

**TESTIMONY BEFORE THE SENATE ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON WATER AND WILDLIFE,
AND THE SUBCOMMITTEE ON OVERSIGHT
REGARDING THREATS TO FISH AND WILDLIFE FROM DISEASES
by Rebecca Humphries, Director
Michigan Department of Natural Resources, on behalf of
the Association of Fish and Wildlife Agencies
July 8, 2009**

Thank you, Chairman Cardin and members of the Subcommittee. I am Becky Humphries, Director of the Michigan Department of Natural Resources, and I also chair the Fish and Wildlife Health Committee for the Association of Fish and Wildlife Agencies. I appreciate the opportunity to share with you today the perspectives of the state fish and wildlife agencies on this vital issue of emerging fish and wildlife diseases, and the need to manage for the health and sustainability of our fish and wildlife resources in the face of these disease and pathogen challenges. All 50 states are members of the Association, and among other missions, the Association strives to enhance and facilitate cooperation and coordination among state, federal and tribal agencies with respect to fish and wildlife conservation. This approach is particularly critical in the issue of fish and wildlife diseases as chronic wasting disease (CWD), bovine tuberculosis (TB), viral hemorrhagic septicemia (VHS), and the potential for highly pathogenic avian influenza (HPAI), all of which are of growing and significant concern to fish and wildlife, animal health and human health officials, and the public that they serve. Today I will share with you the Association's approach to this challenge through the development and implementation of a "National Fish and Wildlife Health Initiative"; I will briefly characterize as a model the national approach to managing CWD through the development of a state-federal national plan; and, I will also reflect on my experiences in Michigan with several of these diseases including bovine TB, CWD, and VHS.

National Fish and Wildlife Health Initiative

State fish and wildlife agencies have the statutory, and often constitutional, responsibility for the conservation of fish and wildlife within their borders for the benefit of their citizens. Where Congress has given federal agencies certain conservation responsibilities for fish and wildlife, such as migratory birds and listed threatened and endangered species, Congress has recognized that the states retain concurrent jurisdiction also for those species. Thus, states are the front-line managers of fish and wildlife, and consequently, fish and wildlife diseases. The Association of Fish and Wildlife Agencies embarked on the development of a National Fish and Wildlife Health Initiative to create a system for coordination between state, federal, tribal and local governments, and private industry to ensure the early detection of pathogens, and the appropriate response to and management of diseases. The two overarching goals of the Initiative are first, to assist the states and federal agencies in enhancing their capacity to appropriately address fish and wildlife health issues; and, second, facilitate close cooperation between state and federal fish and wildlife, animal health, and human health agencies with respect to fish and wildlife pathogens and diseases in order to minimize their negative effects. The Initiative was approved and adopted by the assembled state fish and wildlife directors in September 2006, and has also been endorsed by the U.S. Animal Health Association. A copy of the Initiative is appended to my statement. A

state–federal steering committee has also been established to oversee the Initiative; I will speak to that shortly.

The importance of maintaining healthy fish and wildlife populations has long been recognized by fish and wildlife managers, and several disease issues are a growing concern to fish and wildlife, domestic animal, and public health professionals and the publics they serve. Significant diseases, such as plague, hemorrhagic disease, pasteurellosis, CWD, botulism, VHS, West Nile virus, whirling disease, and others have been found in both free-ranging wild, and farmed, fish or wildlife populations in North America, and can have significant biological and economic effects on state and federal public trust resources. Reservoirs of economically important diseases including bovine brucellosis and bovine TB have inadvertently become established in native wildlife and threaten livestock industries in some areas. Foreign animal diseases eradicated from the continent decades ago, such as foot and mouth disease and classical swine fever, and those historically not reported in North American wildlife, such as HPAI, are a constant concern. Human activities (alteration of ecosystems, movement of pathogens, hosts or vectors, etc.), as well as improved recognition through advances in diagnostics and epidemiology, continually provide occasions for the discovery, emergence and resurgence of diseases at the interface of wildlife, domestic animals, and humans. The potential effects of climate change to both ecosystems and the species that they support has great significance to the presence and prevalence of pathogens, diseases, and their vectors. The intentional or accidental introduction of new disease agents could have a significant impact on fish, wildlife, domestic animals or human populations and will necessitate a coordinated multi-agency response.

The dramatically growing importance of fish and wildlife health issues in natural resource management makes it imperative that more human, financial, and technological resources be directed toward them in the future. Responsibility and authority issues warrant greater state, federal, tribal, and territorial fish and wildlife management agency attention, as does the increasing recognition that disease agents in free-ranging fish and wildlife have implications for domestic animals and humans. In addition to more traditional fish and wildlife health issues, state, federal, tribal, and territorial natural resource management agencies must also face emerging issues, including the threats of bio- and agro-terrorism, and unintentional introduction of disease agents, such as HPAI virus. As stewards in trust of priceless public resources, state and federal fish and wildlife management agencies must proactively take on such issues. Failure to do so invites the risk that issues of fish and wildlife health will be addressed haphazardly, inadequately, or not at all; none of these consequences is acceptable.

