NATIONAL BIOLOGICAL INFORMATION INFRASTRUCTURE

WILDLIFE DISEASE INFORMATION NODE

FY 2008 PROGRESS REPORT

FY2009 PLANS
NBII WDIN FY2008 REPORT

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INTRODUCTION
The Wildlife Disease Information Node (WDIN) is a unique asset to the National Biological Information Infrastructure (NBII), filling an information void 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 not only wildlife health research, but also 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 FY2008, and proposed project plans for FY2009. We have arranged this information by projects, detailing for each:

- Our 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
- Goals for FY2009

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

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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. 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 involves monitoring incoming messages and prepare outgoing notifications, which takes about 1 hour per month.

   c. Outputs and Metrics
      • Membership is over 470 subscribers in 25 countries.
      • In FY2008, 47 new members have joined the list.
      • WDIN contributes about 2 informative postings per week which include:
d. Outcomes and Assessment
Based on its growing membership and the routine use of the List, users appear to find this service useful. The numerous benefits users receive compared to the minimal work required to maintain the List leads WDIN to conclude we should continue to support this product.

e. FY2009 Plans and Goals
- Continue to post informative postings, issuing at least two postings per week.
- Research new ways to market the List and encourage members to make use of this tool.
- Explore other ways to provide members with useful information (e.g. bi-weekly summary of upcoming wildlife disease related conferences).

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

b. Efforts
- Entries take between 2 and 3 hours total, and are made almost daily, resulting in approximately 5 posts per week.
  - The process begins by searching for relevant news items and recently published journal articles. It takes about 45 minutes to an hour to skim over 40 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.

The main news stories (approximately 3 to 5 articles) are cataloged to create a cleaner RSS feed for the WDIN homepage. The amount of time to catalog is about 30 to 45 minutes.

The last step of the process is copying the Digest entry into an email format that is sent out to subscribers of the whnewsdigest mailing list. This service, which is offered to those who prefer to receive their Digest news by email, takes about 15 minutes to create the email message.

- A weekly digest of all the posts is made to the WildlifeHealth List. Creating and publishing the digest takes about 30 minutes.
- WDIN maintains the Digest emailing list, whnewsdigest, which includes answering questions, along with adding and deleting members.

c. Outputs and Metrics

Stats on Wildlife Disease News Digest Website:
- Average times feed is accessed per 24 hours: 120
- Email Alerts Subscribers (Listserv + Feedburner Subscribers): Over 460
- Weekly Summary Subscribers (via WildlifeHealth list): 499
- Geographical reach: 128 countries

d. Outcomes and Assessment

Based on membership, usage statistics, and feedback, we believe the WDIN team should continue to support and explore ways to extend the functions of this project. In addition to becoming a source for current wildlife disease news, it also has the capacity to become a historical database for public awareness trends.

e. FY2009 Plans and Goals

- Post news content and citations to recently issue journal articles approximately 5 times per week.
- Develop strategies that will promote and market the blog as an important communication tool for the wildlife health community to share ideas and to stay current on the latest wildlife issues.
- Solicit members to volunteer and assist with posting, so that maintaining the Digest is a community effort rather than just a WDIN project. Look for partners who would be willing to help expand the international component through foreign language media.
- Make the content of the News Digest searchable and capable of generating reports and maps, so that users can discover and compare
what wildlife disease issues were grabbing the public's attention when, and similarly the headlines during different periods of time.

- Redesign the format of the Digest for a more user friendly experience, tying in WDIN website content more closely with the news.
- Explore new methods for disseminating the postings that are less time consuming for WDIN staff.

f. Application Status
- Being updated with news, recently release journal articles, and other pertinent information on a regular basis

g. Partners Involved
Exploring opportunities with following groups to include more relevant information within the RSS feed 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.

- **CDC BioPHusion**
  - Interested in WDIN including SNOMED concept codes representing a number of diagnostic and pathology terms
  - Currently using a number of WDIN feeds to populate their BioPHusion Situational Awareness system.

- **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.

