Radio, Scientific American, and the Discovery Channel. His recent book Precious Heritage: The Status of Biodiversity in the United States (Oxford Univ. Press), has been described by Harvard University biologist E.O. Wilson as "the definitive text on U.S. biodiversity." A native of California, Dr. Stein holds a B.A. in Biology and Environmental Studies from the University of California, Santa Cruz and received his Ph.D. from Washington University, St. Louis in a joint program with the Missouri Botanical Garden.
Closing Session

Facilitated by Art Smith
Poster Session

Chris Baker and Nancy Thompson
Ducks Unlimited, Inc.

Cara Campbell and James W. Meade
USGS/BRD Northern Appalachian Research Laboratory
Maurie Caitlin Kelly, Pennsylvania State University

Abbey Compton
Atlantic States Marine Fisheries Commission

Cedric X. Cooney and Jennifer K. Lloyd
Oregon Department of Fish and Wildlife

Brodie Cox
Washington Department of Fish and Wildlife

F. Joshua Dein, Karen A. Cunningham, and Harold E. Rihn
USGS/BRD National Wildlife Health Center
Vivian P. Nolan, USGS/BRD National Biological Information Infrastructure

Glenn Gravatt
U.S. Fish and Wildlife Service, National Conservation Training Center

Eric Haney, California Department of Fish and Game
Robin Carlson, Pacific States Marine Fisheries Commission
Stan Allen, Pacific States Marine Fisheries Commission

Jim Hirsch
New Mexico Department of Game and Fish
Jeff Waldon, Virginia Polytechnic Institute and State University

Trina Innes
FORREX Forest Research Extension Partnership

Paul Kanciruk and Tim Rhyne
Oak Ridge National Laboratory

Dr. Ilene M. Kaplan and Dr. Barbara C. Boyer
Woods Hole Oceanographic Institution and Union College
Poster Session (cont.)

Mary Klein
NatureServe

Steven T. Knick, Thomas J. Zarriello, Linda S. Schueck,
Sean P. Finn, and ElRoy Taylor
USGS/BRD Forest and Rangeland Ecosystem Science Center

Susan Marden and Richard Kirk
Tennessee Wildlife Resources Agency

Amy Martin
Virginia Department of Game and Inland Fisheries

Robert J. Meese
University of California, Davis

Brian J. Montague and F. Nicholas Mastrota
U.S. Environmental Protection Agency

Kathleen J. Quindlen and Susan H. Watson
Virginia Department of Game and Inland Fisheries

Steve Sobaski, Illinois Department of Natural Resources
Steven Niemann, University of Illinois Extension
Dr. Rick Farnsworth, University of Illinois

Geoffrey White and Lisa Kline
Atlantic States Marine Fisheries Commission

Mark Wimer
USGS/BRD Patuxent Wildlife Research Center
Serving Habitat Restoration Data to the Community Using GIS

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This poster describes the methods used to build a community based GIS model to identify and target areas for habitat restoration using data layers for hydrology, vegetation, soil types, geologic features, habitat value to waterfowl, wildlife values, and land ownership. This relational database model is web-enabled to allow access by state and federal agency personnel as well as local planners. Using only a web browser, planners can query, display, print, and even modify spatial data layers. This model uses the latest GIS and RDBMS software to deliver client/server technology to the community.
The Fisheries and Aquatic Resources (FAR) Node of the National Biological Information Infrastructure (NBII)

