NATIONAL BIOLOGICAL INFORMATION INFRASTRUCTURE
WILDLIFE DISEASE INFORMATION NODE

FY 2006 PROGRESS REPORT
FY2007 PLANS

January, 2007
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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 FY2006, and proposed project plans for FY2007. 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 FY2007

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**

<table>
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<th>Funding Source</th>
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<th>Other DOI</th>
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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](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, which takes about 1 hour per month.
      • An evaluation survey questionnaire on the List was distributed to the membership in December 2006. It took a total of approximately 15 hours to create and distribute the survey, and to compile the results.

   c. **Outputs and Metrics**
      • Membership is over 450 subscribers in 34 countries.
• In FY2006, 67 new members have joined the list.
• WDIN contributes about 2 informative postings per week which include:
  o A weekly wildlife disease news digest
  o A bi-monthly WDIN newsletter
  o Job announcements
• Approximately 2 posts are contributed per month by other members that include primarily:
  o Job announcements
  o Meeting announcements
• List Survey results [See Appendix A for full results]
• Members subscribe to the List for the following purposes:
  o Learn about issues and developments (97%)
  o News, events, resources and job/educational opportunities (91%)
  o Engage in conversation (21%)
  o Communicate relevant news (18%)
  o Query members (9%)
• They use the List to:
  o Read messages selectively based on the subject heading (61%)
  o Read messages regularly (31%)
  o Post occasional messages (3%)
  o Seek further information from resources provided within a message (88%)
• They choose to subscribe because of a colleague’s recommendation (48%).

d. Outcomes and Assessment
Based on a growing membership, the December 2006 List survey, and the routine use of the List, users appear to find it 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. The high rate of subscription due to a colleague’s recommendation suggests that an increase in quality may increase subscribers.

e. FY2007 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.
• Using the survey results, explore other ways to provide members with useful information (e.g. bi-weekly digest of upcoming wildlife disease related conferences).
2. **Wildlife Disease Information Node Blog**

The WDIN Blog ([http://wdin.blogspot.com](http://wdin.blogspot.com)) was begun 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. [See Appendix B for a sample of WDIN Blog posting]

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 to the blog take between 1 and 1 ½ hours total, 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 20 to 30 minutes to skim over 30 news resources.
  - Items are selected and a blog entry is created by entering the title, author, publisher, and about ten sentences from the beginning of each news article. This takes about 20 to 40 minutes. Some entries take longer if additional related links and/ or journal citations are included.
- A weekly digest of all the posts is made to the WildlifeHealth List. Creating and publishing the digest takes about 30 minutes.
- An evaluation survey questionnaire was distributed to the membership in December 2006.

c. **Outputs and Metrics**

- Traffic to the blog referred visitors to the WDIN website over 6,000 times between April 2006 and December 2006.
- Blog membership (those who receive daily postings) stands at 30 members, as of December 2006. From November 2006 through December 2006, approximately 47 people subscribed to the Blog RSS for their news.
- From September to December 2006, traffic to the blog has increased from 150 to 450 visits per week.
- Survey results [See Appendix C for full results]:
Members found the news digest to be:
- Very Helpful (68%)
- Somewhat Helpful (9%)

Members subscribe to:
- Obtain wildlife disease news (35%)
- Learn about issues and developments in the field (30%)
- Learn about recently published wildlife disease related journal articles (25%)

Members use the message postings to:
- Skim subject headlines to stay current on wildlife disease issues (22%)
- Find interesting articles and read the entire piece (22%)
- Share an interesting article with a colleague (22%)
- Pursue additional resources pertaining to an interesting post (19%)
- Recommend the blog to others (16%)

Subscribed to the Blog:
- Because of a posting from the Wildlife Health List (57%)
- Because of a posting from another List (29%)

**d. Outcomes and Assessment**

Based on membership, usage statistics, and feedback (although very limited) from the December 2006 List and Blog surveys, 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 is also becoming a historical database for public awareness trends.

Although this was intended to be a forum for discussion of issues raised by news or journal articles, it is not being used in this manner. Additional feedback and discussion are needed to determine if this is a good product to meet this objective.

**e. FY2007 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 blog is a community effort rather than just a WDIN project.
- Use the historical data to map disease trends over time.
Make the content of the blog 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.

3. **WDIN Newsletter**
   Established in August 2006, the WDIN Newsletter (http://wildlifedisease.nbia.gov/newsletters.jsp) is a bi-weekly 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. [See Appendix C for a Newsletter sample]

a. **Objectives**
   - To provide topical information about WDIN resources and features

b. **Efforts**
   - Each newsletter 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
   - An evaluation survey questionnaire was distributed in December 2006.

c. **Outputs and Metrics**
   - Ten issues published between Aug 2005 and Dec 2006
   - Between October 2006 and December 2006, when the newsletter was made available from the WDIN site, this publication was downloaded over 400 times.
   - User survey results:
     - Respondents found the WDIN Newsletter to be:
       - Very Helpful (59%)
       - Somewhat Helpful (33%)
       - Not Helpful (4%)

d. **Outcomes and Assessment**
   Although this product has only been available for a short time, survey results suggest it is well received. Additional feedback and review will be required to achieve a more reliable assessment.
e. FY2007 Goals

- Continue publication of newsletter, and reevaluate effectiveness at end of FY2007.
- Increase visibility of product through presentations, publications and promotional materials.

4. Cataloging Tool

The cataloging tool allows WDIN staff to easily input new website content which is saved to the local WDIN database [See Appendix D for screenshots of the cataloging tool]. The current website content is dynamically created from database entries, and transferred to the NBII's records database. This tool can be used by non-technical staff, and maintains a standardized format and vocabulary.