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

i. 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.

j. Cost – see section D.a.

k. Stakeholder needs analysis documentation
• Have support letters from professional community,
• Had a survey in 2007 of Digest Users at the Wildlife Disease Association Meeting in Colorado.
• 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.

I. 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 regular release 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.

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:
  o Writing the main article and highlights section
  o Finding or creating images and figures
  o Reviewing and selecting upcoming conferences and newly added web resources to highlight
  o Formatting the content

c. Outputs and Metrics
• 11 Issues published in FY2008
• Between September 2007 and September 2008, current and past issues were downloaded over 6,500 times.

d. Outcomes and Assessment
• The Highlights issues are a good way to communicate with the wildlife health community on what new tools and services on which WDIN is working, with an extensive reach.
Based on its usage, the Highlights should be continued as a meaningful way to disseminate information about what the WDIN is working on.

e. FY2009 Goals
   • Increase visibility of product through presentations, publications and promotional materials.
   • Redesign the formatting of the Highlights to make it more reusable and quicker to put together.
   • Market the Highlights as a way to keep in touch with our partners
   • Explore using a Blog type of format which would make each post less formal and released in a more timely fashion
   • Increase focus on metrics of WDIN product utilization.

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 database entries, 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 information cataloged easily on the website, the Digest, the Global Wildlife Disease News Map, a Google Earth KML file, and a handful of RSS feeds and GeoRSS feeds, and also push the content to the NBII Resource Catalog Database, populating the Portal and corresponding portlets.

   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
         o 10-20 minutes for journal articles
         o 20-40 minutes for a web resource
         o 5 – 10 minutes for a News Digest story. Three to six stories are cataloged daily

   c. Outputs and Metrics
      • For FY2008, 131 new web resources have been cataloged.
• For FY2008, 1446 new News Digest postings have been cataloged.
• To date, over 1100 web resource records have been sent to the NBII records database.
• Contains standardized keyword list of over 1000 terms relating to wildlife health

d. Outcomes and Assessment
Extension of the cataloging tool to include the daily postings to the WDIN News Digest has allowed WDIN to extend its information into a variety of novel formats. Not only have we utilized this information to populate an interactive web mapping application using Google Maps API, (the Global Wildlife Disease News Map version 1); we also now are able to provide RSS feeds, and a GeoRSS feed with this information.

e. FY2009 Plans and Goals
• Catalog 5-10 resources per month.
• Send new keywords to NBII for incorporation into the Biocomplexity Thesaurus.
• Solicit members of the wildlife health community to volunteer to contribute new content to the site, especially those who have a particular disease specialty.
• Plan mechanism for adding definitions to keywords to generate a public glossary for our site
• Explore new and novel ways to distribute the contents of our local Catalog Database
• Met with Tim Woods and other members from the NBII staff to discuss developing a web service for the NBII Resource Catalog at the December 2008 Developers meeting. Suggested development ideas and a draft implementation plan. WDIN staff available in the future for additional consultation on generating the web services for the DIL and the NBII Resource Catalog.
• Invited to present information on the inner workings of the WDIN, our database, and the products and services it helps us provide to the World Data Center group in Reston, Virginia.

f. Application Status
• Steady state

g. Partners Involved
• None

h. Server Hosting/Maintenance
• Uses server physically sited at the USGS National Wildlife Health Center
i. Timeframe for development

- Steady state currently – aside from small fixes when upgrading to SQL Server 2005 in FY2008, majority of development was completed in March 2007.

j. Cost – see section D.a.

k. Stakeholder needs analysis documentation

- Provides for our own internal needs – website, RSS, GeoRSS, NBII Portal content push, Google Earth files, Digest content and many other uses.
- Provides exports for NBII Cataloging Tool/Database

l. 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
- Cataloging Guidelines
- Cataloging Guidelines_QuickNDirty_Journal
- Cataloging Guidelines_QuickNDirty
- WDIN_collection_development_policy

5. **WDIN Website and Web Applications**

a. Objectives

- To provide a location for users to explore wildlife health resources, until these features and functions are enabled through the NBII portal. Migrate website sections to portal when possible.