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The National Biological Information Infrastructure (NBII) was established in 1993 to provide online access to biodiversity, conservation, and general biological information. In 1998, the “Teaming with Life” report to the President called for a new generation NBII that would serve as a “research library system”, expanding the capability of the NBII to rapidly and accessibly deliver comprehensive and comprehensible information to society. As part of this new generation NBII, ten nodes were initiated for development in 2001, one of which was the thematic Fisheries and Aquatic Resources (FAR) node. Fisheries and aquatic resources are economically, recreationally, and aesthetically important to the nation, yet many of these resources are in decline due to factors such as habitat alteration, degrading water quality, invasive species, and inadequate stock management. Thus, to aid conservation and restoration efforts, comprehensive data and information on the various aspects of fish biology, population dynamics, hatcheries, water quality, and aquatic habitat and ecosystems is needed in a format accessible to an audience ranging from scientists and managers to environmentalists and the general public. The FAR node will fill this need through the creation of an integrated, comprehensive web-based resource that will: 1) serve and access fishery and aquatic databases and 2) link to fishery and aquatic resource information sites. Early node efforts will focus on...
synthesizing quantitative life history and habitat information to aid management and conservation activities.
The Atlantic Coastal Cooperative Statistics Program (ACCSP) is a cooperative state-federal program to design, implement, and conduct marine fisheries statistics data collection programs and to integrate those data into a single data management system that will meet the needs of fishery managers, scientists, and fishermen. Initially focusing on fishery-dependent data, program partners have examined the data collection needs for commercial, recreational and for-hire fisheries coastwide, and set minimum standards for collecting relevant data from each. Planning began with establishment of an MOU in 1995 and implementation has been progressing rapidly since the late 1990s.

The budget of the ACCSP has grown to $3.5 million in 2002, funding over 40 projects to implement the system since 1999. The ACCSP’s online data management system uses state-of-the-art technology and currently offers commercial and recreational catch and effort data. The ACCSP’s recreational data are collected through the Marine Recreational Fisheries Statistics Survey (MRFSS). Commercial catch and effort data are currently available from five of the 17 ACCSP partners charged with collecting coastal fishery data. The remaining partners’ data are being added as they meet the ACCSP’s minimum standards. Confidentiality rules control access to trip-level commercial data.

Since its 1995 inception, the ACCSP’s success has depended on participation from its 23 partners. As online availability of catch and effort data grows, and collection standards for bycatch, socioeconomic and fishery-independent data are established, and programs implemented, the ACCSP will provide standardized and timely data needed for responsible resource management.
Cooperative Development of 1:24,000-Scale Fish Habitat Distribution Spatial Data in Oregon

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Since 1995, the Oregon Department of Fish and Wildlife (ODFW) has made several attempts to develop a 1:100,000 scale spatial dataset for statewide fish habitat distribution. While these efforts have been fruitful, they primarily involved information from ODFW sources, which limited the utility of the information across the user community, and failed to elicit a truly consistent and comprehensive dataset. Additionally, many users expressed a need for fish distribution data at a finer scale.

In February 2001, ODFW initiated an effort to develop fish habitat distribution information at the 1:24,000 scale. The new effort involved compiling information from state and federal natural resource management agencies, Native American Tribes, local watershed councils, soil and water conservation districts, and major timber operators to ensure a comprehensive dataset. The resulting information is now available at the ODFW Natural Resources Information Management Program web site at http://osu.orst.edu/dept/nrimp/. This presentation will highlight the procedures, challenges, successes, and lessons we have learned throughout this effort. A sample dataset will also be available for review.
Washington Dept. of Fish and Wildlife’s *Warm Water Fish Enhancement Program* has been confronted with the familiar problem of both expanded operations and an obsolete data system. This database facilitates several warm water fish analyses like age growth analysis, species composition, catch per unit effort, stock density.

After exploring a number of options, including the adaptation of pre-existing warm water fish biological analysis software, we decided to adapt and expand our current system’s architecture to meet our needs. We also decided to upgrade our software from the original Quattro Pro/Paradox hybrid system to a more modern platform with a Visual Basic.NET front end and Access database back end for the prototype; eventually to be migrated to our agency’s ‘corporate data’ Sybase environment.

