NATIONAL BIOLOGICAL INFORMATION INFRASTRUCTURE

WILDLIFE DISEASE INFORMATION NODE

2009 ANNUAL REPORT
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INTRODUCTION

The National Biological Information Infrastructure’s Wildlife Disease Information Node (WDIN) provides information to a variety of users on the topic of wildlife diseases and their relationship to diseases of humans and domestic animals. Few wildlife disease databases exist on a national or international scale and no central data or information system exists for common access to geospatial wildlife disease information, which hampers rapid identification and response to disease outbreaks. Without ample quality information, designing disease prevention and control programs is a challenging task.

Currently, information and data about wildlife diseases is disparate and disconnected. WDIN’s goal of combining an information portal website and a disease reporting and monitoring system will bring this specialized and diverse information into a centralized, virtual location. There are many advantages to this approach: (1) the website will bring together quality, on-line information sources, saving time for those gathering information; (2) the disease reporting and monitoring system will provide partners with a database for storing, organizing and retrieving their agency’s own data, or provide them with the data schema of the system; and (3) because of the system’s standards, data can be exchanged and shared, so it will benefit wildlife health research and human and domestic animal health efforts. Ample quality information is what makes disease prevention and control programs work.

This document provides a review of WDIN efforts and accomplishments for the 2009 calendar year. Proposed project plans for 2010 are now in the 2010 NBII WDIN Workplan. This report is arranged by projects with the following details for each:

- Objectives
- Degree of effort required to develop or maintain
- Progress made this year
- Outputs and metrics used to assess progress
- An internal assessment of these metrics and project outcomes
NODE GOAL STRATEGIES

- Facilitate access to data and information on wildlife and zoonotic diseases
- Foster established partnerships and develop new professional relationships
- Encourage cross organization collaboration to build data standards promoting and enabling data integration
- Visualize clusters on morbidity and mortality events
- Track the prevalence and spread of various diseases at the most discrete spatial and temporal levels through interactive GIS mapping and other applications
- Predict possible new disease appearances
- Identify previously unrecognized wildlife-human-domestic animal disease relationships
- Help limit further disease spread and prevent future outbreaks

FUNDING SUMMARY

This report covers activities primarily supported by NBII funding. Many of these projects, as well as those not described are enhanced by funding provided from other institutions and grants as noted below.

<table>
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<th>Funding Source</th>
<th>NBII</th>
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<th>Other Federal</th>
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<td>$68,697</td>
<td>$51,460</td>
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NBII Funding Summary by Project Theme

| Information Products | $68,697 |
| Data and Surveillance Tools | $51,460 |
A. INFORMATION PORTAL/WEBSITE PROJECTS

1. WildlifeHealth Electronic Discussion List
Established in 1998, the WildlifeHealth List (http://wildlifedisease.nbii.gov/c&aLists.jsp) is an open electronic mailing list that serves the wildlife health community with a forum for discussion, news of meetings and events, job openings and educational opportunities. This List works as a two–way communication tool where users can both receive and send messages.

   a. Objectives
      • To provide the wildlife health community with an easy-to-use communication tool that fosters sharing ideas and information among members.

   b. Efforts
      • The work required to run the List is minimal, with the majority of it involving the monitoring of incoming messages and preparing outgoing notifications, which takes about 1 hour per month.

   c. Outputs and Metrics
      • Membership represents more than 473 subscribers in 20 countries.
      • WDIN contributes about 2 informative postings per week which include:
         o A weekly summary from the WDIN Wildlife Disease News Digest
         o The table of contents of the WDIN news bulletin
         o Job announcements
         o Education opportunities

      • Approximately 2 posts are contributed per month by other members that include primarily:
         o Job announcements
         o Meeting announcements
         o Education opportunities

   d. Outcomes and Assessment
   Based on its continued strong membership numbers and the routine use of the List, users find this service useful.

   e. Cost – see Project Theme summary, P.4.

2. Wildlife Disease Information Node News Digest (Formerly WDIN Blog)
The WDIN News Digest (http://wdin.blogspot.com) was started in December 2005 as a communication tool for the wildlife health community. Each entry to the blog contains a rich source of news from the US and International sources. An RSS (Really Simple Syndication) feed is available to anyone to monitor when new content is added, but only blog members can opt to receive an email notification that a new post has been made.
a. Objectives

- To fill the need for a service that brings together wildlife disease-related news, gleaned from the worldwide press.
- To provide the wildlife health community members an alternative method of sharing resources and ideas, different from the WildlifeHealth List.
- To help the wildlife health community stay abreast of current developments with wildlife disease.

b. Efforts

**New Efforts Completed in 2009**

- Designed a fresh new look for the Digest which incorporated a number of useful features:
  - Quick links to the Global Wildlife Disease News Map are included with the news titles for stories that report a disease detection or spread.
  - RSS feeds that pull content directly from the WDIN website (e.g. upcoming conferences and newly cataloged resources).
  - Easy online signup for eAlert delivery service.
  - Access to Digest Disclaimer and News Selection Policy.
- Added a new special feature called, *In the Spotlight*:
  - Showcases an assortment of interesting and useful nuggets of information such as web resources that may have been overlooked, a summary report of a past wildlife disease investigation or a reminder list of upcoming wildlife disease related conferences.
  - Engages readers to contribute useful information. WDIN was contacted on several occasions by readers with useful information to share.
  - Takes between 30 min to 2 hours depending on the selected topic to create this type of blog post.
- Began exploring the use of Facebook and Twitter to market to a larger audience and to further connect and network with readers.
- Implemented the use of the news aggregator, Yahoo Pipes, to automate parts of the publishing process and to reduce staff time without compromising the quality of content. The application filters through over 125 different new sources, which greatly reduces the number of stories that the staff manually scans to less than 300 titles.
- During a multi-meeting trip to Europe, reached out to the international wildlife health community to discuss methods by which members could assist the Digest staff with acquiring more non-English world news in order to expand the Digest’s coverage of international news.
- With the assistance of the NBII Program Office, created an NBII fact sheet for the Digest.
Maintenance Efforts

- Entries take between 3 and 4 hours total, and are made almost daily, resulting in approximately 4 news posts per week (The special feature, In the Spotlight, is done once a week).
  - The process begins by searching for relevant news items and recently published journal articles. Using the freely available application, Yahoo Pipes, it takes about 45 minutes to an hour to skim over 125 news sources.
  - Items are selected and an entry is created by entering the title, author, publisher, and about ten sentences from the beginning of each news article. This takes about 45 minutes to an hour. Some entries take longer if additional related links and/or journal citations are included.
  - Articles that discuss the detection or spread of a disease (approximately 2 to 5 articles) are cataloged and geocoded for placement on the Global Wildlife Disease News Map. The amount of time to catalog is about 30 to 45 minutes.
  - Using the free application, Feed Burner, the last step of delivering the email notification to WDIN subscribers as an eAlert is automated.
- A weekly summary of all the posts is made to the WildlifeHealth List. Creating and publishing the summary takes about 30 minutes.
- WDIN maintains the Digest emailing list which includes answering questions, along with adding and deleting members.

c. Outputs and Metrics
- Average times RSS feed is accessed per 24 hours: 800
- RSS feed access increased: 85%
- Email Subscribers (Feedburner Subscribers): Over 600
- Email Subscribers increased: 32%
- Weekly Summary Subscribers (via WildlifeHealth list): 473
- Geographical reach: 142 countries

d. Outcomes and Assessment
This service continues to provide valuable information to users based on increasing membership, usage statistics, and positive feedback. In addition to becoming a source for current wildlife disease news, it also has the capacity to become a historical database for situational awareness trends.

e. Application Status
- Being updated with news, recently release journal articles, and other pertinent information on a regular basis
f. Partners Involved
Exploring opportunities with the following groups to include more relevant metadata within the RSS feed in order to provide more in-depth details about each news story

- **HealthMap: Global Disease Alert Map**
  - Interested in WDIN expanding the item elements to include the geonamesId from Geonames database of geographic information.
  - Currently using the WDIN Digest GeoRSS feed as a layer in their HealthMap application representing a significant portion of the information shown regarding wildlife health.