b. Efforts

- Much of the work in maintaining the website is accomplished through use of the cataloging tool as described above.
- Maintain and enhance website features and functions
  - Modify website 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.
- Examine locally hosted website and determine how to fit into a section within the NBII portal. Due to current limitations within the portal framework, cannot easily migrate all website functions. Will have to plan for a balance between what portal can take on and what must remain hosted locally.
- Netvibes Widget and Google Gadget released in 2008
  - In order to provide our users with a wide variety of ways to access the updated content we provide, the WDIN released a Netvibes Widget programmed with the Universal Widget API and a Google Gadget in 2008.
  - These tools allow users to pull WDIN feeds into their own applications like Facebook, MySpace, Mac Desktop, Apple’s iPhone, iGoogle, and many other social networking sites.
- GeoRSS feed support added to provide georeferenced RSS items to users. This feed is freely available to anyone who wishes to work with our information in GeoRSS format. The simplified standard for GeoRSS was used to include this information in our Wildlife Disease News Digest GeoRSS feed.

c. Outputs and Metrics

Wildlife Disease Information Node Website
Server statistics for the WDIN Website
- Approximately 250 hits per day throughout the site on average for FY08
- West Nile Virus website attracts 350 hits each day on average for FY08
- Chronic Wasting Disease References website (http://www.cwd-references.org) released in FY2007 attracts approximately 5 hits per day. Need to poll potential users and work with a focus group to determine how to make the site more useful and explore venues for marketing the site and its contents.

Wildlife Disease Information Node RSS Feeds
Statistics on Popular RSS Feeds (average times feed is accessed per 24 hours) from October/November – September 30, 2008. The start of these stats depends on when the feed came online.
- New WDIN Content: 38
- Avian Influenza Content: 29
- Upcoming Wildlife Disease Related Meetings & Events: 19
- HEDDS Surveillance News: 21 (plus 208 subscribers to email alerts)
- Chronic Wasting Disease Content: 17
- Connotea - New Wildlife Health Publications: 4
- GeoRSS feed
  - Over 2,400 uses between December 2007 and September 2008
  - Used by IBM Mashup Wiki in educational exercise posted to their website
  - Picked up by the HealthMap application (www.healthmap.org), as a highly valued source for wildlife health news on their map
  - Attracted attention of the CDC BioPHusion team for use in Situational Awareness application, specifically with the Zoonoses Information Partnership (ZIP) program
- Google Earth KML file
  - Over 1050 uses in FY08

**d. Outcomes and Assessment**

- As seen through web traffic statistics and search engine ranking (e.g. Google), the web site appears to be a highly used and a "linked-to", resource.
- Examination of the feed stats available, there is an upward trend in usage for each feed.

**e. FY2009 Goals**

- Explore working more within the portal framework, how things can be supported by the portal framework and what currently is not supported, and how those are maintained and supported.
- Expand the number of diseases that WDIN provides extensive information on. Expand to include information about White Nose Syndrome as more information becomes available.
- Provide a mechanism for users to get content off the site more easily by email, sharing with friends and colleagues through social networking tools and other popular formats.

**f. Application Status**

- Being updated with new content on a regular basis although framework is steady state.

**g. 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.

**h. Server Hosting/Maintenance**

- Uses local server physically sited at the USGS National Wildlife Health Center
i. 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. The
     majority of development was finished in March 2007. Shifting functions to portal is
     ongoing and time consuming. Will continue to migrate functions and jumping off
     points to NBII Portal in FY2009.

j. Cost – see section D.a.

k. Stakeholder needs analysis documentation
   - Google PageRank: 7 (on a scale from 1-10, the higher the page rank
     means higher placement on the search engine results page)
   - See survey done in 2007 at the WDA conference in Colorado.

l. 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 is a group "working to protect the health of managed and
native pollinating animals vital to the North American ecosystems and agriculture." (http://www.pollinator.org/about.htm) In 2008, 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
   - A simple web-based form was created and is hosted on the NBII WDIN
     web server which accepts a zipcode provided by the user and returns a
     static map, a link to the Ecoregional Guide provided by the Pollinator
     Partnership, and the option to explore their ecoregion and others by using
     the interactive map created with the Google Maps API.
   - As new Ecoregional Guides are completed by the Pollinator Partnership,
     the URLs to the PDFs are added to the MS SQL Database table which
     provides information to the web application.
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.
   - Each time a new set of guides are released a spike is shown in traffic statistics.