The resulting data system will need to possess a central repository controlled by an administrator as well as four to five satellite data-entry user interfaces governed by field form mimicking data entry forms. This new system will pay special attention to enhanced analysis components, WDFW code standardization wherever possible as well as an eye toward eventual web accessibility.
Disease has long been recognized as one of the limiting factors on wildlife populations. Now, the rapid spread of established diseases; the emergence of new diseases in humans, domestic livestock, and wildlife; and the threats of bioterrorist attacks have attracted considerable public attention – and generated a call for action. In addition, convincing evidence has been presented advocating the use of wildlife as sentinels for public health threats. Emerging “zoonotic” diseases (transmissible between humans and animals) have been identified as among the most important health threats facing humanity. Few wildlife disease databases exist on a national or international scale. No central database or information system exists for common access to geospatial wildlife disease information. The Wildlife Disease–Human Health Information Node will develop a Web-based hazard information and delivery system, providing state and federal resource managers, animal disease specialists, physicians, public health workers, and the public with access to near real-time data on wildlife mortality events and critical related information. Such a system can be used both to visualize clusters of morbidity/mortality events, and track the spread of various diseases. This can lead to the identification of previously unrecognized wildlife – human – domestic animal disease relationships, limit further spread, and prevent future outbreaks. The concept provides broad electronic access to both raw (event database) and derived (maps and other) data products, as well as a direct link to broad information on specific diseases, disease agents, and host species through a link to WILDPro, an electronic wildlife information retrieval system <www.wildlifeinformation.org>.
The U.S. Fish and Wildlife Service's National Conservation Training Center (NCTC) provides training and education to the natural resources community to better accomplish the FWS mission of conserving fish, wildlife, and their habitats for the continuing benefit of the American people. NCTC is a gathering place where conservation professionals from all sectors can learn together in a collaborative environment by acquiring new skills, sharing perspectives, breaking down barriers, establishing professional networks, and developing solutions built on sound biology and mutual interest. Located outside Shepherdstown, West Virginia, approximately 85 miles from Washington, D.C., the NCTC campus provides full-service residential facilities complemented by a professional staff, cutting edge programs and curriculum, and the most advanced technologies available to provide quality training and education. NCTC's extensive training programs include technical curriculum in data management, geographic information systems, global positioning systems, biotelemetry, and new technologies. To facilitate quality training, NCTC maintains the latest in data measurement devices, GPS devices, GIS software, and other technical field equipment. NCTC also maintains detailed, spatially referenced, aquatic and terrestrial resource data sets for use in its technical training courses. Information on NCTC's technical training program and courses can be found at:
http://training.fws.gov/TEC/NCTC_TEC
California Cooperative Fish and Aquatic Habitat Data Program (CalFish)

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Many programs in California are actively gathering, compiling and analyzing fish and aquatic habitat data. Bringing all of this information together and making it available to a variety of users is crucial to the success of fisheries and habitat management and evaluation in the state. The California Cooperative Fish and Aquatic Habitat Data Program (CalFish) is being developed to address this need. CalFish builds on existing data collection programs in California to compile information about anadromous fish populations and their habitats into consistent, high-quality databases. This information will be presented to agencies and the public via the web, through online queries, data downloads, and a customized mapping application that allows the user to search for data geographically.

Centralizing access to fisheries data makes it much easier to develop and maintain data standards and to guide the further development of related data programs in California. CalFish is a cooperative program involving a growing number of agency and organization partners. This approach develops widespread support for the program as well as ensuring that the data are useful to as many people and groups as possible.