- **NBII RSS Working Group**
  - Exploring ways that other NBII nodes can repurpose feeds already created using a variety of tools such as Yahoo! Pipes to streamline generation of RSS feeds and control their output format.

- **Department of Homeland Security (DHS), National Biosurveillance Integration Center**
  - Currently incorporates the Digest RSS feed into a local information gathering system. Also uses the Digest web site and Global Wildlife Disease Map to quickly scan for wildlife events of possible significance to the security of the U.S. and the rest of the world.
  - Exploring ways to make the Digest feed more compatible to this agency’s needs.

g. Server Hosting/Maintenance
- Uses Google’s Blogger application hosted at [http://wdin.blogspot.com](http://wdin.blogspot.com)

h. Timeframe for development
- The framework could be considered in Steady State, while efforts are made to improve additional services (like the Netvibes Widget or the Google Gadget) and tweaks when time allows. The contents are updated nearly daily but this does not require any modifications to the application itself.

i. Cost – see Project Theme summary, P.4.

j. Stakeholder needs analysis documentation
- Support letters from professional community submitted to WDIN.
- Completed a survey in 2007 of Digest Users at the Wildlife Disease Association Meeting in Colorado and used results to make improvements in FY08/09.
- Requests from organizational and institutional users for additional information to be included in the feeds to make the news item information more in depth and standardized.
k. Documentation

- Digest Disclaimer
- Digest News Selection Policy
- Digest EAlerts SignUp Instructions
- WDA conference survey Total_2

3. **WDIN Highlights**

Established in August 2006, the WDIN Highlights (http://wildlifedisease.nbii.gov/newsletters.jsp) is a news bulletin that promotes WDIN products, functions and resources. It is written for the wildlife health specialist, but it also contains information of interest to a wider audience such as medical professionals, wildlife managers and the general public. Every issue features different aspects of the WDIN website, lists upcoming professional meetings, and highlights recently added web resources. It is delivered to the WildlifeHealth subscriber list, as well as posted to the WDIN website and Wildlife Disease News Digest.

a. **Objectives**

- To provide topical information about WDIN resources and features

b. **Efforts**

- Each issue takes approximately 6-8 hours to put together and publish. This time includes:
  - Writing the main article and highlights section
  - Finding or creating images and figures
  - Reviewing and selecting upcoming conferences and newly added web resources to highlight
  - Formatting the content
- To expand readership, the news bulletin is not only posted to the WDIN website, but it is distributed to the WildlifeHealth listserv and the Digest.

c. **Outputs and Metrics**

- 1 Issue published in 2009
- Number of times WDIN Highlights was downloaded: 480

d. **Outcomes and Assessment**

- Due to loss of a student assistant the news bulletin was not issued as frequently as desired in 2009, but this resource is still of interest to WDIN visitors as reflected in the usage stats. WDIN Highlights continues to provide a meaningful way to disseminate information to the wildlife health community about what new tools and services WDIN is working on and also contributes to NBII publication venues such as the NBII Access newsletter and NBII Blog.

e. **Cost** – see Project Theme summary, P.4.
4. **Cataloging Tool**

The cataloging tool allows WDIN staff to easily input new website content which is saved to the local WDIN database. The current website content is dynamically generated from the database records, and resource metadata are transferred to the NBII’s central database on a regular basis using their XML upload function. The WDIN Cataloging Tool can be used by non-technical staff, and maintains a standardized format and vocabulary.

The Catalog tool and its corresponding database allows WDIN to repurpose cataloged information easily to the website, the Digest, the Global Wildlife Disease News Map, a Google Earth KML file, the NBII-WDIN public portal and related portlets, a handful of RSS feeds and GeoRSS feeds, and also pushes the WDIN content to the NBII Resource Catalog Database.

**a. Objectives**

- Develop and maintain a tool that catalogs a wide range of information resources available through WDIN products
- Transfer cataloged resources for inclusion in NBII’s records database
- Provide alternate means for users to access WDIN database content through various web services and applications

**b. Efforts**

- Content cataloging
  - 10-20 minutes for journal articles
  - 20-40 minutes for a web resource
  - 5-10 minutes for a News Digest story. Three to five stories are cataloged daily for placement on the Global Wildlife Disease News Map.
- Continued to work with NBII staff and node members to develop a web service for the NBII Resource Catalog
- With the assistance of the NBII Program Office, created an NBII fact sheet for the NBII Wildlife Disease Information Node.
- Created two new feeds that provide more interesting ways to access and explore content from the WDIN Cataloging Database
  - WDIN Ten Random Hidden Gems
  - WDIN Top Ten Web Resources

**c. Outputs and Metrics**

- For 2009, new web resources cataloged: 39
- For 2009, new News Digest postings cataloged: 484
- To date, web resource records sent to the NBII records database: over 1231
- Contains standardized keyword list relating to wildlife health: over 1100 terms
- Combined average number of click throughs and full views through the website for all records: 745 / day, a usage increase of 64%
- Combined average number of click throughs and full views through the New Content RSS feed: 99 / day
d. Outcomes and Assessment
   - The WDIN resource collection continues to grow and to be used by visitors. In addition to an increase in the access of the WDIN records through the website, the number of times records were accessed through the RSS feeds also increased, indicating that the implementation of RSS feed technology helped provide users another option for obtaining cataloged materials.