Responsibility and authority for conserving fish and wildlife resources rest in state and federal natural resource management agencies. Public trust stewardship is the very cornerstone of North American natural resource management as fish and wildlife are common property of the citizens of each state. Thus, successful fish and wildlife health programs must necessarily be centered in the states as well. However, there is no “one size fits all” approach to fish and wildlife health programs. Several states have had strong programs with full-time fish and wildlife health professionals for decades. Others have instituted new programs in recent years. Still others have pooled resources to create regional wildlife health cooperatives.

Regardless of the structure of a state's fish and wildlife health program, cooperation among local, state, tribal, territorial, and federal public health, domestic animal health, and natural resources agencies will invariably be essential because of overarching issues, shared regulatory authority, and limited resources. The greatest opportunities for addressing significant local health issues will be in programs where the state fish and wildlife management agency prioritizes the issues and collaborates with other governmental and nongovernmental organizations to address them. Through this approach, state fish and wildlife management agencies will improve their understanding and management of diseases, develop and share data useful to others, and maximize the financial, technological, and human resources that inevitably will be limited.

To accomplish these goals, the Association developed and is implementing the National Fish and Wildlife Health Initiative (NFWHI) by a multi-disciplinary consortium of state, tribal, territorial, federal, university, corporate, and nonprofit organizations under the leadership of the Association. Although national in scope, the NFWHI will not mandate programs at the state, federal, tribal, or local level. The NFWHI is dedicated to advancing the science, awareness, and fostering cooperation related to all aspects of fish and wildlife health. It is a policy framework by which all interested parties may seek both to minimize the negative impacts of disease agents in fish and wildlife, and to proactively promote healthy fish and wildlife populations.

The mission of the NFWHI is to conserve, restore, and enhance the fish and wildlife resources of the United States by providing a cooperative platform to empower fish and wildlife managers to set priorities and to manage fish and wildlife health issues of local, national and international scope. This mission will be achieved by six principal strategies:

1. Identify, characterize, respect, and integrate the authorities and capabilities of cooperating partners in complementary fashion.
2. Identify state, federal and other fiscal and staff resources for state, federal, and territorial fish and wildlife health programs and facilitate their optimal use and allocation.
3. Conduct proactive, coordinated and sustained surveillance for pathogens in fish and wildlife, and respond to findings according to risk.
4. Support applied research pertinent to fish and wildlife health, and development of integrated disease management strategies, and improved technology for fish and wildlife health management.
5. Establish and maintain a fish and wildlife disease Web site, uniform training for critical staff of cooperating partners, and communication plans and networks to inform policymakers and citizens about fish and wildlife health.
6. Establish a NFWHI Steering Committee to facilitate, oversee, and coordinate interactions among partners and provide the support necessary for effective implementation of the Initiative.

The goals of the NFWHI are exquisitely simple:

1. Facilitate establishment and enhancement of state, federal, and territorial fish and wildlife management agency capability to effectively address health issues involving free-ranging fish and wildlife.
2. Minimize the negative impacts of health issues affecting free-ranging fish and wildlife through surveillance, management, and research.

The Initiative details an implementation strategy which you can reference in the document so I won't go into detail. However, I would like to observe that there has been a steering committee established to oversee the Initiative, which is comprised of the following partners in this endeavor.

- Chairperson of the AFWA Fish and Wildlife Health Committee (1), Chair;
- Directors from each of the four Regional Fish and Wildlife Associations (Northeast, Midwest, Southeast and Western) (4);
- Director of the U.S. Fish and Wildlife Service (USFWS) (1);
- Associate Director of Biology, U.S. Geological Survey (1);
- Deputy Administrator of USDA, Animal Plant Health Inspection Service (APHIS), Veterinary Services (1);
- Deputy Administrator of USDA, APHIS, Wildlife Services (1);
- State Veterinarian (1);
- Academic Institution (1);
- Tribal fish and wildlife management entity (1).

Chronic Wasting Disease National Plan

Let me briefly describe the coordinated federal-state response to the detection of CWD east of the Mississippi River earlier this decade. In early 2002, the U.S. Department of Agriculture (USDA) and U.S. Department of the Interior (USDI) convened a federal task force to coordinate CWD management. Under the chairmanship of the Administrator, APHIS, and, Director, U.S. Fish and Wildlife Service, they quickly recognized the need for and utility of adding state fish and wildlife agency representatives to the task force. That was expeditiously done and six working groups each comprised of federal, state and university representatives, ultimately drafted the national plan that the task force released to the public (A Plan for Assisting States, Federal Agencies, and Tribes in Managing Chronic Wasting Disease in Wildlife and Captive Cervids) on June 26, 2002. The plan proposed goals and actions and served as a blueprint for future activities to identify the extent of the disease and management actions needed to eliminate it or prevent its spread.