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.

b. Efforts

- Approximately 120 hours (student contractor) were required to develop the tool in its current form. An additional 2 hours total per week is required for maintenance.
- Content cataloging
  - 10-20 minutes for journal articles
  - 20-40 minutes for a web resource
- From September 2006 to the present, 480 resources have been transferred to NBII.

c. Outputs and Metrics

- For FY2006, over 1050 new resources have been cataloged.
- To date over 480 records have been sent to the NBII records database.
- Site Improvements
  - Upgrades to the current version include more powerful keyword application tools, and standardization functions for all keywords, publishers and other dynamic lists. [See Appendix E for screenshots of keyword application tools]
  - Developed an automated function to export records in the required format for the NBII XML Upload Tool to accept
  - Designed robust web based metadata input forms
  - Increased administrative functions
o Created keyword standardization modules
  • Contains standardized keyword list of over a 975 terms

d. Outcomes and Assessment
The changes made to the cataloging tool over this past year have greatly improved cataloging efficiency. New records can be more quickly added to the database. In addition, this new version has also improved the quality of the records through standardized lists (e.g. author names, publisher names, keywords). The tool is successful in enforcing format and vocabulary standards, and enhances the ability to use entered records in multiple applications and products. Records are now more easily entered into the NBII records database.

e. FY2007 Plans and Goals
  • Catalog 10-15 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.

5. WDIN Website and Web Applications

a. Objectives
  • To provide the entry portal for WDIN resources, until these features and functions are enabled through the NBII portal

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
    o 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.
    o Conduct routine monthly checks for broken links. This typical takes about 6 hours to review a link report and to repair the broken URLs.
    o Search and select quality resources to add to the website.
      ♦ Approximately 5 hours per month is set assigned for this task.

c. Outputs and Metrics
  • Added a searchable conference calendar. User can browse events by month or they can use the search feature. Calendar event information
includes dates, title and URL. [See Appendix F for screenshots of calendar]

- Implemented a highly precise, easy to use guided search to help users narrow their search for content. [See Appendix G for screenshots of the guided search]
- Added RSS feeds
- Please see Appendix H for graphs of selected web traffic statistics

d. Outcomes and Assessment
Based on web traffic statistics and search engine ranking (e.g. Google), the web site appears to be a highly used and a “linked-to”, resource.

e. FY2007 Goals
- Integrate the WDIN website with the NBII public portal.
- Create new disease sections
- Create an interactive environment within the site where users can rate and comment on a specific resource as to how useful or interesting they are. These comments could include providing related resource links. Higher rated resources would have a more prominent presence on the site and return higher up in the search functions.

6. WDIN Section within NBII Portal
In December 2006, NBII launched a new portal based version for www.nbii.gov. A WDIN section was created as an Ecological Topic, and this links to the current WDIN web site.

a. Objectives
- Integrate appropriate WDIN resources into the NBII portal section.

b. Efforts
The technical details of developing the WDIN portal section must be learned, and new portlets and links added to the site. WDIN staff participated in four days of training for this purpose.

c. Outputs and Metrics
- The WDIN Content manager participated in March 2006.
- The WDIN Technical Manager and Student Contractor participated NBII portal technical training in October 2006.
- Three new features have been added to the portal section.

d. Outcomes and Assessment
Other than staff training, a minimal effort has been directed to migrating WDIN resources to the new portal system. The intensive development efforts required
for the HEDDS system (see below) have precluded a concentrated effort to populate the portal section.

e. FY2007 Plans and Goals
   - Dedicate additional staff time to portal migration
   - Integrate all current applications with portal by end of FY2007.

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. With the creation of HEDDS (#2 below), it is our intent 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
      - Most of the development time for this project is coincidental with Projects B2 and B5 below.
      - Significant discussion has occurred with the Wildlife Conservation Society (WCS) to develop a collaborative effort on this project.
      - Weekly conference calls with partners of approximately one hour each facilitate communication of development tasks.
      - Proposals have been developed to secure additional funding to support this project.
      - The Principal Investigator and Technical Manager participated in a workshop sponsored by the Wildlife Conservation Society (WCS) to develop a Global Avian Influenza Network for Surveillance (GAINS; www.gains.org).
      - The WDIN Technical Manager spent one week at the WCS refining the existing WHNM database.
      - There have been ongoing conversations with other federal, state and academic partners regarding support and interest in WHNM.

   c. Outputs and Metrics
A “Letter of Intent” has been developed with the WCS which describes the general and specific areas of collaboration in the development of WHNM. [See Appendix I]

The WHNM database is being used as the platform to develop GAINS, and as the basis of WISDOM software, a collaborative project underlying the creation of WHNM.

A draft strategic planning document entitled “WCS and NBII Technical Collaboration on Wildlife Health Monitoring Systems” was created. [See Appendix J]

Through the UW Nelson Institute, a proposal entitled, “Development of Wildlife Health Data Management Tools and National Network” was submitted for consideration to the AFWA multi-state conservation grants program, and is available from WDIN for review. Although the proposal received high marks from the reviewers, the limited resources available in 2006 prevented its funding.

d. Outcomes and Assessment
With the development of the strong collaborative arrangement with the WCS, the prospects for continued development of WHNM and its international linkages seem very positive.

e. FY2007 Plans and Goals
- Continue collaborative work with the WCS
- Explore opportunities for additional funding with governmental and non-governmental agencies
- Target possible completion of WHNM prototype by end of FY2007

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 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
• This has been the WDIN project to which most staff time has been devoted in FY2006, consuming approximately 75% of our efforts.
• Effort has been divided among the development of outputs listed below, updating of products, and training of users.
  o Surveillance summaries for the public view are updated at least weekly.
  o HEDDS surveillance news is posted to the HEDDS List at least weekly. [See Appendix K for a news update sample]
  o Total number of samples and tests are updated weekly. Required time to complete updates and make maps for NWHC AI weekly reports is about 4 hours/week.
  o Review and code data. Initially this task took about 20 hours/week. After USDA became solely responsible for reviewing their data, the number of hours per week reduced to 4 to 5 hours/week.