One of the data programs that make up CalFish is the California Habitat Restoration Project Database (CHRPD). The CHRPD was created to capture and maintain data about stream habitat restoration projects in California benefiting anadromous fish. With its California-wide interagency scope, the database presents a unique opportunity to summarize and study restoration efforts across the state. In addition, project locations are georeferenced using a standard set of routed 1:100,000 California hydrography. All CalFish data will use this standard
hydrography, enabling comparisons and joint analyses of the different data sets managed in CalFish.
The Biota Information System of New Mexico (BISON-M) is an animal species information database for New Mexico that was developed in the late 1980's and has been updated and expanded since that time. Currently, BISON-M is distributed over three (3) platforms: (1) a species narrative web site (http://fwie.fw.vt.edu/states/nm.htm), (2) a species search web site hosted by New Mexico Natural Heritage Program (http://nmnhp.unm.edu/bisonm/bisonquery.php), and (3) an Advanced Revelations database. New Mexico Department of Game and Fish is working with Virginia Tech University-Conservation Management Institute, USDI- National Biological Information Infrastructure (NBII), and other federal agencies to convert BISON-M to Oracle 9i. This will modernize BISON-M onto a centralized platform. A web interface will be developed to allow online database queries and potentially include GIS species range maps.
No industry needs knowledge management more than the forest sector. Managing forest knowledge is of increasing importance in British Columbia, Canada and the world. Information about social, economic and environmental science is critical to the sustainable management of forests.

Sustainability received worldwide attention in 1987, with the release of Our Common Future, a report of the United Nations Commission on Environment and Development. The long-term survival of today's businesses is directly linked to their ability to embrace sustainability as part of their corporate responsibilities (i.e., to manage across a range of perspectives, including profits, people and the planet). The trend towards sustainable management is forcing organizations to take a closer look at how they manage and use information.

The FORREX Forest Research Extension Partnership is working to effect positive change in the way people manage and use knowledge. FORREX is a charitable non-share corporation that links people to science and innovative solutions. By linking people to knowledge, we facilitate continuous innovation and improvement in natural resource management.

The poster will highlight how FORREX is helping organizations achieve sustainability using knowledge management and extension tools/services.
Mercury, a New Paradigm for Distributed Metadata Search and Data Access

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Mercury is a computer paradigm developed by Oak Ridge National Laboratory for NASA and is designed for 1) extraction of information from extant sources, 2) searching that information, and 3) retrieval of data. Mercury is a system that lets disparate distributed data sources appear as a single, coherent data source. It is used by over 15 projects and has diverse sponsor support (NASA, USGS, EPA, and DOE). It is the information infrastructure for the USGS National Biological Information Infrastructure (NBII) Clearinghouse.

EXtensible Markup Language (XML) enables systems to share data via Mercury and add value as it is passed from point to point. Data can be seamlessly merged from different sources and represented in one common way in local metadata indices. XML has become a popular mechanism for exchanging data among many otherwise incompatible information repositories. Four major advantages of using XML are that it 1) is an open standard, 2) works on all platforms, 3) it is extensible – to describe almost any data application, and 4) it is self-describing – tags add the metadata to data.