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

e. FY2009 Plans and Goals
   - Adding new URLs as necessary when provided by the Pollinator Partnership

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

g. Partners Involved
   - Pollinator Partnership

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

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

j. Cost – see section D.a.

k. Stakeholder needs analysis documentation
   - See partner comments letter

l. 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
In October 2007, WDIN began developing the first version of the Global Wildlife Disease News Map. The first version came online in December 2007.

- Map was designed to show recent additions to the Wildlife Disease News Digest which had a geographic context. Users could filter the map by Wildlife Health Topic, and expand map markers to see more details about the news items and follow the link to the original article.


- This new release included the ability to filter the Digest contents by one of seven filters; Wildlife Topic, Domestic Animal Topic, Human Health Topic, Disease Type, Country, Species, and Date.
- Geographic detail is captured and displayed at a finer detail than the previous version – at one of five levels – Place Name, County (US), Administrative Unit, Country or Continent.
- Provide users with the option to stream the contents of the Map into Google Earth with the provided KML file. If this layer is added to their local Google Earth application, each time they open the program the layer will automatically refresh itself with the latest items.
- Includes other options to Browse Articles which displays the recently added stories in a textual form, and background information about the Map.

In May 2008, a joint press release between the Nelson Institute of Environmental Studies at the University of Wisconsin and the USGS National Wildlife Health Center was distributed.

c. Outputs and Metrics

- Over 14,000 page loads with an average of 54/day
- Press release in May 2008 was picked up by over 75 internet media sources and generated over 2,500 hits on one day

d. Outcomes and Assessment

- Due to the amount of attention gained by releasing the map, the significant media coverage and praise given to the application, the WDIN feels as though it is of significant value to the community and should continue to be supported.

e. FY2009 Goals

- Explore mechanisms of improving upon the maps abilities to filter news items
- Investigate other mapping frameworks in which the map could be developed (SIMILE Exhibit for example)
f. Application Status
   • Steady state at version 2. Investigating future improvements which could be made as well as identifying potential frameworks.

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

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

i. Timeframe for development
   • Released version 2 in March of 2008.

j. Cost – see cost section D.a.

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

l. Documentation
   • Map Tips
   • About the Map
   • wdinNewsMapHelpV2

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. A goal is that any future development 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.
      • To develop a common terminology system consistent with established medical informatics standards.

   b. Efforts
      • Working cooperatively with the CDC, WDIN received a copy of the CDC’s application, the Rapid Data Collector (RDC). Efforts will be made to work
with the CDC in the upcoming year to have specific modifications made to
the tool so that it more closely matches the goals we have for it.
Modifications desired include document upload and storage, loading
interface terms from a local database table, interaction with web services.
A list of our needs have been given to the CDC team working on RDC and
ongoing phone discussions will continue.

- With the assistance of the University of Wisconsin, Department of
  Information Technology (DoIT), WDIN restructured the original WISDOM
database which greatly improved its ability to contain the desired
information in a more logical manner. The abstract nature of the structure
allows WDIN to plug a large variety of information into the system, which
will serve as the basis for all future applications that the WDIN creates.

- Working closely with DoIT, WDIN also has created prototype data entry
  web application, Extract Transform and Load tools (ETL) to move data
  from the data entry application to the data warehouse, reporting functions
  utilizing the Pentaho Data Integrator (PDI) toolset, and mapping using PDI
  as well.

c. Outputs and Metrics

- Database schema refactored into a less redundant, more encompassing
  structure. Allows for easy addition of new types of information (new
  observations, etc) which will allow our system to contain new novel
  observations without adding new fields to the database.
- Data entry applications are flexible; essentially any type of input can be
  accepted. A web application with web-based forms, an Excel file, the
  Rapid Data Collector application from CDC, etc.
- ETL Tool – The Extract Transform and Loading toolset allows an Admin
  level user to establish relationships from the output of the Data Entry
  applications above 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.
- Administrative application – The Administrative functions include the
  validation and data moving pieces of the puzzle, along with user
  management and data editing.