   - RSS technology has opened the catalog and enabled users to repurpose and port metadata from WDIN records into non-WDIN applications, such as organizational portals, personal websites, maps, and feed aggregators. Once available outside the WDIN catalog, this metadata can be mashed up with other data and information sources to provide a different perspective.

e. Application Status
   - Steady state

f. Partners Involved
   - None

g. Server Hosting/Maintenance
   - Uses server physically sited at the USGS National Wildlife Health Center

h. Timeframe for development
   - Steady state.

i. Cost – see Project Theme summary, P.4.

j. Stakeholder needs analysis documentation
   - Provides information in a format to improve the website, RSS, GeoRSS, NBII Portal content push, Google Earth files, Digest content and many other uses.
   - Provides exports for NBII Cataloging Tool/Database

k. Documentation – this application is only used internally at this point in time. The documentation is purely technical and not for the casual user unless otherwise specified.
   - Deleting places from the input tool
   - Document Uploads
   - Forms
   - Header
   - Help
   - Keywords
   - Placements
   - Resources
   - WDIN DB Data Dictionary
   - Application code (Java and JSP) code is well documented inline
5. **WDIN Website and Web Applications**

a. **Objectives**
   - To provide a location where users can easily explore wildlife health resources. When possible, WDIN content is available from the NBII-WDIN public portal. Links have been provided to those WDIN applications that currently can not be supported in a portal environment.

b. **Efforts**
   - Much of the work in maintaining the website is accomplished through use of the cataloging tool as described above.
   - Opened up a new resource section to help users learn more about the newly emerging bat disease, white-nose syndrome. Published 10 new records that lead users to high quality information, including videos, maps and images.
   - Maintain and enhance website features and functions
     - Modify web site if found to be non-compliant with Section 508 of the Disabilities Act. If non-compliant website files are found, correcting them takes between 1 to 5 hours to repair.
     - Conduct routine monthly checks for broken links. This typically takes about 3-4 hours (depending on the number of questionable links) to review a link report, research broken links, and repair the broken URLs.
     - Search and select quality resources to add to the website. Approximately 5 hours per month is set aside for this task.
     - Manage the various WDIN RSS feeds (including a GeoRSS feed) and the Netvibes Widget and Google Gadget. These applications provide WDIN users with a wide variety of ways to access the updated content WDIN provides.

c. **Outputs and Metrics**

**Wildlife Disease Information Node Website**
- The newly created white-nose syndrome web page was highlighted on the NBII home page slide show.
- Server statistics for the WDIN Website
- Over 13,350 successful page requests (one user can request multiple pages) with an average of 6,695 requests per day.
- West Nile Virus website attracts 132 hits each day on average for 2009
- Domain breakdown: 56% public, 8% non-profit, 4% education
• Geographical reach: 156 countries (top visiting countries: 70% U.S., 3.7% Canada and 3.3% UK)
• WDIN makes it presentations, posters and other conference materials available to view and download. This content was downloaded over 6100 times in 2009. The popular materials included: NBII Wildlife Disease Informatics Workshop (895 downloads), OFWIM WDIN Web 2.0 (643 downloads), and Wildlife Disease Surveillance and Investigations (535 downloads)

WDIN Presence on NBII Public Portal
• Fully established on the NBII Public Portal. Developed seven pages, including the WDIN home page, and 27 portlets.
• Continued to identify additional WDIN content for the NBII Public Portal.

Wildlife Disease Information Node RSS Feeds
Statistics on Popular RSS Feeds (average times feed is accessed per 24 hours) from 2009. Percent total shows the estimated increase in RSS subscribers from 2008 to 2009.
• New WDIN Content: 65%
• Avian Influenza Content: 63%
• Upcoming Wildlife Disease Related Meetings & Events: 66%
• HEDDS Surveillance News: 64% (plus 217 subscribers to email alerts)
• Chronic Wasting Disease Content:: 69%
• Connotea - New Wildlife Health Publications: 56%
• GeoRSS feed
  o Over 580 uses / day between January 2009 and December 2009
  o Continues to be used by HealthMap application (www.healthmap.org), as a highly valued source for wildlife health news on their map
  o Attracted attention of the National Biosurveillance Integration Center, a division of the Department of Homeland Security (DHS) to incorporate the feed into a larger surveillance system
• Google Earth KML file
  o Over 2431 uses in 2009, a usage increase of 57%

d. Outcomes and Assessment
• Even though web traffic appears to have decreased, interaction with the site content has increased as seen in the statistical averages of full views and click throughs (see Section 4 – Cataloging Tool). A speculative explanation for this trend is that people are visiting the WDIN site with a purpose rather than coming serendipitously to it.
• Despite the decrease in web traffic, the usage statistics and search engine ranking (e.g. Google), shows that the site continues to be a highly used and a “linked-to” resource.
• Review of the RSS feed statistics show an upward trend in usage for each feed.
e. Application Status
   • Being updated with new content on a regular basis although framework is steady state.

f. Partners Involved
   • USGS NWHC experts in wildlife health issues provide a great deal of background information and help revise overview and fact sheet information provided on the website.

g. Server Hosting/Maintenance
   • Uses local server physically sited at the USGS National Wildlife Health Center

h. Timeframe for development
   • Steady state – the framework of this application is fairly steady state with the exception of various fixes when the server environment is updated.

i. Cost – see Project Theme summary, P.4.

j. Stakeholder needs analysis documentation
   • See survey done in 2007 at the WDA conference in Colorado.

k. Documentation – Mostly technical documentation exists for this application
   • WDIN DB Data Dictionary
   • Application code (Java and JSP) code is well documented inline
   • How the Website is Organized
   • WDIN Search Tips
   • WDA conference survey Total_2

6. Pollinator Partnership – Zip code Ecoregion Locator and Interactive Map
   The Pollinator Partnership, <http://www.pollinator.org/about.htm>, is a group “working to protect the health of managed and native pollinating animals vital to the North American ecosystems and agriculture“. In 2008, in response to a request from Steve Hilburger in the BRD Wildlife and Terrestrial Resources Program, the Wildlife Disease Information Node helped the Pollinator Partnership construct a function to identify a user’s ecoregion based on a provided zipcode, and in turn provide useful information to them about promoting pollinators in their area.

a. Objectives
   • Provide a mechanism for users to input their zipcode and return their Bailey’s Ecoregion as well as a link to a PDF guide containing detailed information on how to promote and attract pollinators in their area.
   • Provide a static and interactive map of the ecoregion based on the zipcode entered.
b. Efforts
- Added last few remaining guide URLs in 2009. Maintenance on the server is only other effort.

c. Outputs and Metrics
- Since its debut in June 2008 during National Pollinator Week, the Zip code Ecoregion Locator and Interactive Map functions are frequently accessed
  - In its launch month, over 5,900 visits were made to the function
  - In 2009, average daily function use was over 1600
  - July 2009 had over 300,000 uses after many Pollinator Week activities scheduled around the nation.

d. Outcomes and Assessment
- With minimal efforts, WDIN was able to provide this functionality to the Pollinator Partnership and their partners.

e. Application Status
- New URLs are added to the database as new Ecoregional Guides are published. All other application functionality was completed in June 2008.

f. Partners Involved
- Pollinator Partnership
- NBII Pollinator Project

g. Server Hosting/Maintenance
- Uses local server physically sited at the USGS National Wildlife Health Center

h. Timeframe for development
- Steady state as of June 2008.

i. Cost – see Project Theme summary, P.4.

j. Stakeholder needs analysis documentation
- See partner letter

k. Documentation
- JAVA/JSP code is well documented
7. **Global Wildlife Disease News Map**

a. **Objectives**

- To provide a method for users to explore the contents of the WDIN News Digest in a geographical way.