Subsequently, an Implementation Document for said plan was produced on October 11, 2002, by a team of three state fish and wildlife agency representatives, four USDA, and four USDI representatives, working with input from a myriad of wildlife management and animal health professionals from across the nation. The Implementation Document steps down the goals in the national plan to action items, assigns agency responsibilities, and identifies timelines and budgets for each of six categories of diagnostics, disease

management, communications, research, surveillance, and information dissemination. The Implementation Plan represented the best and most current thinking with respect to what is necessary to successfully manage this disease.

Subsequent to the development of the National Plan and Implementation Document, the USDA APHIS has each year requested in the President's Budget, and Congress has appropriated, from \$10-\$16 million per year to APHIS-VS for CWD management. Approximately 25 percent has been made available as grants to the state fish and wildlife agencies for surveillance and response to CWD in free-ranging cervid (deer, elk, and moose) populations, and Veterinary Services uses another approximately 25% for its wild cervid work. The remaining approximately 50 percent is used for the management of CWD in captive cervid herds. The Association sincerely appreciates both the national approach to management of this disease, and the provision of federal grants to the states to enhance their management of CWD. We believe this is a good model of state-federal approaches to fish and wildlife diseases that should be emulated in other disease circumstances.

In Michigan, we utilized the national plan and the funding made available through USDA-APHIS to specifically plan for and prepare a response to the potential detection of CWD. Over a period of two years, funds made available by USDA-APHIS accounted for testing nearly 12 percent of all cervids tested in Michigan for CWD. Coordinating federal efforts and funding within state specific planning efforts, state fish and wildlife agencies have been better positioned to characterize the distribution and intensity of CWD and evaluate the attendant risks. These federal funds and the flexibility of cooperative agreements between states like Michigan and the federal government have made it possible to conduct large-scale wildlife disease surveillance, in some states for the very first time—which certainly could not have occurred without a coordinated effort across many jurisdictional lines.

As you might expect, we view full funding of these efforts as essential to their success but I understand that appropriations is the purview of a different committee. Suffice it to say, successful disease monitoring and assessment programs require both operational and financial consistency.

Based upon our experiences with bovine TB and VHS, Michigan has learned another important lesson: fish and wildlife disease management is not restricted to the identification of vectors, isolation of infected individuals, and their removal from the population. Fish and wildlife bring significant economic and cultural interests to bear upon management strategies, and those interests necessarily confer political attention as well.

When creating fish and wildlife disease strategies, it is especially important to be thoughtful, deliberate, and consistent. The public has very strong opinions about their resources, how we manage them, and how they use them.

The detection of bovine TB in Michigan brought together the sometimes juxtaposed elements of wildlife management, agricultural practices, outdoor recreation, and commerce. Because of the complexity of the parties involved, a new paradigm for disease risk mitigation was needed to adequately ensure the protection of both wildlife and livestock.

The new cultural norm where hunting traditions and traditional agricultural practices were altered to conform to the new demands of disease on the landscape, have been partially achieved, but not without concerted and consistent effort in the face of an unwilling public. Planning for the cultural, social, and political consequences of disease incidents should be viewed as an essential and primary outcome.

Similarly, and more recently, we have learned that lesson again through the detection of VHS in our waters. There are no practical methods for eliminating a pathogen from wild fish populations. The most important vectors for moving a pathogen such as viral hemorrhagic septicemia virus (VHSV) is the movement of infected fish and fish parts, the discharge of infected water from recreational boats, and infected ballast water discharge.

Notably, two of the three most important vectors I just mentioned are actions taken by our public. Recognizing this, the Michigan Department of Natural Resources created an information campaign backed by regulation changes that were designed to increase angler and boater awareness of pathogens like VHSV. Similar efforts engaged the commercial bait industry and operators of boat launch sites.

These education and outreach efforts have sparked independent citizen driven efforts to develop voluntary boat disinfection stations. It is our opinion that the combination of education, outreach, and regulation changes has in part slowed the spread of VHSV and reduced fish losses.

Amphibian Chytrid Fungus

Pathogens and diseases have the potential to affect all fish and wildlife, including some taxa that the public may not consider as charismatic as white-tailed deer or trout. Worldwide, approximately one-third of amphibians are threatened; we may be witnessing the 6th major extinction event the Earth has experienced, as described recently in the scientific and popular literature. Across the globe, and in the US, amphibian die-offs and extinctions have been attributed to the amphibian chytrid fungus (*Batrachochytrium dendrobatidis*; hereafter *Bd*), which results in chytridiomycosis, a recently-described fungal disease. Records of *Bd* occur as early as 1930 in specimens of the African clawed frog native to South Africa; the pathogen now appears to be invasive in many parts of the world causing extinctions of native species that have not evolved defenses against this novel disease. Not all amphibians are susceptible to *Bd*; some individuals survive the initial epidemic and serve as reservoirs and vectors capable of spreading the disease if they move or are translocated between sites. The highly infectious nature and devastating repercussions of *Bd* led to a proposal in the United Kingdom to ban the sale of African Clawed Frogs and the designation of chytridiomycosis as a notifiable disease by the World Organization of Animal Health (OIE). In the US, *Bd* is thought to have spread through commercial trade activities, such as through amphibian pets, food (e.g., frog legs), and bait (e.g., tadpoles, etc.). It has impacted native US species including federally endangered mountain yellow-legged frogs, federally threatened California red-legged frogs, western toads, and Wyoming toads, and has been implicated in the extinction of two species in the US territory of Puerto Rico, web-footed and golden coquis.