d. Outcomes and Assessment
• Progress made this year has established a great deal of specific functions required to make the WISDOM toolset complete. While the tools are not connected with any interface at the moment, they all function on their own.

e. FY2009 Plans and Goals
• Explore opportunities for additional funding with governmental and non-governmental agencies
• Demonstrate functions to interested parties to garner support and adoption of the system for a variety of uses; demonstrate individual project functions and how they all feed into the database and can work with all the data using the included tools.
• Work with the terminology lab at Virginia Tech to generate needed terminology to populate drop down lists with standard terms.
• Get involved with TDWG to generate community involvement in standards for exchanging wildlife health information and terminology development.

f. Application Status
• Currently in prototype phase. Engaging real life partners to work with in order to put together actual working pieces.

g. Partners Involved
• UW Madison DoIT, Wisconsin DNR, University of Minnesota Raptor Center

h. Server Hosting/Maintenance
• Current prototype applications are hosted on UW Madison DOIT servers

i. Timeframe for development
• A generalize development plan has been created with our DoIT partners. Target milestones will be set based on funding available.

j. Cost – see section D.a.

k. Stakeholder needs analysis documentation

l. Documentation
• usgs-wdard-workflow-overview
• WDARD data access control
• WDARD Ontology (brief)
• WDARD ontology Barton Email
• WDARD_Architecture 03-07-2008
• WDARD_Database_Design Barton 03-17-2008
• WDARD_database_design.graffle 03-17-2008
• WDARD_Database_Design_1.0draft_5
• WDARD_database_design_diagram_1.0.draft5
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](http://wildlifedisease.nbii.gov/ai)) as a data management tool that can be used by all agencies, organizations, and policy makers. 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**

- Due to expansion of USFWS regions performing surveillance in 2008, six training sessions were held in order to get all those doing surveillance up to speed on how the HEDDS system works for submitting avian influenza surveillance data.
- Continued to maintain the system for the 2008 sampling season (April 1, 2008 - March 31, 2009)
- Continued to provide support to users through email, phone and one-on-one training
- Deployed sample submission and tracking system within HEDDS for submission, edit and notification to users on surveillance data entered. As users upload data, their data coordinator and the USGS NWHC Lab personnel are notified of new data. As the information moves through the approval process, each edit is tracked and saved for review if needed. This will greatly reduce the need for concerns about versioning of data. Introducing new users to this method as they come on board.
- Consolidated species list (removed subspecies, rectified differences in agency's AOU codes, etc.)
- Mass editing function within HEDDS application added to provide editing capabilities on a Group Identifier level rather than sample by sample
- Created Browse function specific to the Pacific region to facilitate reporting needs of users in the Pacific
- Created several custom reports for various USFWS coordinators
- Created canned report set for 2008 sampling year

c. **Outputs and Metrics**

- HEDDS Contributor Site
Statistics on usage by data contributors:
- Over 78,000 samples contributed
- 329 datasets processed from contributors to the USGS NWHC (USFWS, USGS, States, NGOs, Universities)
- Over 6100 referrals processed from USDA
- Over 950 records from the USGS NWHC Diagnostic Database included

- HEDDS Public Site
  - Statistics on public usage:
    - Average of 3001 unique page loads per month
    - Average of 1567 unique visits per month
    - Average of 1218 first time visits per month
    - Average of 349 returning visits per month
    - LPAI Chart (PDF & web based) accessed over 10,645 times
    - RSS Feed for HEDDS Surveillance News accessed on average 25 times per day

d. Outcomes and Assessment
HEDDS has become a widely accepted and accessed resource for avian influenza surveillance information, and is a good example of interagency cooperation. Questions and issues still exist regarding specific processes and policies for contributions and access to HEDDS, and these have been forwarded to the Interagency Steering Committee for resolution.