b. **Efforts**

- Minimal work is required to maintain the site. After news articles are selected for placement on the Disease Map, they are cataloged and geocoded. The publication to the map is fully automated. More effort was spent on marketing opportunities for this popular application.
- With the assistance of the NBII Program Office, created an NBII fact sheet for the Disease Map.
- Explored mechanisms of improving upon the maps abilities to filter news items
- Investigated other mapping frameworks in which the map could be developed (SIMILE Exhibit for example)

c. **Outputs and Metrics**

- Over 30,376 successful page requests (one users can request multiple pages) with an average of 83/day.
- Domain usage breakdown: 58% public, 11% government, and 3% education
- Map received attention from the following sources (meeting details in Section E):
  - Ivanhoe Broadcast News (IBN) visited the USGS National Wildlife Health Center to do a story on the Global Wildlife Disease News Map. IBN produces health, medical and science stories for about 250 local TV stations across the country. They worked with the American Institute for Physics on this story.
  - WDIN presented both a poster and talk on the WDIN Disease Map at The Wildlife Society 16th Annual Conference.
  - WDIN and NBII were interviewed about the mapping application by the Federal Geographic Data Committee's (FGDC) Geospatial Line of Business group, which generated a fact sheet on the project which is available here, <http://www.fgdc.gov/geospatial-lob/documents/nbii-wildlife-disease-map-factsheet.pdf>.
  - The Disease Map was showcased on the NBII slideshow gallery
  - WDIN was invited to present about the Disease Map at the American Association of Geographers meeting in 2010.

d. **Outcomes and Assessment**

- The Global Wildlife Disease News Map continues to generate interest from a variety of communities and has increasing usage traffic in 2009.
e. Application Status
   - Steady state at version 2. Investigating future improvements which could be made as well as identifying potential new frameworks.

f. Partners Involved
   - Lots of interest from external organizations and institutions to include additional pieces of information in the feeds that power the News Map. See section in WDIN News Digest above.

g. Server Hosting/Maintenance
   - Uses server physically sited at the USGS National Wildlife Health Center

h. Timeframe for development

i. Cost – see Project Theme summary, P.4.

j. Stakeholder needs analysis documentation
   - Planning to conduct user survey or focus group to help guide future improvements.

k. Documentation
   - Map Tips
   - About the Map
   - wdinNewsMapHelpV2

8. Ecohealth 101 Website – UW Madison
   In 2009, WDIN began working with Dr. Jonathan Patz, a Professor and Director of Global Environmental Health with the Nelson Institute for Environmental Studies at the University of Wisconsin in Madison, on a university cooperative project, the Ecohealth 101 website, <http://ecohealth101.org>. As the Project Leader, Dr. Patz worked to develop an on-line resource tool for students and teachers to gain a better understanding about the interconnection between environmental health and human health.

   There was a desire to move the static html website into a flexible content management system (CMS), which would allow student assistants with no web programming experience to add and change the site’s content. In addition, because a CMS is database driven, information and data can easily be exchanged between compatible web applications. WDIN and Nelson Institute mutually created a position, the EcoHealth Outreach Specialist, to assist Dr. Patz with this migration and once completed, both parties will discuss information exchange between the two sites.
a. Objectives
   • To migrate existing data on the EcoHealth 101 website into a more flexible content management system

b. Efforts
   • Researched content management systems and selected Joomla because it was considered a good match for the needs of the EcoHealth website.
   • Coordinated meetings to informed Dr. Patz of progress and obstacles.
   • Spent about 7.5 hours per week working on project.
   • Worked on troubleshooting site hosting problems, which included contacting hosting service, researching hosting site alternatives, and selecting and establishing the site on a new, more reliable hosting service.
   • Researched and interviewed for an assistant position.
   • Hired the University of Wisconsin, Division of Information Technology, to assist with redesigning the original site’s logo.
   • Submitted a proposal to Dr Patz outlining Phase II of the project, which include organizing a focus group of teachers to evaluate the site and provide feedback.

c. Outputs and Metrics
   • Created a whole new site in a content management system and reformatted all the content.
   • Secured a permanent hosting site for old site during development phase and a new hosting site for the production phase.
   • Recreated over 250 web pages on the new site, which included images, text, hyperlinks, and new navigation menus.

d. Outcomes and Assessment
   • A proposal for Phase II of the EcoHealth website project
   • A secure, reliable hosting site
   • A CMS framework that can house and organize the EcoHealth content
   • Hired a student to assist with the EcoHealth content formatting and migration
   • A set of reusable graphics

e. Partners Involved
   • University of Wisconsin Madison

f. Server Hosting/Maintenance
   • Content management system and database will be hosted on a webhosting service and maintained by Dr. Jonathan Patz
g. Timeframe for development
   • Foresee completion of Phase I of the project in early 2010

h. Cost – see Project Theme summary, P.4.

i. Stakeholder needs analysis documentation
   None to date

j. Documentation
   None to date

B. DISEASE REPORTING AND MONITORING SYSTEM PROJECTS

1. *Wildlife Health Monitoring Network*
   The Wildlife Health Monitoring Network (WHMN) is currently a suite of individual applications with similar functions. The primary goal for the WHMN is that any future developments will occur using the same data platform and web tools, and allow integration with similar web-based disease reporting applications. This will be done through collaboration with multiple partners.

   a. Objectives
      • To create a web-based mortality reporting and surveillance system for wildlife diseases that is available to the general public and to resource agencies that do not have specific needs for mortality reporting.
      • To develop a common terminology system consistent with established medical informatics standards to use within the network
      • Provide a mechanism for resource agencies and other organizations to generate their own data entry forms based on standard questions and answers, with a minimum required dataset contributed to the larger network (using the Rapid Data Collector)
      • Provide an ETL (Extract, Transform, Loading) mechanism for each group interested in contributing to the larger network
      • Provide a mechanism for network users to access canned reports, ad hoc reporting capabilities and mapping capabilities for the larger network dataset

   b. Efforts
      • Due to the Centers for Disease Control’s (CDC) staff turnover and shifting priorities, the resources needed to implement the CDC’s application, the Rapid Data Collector were not available in 2009.
      • So, with the assistance of the University of Wisconsin, Division of Information Technology (DoIT), WDIN generated a specific mortality reporting tool, which is an extension of the Public Data Collector for the UW Madison School of Veterinary Medicine, Four Lakes Wildlife Center. Feedback was collected from the general public and personnel at Four Lakes to apply to the refinement of the
Public Data Collector, which was renamed the Wildlife Health Event Reporter (WHER)

- Worked with the terminology lab at Virginia Tech to generate needed terminology to populate drop-down lists with standard terms for the Public Data Collector for publicly submitted mortality reports.

- Demonstrated WHMN functions to interested parties to garner support and adoption of the system for a variety of uses; demonstrated individual project functions and how they all feed into the database and can work with all the data using the suite tools.

- With the assistance of DoIT conducted a usability study on the data entry form for the WHER application.

- Revised prototype data entry mechanisms to incorporate feedback generated from demonstrations of the WHMN system and the WHER usability study.

- Participated in TDWG and by working with the NBII Program Office, WDIN developed a presentation and discussion session to generate community involvement in standards for exchanging wildlife health information as an extension or modification of existing biological information exchange mechanisms.