c. Outputs and Metrics
• HEDDS Contributor Site
  o A functioning web application for the input and display of multi-institutional data.
    ▪ The initial HEDDS prototype system was developed in Fall 2006. The prototype contained the following features:
      ▪ Left Side Information Frame
        ◆ Resources/Related Resources links
      ▪ Menu page link to WDIN AI Web resources
      ▪ Simple username/password login
      ▪ Single sample data entry forms
      ▪ Dynamically generated maps and reports [See Appendix L for a screenshot of maps]
        ◆ Browse, search and data edit functions
    ▪ With additional partner funding, enhancements have been continually added in response to Interagency Steering Committee requests as well as requested by collaborators and users.
      ▪ Left-side Information Frame
        ◆ Frequently Asked Questions (FAQ)
        ◆ Documents
          ◆ Fact Sheet
          ◆ Excel Worksheets
          ◆ Detailed “Help” documents
        ◆ Announcements
        ◆ New resource links
          ◆ Created pages to hold 1/06 Alaska Workshop materials
- Login function that addresses the challenge of a user who is collecting samples for more than one agency.
- Excel spreadsheets for user convenience data uploads
- Shipment tracking
- User feedback button and web-form
- Data validator function – data is reviewed for quality control through an easy-to-use, automated process. [See Appendix M]

- **HEDDS Public Site**
  - A site available to the public was launched in August 2006 with the following features:
    - Total number of samples entered into HEDDS
    - Links to DOI and USDA AI web sites
    - Surveillance News section to announce updates
    - USA map showing number of samples collected by state
    - Table showing samples collected by state within each of the Strategic Plan strategies
    - Past Surveillance News archive
    - Link to NWHC AI news feed
    - HEDDS Contributors/Samples collected section
    - “About HEDDS” information section
  - With additional partner funding, and from contributor/user input, the following enhancements were made:
    - A HEDDS News electronic mailing list for updates
      - Launched in September 2006, and the list now has 157 subscribers. The compositional breakdown of its members is as follows: Public (32%); State (22%); Federal (22%); Education (12%); Nonprofit (7%); Other countries (3%) and Military (2%).
    - A RSS feed for HEDDS News updates. Since October 2006 through December 2006, it is estimated that there are 101 subscribers that use the HEDDS RSS feed.
    - A joint DOI/USDA table for reporting LPAI H5N1 results
      - See Appendix N for example of table
      - Available in both HTML and PDF format
A web form for DOI/USDA personnel to perform remote updates to table

- HEDDS Demonstration site
  - A site that mirrors the HEDDS Contributor site was created to allow users and the public to explore the system capabilities.

- HEDDS Operations
  - Data tables are updated weekly.
  - HEDDS News updates are issued weekly, or when new results become available.
  - Customized reports are created as per individual requests.
  - Four WebEx training sessions for state and federal collaborators were held.
  - Total number of samples and tests are updated weekly.
  - Total number of registered users - 1,197
  - Total number of records submitted in FY2006 – 46,159
  - Number of agencies contributing data – 62
  - Web traffic to HEDDS is approximately 1400 hits/week, since mid-August. [See Appendix H]

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. FY2007 Plans and Goals
- Continue maintenance of the system and consider new enhancements as requested
- Continue conducting training session as requested
- Identify and focus on data management personnel
- Develop mortality reporting component
- Develop Terms of Agreement for contributors to use the system
- Explore using Bird Banding Lab data to integrate the similar data that both HEDDS and the BBL system are collecting.
- Enhance data entry system so that samples can be batch entered
- Create automated Excel upload, verification and integration system
- Work with USDA VS to develop automated data push for more efficient transfer of USDA data
Work with additional national and international partners to integrate HEDDS data with other surveillance systems

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](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**
- Most of the efforts in FY 2006 were dedicated toward:
  - Adding new beach information to the database as beaches walked expand
  - Correcting and/or deleting data when volunteers or Tufts staff contacts the Technical Manager for help
- Approximate time required is 10 hours/month

**c. Outputs and Metrics**
- Web-based data entry system being used by volunteers from Maine to Florida
- Administrative functions including ability to mark walk and subsequent information as verified/unverified
- Saves Tufts time by volunteers entering data online directly instead of mailing in paper forms, and subsequent Tufts standardization and entry into an Excel Spreadsheet
- Enforces the use of standards at the point of data entry, no need to clean up data later when needed for reports
- Total volunteers registered with SEANET web system - 58
- Total beached birds reported in 2006 - 424
- Total Transects being monitored - 217
- Total beach walks entered in 2006 - 475
- Total historical records imported - 2,496 walks from 2002-2005; 1,496 mortalities reported
- New beaches added in 2006 - 84
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. FY2007 Goals
- Assist in maintaining the system
- Export data in XML format to EPA hub at Gulf of Maine (GoMOOS)
- Meet with SEANET partners to determine future needs and direction as their volunteer network expands down the east coast
- Identify additional web functionality that may be added in order to allow Tufts staff more web-based administrative control over the dataset (deleting, exporting, and so on).

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
- Met with NPS staff to discuss current efforts to track wildlife health
- Developed a draft list of user needs

d. Outcomes and Assessment
Work on this project has been slow and is behind schedule. This is due to the effort required for HEDDS development and maintenance. Some of the features that are required for the NPS system can be drawn from WHNH/HEDDS development. The USGS BRD manager for the POBS program has been informed of the project status.

e. FY2007 Goals
5. **Wisconsin Department of Natural Resources (DNR) Wildlife Health Database**

This in-progress project will develop a comprehensive wildlife health database incorporating both disease and toxicology data from Wisconsin wildlife, including many species with the greatest conservation need. It serves as a model for development needs for WHNM.

a. Objectives
   - To create a database and wildlife disease reporting and data management system for use by the Wisconsin DNR

b. Efforts
   - Frequent meetings and consultation with the WI DNR and the UW Division of Information Technology (DoIT) have identified the functional requirements and use cases for the development of the system.

c. Outputs and Metrics
   - DoIT has produced a group of documents describing the “DNR Wildlife Health Software Requirements Specification,” which are available for review.

d. Outcomes and Assessment
   - We have identified the important components of a wildlife health data management system that would be required by most states.
   - Limited WI DNR funding will restrict additional progress on this project outside of the efforts to develop WHNM.

e. FY2007 Goals
   - Integrate DoIT findings into WHNM development.
   - Explore possible additional collaborations with other Wisconsin state agencies, and UW Schools through the UW Nelson Institute.