e. FY2009 Plans and Goals
- Continue maintenance of the system, adding users, importing and updating datasets
- Consider new enhancements to data upload/validation mechanisms for contributor use
- Continue conducting training sessions as requested

f. Application Status
- Being updated with new data on a regular basis;
- Would like to have DoIT assess incorporating more automated functions to ensure maintenance is less time consuming.

g. Partners Involved
- USFWS
- USDA
- USGS
- DoIT

h. Server Hosting/Maintenance
- Uses server physically sited at the USGS National Wildlife Health Center
i. Timeframe for development
   - Working to incorporate the automation tools developed by DoIT.
   - Would like to expand automation tools for less intense manual maintenance by WDIN staff.

j. Cost – see section D.a.

k. 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

l. 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
     - Uploading a Dataset into HEDDS
   - Technical Documentation
     - State and Contributor Totals
     - How to Compile
     - Header
     - Admin Panel
     - Lists
     - HEDDS Simplified Data Dictionary
     - HEDDS database data dictionary_erica
     - 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
   - New user dashboard displays statistics to volunteers. Top ten lists of most walks performed, most beached birds reported, etc.
   - Revised data forms post data analysis by Tufts to remove unnecessary or statistically insignificant data being captured.
   - 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 use in 2008:
     - Total beach walks entered – 1039 walks
     - Total beached birds reported – 898
     - Unique transects monitored – 128
     - Over 6,500 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.

e. FY2009 Goals
   - Maintenance only

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

g. Partners Involved
   - Tufts School of Veterinary Medicine
   - NBII Northeast Information Node

h. Server Hosting/Maintenance
   - Uses local server physically sited at the USGS National Wildlife Health Center
4. National Park Service Disease Reporting and Monitoring System

Funded in 2006 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.

   d. Outcomes and Assessment
      This project is dependent on the development of the larger WHMN/WISDOM infrastructure. Accordingly, we hope to resume 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. FY2009 Goals
      - Keep NPS informed of status.

6. 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
   • As avian influenza has become a high profile wildlife disease, interest in CWD has diminished. As WDIN has received past guidance that we should not be directly soliciting data for inclusion into the CWDDC, we only respond to inquiries. Additional partners might be found if another agency was solicited to encourage data contributions.

e. FY2009 Plans and Goals
   • Maintain system at current level

f. Application Status
   • Steady state

g. 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

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

i. Timeframe for development
• Steady state currently

j. **Cost** – see section D.a.

k. **Stakeholder needs analysis documentation**
   None to date

l. **Documentation**
   • Cwddc data dictionary_Current
   • Cwddc_schema

C. **WDIN PARTNERS AND PROJECTS**
   • This section outlines the current 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
   3. State
      i. Wisconsin Department of Natural Resources
         o Wildlife Health Database
   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

5. Non-profit
   i. Wildlife Conservation Society
      o WISDOM

D. DETAILED FUNDING

FY 2007 NBII Wildlife Disease Information Node Funding and Partners

<table>
<thead>
<tr>
<th>Funding Source or Partner</th>
<th>Direct Funds</th>
<th>Non-USGS Funds</th>
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<tr>
<td>NBII</td>
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<tr>
<td>Node base funds</td>
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<tr>
<td>USGS NWHC</td>
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<tr>
<td>Center base funds</td>
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USGS/NPS

POBS $42,167

Sub -totals $322,819 $42,167

Total Direct Funding $364,986
Aggregated Indirect Costs $74806
Total available for WDIN projects $289,810

In Kind contributions were received from UW-Nelson Institute, but the value has not been estimated

**a. Estimated Project Costs**

It is difficult to accurately assess the specific costs involved in each of the WDIN projects. This is primarily due to the efficiencies gained by developing tools and processes that benefit more than one project. However, a general percentage distribution of effort per major project described above, is presented below:

<table>
<thead>
<tr>
<th>Project</th>
<th>Percentage WDIN Effort</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information Products</strong></td>
<td></td>
</tr>
<tr>
<td>WildlifeHealth Electronic Discussion List</td>
<td>2</td>
</tr>
<tr>
<td>WDIN Website and Web Applications (including Portal)</td>
<td>10</td>
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<tr>
<td>Cataloging Tool</td>
<td>4</td>
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<tr>
<td>Wildlife Disease Information Node News Digest</td>
<td>15</td>
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<tr>
<td>WDIN Highlights</td>
<td>5</td>
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<tr>
<td>Global Wildlife Disease News Map</td>
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<td>Pollinator Partnership</td>
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<td><strong>Disease Reporting and Monitoring Projects</strong></td>
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<tr>
<td>Wildlife Health Monitoring Network</td>
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<tr>
<td>The Highly Pathogenic Avian Influenza (HPAI) Early Detection Data System (HEDDS)</td>
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<tr>
<td>Seabird Ecological Assessment Network (SEANET)</td>
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<tr>
<td>National Park Service Disease Reporting and Monitoring System</td>
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<tr>
<td>Chronic Wasting Disease Data Clearinghouse (CWDDC)</td>
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<table>
<thead>
<tr>
<th><strong>E. WDIN STAFF PRESENTATIONS AND POSTERS</strong></th>
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<tbody>
<tr>
<td>Title</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>Wildlife Disease Surveillance</td>
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<tr>
<td>Avian Influenza</td>
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<tr>
<td>Event Description</td>
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<tr>
<td>----------------------------------------------------------------------------------</td>
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<tr>
<td>New York Workshop 2008</td>
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<tr>
<td>HEDDS Training Session</td>
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<tr>
<td>HEDDS Training Session</td>
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<tr>
<td>HEDDS Training Session</td>
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<tr>
<td>HEDDS Training Session</td>
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<tr>
<td>Global Wildlife Disease News Map</td>
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</table>
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<table>
<thead>
<tr>
<th>All about the Wildlife Disease Information Node</th>
<th>Live Presentation</th>
<th>Marsh</th>
<th>6/11/2008</th>
<th>At the USGS NWHC with invited UW Madison Librarians</th>
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</thead>
<tbody>
<tr>
<td>HEDDS Training Session</td>
<td>Teleconference/ WebEx</td>
<td>Hines</td>
<td>7/1/2008</td>
<td>La Crosse, WI Attendees physically at the training center and Hines communicated via WebEx and Teleconference.</td>
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<tr>
<td>Linkages Between Wildlife and Human Health</td>
<td>Live Presentation</td>
<td>Dein</td>
<td>9/x/2008</td>
<td>UW Nelson Institute Environment Symposia</td>
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### F. NBII WILDLIFE DISEASE INFORMATION NODE FY2008 PERSONNEL

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joshua Dein</td>
<td>Principal Investigator</td>
</tr>
<tr>
<td>Steven Gustafson</td>
<td>Information Technology Specialist</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>Erica Schmitz</td>
<td>Student Assistant</td>
</tr>
<tr>
<td>Vicki Szewczyk</td>
<td>Administrative Manager</td>
</tr>
</tbody>
</table>
G. NEW PROPOSED FY2009 PROJECTS

1. Appalachian Trail Mega Transect Data Entry Application
   Together with the University of Tennessee at Knoxville, in 2009 the WDIN will be developing a specific reporting form for the Appalachian Trail Mega-Transect Monitoring project. In 2008, a statement of work was developed for generating an RDC form which will allow volunteers on the project to enter data in a standardized way on the web. The RDC application will include a number of customizations in order to provide the AT the ability to export their information and ingest it locally in their Access Database.

2. The Raptor Center
   Work with The Raptor Center and their database of rehabilitation information to include in the WHMN system. Need to establish an ETL process for the movement of data from their local Access database to the WHMN database.

3. TDWG
   Explore possible interactions with the Taxonomic Data Working Group on the integration of medical informatics with biodiversity informatics

4. EcoHealth101.org
   Begin work with Nelson Institute partner Dr. Jonathan Patz to revise the ecohealth101.org website along the lines of the WDIN website, so that it is database driven when possible. Create new position within Nelson Institute for an EcoHealth Outreach Specialist which will incorporate work done for WDIN @ 0.5 FTE, from WDIN funds and .25 FTE from ecohealth101.org funds.