White-Nose Syndrome (WNS) in Bats

With acknowledgement to Scott Darling, Vermont Fish and Wildlife Department, who is at the epicenter of response to WNS, let me share a few of his observations that can inform the development of a response to this particular outbreak.

Understanding the role of state fish and wildlife agencies in addressing WNS is essential to working toward a comprehensive, collaborative resolution to the crisis. Unless otherwise federally listed, the conservation of all bat species is the authority and responsibility of state fish and wildlife agencies. For example, of Vermont's nine species of bats, only the federally endangered Indiana bat is eligible for federal protection and oversight. The remaining eight species are the sole authority of the Vermont Fish and Wildlife Department. The distinction of state and federal authorities is appropriate under most conservation efforts; however, such distinctions add complexity for species such as bats that migrate across state boundaries, if not regions, and for highly infectious wildlife diseases such as WNS that can sweep across the country in a matter of a few years.

It is the state fish and wildlife agencies that provide on-the-ground local knowledge of bat populations, historic survey results, locations of caves and mines where bats hibernate, and information on key summer colony habitats. State fish and wildlife agencies are often the most credible, familiar voice in providing public outreach and education. In addition, state wildlife biologists play a role in implementing or assisting in much of the research activities associated with WNS. Therefore, any strategies to contain WNS or slow its progression across the country will require an increased level of effort from state fish and wildlife agencies.

We commend the USFWS for its initiative in assuming WNS coordination responsibilities when that niche clearly needed filling. In particular, regional staff in the USFWS New England and New York field offices was instrumental in such critical components as multi-state coordination, the development of WNS protocols, and assistance in conducting WNS surveillance. The USGS staff at the National Wildlife Health Center in Madison, Wisconsin, also availed their expertise, their lab, and themselves in the efforts to determine what was killing the bats.

White nose syndrome demonstrates that a high level of coordination, mutual commitment, open access to expertise, and responsiveness by the state and federal agencies will absolutely be required to successfully respond to emerging fish and wildlife disease issues.

Like our experience with CWD, TB and other diseases, in the case of WNS, we believe that adequate authorities already and sufficiently exist at state and federal levels. Using and coordinating the strengths of these existing authorities is a challenge, but one that is achievable. What is most needed is adequate funding in the disciplines of fish and wildlife, animal health, and public health, to enhance the respective agencies capacity and capabilities to respond to what is likely to be an increasing number of disease outbreaks that threaten not only fish and wildlife health, but domestic animal health, and potentially human health.

Thank you for the opportunity to share the Association's perspectives, and I would be pleased to address any questions from the Subcommittee.



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National Fish & Wildlife Health Initiative

for the United States

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Emerging fish and wildlife diseases, such as Chronic Wasting Disease, West Nile Virus, Highly Pathogenic Avian Influenza, and others have recently become of growing and significant concern to fish and wildlife, animal health and public health professionals, and the public that they serve. There are indications that some factors in the spread of disease will tend to expand the range of disease vectors in the future, leading wildlife managers to conclude that they need to better monitor their spread and be prepared to take coordinated action to prevent or contain such outbreaks in the future.

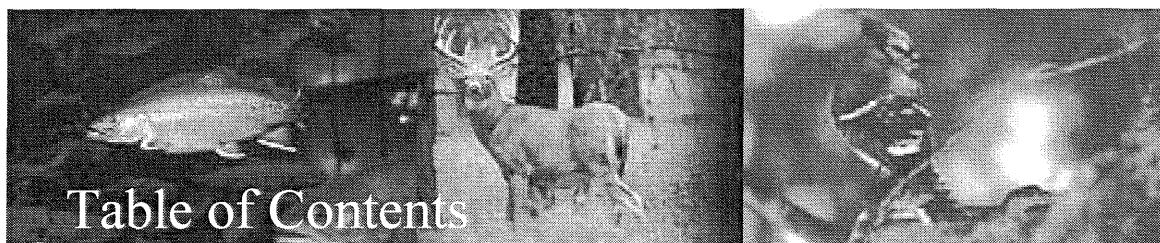
State fish and wildlife agencies have the statutory, and often constitutional, responsibility for the conservation of fish and wildlife within their borders for the benefit of their citizens. Thus, they are the front-line managers of fish and wildlife and fish and wildlife diseases. The Association of Fish and Wildlife Agencies, which represents the 50 state fish and wildlife agencies, embarked on the development of a National Fish and Wildlife Health Initiative to create a system for coordination between state, federal, and local governments and private industry to ensure early detection of pathogens and appropriate response and management of diseases.