6. **Plague and Tularemia Surveillance**

USDA/APHIS/Wildlife Services needed a system so that their field Wildlife Disease biologists could remotely enter data for samples collected during targeted and routine animal damage control operations, and for investigation of outbreaks of these diseases in wildlife and human populations.

a. Objectives
To create a data entry and management system for use by USDA Wildlife Services biologists.

b. Efforts
   • Minimal effort has been dedicated to this project in FY2006.

c. Outputs and Metrics
   • A prototype data system has been created.

d. Outcomes and Assessment
   • This project is waiting for feedback on the prototype system from the partner.
   • It is likely that this project will be incorporated into the larger WHMN system, if this is of interest to the partner.

e. FY2007 Plans and Goals
   • Consult with partner to receive feedback and guidance on whether this project should continue or not.

7. 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
      • Agencies offering to contribute data:
        o Utah
        o Arizona
        o Nebraska
      • A public view is available

   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. FY2007 Plans and Goals

- Explore possibilities that AFWA may engage state’s interest in contributing data
- Maintain system at current level

C. NEW PROPOSED FY2007 WDIN PROJECTS

1. **Establish WDIN Stakeholders/Advisory Committee**

   Since its inception, WDIN has worked closely with many federal, state, tribal, academic and non-profit partners to develop the current collection of information resources and applications. While these efforts have always been conducted in a collaborative environment, much of the direction and management has been internally driven. To gain a broader perspective of the views of the wildlife health, and associated domestic animal and human health communities, we propose to establish a working committee of stakeholders who can provide a consistent review of WDIN activities, and offer suggestions regarding how community needs might best be met. A comparable course of action has already been recommended for the HEDDS project through a WDIN support grant from USDA Wildlife Services. We plan to invite a cross-section of current HEDDS/WDIN partners for a 2-3 day review and strategic planning workshop, and look to retaining the participants as a longer term consultative team. This process will be organized and managed through the assistance of the University of Wisconsin - Madison Nelson Institute for Environmental Studies ([www.ies.wisc.edu](http://www.ies.wisc.edu)).

2. **Establish co-location of WDIN at the UW Nelson Institute**

   There are significant opportunities for the WDIN in developing a closer relationship with the UW Nelson Institute. Already, the Institute has provided assistance with grant proposals and awards, particularly with those from agencies and organizations that would find it difficult to support programs housed solely within a federal agency. In addition, the Institute has strong programs studying the impacts of human altered landscapes and climate change, with a desire to more closely examine the relationships of these changes to human, environmental, and wildlife health. The Wildlife Disease Information Node can play an important role in these efforts, linking their information products with Institute programs, as well as those in the School of Medicine and Public Health, and the School of Veterinary Medicine. WDIN can also contribute through its existing collaboration with the UW School of Library and Information Studies. To facilitate stronger ties, the Institute is interested in establishing WDIN as one of its component groups, and has
offered office space to encourage interactions among staff members. This arrangement would create two homes for WDIN, one at the USGS National Wildlife Health Center, and one at the University, providing the opportunity to take advantage of the expertise, facilities, and connections of both institutions.

3. **Coordinate a Wildlife Disease Informatics Symposium at the 2007 International Wildlife Disease Association Meeting.**
   WDIN personnel are continually looking for new processes and products to better reach and interact with the wildlife health community. Through our work with our partners, our communications products, and the evaluation surveys, we have come to believe there is a need for increased attention to the role of informatics in wildlife health research and management. In addition, there is an increasing interest in data management and wildlife mortality monitoring systems worldwide, and thus a need to discuss how these programs can effectively share information. In August 2007, the Wildlife Disease Association will hold its (once every five years) International Conference in Rocky Mountain National Park, Colorado ([http://www.wildlifedisease.org/2007_Conference/index.html](http://www.wildlifedisease.org/2007_Conference/index.html)) WDIN has proposed organizing a symposium on wildlife health informatics that would cover such topics as information resources, terminology and vocabulary standards, and monitoring systems. We hope that other NBII personnel will be able to participate, and hope to find financial support to sponsor some speakers who might not ordinarily attend this meeting.

4. **Explore integrating Bird Banding Laboratory data into WDIN applications**
   Many of the WDIN applications capture and display data on diseases of wild birds. In addition to disease and mortality data, it is also useful to provide species and population data that can assist in the development of epidemiological and ecological metrics such as number of animals at risk, prevalence of disease, and geographic spread. In the collection of ornithological field data, details are often recorded for transmission to the USGS Bird Banding Laboratory (BBL) as a primary task, with the disease sampling data collected as an added responsibility. With the recent transfer of BBL datasets to NBII, and with the relationship that the NWHC Center Director has with the Director of the BBL, we would like to investigate how integration of these data with WDIN data may highlight new opportunities for analysis and development of information products.

5. **Explore collaboration with the Fisheries and Aquatic Resources Node to produce a portal page for fish diseases**
   The NBII Fisheries and Aquatic Resources Node (FAR) and the NBII Wildlife Disease Information Node have a potential area of overlap in the area of fish diseases. The Association of Fish and Wildlife Agencies (AFWA) has asked its Fish and Wildlife Health Committee members to address fish health more regularly and in more detail. At this time, FAR staff have little expertise in the
area of disease, while WDIN staff are more focused on this issue as it relates to birds and mammals. However, there may be a possibility for a synergistic collaboration between these Nodes to develop a common site in the NBII portal that could assemble information and resource links to fish diseases, and at the same time assist AFWA with its needs. Other fisheries-related BRD research centers could also be contacted to determine their interest in contributing to such a project.