Data are extracted by either writing small script codes to run on distributed machines to produce XML files for harvest or by using direct database access mechanisms, such as Java Data Base Connector (JDBC). Mercury will harvest the information, and reformat it if necessary before inclusion into the aggregate auxiliary database. Alternatively those sites without extant databases can just encode their metadata directly into XML files. Mercury is also fully compatible with Z39.50.
An ecosystem-based approach is one of the most valuable tools used to investigate environmental issues but it has only recently become an important focus for fisheries management and marine studies. This approach takes into account the different components of the marine environment and is interdisciplinary, including biological, social, physical and technological elements and the inter-relationships that emerge. Ecosystem-based investigations can effectively increase our understanding of diverse but related marine systems and the marine regulations that need to balance both the use and protection of the marine environment. Interdisciplinary and ecosystem oriented educational projects are presented. Emphasis is on fieldwork covering marine biology, coastal environments, the sociology of fishing communities and marine policy in Bermuda, New England and Newfoundland.
Information has the power to transform the decision-making process by illuminating the range of acceptable options and providing clarity for stakeholders from different backgrounds. However, information about wildlife and its habitats is primarily generated by many independent sources in a highly distributed environment. Thus, its ability to have a broader impact on regional, national and even international levels is constrained by poor interoperability between distributed information nodes. NatureServe has a 25-year history of working with state agencies to develop and implement systems based on common data standards and information management protocols. Beginning in November 2002, NatureServe will roll out the latest generation of its software, the Heritage Data Management System (HDMS). Built on a sophisticated data model implemented in an Oracle database, the system incorporates custom applications for spatial data management, tabular data management, data import/export and reconciliation, and reporting. The spatial component of the system, known as Biotics, is a custom geographic information system (GIS) application that supports basic digital mapping, spatial analyses, and data visualization. The HDMS system embodies the common data standards and methods that are the hallmark of NatureServe’s network of state-based Natural Heritage programs, and will enhance our ability to provide integrated data sets to federal agencies and other organizations that operate at a multi-state level. The result will be more efficient and effective conservation of wildlife and their habitats.
The Snake River Field Station of the USGS Forest and Rangeland Ecosystem Science Center has developed a database of spatial information needed to address management of sage grouse and shrubsteppe habitats in the western United States. We continue to identify and collect information for the region encompassing the historical extent of sage grouse distribution. State and federal agencies, the primary entities responsible for management of sage grouse and their habitats, need the information to develop responses if sage grouse are listed as a Threatened or Endangered Species. Local working groups need information to develop plans for conserving sage grouse on private lands. The spatial data are an important component in documenting current habitat and other environmental conditions. In addition, the data can be used to identify areas that have undergone significant changes in land cover and to identify underlying causes. As such, the database permits analyses for large-scale and range-wide factors that may be causing declines in sage grouse populations. Spatial data also are a critical component guiding the decision processes for restoration of habitat in the Great Basin. Therefore, development of a reliable spatial database carries multiple benefits for land and wildlife management. The project consisted of 3 phases: (1) identify all relevant spatial data, (2) assemble, document, and archive spatial data on a computer server, and (3) develop the web site (SAGEMAP.wr.usgs.gov) for query and transfer of GIS data to managers and researchers.
The Tennessee Aquatic Database System (TADS)

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Tennessee has the richest freshwater fauna in the country with over 300 species of freshwater fishes, over 120 species of freshwater mussels and 76 species of crayfish. This aquatic species richness is due to Tennessee’s geologic and hydrographic diversity, with seven major physiographic provinces and five major watersheds. Population growth, point and nonpoint pollutants, and river and stream alterations threaten this aquatic diversity. The Tennessee Wildlife Resources Agency’s (TWRA) goal is to protect, enhance, and restore the state’s aquatic resources.

To address TWRA’s goals, databases are needed to identify the species locations and monitor use of the water resource. The Tennessee Aquatic Database System (TADS) provides information on fish and invertebrate species distributions. The TADS originated in the mid-1980’s as a geographically referenced fisheries database. It consists of mapping coverages of streams, rivers, and reservoirs with relatable fisheries data files. These files include fish distributions, sample sites, Index of Biological Integrity (IBI), invertebrate distributions, physical and chemical data, and habitat evaluations. The TADS has been an important resource for aquatic distribution publications, river assessments, and Aquatic GAP Analysis projects.
Re-engineering the Virginia Fish and Wildlife Information Service (VAFWIS)

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The Virginia Fish and Wildlife Information Service (VAFWIS), an online system developed by The Virginia Department of Game and Inland Fisheries (VDGIF) and the Conservation Management Institute (CMI) at Virginia Tech, contains information on over 2000 of Virginia’s wildlife species. Users of the system fall into two categories: visitors and subscribers. At the visitor level of access, the user is able to perform general geographical searches, generate species lists, and access the species information database, which provides life history information, distribution and food habits of any species in Virginia. Subscribers, however, have much greater access to the databases associated with the VAFWIS. Not only can subscribers obtain species information, species lists by county, hydrologic unit or quadrangle, but subscribers can also view buffered species locations and perform custom queries of the ten associated databases.