- Worked with the Wisconsin DNR and University of Minnesota Raptor Center to set up ETL processes for their datasets
  - Discussed with the Minnesota Raptor Center developing an ETL mechanism for data migration into the WHMN, but their group is migrating their own local system to a new platform and database. WDIN will follow up on performing this activity in 2010.
  - Discussed with the Wisconsin DNR the possibility of migrating their dataset on an ongoing basis to the WHMN database, and without support in the means of funding, they do not have time to devote to this activity. WDIN will pursue this in the 2010-2011 timeframe.

- Worked on connecting all the individual tools in the WHMN suite to function together:
  - Data Entry - Flexible data entry application that can essentially accept any type of input (e.g. Excel file or web-based form).
  - ETL Tool – The Extract Transform and Loading toolset allows an Admin level user to establish relationships from the output of the Data Entry applications to the WISDOM database. An ETL process must be developed for each unique Data Entry mechanism.
  - Reporting – The Pentaho Data Integrator toolset provides two types of reporting options: canned reports, which are pre-established outputs designed for a specific use or to answer a specific question, or ad-hoc reporting, which allows an Admin user to decide what data pieces are available for reporting, and then a normal level user can query those data pieces and design the output format however they wish.
  - Mapping – The Pentaho Data Integrator allows an Admin user to push report output onto a Google Map style application. The mapping tool is
not meant to replace any GIS toolkits (e.g. ESRI’s ArcMap) but to provide a simple means of geographic data exploration.

• Worked with various organizations, including partners, throughout the year on different informatics components needed for a comprehensive wildlife disease surveillance system
• With the assistance of the NBII Program Office, created an NBII fact sheet for the WHMN.
• Worked on the development of the WHER application
• Worked on the development of the WHAV application

c. Outputs and Metrics
• Completed work with the Four Lakes Wildlife Center on the WHMN system and incorporated their feedback to enhance the WHER prototype application.
• Produced a report from the usability study. Participant feedback was incorporated into the next development version of the WHER application.
• Workshops and meetings on wildlife disease surveillance informatics (meeting details in Section E)
  o Participated in the Integrating Wildlife Health: Strategic Planning Workshop, organized by the University of Minnesota Raptor Center. Workshop objective was to bring professionals from diverse disciplines together to discuss data requirements for a successful wildlife disease surveillance system.
  o Participated in the Interagency Health Workshop hosted by NOAA National Marine Fisheries Service. Workshop focus was to provide the information and an opportunity to integrate NOAA’s health information with surveillance data and systems being built and managed by other federal agencies.
  o Traveled to Virginia Polytechnic Institute and State University (Virginia Tech) for a working meeting. As collaborating partners on the U.S. Department of Defense grant project, GEIS, the Global Emerging Infections Surveillance and Response System, the goal of this partner meeting was to develop a standard terminology model for the integration of avian influenza surveillance data being collected from multiple institutions that will permit data access by military and civilian health and natural resource agencies.
• WDIN meetings and presentations on WHMN (meeting details in Section E)
  o Traveled to CDC headquarters to discuss WDIN’s needs for the application, the Rapid Data Collector for the WHMN system.
  o Met with EPA members with the Great Lakes Initiative to demonstrate how WHMN could be used to collected Botulism E surveillance data.
  o Demonstrated WHMN to the Field Investigation Team members at the USGS National Wildlife Health Center.
  o Presented at The Wildlife Society Annual Conference to describe WDIN efforts and progress on the WHMN.
d. Outcomes and Assessment

- Produced first beta Wildlife Health Event Reporter (WHER) application
- Conducted a usability study on the first WHER beta application: 1) to garner feedback to streamline and improve data entry mechanisms, 2) to make the application’s purpose more clear to users, and 3) improve the overall ease of use of the application.
- Produced second beta WHER application (http://www.whmn.org/wher)
- Produced the WHAV (Wildlife Health Analysis & Visualization) application: 1) for the visualization of integrated GEIS datasets, and 2) to allow filtering functions and report exports of the dataset. (http://www.whmn.org/whav)
- Expanded the backend ETL Java application to allow for data migration with various ETL XML configurations for integrating the GAINS, HEDDS, and SEANET avian influenza datasets
- Established a server housed at the University of Wisconsin DoIT, where beta WHMN applications are now hosted (http://www.whmn.org)

e. Application Status

- WHER and WHAV are in second round of beta testing, engaging real life partners to work with applications in order to ensure they suit their workflow needs.
- FLWC application used last summer to log in animals brought to the Center. In fall had to remove computer due to approaching winter, will attempt to set up entry system again in late spring 2010.

f. Partners Involved

- UW Madison DoIT, Wisconsin DNR, University of Minnesota Raptor Center, UW Madison School of Veterinary Medicine Four Lakes Wildlife Center, Tufts University, Virginia Tech, Wildlife Conservation Society

g. Server Hosting/Maintenance

- Current prototype applications are hosted on WDIN funded server hosted at UW Madison

h. Timeframe for development

- Planned 2010 development efforts are described in the 2010 Project Plans.

i. Cost – see Project Theme summary, P.4.

j. Stakeholder needs analysis documentation

- See partner comments documents

k. Documentation

- usgs-wdard-workflow-overview
- WDARD data access control
- WDARD Ontology (brief)
- WDARD ontology Barton Email
2. The Highly Pathogenic Avian Influenza (HPAI) Early Detection Data System (HEDDS)
As directed by the Implementation Plan for the National Strategy for Pandemic Influenza, WDIN developed the HEDDS system (http://wildlifedisease.nbii.gov/ai) as a data management tool that can be used by all agencies, organizations, and policymakers. Core field data from state and federal agencies are being entered into this system to provide a common platform to assess surveillance data and monitor the potential spread of the H5N1 influenza virus in wild birds. HEDDS development has been guided by an Interagency Steering Committee.

a. Objective
To manage avian influenza animal and specimen collection data taken by many institutions and individuals, analyzed by multiple laboratories, and make them available on a common web platform.

b. Efforts
- Offered three training sessions to get all those doing surveillance up to speed on how the HEDDS system works for submitting avian influenza surveillance data.
- Transferred system maintenance tasks to the USGS National Wildlife Health Center in July 2009. Approximately 25 hours were spent on training IT staff and developing help documents to aid them in maintenance efforts.
- Continued to support HEDDS information services
  - HEDDS RSS Feed
  - HEDDS Listserv
  - HEDDS Weekly Updates
- Continued to maintain the system for the 2009 sampling season (April 1, 2009 – August 1, 2009)
- Continued to provide support to users through email, phone and one-on-one training. Once transfer to the NWHC was complete, WDIN continued to be available for questions or troubleshooting.
- WDIN continues to maintain and distribute weekly HEDDS update mailings
- With the input of WDIN and the National Wildlife Health Center, Steve Gillespie (USGS) created surveys for the two parts of the HEDDS system, the freely available public website and the secure data entry and reporting system.
c. Outputs and Metrics

- Two user survey reports. The results of both surveys indicated people were overall satisfied with HEDDS; the publically available website and the secure data system. In addition, feedback provided ideas for enhancement and modification to HEDDS.
  - Public Site
    - Satisfaction with overall appearance and usefulness: 96%
    - Why users visited HEDDS: 47% check news and 38% browse for information
    - What parts of HEDDS used most often: 29% current sampling information and 19% news
    - Usage frequency: 36% as needed and 29% weekly
    - What was the information being used for: 63% as information resource and 26% for research
  - Secure Site
    - Satisfaction of site design and usefulness: 81%
    - Satisfaction of customer service: 88%
    - What activities were performed most often: 53% search for test results; 50% retrieve reports; 40% use interactive map
    - Public portion – what parts of HEDDS used most often: 67% current sampling, and 53% pasting sampling
    - Login portion – 53% search data, and 53% browse data
    - Frequency of visits: 43% as needed and 25% monthly
    - General use of HEDDS information: 70% as information resource and 30% for reach purposes.
    - Specific use of HEDDS: 60% view/manage own data and 30% view data as a whole.