D. 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. US Fish and Wildlife Service
        o HEDDS
   
   iv. National Park Service
       o POBS Wildlife Disease Reporting System
   
   v. USDA Wildlife Services
       o HEDDS
       o Plague and Tularemia monitoring
   
   vi. USDA Veterinary Services
       o HEDDS
       o CWD Data Clearinghouse

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 School of Library and Information Studies
o WDIN Content Manager
o WDIN Technical Manager
o Technical assistance
o Practicum students

ii. University of Wisconsin Nelson Institute for Environmental Studies
   o Grant assistance

iii. University of Wisconsin Division of Information Technology
   o Wisconsin DNR Wildlife Health Database
   o Technical assistance

iv. Yale University Environmental and Occupational Health Program
   o Canary Database
   o Technical assistance

v. Tufts University Cummings School of Veterinary Medicine
   o SEANET

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

E. DETAILED FUNDING

FY 2006 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>
</tr>
</thead>
<tbody>
<tr>
<td>NBII</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Node base funds</td>
<td>$150,000</td>
<td></td>
</tr>
<tr>
<td>USGS NWHC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Center base funds</td>
<td>$54,742</td>
<td></td>
</tr>
<tr>
<td>Center AI funds</td>
<td>$67,367</td>
<td></td>
</tr>
<tr>
<td>USGS BRD Wildlife Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HEDDS operations</td>
<td>$60,000</td>
<td></td>
</tr>
</tbody>
</table>
USFWS
HEDDS operations $120,000

USDA Wildlife Services
HEDDS operations and advisory group $100,000

USGS/NPS
POBS $35,462

Wisconsin DNR
Wildlife Health Database $40,000*

Wildlife Conservation Society
GAINS $5,000*

Tufts University
SEANET $5,000*

Sub -totals $332,109 $305,462

Total Direct Funding $587,571
Aggregated Overheads $93,401
Total available for WDIN projects $494,170

*In-kind

F. WDIN STAFF PRESENTATIONS

<table>
<thead>
<tr>
<th>Title</th>
<th>Presenter</th>
<th>Date</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of the Interior and the National Avian Influenza Early Detection Strategy</td>
<td>Dein</td>
<td>1/9/06</td>
<td>Avian Influenza Surveillance in Zoos Workshop</td>
</tr>
<tr>
<td>HPAI National Early Detection Data Management and Integration</td>
<td>Dein</td>
<td>1/9/06</td>
<td>Avian Influenza Surveillance in Zoos Workshop</td>
</tr>
<tr>
<td>HPAI National Early Detection Data Management and</td>
<td>Dein</td>
<td>1/19/06</td>
<td>Alaska AI Workshop, Anchorage, AK</td>
</tr>
</tbody>
</table>
## Integration

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Dein</th>
<th>Date</th>
<th>Location and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Management in the United States</td>
<td>Dein</td>
<td>3/10/06</td>
<td>Avian Influenza Wild Bird Surveillance Workshop, Phnom Penh, Cambodia</td>
</tr>
<tr>
<td>Global Wildlife Disease Surveillance: Does it exist?</td>
<td>Dein</td>
<td>4/7/06</td>
<td>Global Biological Threats Symposium; University of Wisconsin-Madison</td>
</tr>
<tr>
<td>HEDDS</td>
<td>Dein</td>
<td>5/17/06</td>
<td>X Trilateral Committee Mtg., San Diego, CA</td>
</tr>
<tr>
<td>HEDDS</td>
<td>Dein</td>
<td>5/19/06</td>
<td>GAINS Workshop, Washington, DC</td>
</tr>
<tr>
<td>Wildlife Disease Data Management</td>
<td>Dein</td>
<td>6/14/06</td>
<td>East China Normal University, Shanghai, China</td>
</tr>
<tr>
<td>The NBII Wildlife Disease Information Node</td>
<td>Dein</td>
<td>7/25/06</td>
<td>Western States Fish and Wildlife Association, Bismarck, ND</td>
</tr>
<tr>
<td>HEDDS</td>
<td>Dein</td>
<td>8/9/06</td>
<td>Wildlife Disease Association Annual Meeting, Storrs, CT</td>
</tr>
</tbody>
</table>

## G. NBII WILDLIFE DISEASE INFORMATION NODE FY2006 PERSONNEL

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matt Brost</td>
<td>Student Programmer</td>
</tr>
<tr>
<td>Joshua Dein</td>
<td>Principal Investigator</td>
</tr>
<tr>
<td>Megan Hines</td>
<td>Technical Manager</td>
</tr>
<tr>
<td>Dan Lettow</td>
<td>Student Programmer</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>David Welther</td>
<td>Student Cataloger</td>
</tr>
</tbody>
</table>
### Appendix A

**WildlifeHealth List Survey Results**

**Questions and Responses:**

**Total Number of Surveys: 33**

<table>
<thead>
<tr>
<th>Question 1: For what purposes do you use the List? Check all that apply.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response</strong></td>
</tr>
<tr>
<td><strong># of Responses</strong></td>
</tr>
<tr>
<td>Learn about issues and developments in the field</td>
</tr>
<tr>
<td>Learn about news, events, resources and job/educational opportunities</td>
</tr>
<tr>
<td>Network and engage in conversation with List members</td>
</tr>
<tr>
<td>Communicate relevant news, events and resources to the List</td>
</tr>
<tr>
<td>Query List members</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 2: How did you initially find out about the List?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response</strong></td>
</tr>
<tr>
<td>Referred by colleague</td>
</tr>
<tr>
<td>WDIN web site</td>
</tr>
<tr>
<td>A posting from another List</td>
</tr>
<tr>
<td>Web search</td>
</tr>
</tbody>
</table>
### Question 3: Which statement best characterizes your use of the List?

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of Participants</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>I read the subject headings and selectively read messages.</td>
<td>20</td>
<td>61%</td>
<td>NA</td>
</tr>
<tr>
<td>I read posted messages regularly.</td>
<td>12</td>
<td>36%</td>
<td>NA</td>
</tr>
<tr>
<td>I read posted messages regularly and occasionally post messages.</td>
<td>1</td>
<td>3%</td>
<td>NA</td>
</tr>
<tr>
<td>I read and post messages regularly.</td>
<td>0</td>
<td>0%</td>
<td>NA</td>
</tr>
<tr>
<td>I rarely read subject headings or messages.</td>
<td>0</td>
<td>0%</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Question 4: Please rate the helpfulness of each type of information posted to the List.