Currently, VDGIF and the CMI are working together to re-engineer the VAFWIS. The purpose of the re-engineering is to increase the functionality by adding features such as Geographic Information Systems (GIS), improving existing features, adding newly created databases, revamping existing databases, and updating the overall look and feel of the VAFWIS. The re-engineered VAFWIS, which should be complete by the beginning of 2003, will be much improved over the current system. Hopefully a display at the National Data Summit/OFWIM Annual Meeting of the many stages of the re-engineering process, and the VAFWIS itself, will prompt discussion and provide insight to others who are thinking about developing and online fish and wildlife information service of their own.

Please visit the VAFWIS by navigating to www.dgif.state.va.us, clicking on “Wildlife”, “Wildlife Information and Mapping Services” and then “Wildlife Information Online Service”
Visual MABFlora/MABFauna: The Accumulation and Dissemination of Documented Species Occurrence Data

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Abstract: The Internet has provided an unprecedented opportunity for the rapid dissemination of information. However, a wealth of existing and much recently generated data is not available via the Internet. In addition, much of the information available via the Internet is undocumented as to its origin, date of acquisition, how and by whom it was collected, and many other elements, which may be essential for proper interpretation by users of the information. The California Information Node (CAIN) of the National Biological Information Infrastructure (NBII) has taken a dual approach to address these issues: the development of a suite of computer tools to integrate existing, Internet-based data sets, and the development of specialized computer software, Visual MABFlora and Visual MABFauna, which standardizes, documents, and describes species occurrence information which has not previously been available via the Internet. The data accumulated with the Visual MABFlora/MABFauna software are then made available via the Internet through a Web site hosted by the Information Center for the Environment (ICE) at the University of California, Davis @ http://ice.ucdavis.edu/mab. Visual MABFlora/MABFauna thus play essential roles in providing access to standardized, documented, and previously inaccessible information.
EPA’s Office of Pesticide Programs maintains two databases that would be of interest to fish and wildlife biologists. The Pesticide Ecotoxicity Database contains data on the acute and chronic toxicity of pesticides to wildlife, fish, invertebrates, and plants. The database presently contains over 15,500 acute and chronic toxicity endpoints on 698 pesticide active ingredients. The toxicity data were compiled from EPA evaluations of studies submitted by pesticide registrants and studies performed by EPA, U.S. Department of Agriculture, and U.S. Fish and Wildlife Service laboratories. A second database is the Ecological Incident Information System (EIIS), which contains data on kills and other adverse field effects attributed to pesticide poisoning of fish, wildlife, and other non-target plants and animals. The database records information on the mortality or other adverse effects observed, diagnostic information such as residues of pesticides detected in carcasses and the environment, and, when available, descriptions of the use of pesticide uses that allegedly caused the incident. Upon request, OPP will provide interested parties with data from the Pesticide Ecotoxicology Database and summary printouts from EIIS. OPP also has plans of including these databases on an integrated office-wide database called OPPIN, which will make the data accessible to the public through the Internet.
The Virginia Department of Game and Inland Fisheries (VDGIF) is developing and enhancing a number of GIS and database applications for use by Agency biologists, cooperating agencies, and interested citizens. The Anadromous Fish Use Areas, Threatened and Endangered Species Waters, and Bald Eagle Nest applications use Geographic Information Systems (GIS) and databases to provide cooperators with the data needed to effectively manage these natural resources. The Obs Book Database provides a useful way to capture important incidental observations of wildlife by Agency biologists. WildlifeMapping allows citizens trained in wildlife observation to contribute their data to the Department. Data and maps from these applications will be made available through the VDGIF web site at www.dgif.state.va.us.