We gratefully acknowledge our debt to those organizations that have blazed the trail for broad multidisciplinary partnerships in environmental health such as this one. In particular, we thank the Canadian Cooperative Wildlife Health Centre for its seminal Canada's National Wildlife Disease Strategy and the National Fish Habitat Initiative Core Team for its Action Plan, both of which served ably as models for this document. We endorse the National Fish and Wildlife Health Initiative and commit to playing an active role in its implementation.



Rebecca A. Humphries
Chair, Fish & Wildlife Health Committee
April 19, 2007





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Executive Summary

Human activities, such as ecosystems alterations and the movement of pathogens, hosts or vectors, often enhance the emergence and resurgence of diseases at the interface of wildlife, domestic animals, and humans. The intentional or accidental introduction of these diseases can significantly affect fish, wildlife, domestic animals or human populations and necessitate a coordinated, multi-agency response.

The mission of the National Fish and Wildlife Health Initiative (NFWHI) is to conserve, restore, and enhance healthy fish and wildlife resources of the United States by recognizing and respecting the missions, jurisdictions, and abilities of fish and wildlife managers to address health issues. This mission will be achieved by six principal strategies:

1. Identify, characterize, respect, and integrate the authorities and capabilities of cooperating partners in complementary fashion.
2. Identify state, federal and other fiscal and staff resources for state, federal, and territorial fish and wildlife health programs and facilitate their optimal use and allocation.
3. Conduct proactive, coordinated and sustained surveillance for pathogens in fish and wildlife, and respond to findings according to risk.
4. Support applied research pertinent to fish and wildlife health, development of integrated disease management strategies, and improved technology for fish and wildlife health management.
5. Establish and maintain a fish and wildlife disease Web site, uniform training for critical staff of cooperating partners, and communication plans and networks to inform policymakers and citizens about fish and wildlife health.
6. Establish a NFWHI Steering Committee to facilitate, oversee, and coordinate interactions among partners and provide the support necessary for effective implementation of the Initiative.

The two over-arching goals of this initiative are to: facilitate establishment and enhancement of state, federal, and territorial fish and wildlife management agency capability to effectively address health issues involving free-ranging fish and wildlife; and minimize the negative impacts of health issues affecting free-ranging fish and wildlife through surveillance, management, and research.

The following objectives provide a solid course to facilitate actions needed to achieve the goals of the NFWHI:

1. Establish or augment state, federal, and territorial fish and wildlife management agency capacities (human, financial and physical) to address fish and wildlife health issues.
2. Train fish and wildlife biologists and veterinarians as cornerstones of a comprehensive network of state, federal, and territorial fish and wildlife health programs.
3. Recognize, respect, articulate and integrate the abilities and authorities of cooperating state, tribal, territorial and federal agencies and other partners.
4. Create communication strategies to build support for this Initiative via active dialogue with other agency personnel, policymakers, stakeholders and the public about fish and wildlife health issues.
5. Prevent introduction, establishment, and spread of priority pathogens in fish and wildlife populations through policy, early detection, and rapid response appropriate to risks.
6. Protect fish and wildlife population health through habitat conservation, risk analysis and adaptive management.

Beyond this written formulation of the Initiative, the next steps to be undertaken are:

1. Appoint a Steering Committee for the Initiative by May 2007, and
2. Steering Committee will work with the Fish and Wildlife Health Committee to oversee the development of the Implementation Plan.

DEFINITIONS

Health: The state of an organism when it functions optimally without evidence of disease or abnormality.

Pathogen: any agent (organism or substance) capable of inducing abnormal structural or functional changes in the body, which, in turn can lead to illness and clinical manifestations of disease.

Disease: Illness; an interaction of the affected animal (the host), the pathogen and /or processes causing illness (the agent), and the environmental factors influencing all of them.

Epidemiology: The study of the distribution of disease in populations and of the factors that determine its occurrence.

Risk analysis: A process for objectively assessing risks of disease introduction into a population, evaluating management options for diminishing or controlling those risks, and communicating information about those risks to all stakeholders.

Vector: An organism or object capable of transferring an agent from one host to another biologically or mechanically.