#### WDIN Newsletter:

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of Participants</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very helpful</td>
<td>18</td>
<td>60%</td>
<td>NA</td>
</tr>
<tr>
<td>Somewhat helpful</td>
<td>9</td>
<td>30%</td>
<td>NA</td>
</tr>
<tr>
<td>Never used/Unsure</td>
<td>2</td>
<td>7%</td>
<td>NA</td>
</tr>
<tr>
<td>Not helpful</td>
<td>1</td>
<td>3%</td>
<td>NA</td>
</tr>
</tbody>
</table>

#### WDIN Wildlife Disease News Digest:

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of Participants</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very helpful</td>
<td>22</td>
<td>67%</td>
<td>NA</td>
</tr>
<tr>
<td>Somewhat helpful</td>
<td>11</td>
<td>33%</td>
<td>NA</td>
</tr>
<tr>
<td>Not helpful</td>
<td>0</td>
<td>0%</td>
<td>NA</td>
</tr>
<tr>
<td>Never used/Unsure</td>
<td>0</td>
<td>0%</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Job Postings:
<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of Participants</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somewhat helpful</td>
<td>12</td>
<td>36%</td>
<td>NA</td>
</tr>
<tr>
<td>Never used/Unsure</td>
<td>11</td>
<td>33%</td>
<td>NA</td>
</tr>
<tr>
<td>Very helpful</td>
<td>10</td>
<td>30%</td>
<td>NA</td>
</tr>
<tr>
<td>Not helpful</td>
<td>0</td>
<td>0%</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Conference/ Meeting Announcements:**

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of Participants</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very helpful</td>
<td>16</td>
<td>47%</td>
<td>NA</td>
</tr>
<tr>
<td>Somewhat helpful</td>
<td>11</td>
<td>32%</td>
<td>NA</td>
</tr>
<tr>
<td>Never used/Unsure</td>
<td>7</td>
<td>21%</td>
<td>NA</td>
</tr>
<tr>
<td>Not helpful</td>
<td>0</td>
<td>0%</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Question 5: Do you use the List in the following ways?**

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of ttl Responses</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seek further information from resources provided with messages.</td>
<td>29</td>
<td>31%</td>
<td>88%</td>
</tr>
<tr>
<td>Recommend the List to others.</td>
<td>26</td>
<td>28%</td>
<td>79%</td>
</tr>
<tr>
<td>Forward a List message to a colleague.</td>
<td>25</td>
<td>27%</td>
<td>76%</td>
</tr>
<tr>
<td>Use List messages for personal use.</td>
<td>14</td>
<td>15%</td>
<td>42%</td>
</tr>
</tbody>
</table>

Comments/Suggestions
I feel this is an excellent way to share information related to the topic in a quick and efficient manner without being overwhelmed by the sheer numbers of independent sites. Yet the links are available to obtain further information on subjects I find of use or interest.

Providing a mechanism to enhance communication is fantastic. I learn a lot from the information you send (similar to what I get out of the emerging disease List). There might be ways to enhance it and maybe digests would work (pros and cons of that as well though). We are also working out how best to disseminate information on health issues in the marine environment. I hope you post the results of this usage survey but would love to chat with more folks in brainstorming session on how best to communicate with each other, enhance disease information exchange, and be more integrated with other health Lists.

I find the List very useful in helping me to keep my veterinary students in touch with what's going on in the field!

I think the List is very useful and have forwarded select postings to veterinary students to keep them up on issues affecting wildlife at the population level.

Unsure what is meant by first question under number 5. I read the List messages regularly and appreciate it as one way of keeping current on issues in wildlife health/disease. Thanks for all y'all do to make it happen!

Using today's Internet parlance, I would probably be considered a "lurker" (not my favorite term). I am neither a professional in the field nor even a student. I am interested in a specific wildlife disease outbreak, Mycoplasma gallisepticum, in house finches and songbirds, which, for whatever reason, I was apparently the first person to ever notice (swollen-eyed house finches showed up at my feeders in January, 1994). I joined Wildlife Health back when the list first started, when the MG outbreak was still news. I've stayed on the list in case news or recent findings or information about the outbreak happen to be posted, as well as to feel still connected to the wildlife health community. I created a website about the outbreak almost 10 years ago (aimed at bird feeders and wildlife rehabilitators), which I desperately need to update. That is one of the things I hope the list will help me do in the coming year, giving me an avenue to solicit information from perhaps those still working with MG in songbirds who may be on the list.

I think it a great List.

Include information for wildlife rehabilitators, nature centers, etc. Include information for veterinary students.
Appendix B

WDIN Blog
http://wdin.blogspot.com/

The WDIN blog provides easy access to current news on wildlife disease nearly daily. Each entry includes 3 to 5 news articles. If available, links to additional information are included along with citations to journal articles of interest.

Sidebar links connect to resources such as WDIN, wildlife disease and related information, as well as help topics, and an archive of posts by month.

Each entry offers options to post a comment, view others’ comments, and to forward the entry to colleagues by email.
## Appendix C

### WDIN Blog Member Survey Results

Blog Survey Questions and Responses:  
Total Number of Surveys: 4

#### Question 1: Do you use the WDIN Blog in the following ways?  
Check all that apply.

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of ttl Responses</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skim blog postings to stay current on wildlife disease issues.</td>
<td>4</td>
<td>24%</td>
<td>100%</td>
</tr>
<tr>
<td>Share an interesting article or posting with a colleague.</td>
<td>4</td>
<td>24%</td>
<td>100%</td>
</tr>
<tr>
<td>Find interesting articles and read the entire piece (OC: 2 OF: 0)</td>
<td>4</td>
<td>24%</td>
<td>100%</td>
</tr>
<tr>
<td>Pursue additional resources pertaining to an interesting post.</td>
<td>3</td>
<td>18%</td>
<td>75%</td>
</tr>
<tr>
<td>Recommend the blog to others.</td>
<td>2</td>
<td>12%</td>
<td>50%</td>
</tr>
</tbody>
</table>

#### Question 2: As a member choose your preferred level of interaction with the blog. Choose only one.

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of Participants</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to just read the postings.</td>
<td>3</td>
<td>75%</td>
<td>NA</td>
</tr>
<tr>
<td>I would like to post wildlife disease stories and resources that I believe other members would find interesting.</td>
<td>1</td>
<td>25%</td>
<td>NA</td>
</tr>
<tr>
<td>In addition to posting interesting content (e.g. relevant news and resources), I would like to share my opinions and views about current wildlife health issues.</td>
<td>0</td>
<td>0%</td>
<td>NA</td>
</tr>
</tbody>
</table>
### Question 3: How do you find the quantity of the information contained in each daily posting?