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Information on the location, nature, and duration of active conservation easements created through conservation programs such as Illinois CREP or CRP is essential for managers evaluating the status of natural resources within a region, assessing the efficacy of conservation programs, or planning watershed or ecosystem-scale restoration. Furthermore, having this information in a comprehensive, readily-accessible, digital and mapable format would provide a powerful tool for agencies to convey the extent of conservation and restoration efforts to constituent groups as well as facilitate interagency coordination in planning and targeting conservation projects. However, access to information on conservation easements has, historically, been limited in scope and format to paper forms in county or agency files. The Illinois Conservation Practices Tracking System (ICPTS) is a PC-based application, developed through a multi-agency initiative of the Illinois Dept. of Natural Resources, the University of Illinois, and USDA-Farm Service Agency, designed to address this need for such information digitally. Using an integration of ESRI’s ArcView GIS, Digital Orthophotography (DOQQs), and Corel’s Paradox relational database system, the ICPTS represents the first attempt within Illinois to comprehensively map the precise location and nature of conservation practices being implemented within the Illinois River basin through the many government and non-governmental conservation incentive programs available to landowners. Attribute data included in each conservation easements record describes the practice implemented (e.g., wetland restoration, riparian buffer, filter strip), the program and agency funding the project, the planned duration of the contract, total area enrolled, cropping history, and watershed.
Development of a Regional Database to Support ASMFC Stock Assessments: 
Linking Data Collection and Management 
to the Decision Making Process

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The Atlantic States Marine Fisheries Commission is developing a data repository for fisheries 
dependent and independent data to meet the needs of scientists conducting fisheries stock 
assessments. ASMFC stock assessments typically occur every year and utilize data collected 
from many states (Maine - Florida). Many stock assessments, and therefore management 
decisions, have been delayed (up to 1yr) due to difficulties in compiling data from multiple 
sources into a useable format. Even with the advent of the ACCSP fisheries dependent data 
warehouse, additional tasks of integrating fisheries independent survey data and growth 
parameters by area and time are required to calculate the catch-at-length matrix for entry into a 
stock assessment model. The principal objectives of the ASMFC database project are to 1) 
establish procedures to convert data (1981 – present) into a standard format, 2) establish a 
centralized repository, 3) automate, (to the extent possible) the process for data analysis resulting 
in the catch-at-length matrix, and 4) provide fishery managers with more timely assessment 
results (from 12 months to 2). The system is designed to use raw landings and survey data to 
calculate the catch-at-length matrix given appropriate parameters by assessment scientists. The 
system will also capture metadata on the rationale for data manipulation decisions required 
during the process. The database is being developed in Oracle 9i with a web-enabled named user 
interface. As of August 2002, the requirements document and logical model are complete, while 
the physical database and interface are scheduled for early 2003 completion.
Managing Your State's Bird Survey Data On-line
Using Tools from USGS and NBII

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USGS Patuxent Wildlife Research Center, in conjunction with National Biological Information Infrastructure, is building on-line data management tools that state biologists and other resource managers may use to store and work with their own data. Two tools I will highlight are the Bird Point Count Database, and the Breeding Bird Atlas manager. Both point count surveys and breeding bird atlases are bird surveys that are typically conducted or managed at a state level. With the Bird Point Count Database, for example, a manager in a wildlife office can set up the structure of the bird and habitat fields so that they match a field sheet of their design. Field data are collected using those sheets by volunteers or staff at sites around the state. Individuals then log in to the system and enter their local sightings information into a form tailored to their field protocol. This information, and basic summary tools, becomes available instantly to the office running the survey program and their partners (e.g. for analysis). The Breeding Bird Atlas manager works similarly, although with more effort to start due to variability in how projects are run. A central office defines what the project participants see when they log on to the system. While the Breeding Bird Atlas manager works for states (and counties eventually), the Bird Point Count Program is designed to work at any scale, for individual research projects, single refuges or management areas, up to a state level or larger. What separates these two systems from many others is that the local manager has control and responsibility for the data, and can distribute the data entry effort with evenly applied quality control standards. At the same time, they are saving resource otherwise needed to design a system from scratch, and needed to perform many of the routine tasks associated with maintaining the data locally.
Appendix A:  
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Appendix B: Radisson Plaza Lord Baltimore Hotel Floor Plan
For more information about OFWIM go to

http://www.ofwim.org