- The HEDDS data system was featured in the NBII slideshow gallery.

- Completed three HEDDS training sessions –
  - Held two training workshops for US Fish and Wildlife Service personnel for the Atlantic and Mississippi flyways who will be collecting and submitting avian influenza samples to USGS National Wildlife Health Center.
  - Offered a training workshop for biologists from the U.S. Fish and Wildlife Service and from numerous states who will be collecting and submitting avian influenza samples to the USGS National Wildlife Health Center.

- HEDDS Contributor Site
  - Statistics on usage by data contributors:
    - Over 19,000 samples contributed in 2009 sampling season
    - 224 datasets processed from contributors to the USGS NWHC (USFWS, USGS, States, NGOs, Universities)
    - Over 639 records from the USGS NWHC Diagnostic Database included

- HEDDS Public Site
  - Statistics on public usage:
• Average of 1,900 unique page loads per month
• Average of 800 unique visits per month
• Average of 647 first time visits per month
• Average of 168 returning visits per month
• LPAI Chart (PDF & web based) accessed over 7,972 times
• RSS Feed for HEDDS Surveillance News accessed on average 60 times per day
• HEDDS weekly email summary service 217 subscribers

d. Outcomes and Assessment
After 2009, efforts will only be put forth towards maintaining the server on which the application resides. The USGS NWHC will lead the effort to provide maintenance and data updates for 2010 and into the future with USGS tested samples. However, due to funding changes in FY2010, no external datasets will be imported into HEDDS.

e. Application Status
• Updated with new data and test results on a regular basis with efforts by the USGS NWHC.

f. Partners Involved
Historically, the USDA Wildlife Services contributed a large number of samples each sampling season to the HEDDS system, however, due to changes in priorities; they are no longer making data contributions.
• USFWS
• USGS
• DoIT

g. Server Hosting/Maintenance
• Uses server physically sited at the USGS National Wildlife Health Center

h. Timeframe for development
• Application development is complete. Steady state as of July 2009. Annual update changes will require some time from the USGS National Wildlife Health Center, as well as periodic data updates.

i. Cost – see Project Theme summary, P.4.

l. Stakeholder needs analysis documentation
• U.S. Interagency Strategic Plan on Avian Influenza in Wild Migratory Birds calling for ‘National database for use by all agencies, organizations, and policy makers’
• Letters of support and survey results
m. Documentation

- **Application Documentation (for end users)**
  - KickStartForDataAdmins
  - AddingNewUsers
  - HEDDS Excel Worksheet Reference Manual_Final_2.0
  - HEDDS Worksheet in a Nushell A Quick Reference
  - Shipment Tracking
  - Search Data
  - Browse Data 20Mar2007
  - Uploading a Dataset into HEDDS
  - HEDDS Reviewing-Editing a dataset
  - HEDDS metadata
  - Citing HEDDS Data
  - CurrentCoreDataFields
  - HEDDS_FactSheet
  - Updating LPAI Table – Data Entry Help File

- **Technical Documentation**
  - State and Contributor Totals
  - How to Compile
  - Header
  - Admin Panel
  - Lists
  - HEDDS Simplified Data Dictionary
  - HEDDS database data dictionary_eric
  - Excel Importer (defunct)
  - Data Entry Numbered in Order of Insert Requirement
  - USGS HEDDS Capture Module Charter (DOIT work)

3. **Seabird Ecological Assessment Network (SEANET)**

Through partnerships with the Tufts University Center for Conservation Medicine, the Wildlife Trust, and the NBII Northeast Information Node, SEANET <http://wildlifedisease.nbii.gov/seanet> has been created to allow volunteers to electronically enter surveillance data for seabird mortality events obtained through transect sampling along the New England and Mid-Atlantic coasts.

a. **Objectives**
   - To develop a web based application to allow volunteers to report seabird mortality events.
   - Establish baseline mortality levels for beaches along the east coast that can be utilized in the future to alert stakeholders in regards to abnormal levels of bird deaths.

b. **Efforts**
   - Maintain system
   - Help users as needed with data entry issues and questions.
c. Outputs and Metrics
   • Web-based data entry system being used by volunteers from Maine to Florida
   • Statistics on web application based on data entry to day for 2009:
     o Total beach walks entered – 1091 walks
     o Total beached birds reported – 225
     o Unique transects monitored – 125
     o Over 4,270 live bird observations entered

d. Outcomes and Assessment
   • The current level of effort from the WDIN is minimal to keep the system online for users.
   • Because submitting data online is quicker than submitting paper records, abnormal levels of mortality are identified in close to real time.

g. Application Status
   • Being updated with new data on a regular basis by volunteer beach walkers

h. Partners Involved
   • Tufts School of Veterinary Medicine
   • NBII Northeast Information Node

i. Server Hosting/Maintenance
   • Uses local server physically sited at the USGS National Wildlife Health Center

j. Timeframe for development
   • Steady state currently

k. Cost – see Project Theme summary, P.4.

l. Stakeholder needs analysis documentation
   • Letters of support and survey results

m. Documentation
   • Web Based Data Entry Help File Complete v1
   • Seanet.xml (metadata)
   • Data Dictionary
   • Seanet Relational Database
   • Validation Tables

4. National Park Service Disease Reporting and Monitoring System
   Funded 2006-2008 through the Park Oriented Biological Support (POBS) competitive grants program, this project will provide a system for Park biologists and management staff to provide information to the Biological Resource Management Division and the NPS Office of Public Health on wildlife morbidity and mortality events that occur on NPS stewardship lands.
a. **Objective**
   - Provide the National Park Service with a Web-based platform for NPS units to report observations of wildlife disease or mortality.

b. **Efforts**
   - There has been communication and collaboration with NPS Wildlife Health personnel, but most of the work on this project has been associated with similar features developed for HEDDS.

c. **Outputs and Metrics**
   - No substantial progress on this project in 2009.

d. **Outcomes and Assessment**
   This project is dependent on the development of the larger WHMN/WISDOM infrastructure. Accordingly, WDIN anticipates resuming work with NPS on this project when the needed tools are available. Concurrence from Program Manager and NPS partners has been received on this approach.

e. **Cost** – see Project Theme summary, P.4.