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of Participants</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Just right</td>
<td>2</td>
<td>67%</td>
<td>NA</td>
</tr>
<tr>
<td>Too much</td>
<td>1</td>
<td>33%</td>
<td>NA</td>
</tr>
<tr>
<td>Too little</td>
<td>0</td>
<td>0%</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Question 4: Why did you become a member of the WDIN blog? Check all that apply.

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of ttl Responses</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtain wildlife disease news.</td>
<td>4</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td>Learn about issues and developments in the field.</td>
<td>3</td>
<td>30%</td>
<td>75%</td>
</tr>
<tr>
<td>Learn about recently published wildlife disease related journal articles.</td>
<td>2</td>
<td>20%</td>
<td>50%</td>
</tr>
<tr>
<td>Communicate relevant news, events and resources to the blog by posting as a member.</td>
<td>1</td>
<td>10%</td>
<td>25%</td>
</tr>
</tbody>
</table>

### Question 5: How did you initially learn about the blog?

<table>
<thead>
<tr>
<th>Response</th>
<th># of Responses</th>
<th>% of Participants</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>A posting from the WildlifeHealth List.</td>
<td>3</td>
<td>75%</td>
<td>NA</td>
</tr>
<tr>
<td>A posting from another List.</td>
<td>1</td>
<td>25%</td>
<td>NA</td>
</tr>
<tr>
<td>Referred by colleague.</td>
<td>0</td>
<td>0%</td>
<td>NA</td>
</tr>
<tr>
<td>WDIN web site.</td>
<td>0</td>
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<td>NA</td>
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<td>Web search.</td>
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Appendix D

WDIN Newsletter
http://wildlifedisease.nbii.gov/newsletters.jsp

Issued bi-weekly, the WDIN newsletter is written to inform its readers about features and tools that can be found on the WDIN web site. It also provides a listing of upcoming wildlife health related meetings and highlights some of the web resources that have recently been added to the site.

Understanding the WDIN Newsletter

- **Upcoming Events** lists upcoming wildlife health related meetings.
- Every issue contains a main article that highlights a WDIN feature.
- The smaller ‘Highlights’ section also emphasizes a WDIN feature and complements the main article topic.
- This section lists newly added resources.
Appendix E

WDIN – Cataloging Tool

The WDIN Cataloging Tool is used to not only assign metadata, but also to assign a location of a web resource onto the web site. It was programmed to be compatible with NBII’s cataloging tool, so WDIN records can be easily exported to the NBII catalog database.

Standardized Lists automatically search for matching keywords as information is typed, allowing user to select existing keywords or add new ones to the list.

Figure 1: A screenshot of the WDIN input tool with an example of the standardized lists.

Individual keywords can be edited or merged with other keywords from the standardized lists. Changes made here result in global changes to all the records with this keyword.

Figure 2: Examples of how the keyword manager can be used to merge or edit a creator name to the standardized lists.
Appendix F

WDIN – Event Calendar
http://wildlifedisease.nbii.gov/c&aevents.jsp

Designed for ease-of-use, the WDIN calendar provides information about current and past wildlife disease related meetings. The calendar can be browsed month-by-month or searched.

Figure 1 – Illustrates how a hyperlink in the calendar links to event information provided by the meeting sponsor.

Figure 2: Shows how the Calendar can be searched using the keyword, ‘surveillance’.

Figure 3: Search results listing meetings retrieved from the keyword ‘surveillance’.
Appendix G

WDIN – Guided Search

To assist visitors in locating desired resources, WDIN offers two search functions, a basic and a guided search. The guided search provides a sophisticated combination of free-text, controlled vocabulary and filtering searching techniques for targeting specific information needs.

The Guided Search makes it easy to find exactly what you’re looking for. First, limit the categories in which you’d like to search. Then, enter one or more keywords. Finally, select sorting criteria and click “Search” to return.

Click a Category to add it as a filter

Scroll down to see all matching records

Figure 1 – Guided Search Menu

Figure 2 – Search results
Appendix H

WDIN, HEDDS, & WNV – Usage

WDIN Home Usage by Week

HEDDS Usage by Week

WNV Site Usage by Week

Date Range (Date Indicates Week Of)

Number of Requests
Appendix I

Letter of Intent
Wildlife Conservation Society and NBII Wildlife Disease Information Node

Background:

The WCS Field Veterinary Program, established in 1989, uses a collaborative approach to address the complexities of maintaining ecosystem health. Working with in-country wildlife experts, government agencies and public health officers from Patagonia to Central Africa, the FVP creates local training programs, conducts cutting-edge health investigations, advises on policies and compiles preventive guidelines to reduce disease transmission between wildlife, humans and their domestic animals. This program -- the first of its kind in the world linked with a major conservation organization -- has the added benefit of being based at WCS's Wildlife Health Center, where resident experts in wildlife pathology and clinical medicine assist in assessing, monitoring, and protecting the health of wildlife worldwide. The Global Network for Avian Influenza Surveillance of Wild Birds (GAINS) is a cooperative program under the management of the Field Veterinary Program of the Wildlife Conservation Society (WCS) and in association with a number of collaborating organizations and agencies. A list of collaborating agencies and organizations can be found at http://www.gains.org. GAINS is currently funded by the U.S. Agency for International Development, the U.S. Centers for Disease Control and Prevention, the United Nations Food and Agriculture Organization, and a number of other sources through WCS and follows the regulations and guidelines provided by those funding sources.