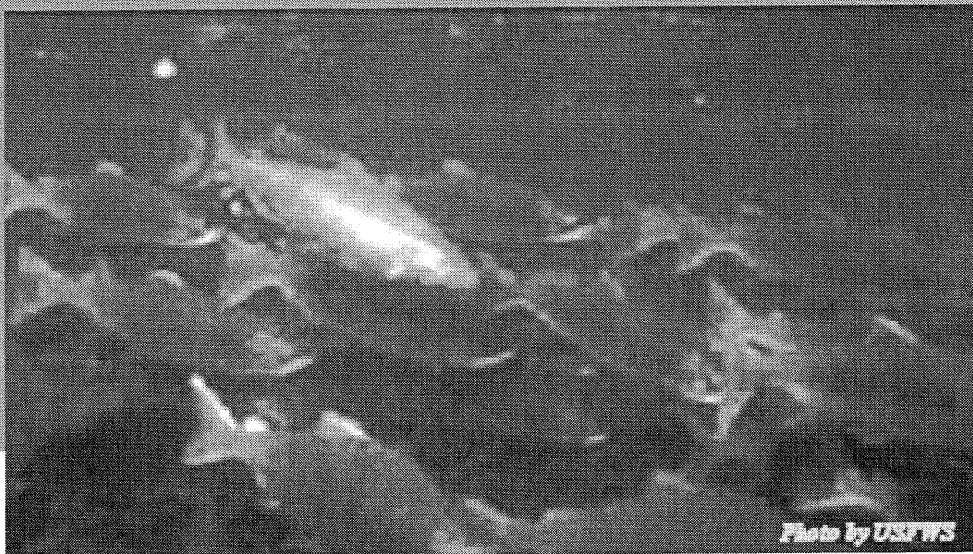
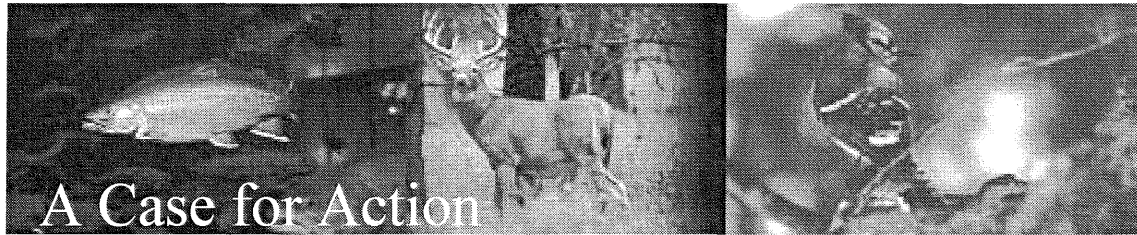


Photo by USFWS



The importance of maintaining healthy populations has long been recognized by fish and wildlife managers, and several disease issues are of growing concern to fish and wildlife, domestic animal, and public health professionals and the publics they serve. Significant diseases, such as plague, hemorrhagic disease, pasteurellosis, chronic wasting disease, botulism, viral hemorrhagic septicemia, West Nile virus, whirling disease, and others have been found in wild and farmed fish or wildlife populations in North America and can have a significant biological and economic effect on state and federal public trust resources. Reservoirs of economically important diseases including bovine brucellosis and bovine tuberculosis have inadvertently become established in native wildlife and threaten livestock industries in some areas. Foreign animal diseases eradicated from the continent decades ago, such as foot and mouth disease and classical swine fever, and those historically not reported in North American wildlife, such as highly pathogenic avian influenza, are a constant concern. Human activities (alteration of ecosystems, movement of pathogens, hosts or vectors, etc.), as well as improved recognition through advances in diagnostics and epidemiology, continually provide occasions for the discovery, emergence and resurgence of diseases at the interface of wildlife, domestic animals, and humans. The intentional or accidental introduction of new disease agents could have a significant impact on fish, wildlife, domestic animals or human populations and would necessitate a coordinated multi-agency response.

The dramatically growing importance of fish and wildlife health issues in natural resource management makes it imperative that more human, financial, and technological resources be directed toward them in the future. Responsibility and authority issues warrant greater state, federal, tribal, and territorial fish and wildlife management agency attention, as does the increasing recognition that disease agents in free-ranging fish and wildlife have implications for domestic animals and humans. In addition to more traditional fish and wildlife health issues, state, federal, tribal, and territorial natural resource management agencies must also face emerging issues, including the threats of bio- and agroterrorism, and unintentional introduction of disease agents, such as highly pathogenic avian influenza (HPAI) virus. As stewards in trust of priceless public resources, state and federal fish and wildlife management agencies must proactively take on such issues; if they do not, they are being deficient in their required public trustee duties and risk the possibility that other state or federal agencies will do so without their input or consent. Alternatively, and perhaps more ominously, they run the risk that issues of fish and wildlife health will be addressed haphazardly, inadequately, or not at all.

Responsibility and authority for conserving fish and wildlife resources rest in state and federal natural resource management agencies. Public trust stewardship is the very cornerstone of North American natural resource management as fish and wildlife are common property of the citizens of each state. Thus, successful fish and wildlife health programs must necessarily be centered in the states as well. However, there is no "one size fits all" approach to fish and wildlife health programs. Several states have had strong programs with full-time fish and wildlife health professionals for decades. Others have instituted new programs in recent years. Still others have pooled resources to create regional wildlife health cooperatives (see Exhibit 1).

Regardless of the structure of a state's fish and wildlife health program, cooperation among local, state, tribal, territorial, and federal public health, domestic animal health, and natural resources agencies will invariably be essential because of overarching issues, shared regulatory authority, and limited resources. The greatest opportunities for addressing significant local health issues will be in programs where the state fish and wildlife management agency prioritizes the issues and collaborates with other governmental and nongovernmental organizations to address them. Through this approach, state fish and wildlife management agencies will improve their understanding and management of diseases, develop and share data useful to others, and maximize the financial, technological, and human resources that inevitably will be limited.