5. **Chronic Wasting Disease Data Clearinghouse (CWDDC)**
   Operational in 2005, the CWDDC (http://wildlifedisease.nbii.gov/cwddc/cwddc.jsp) is a collaboration of state, federal and tribal agencies interested in examining the occurrence of chronic wasting disease (CWD) on a regional and national basis. It is available for all states and tribes to contribute CWD surveillance and testing data, and compare their surveillance efforts with those of surrounding states.

a. **Objectives**
   - To create a common data platform for sharing of CWD testing data.

b. **Efforts**
   - The WDIN staff has responded to inquiries from potential partners interested in contributing data to the CWDDC.

c. **Outputs and Metrics**
   - WDIN is maintaining the site as is at this point.

d. **Outcomes and Assessment**
   - WDIN responds to inquiries about the database, but otherwise it is a static system.
   - Additional partners might be included if another agency was identified to encourage data contributions.
e. Application Status
   • Steady stat

f. Partners Involved
   • Data Contributors – States of Washington, Oregon, Idaho, Nebraska Maryland, Wisconsin, and Tennessee
   • Conservation Management Institute (CMI) – Terminology and standards, workshop planning for terminology development
   • IAFWA
   • Native American Fish and Wildlife Society
   • SCWDS
   • USGS NWHC
   • Wildlife Information Network

g. Server Hosting/Maintenance
   • Uses local server physically sited at the USGS National Wildlife Health Center

h. Timeframe for development
   • Steady state currently

i. Cost – see Project Theme summary, P.4.

j. Stakeholder needs analysis documentation
   None to date

k. Documentation
   • Cwddc data dictionary_Current
   • Cwddc_schema

6. Development of an Integrated Wild Bird Surveillance Database
Using grant funds awarded from the Global Emerging Infections Surveillance and Response System Operations (GEIS), a division of the Department of Defense, the WDIN developed a comprehensive avian influenza data resource through the creation of mechanisms to integrate data from three existing avian influenza monitoring projects.

a. Objectives
   • To migrate and integrate existing wild bird avian influenza surveillance databases, and to develop import and export tools for a common system.
   • Standards Development
     o Build a reference information model to support medical information within and among programs participating in surveillance of wildlife for HPAI.
     o Create vocabulary maps between appropriate terminology standards and existing vocabularies extracted from existing data acquisition systems
(HEDDS, Global Avian Influenza Network for Surveillance (GAINS), SEANET, and WISDOM).
  o Develop model data export protocols

b. Efforts
  • Analysis of existing data structures
    o Review the data structures and sample data from participating systems (HEDDS, GAINS, SEANET, and WISDOM).
    o Identify overlaps between data structures.
    o Identify differences in the semantic handling of data that may require.
  • Identify terminology standards necessary to support the Common Information Model
    o Review of each class (or field) of the Common Information Model
    o Identify an appropriate terminology standard for each content area in the RIM.
    o Explore and identify additional datasets for incorporation
  • Vocabulary Mapping
    o Create SNOMED, LOINC and HL7 mappings for each system (HEDDS, GAINS, SEANET, and WISDOM).
      ▪ Systematized Nomenclature of Medicine (SNOMED) - A multiaxial, hierarchical classification system of medical terminology
      ▪ Logical Observation Identifiers, Names and Codes (LOINC) – a dataset of universal identifiers for laboratory and other clinical observations to facilitate exchange and storage of clinical results or vital signs for patient care and research
      ▪ HL7 – a set of standards for electronic interchange of clinical, financial, and administrative information among health care oriented computer systems
    o Initially, HL7 was selected to be used as the message between systems, but because of time constraints and limitations locally for each participating group, the ETL process was adopted and configured for each participating group.

c. Outputs and Metrics
  • Created a Common Reference Information Model
  • Modified terminology in the common database to use standardized fields and data elements derived from accepted controlled vocabularies.
    o Standardized animal taxonomic identification (species)
    o Medical findings, diagnoses or assessments
    o Land cover
  • Extended the ETL Java backend to include entities required for avian influenza data integration
• Created the Wildlife Health Analysis and Visualization application (WHAV) which allows the DoD GEIS group a mechanism to explore the datasets combined in one location.
• Frequent phone and email communications with the GEIS program manager kept him advised of progress and results.

d. Outcomes and Assessment
• The outcomes and products of this project can provide additional capacity for global emerging infections surveillance.
• Succeeded at demonstrating the ability to link existing avian influenza datasets by incorporating them into an extensible data architecture based on a common information model that is capable of managing a wider range of diseases.
• With this infrastructure, capable of exploring additional opportunities to work with other agencies and institutions, both nationally and internationally that holds wildlife disease event data.
• Will help to create a better understanding of disease prevalence, so that deviations from background might be more easily detected.
• Through ETL process, able to effectively channel data from the Wildlife Health Integrator to whichever AFHSC system is deemed most appropriate.
• The Wildlife Health Event Reporter can be deployed for use by personnel at DoD facilities to increase the number of opportunistic observations of unusual wildlife events that are available for analysis and action.

e. Application Status
• Steady state currently. May make minor modifications to WHAV depending on feedback from the DoD GEIS grantors.

f. Partners Involved
• Virginia Tech VTSL
• Tufts School of Veterinary Medicine
• Wildlife Conservation Society
• Nelson Institute for Environmental Studies, University of Wisconsin – Madison

g. Server Hosting/Maintenance
• Web server, database, and applications hosted on the UW Madison DoIT server.

h. Timeframe for development
• Steady state currently

i. Cost – see Project Theme summary, P.4.

j. Stakeholder needs analysis documentation
None to date
k. Documentation
- Reference Information Model Concept Diagram
- RIM Concept Identity Definitions
- RIM Concept Entity Relationships
- HEDDS Database Structure
- GAINS Database Structure
- SEANET Database Structure
- Wildlife Health Monitoring Network Ontology

7. Appalachian Trail Monitoring Data Entry Project
Under an agreement between the University of Wisconsin Madison and the Southern Appalachian Information Node (SAIN), the WDIN has constructed a data entry system for users to enter data about rare plant observations along transects. In order to standardize reporting across many states, the data entry application was developed with input from the SAIN group as well as personnel from the National Parks Service who are involved in managing the efforts.

a. Objectives
- To create a web-based data entry application for user data entry of observations taken during a rare plant site visit

b. Efforts
- Developed a prototype web application in 2009 for coordinators to test and evaluate
- Incorporated standards for data collected provided by the Appalachian Trail coordinators
- Demonstrated and explained application to evaluators who will provide further information as the data collection specifics are concluded.

c. Outputs and Metrics
- Web-based data entry system capable of recording user collected data during typical site visit to observe rare plants

d. Outcomes and Assessment
- Currently awaiting final data entry options to edit application to reflect the changing needs of the program.

e. Partners Involved
- NBII Southern Appalachian Information Node (SAIN)
- University of Wisconsin Madison
- National Park Service

f. Server Hosting/Maintenance
- Web server, database, and applications hosted on the WDIN server physically sited at the USGS NWHC
g. Timeframe for development
   - Project will be completed in 2010 pending acceptance after changes.

h. Cost – see Project Theme summary, P.4.