The National Biological Information Infrastructure (NBII) http://www.nbii.gov is a broad, collaborative program to provide increased access to data and information on the nation's biological resources. The NBII links diverse, high-quality biological databases, information products, and analytical tools maintained by NBII partners and other contributors in government agencies, academic institutions, non-government organizations, and private industry. NBII partners and collaborators also work on new standards, tools, and technologies that make it easier to find, integrate, and apply biological resources information. Resource managers, scientists, educators, and the general public use the NBII to answer a wide range of questions related to the management, use, or conservation of this nation's biological resources. A list of NBII partners can be found at: http://partners.nbii.gov/portal/server.pt. The Wildlife Disease Information Node (WDIN) is one of the NBII centers and is based at the National Wildlife Health Center of the U.S. Geologic Survey.

General Areas of Collaboration:

1) A senior manager of the WDIN will be identified and serve on the GAINS Information Management Advisory Panel (IMAP).
2) A senior manager of GAINS will be identified and serve on the WDIN Advisory Board.
3) The WCS Field Veterinary Program will become a supporting member of WDIN.
4) WCS will encourage support from government and private institutions for WDIN.
5) WDIN will encourage support from government and private institutions for GAINS.
6) WDIN and WCS will work collaboratively on the development of wildlife disease data management systems.

Specific Areas of Collaboration:

1) WCS and WDIN will work collaboratively to reach consensus on a database structure for GAINS, which will be used in version 1.0, and higher as much as possible and allowing for target deadlines imposed by other agencies or organizations. This database structure should provide support for existing WDIN applications.
2) With agreement from the Interagency Steering Committee, the U.S. Highly Pathogenic Avian Influenza Early Detection Data System (HEDDS) will provide the U.S. information component to GAINS in a format readily importable to the GAINS information management system when databases are aligned.
3) GAINS will provide the international information component to the WDIN’s Wildlife Health Monitoring Network (WHMN) in a format readily importable to the WDIN information management system when databases are aligned.
4) Feedback from users of both the GAINS working prototype version of its information management system and HEDDS will be used for the development of future versions of GAINS information management systems and the WHMN.
5) WCS and WDIN will work collaboratively on development of applications that will become part of GAINS/WHMN, and be used interchangeably.
6) WCS and WDIN logos will be displayed on all joint applications where branding policies allow and do not interfere with effective and efficient sharing of core information of either program.
7) WDIN will explore potential server support from EROS Data Center or NBII.
8) WDIN will explore and facilitate development support through the University of Wisconsin Division of Information Technology (DoIT), as needed.
Appendix J

WCS and NBII Technical Collaboration on Wildlife Health Monitoring Systems

Jonathan Palmer and Megan Hines

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(Full document available from WDIN)
Appendix K

HEDDS News Updates

WDIN offers users two methods of receiving HEDDS News Updates. Users can subscribe to HEDDS News and receive an update report delivered to their email, or subscribe to an RSS feed. The figures below illustrate each option.

Update Example

A HEDDS Update is posted weekly to the listserv where it is emailed directly to members.

News updates include a map showing current sample totals per state and it provides a summary of test date entered into HEDDS.

Surveillance news

- Jan 5, 2007: 317 new samples and tests have been added.

Additional information on Surveillance News items can be found at:


Other links:

HEDDS

LPAI H5N1 Results Table
[http://wildlifedisease.nbih.gov/ai/LPAITable.pdf](http://wildlifedisease.nbih.gov/ai/LPAITable.pdf)

National Wildlife Health Center - Avian Influenza News

Wildlife Disease Information Node – Select Avian Influenza News Sources

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National HPAI Early Detection Data System (HEDDS) Update
Friday, January 5, 2007

Totals
New samples and tested entered since Dec 29: 317
Total samples tested and reported: 30,959

Map displays the current number of birds tested by state in the 2006 sampling season.

Figure 1 – Page one of news update.
Website/RSS Feed Update Example

Figure 2 – Page two of news update.

RSS Feeds are another way WDIN provides HEDDS updates. Users can subscribe to this feed which is then made available in their own personal feed reader account.

Figure 3 - Screenshot from HEDDS News web page illustrating the feeds generated for HEDDS updates and the NWHC avian influenza news.
HEDDS – Interactive Mapping Features

HEDDS offers users a range of mapping functions from simple-yet-informative pre-made maps, to more advanced interactive mapping features. With these expanded mapping functions, users can combine different mapping layers to study relationships between different avian influenza variables.

**Figure 1:** Maps of test samples by Species.

The Interactive Map allows users to choose layers to display samples by species, location, or strategy, color-coded to show number, species, etc.

**Figure 2:** Maps of test samples by Location.

**Figure 3:** Maps of test sample by Strategy.
Appendix M

HEDDS Data Validator

This enhancement has been completed recently and will be made available to users soon. As users upload their completed data sheets, the validator reviews the information. If errors are found, a report is generated. Once the corrections have been completed by the users, they can re-upload the data sheet. The significance of this feature is it automates the task of quality control and frees staff to work on other priorities.

Contributors upload their data sheets with avian influenza data. The system will review and validate their data. If errors are found, a report lists the problems.

Figure 1: Entry screen for uploading a completed data sheet

Data Entry via Excel

Go grab some coffee. This could take a while. (5 minutes to 1 hour)

Figure 2: Message that a data sheet is being reviewed.

Workbook passed validation and the worksheets were imported successfully.

Figure 3: A report of a successful review. The quality of the data has been validated and it will be uploaded into the system.

Workbook validation failed. Please correct the errors listed below and try again.

Figure 3: A report of a failed review. It provides a listing of the errors that needed to be corrected before the data can be uploaded into the system.
Appendix N

Low Pathogenic H5N1 Avian Influenza Results Table
http://wildlifedisease.nbii.gov/ai/LPAI-Table.jsp

At the request of the offices of the Secretaries of Agriculture and Interior, WDIN created a table that displays low pathogenic H5N1 avian influenza test results. Updates to this table can be made easily online. The table is available as a printable PDF.

![Image of table showing low pathogenic H5N1 avian influenza results]

The easy-to-use web form allows authorized users to add new information to the LPAI table, or edit existing records.

![Image of web form for updating LPAI results]

Drop-down menus and search-as-you-type fields for easy data entry.