To accomplish these goals, we propose the implementation of the National Fish and Wildlife Health Initiative (NFWHI) by a multi-disciplinary consortium of state, tribal, territorial, federal, university, corporate, and nonprofit organizations under the leadership of the Association of Fish and Wildlife Agencies (AFWA). Although national in scope, NFWHI will not mandate programs at the state, federal, tribal, or local level. The NFWHI is dedicated to advancing the science, awareness, and fostering cooperation related to all aspects of fish and wildlife health. It is a policy framework by which all interested parties may seek both to minimize the negative impacts of disease agents in fish and wildlife, and to proactively promote healthy fish and wildlife populations. The United States Animal Health Association (USAHA) supports the development and implementation of the NFWHI, under AFWA leadership, and passed a resolution to that effect in 2005. To support the development and implementation of NFWHI, AFWA Guiding Principles in September 2005.

Guiding Principles

THE NATIONAL FISH AND WILDLIFE HEALTH INITIATIVE WILL:

- Support the AFWA vision for healthy fish and wildlife resources throughout North America managed by effective, well-funded resource agencies supported by informed and involved citizens;
- Support the AFWA mission to protect state authority and support territorial authority for wildlife conservation; promote sound science-based resource management; and strengthen state, territorial, federal, and private cooperation in conserving fish and wildlife resources;
- Recognize that free-ranging fish and wildlife have fundamental ecological and aesthetic value and that these resources and associated recreational activities have economic value and contribute significantly to the quality of life and the economy on a local, state, and national basis;
- Recognize that as the front-line managers, state fish and wildlife agencies are responsible for managing diseases in free-ranging fish and wildlife, and several already have in place much of the knowledge, personnel, equipment, and local public support to prevent, monitor, detect, and respond to disease issues;
- Foster development and maintenance of additional competencies, management tools, and training in fish and wildlife health management within state fish and wildlife agencies;
- Promote science-based management strategies for health issues that involve or impact free-ranging fish and wildlife and recognize that some disease agents found in fish and wildlife are of significance to domestic animal and human health, and vice versa;
- Recognize, articulate, and integrate the abilities and authorities of cooperating state, tribal, territorial, and federal agencies and other partners;
- Foster collaboration, coordination, and communication among fish and wildlife health jurisdictions, as well as with domestic animal health and public health agencies at the state and national level;
- Recognize that animals and disease agents do not observe political boundaries, necessitating interstate and international coordination of health management efforts;
- Recognize that state fish and wildlife management agencies are a key component in local response to biosecurity and bioterrorism threats and incidents and emphasize the importance of involvement, support, training, and planning for key agency personnel;
- Recognize fish and wildlife health management as an essential component of any fish and wildlife conservation program and emphasize the importance and efficacy of prevention, as opposed to control or eradication efforts, as a strategy for managing diseases in free-ranging fish and wildlife;
- Recognize the need to develop and disseminate science-based information to educate the public about the significance of diseases in fish and wildlife populations and the value of integrated prevention and management programs; and
- Recognize that free-ranging fish and wildlife are publicly-owned resources, and that effective guardianship of their health must necessarily take human dimensions of wildlife management into account.

Mission, Goals, and Objectives

The mission of the NFWHI is to conserve, restore, and enhance the fish and wildlife resources of the United States by providing a cooperative platform to empower fish and wildlife managers to set priorities and to manage fish and wildlife health issues of local, national and international scope. This mission will be achieved by six principal strategies:

1. Identify, characterize, respect, and integrate the authorities and capabilities of cooperating partners in complementary fashion.
2. Identify state, federal and other fiscal and staff resources for state, federal, and territorial fish and wildlife health programs and facilitate their optimal use and allocation.
3. Conduct proactive, coordinated and sustained surveillance for pathogens in fish and wildlife, and respond to findings according to risk.
4. Support applied research pertinent to fish and wildlife health, and development of integrated disease management strategies, and improved technologies for fish and wildlife health management.
5. Establish and maintain a fish and wildlife disease Web site, uniform training for critical staff of cooperating partners, and communication plans and networks to inform policymakers and citizens about fish and wildlife health.
6. Establish a NFWHI Steering Committee to facilitate, oversee, and coordinate interactions among partners and provide the support necessary for effective implementation of the Initiative.

GOALS:

1. Facilitate establishment and enhancement of state, federal, and territorial fish and wildlife management agency capability to effectively address health issues involving free-ranging fish and wildlife.
2. Minimize the negative impacts of health issues affecting free-ranging fish and wildlife through management, surveillance, and research.