i. Stakeholder needs analysis documentation
   None to date

j. Documentation
   - Reference Information Model Concept Diagram
   - RIM Concept Identity Definitions
   - RIM Concept Entity Relationships
   - HEDDS Database Structure
   - GAINS Database Structure
   - SEANET Database Structure
   - Wildlife Health Monitoring Network Ontology

C. STRATEGIC PLANNING

1. Planning Meeting
   In June 2009, the core WDIN partners (USGS NBII, USGS National Wildlife Health Center, and UW-Madison, Nelson Institute) participated in the NBII WDIN Planning Meeting held in Madison, WI. The WDIN staff presented an overview of WDIN and its current data and information projects as well as partnership collaborations that cover current, developing and future projects. The core partners discussed some specific reporting requirements as well as clarifying organizational roles and responsibilities. One of the outcomes of the meeting will be to develop a project charter that outlines a Workshop that will bring together partners, practitioners, and others in the wildlife disease community to provide input towards strategic planning and help guide and focus WDIN’s future efforts.

   a. Objectives
      - Provide updates on WDIN successes and challenges.
      - Define working relationships between the core partners.
      - Inform core partners about broader WDIN community partners and projects.
      - Describe WDIN’s products and services for collecting, organizing and disseminating wildlife disease data and information.
      - With input from partners, identify future opportunities and prioritize efforts to develop a strategic plan that can guide WDIN in its short-term and long-term efforts.

   b. Efforts
      - Developed meeting materials
      - Developed informative presentations
c. Outputs and Metrics
- Attended by 13 participants.
- WDIN Planning Meeting Participation List
- 2009 WDIN Planning Meeting Agenda
- 2009 WDIN Planning Meeting Minutes
- WDIN Roles and Responsibilities Table
- WDIN Content Management Overview Presentation
- Planning Meeting Session Discussion Presentation
- WDIN Overview Presentation
- WDIN Technical Overview Presentation

d. Outcomes and Assessment
- The meeting was well attended; only two invitees were unable to attend.
- At the meeting conclusion, the overall feeling was that meeting was a success. Partners felt they had a better understanding of WDIN’s workings and had provided WDIN with constructive feedback on its future goals. The WDIN team gained a strategic roadmap to plan it next steps.

e. Partners Involved
- USGS NWHC
- UW – Nelson Institute for Environmental Studies
- USGS – NBII
- UW – Division of Information Technology (DoIT), Academic Technology

f. Cost – see Project Theme summary, P.4.

g. Documentation
- Meeting CD
  - All meeting materials listed above
  - Annual reports (FY06 – FY08)
  - Application Technical Documents
  - Awarded Grants
  - MOUs
  - Partner Letters of Support
  - Submitted Proposals
  - Survey Results (HEDDS and SEANET)
  - WDIN Fact Sheet
D. WDIN PARTNERS AND PROJECTS

- This section outlines some of the current active WDIN partners, the resources they provide, and/or collaborative projects underway.

1. Federal
   i. USGS National Wildlife Health Center (NWHC)
      o Basic Node infrastructure
      o WDIN Principal Investigator
      o IT technical assistance
   
   ii. USGS BRD Wildlife Program
      o HEDDS

   iii. National Park Service
      o POBS Wildlife Disease Reporting System

2. NBII Inter-node
   i. Northeast Information Node
      o SEANET
   
   ii. Southern Appalachian Information Node
      o Appalachian Trail Community Data Entry Project
      o RSS Working Group, web 2.0 knowledge exchange

3. State
   i. Wisconsin Department of Natural Resources
      o Wildlife Health Database
   
   ii. Maryland Department of Natural Resources
      o WHER development

4. Academic
   i. University of Wisconsin Nelson Institute for Environmental Studies
      o WDIN Content Manager
      o WDIN Technical Manager
      o Grant assistance
   
   ii. University of Wisconsin Division of Information Technology
      o Wisconsin DNR Wildlife Health Database
      o Technical assistance
   
   iii. Yale University Environmental and Occupational Health Program
      o Canary Database
      o Technical assistance
   
   iv. Tufts University Cummings School of Veterinary Medicine
      o SEANET
v. University of Minnesota Raptor Center  
   o Wildlife Health Monitoring Network

5. Non-profit  
   i. Wildlife Conservation Society  
      o WISDOM  
   ii. Wildlife Information Network  
      o Wildlife Health Monitoring Network

F. WDIN PRESENTATIONS AND POSTERS

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<td>Integrating Wildlife Health: Strategic Planning Workshop</td>
<td>Live Presentation</td>
<td>Dein</td>
<td>1/12/2009 – 1/15/2009</td>
<td>University of Minnesota Raptor Center</td>
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<tr>
<td>HEDDS Training Session</td>
<td>Live Presentation</td>
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<td>1/27/2009</td>
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<td>Now that You Care About Wildlife Disease: Where do you go for more information</td>
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<td>Marsh</td>
<td>1/28/2009</td>
<td>Wednesday Nite @ the Lab a University of Wisconsin - Madison outreach program</td>
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<td>2/05/2009</td>
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<tr>
<td>HEDDS Training Session</td>
<td>Teleconference/WebEx</td>
<td>Hines</td>
<td>5/17/2009 – 5/18/2009</td>
<td>Training provided for USFWS funded groups including multiple state DNR representatives and some USFWS refuge personnel participating in Avian Influenza Sampling for 2009 Sampling year. Hosted by Kentucky Department of Fish and Wildlife Resources.</td>
</tr>
<tr>
<td>Demonstrated WHER</td>
<td>Live Presentation</td>
<td>Dein</td>
<td>June 2009</td>
<td>Great Lake Initiative, an EPA program</td>
</tr>
<tr>
<td>Demonstrated WHER</td>
<td>Live Presentation</td>
<td>Dein</td>
<td>6/17/2009</td>
<td>Field Investigative Team, USGS National Wildlife Health Center</td>
</tr>
<tr>
<td>Demonstrated RDC for WDNR</td>
<td>Live Presentation</td>
<td>Hines</td>
<td>6/29/2009</td>
<td>Demonstrated the Rapid Data Collector for Wisconsin DNR</td>
</tr>
<tr>
<td>Wildlife Health Monitoring Network</td>
<td>Poster</td>
<td>Hines</td>
<td>9/15/2009</td>
<td>Organization of Fish and Wildlife Information Managers</td>
</tr>
</tbody>
</table>
**G. NBII WILDLIFE DISEASE INFORMATION NODE 2009 PERSONNEL**

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jennifer Carlino</td>
<td>NBII Node Manager</td>
</tr>
<tr>
<td>Joshua Dein</td>
<td>Principal Investigator</td>
</tr>
<tr>
<td>Megan Hines</td>
<td>Technical Manager</td>
</tr>
<tr>
<td>Cris Marsh</td>
<td>Content Manager</td>
</tr>
<tr>
<td>Barbara Nash</td>
<td>Student Assistant</td>
</tr>
<tr>
<td>Vicki Szewczyk</td>
<td>Administrative Manager</td>
</tr>
<tr>
<td>Laura Wynholds</td>
<td>Student Assistant</td>
</tr>
</tbody>
</table>