OBJECTIVES:

1. Establish or augment state, federal, and territorial fish and wildlife management agency capacities (human, financial and physical) to address fish and wildlife health issues.
2. Train fish and wildlife biologists and veterinarians as cornerstones of a comprehensive network of state, federal, and territorial fish and wildlife health programs.
3. Recognize, respect, articulate and integrate the abilities and authorities of cooperating state, tribal, territorial and federal agencies and other partners.
4. Create communication strategies to build support for this Initiative via active dialogue with other agency personnel, policymakers, stakeholders and the public about fish and wildlife health issues.
5. Prevent introduction, establishment, and spread of priority pathogens in fish and wildlife populations through policy, early detection, and rapid response appropriate to risks.
6. Protect fish and wildlife population health through habitat conservation, risk analysis and adaptive management.



Photo by Glen Smart, US FWS

Implementation Strategy

1. Identify, characterize, respect, and integrate the authorities and capabilities of all cooperating partners in complementary fashion.

- ⇒ Conduct a comprehensive survey of all partners to ascertain their current authorities, capabilities and spheres of influence. Make this information available to all partners, with periodic updates over time.
- ⇒ Identify policies needed to fill gaps in authority and capabilities and to increase efficiency of existing policies.
- ⇒ Identify the benefits derived by fish and wildlife resources and the public from new policies.
- ⇒ Work with partners to advance a legislative agenda at both the state and federal level that:
 - Ensures each state fish and wildlife management agency has the legally mandated responsibility for fish and wildlife health issues within the state or territory;
 - Implements necessary protective legislation and regulations to prevent pathogen importation, establishment, and/ or dispersal in fish and wildlife, and controls human activities that increase opportunities for those outcomes.

Measures of progress: Periodic reviews of national, state, tribal, and territorial health program capabilities and legal authorities; report of survey findings.

2. Identify state, federal and other (e.g., non-governmental organization, university, etc.) fiscal and staff resources for state, federal, and territorial fish and wildlife health programs and facilitate their optimal use and allocation.

- ⇒ Identify federal and other resources for fish and wildlife health to enhance the capabilities of federal, state, tribal, and territorial fish and wildlife agencies.
- ⇒ Make recommendations and provide coordination for allocation of these resources to ensure adequate capabilities in all states and efficiently address national priority issues, based on their risk.
- ⇒ Develop new funding options for fish and wildlife health research and to implement the Initiative.

Measures of progress: Accounts of resources committed and their distribution; development of new funding opportunities and options.

3. Conduct proactive, coordinated and sustained surveillance for pathogens in fish and wildlife, and respond to findings according to risk.

- ⇒ Develop an integrated infrastructure necessary to ensure rapid, accurate collection, analysis and dissemination of pathogen and disease surveillance information. Tasks include:
 - Establish an integrated national surveillance network, with potential for international expansion, by connecting existing state, federal, and territorial surveillance programs and diagnostic laboratories, and promoting complementary growth.
 - Implement a secure, standardized reporting system for state, federal, and territorial fish and wildlife agencies (perhaps linked to the fish and wildlife disease Web site), to increase the availability of timely, comprehensive information, and improve the efficacy of their limited resources.
 - Incorporate information from human and domestic animal disease surveillance systems to monitor risk of pathogen movement between these species and free-ranging fish and wildlife.

- ⇒ Proactively develop contingency plans for emergency disease events, including decision and communications processes, coordinated among agencies and political jurisdictions.
- ⇒ Promote and facilitate the development of standardized surveillance systems for free-ranging fish and wildlife pathogens.
- ⇒ Develop and maintain adequate capacity for highly effective field response to pathogen introductions and disease outbreaks in free-ranging fish and wildlife.

Measures of progress: Number of states and territories implementing standardized fish and wildlife disease surveillance; accounts of state and territorial field response capacities for pathogens in fish and wildlife; numbers of contingency plans for pathogens in fish and wildlife; and annual reports of number and distribution of pathogens in fish and wildlife by state and territory.

4. Support applied research to improve technologies and strategies for detecting and managing health issues in fish and wildlife.

- ⇒ Consult with partners to identify priority areas of multidisciplinary fish and wildlife health research, including:
 - Prevention: Manage fish and wildlife habitat and populations for optimal population health;
 - Risk analysis: Quantify fish and wildlife population health risks, develop appropriate risk analysis methodology, enumerate decision support and risk management options, and identify methods for effective risk communication;
 - Surveillance support: Epidemiology, pathogenesis, new rapid detection equipment and methods, and development of specific and sensitive standardized and validated fish and wildlife health diagnostic techniques, procedures, and tests;
 - Disease management: Specifically identify objectives and limits, and critically evaluate available integrated | disease management methods; and
 - Human dimensions: Understand factors affecting stakeholder beliefs and attitudes about fish and wildlife health and how those beliefs and attitudes influence effective disease management.
- ⇒ Maintain an ongoing dialogue with decision makers in government, academia and stakeholder groups to make certain fish and wildlife health priorities are included in research programs.
- ⇒ Apply research findings to develop improved health management options, and compile a depository of those options as reference case studies via the fish and wildlife disease Web site.



Measures of progress: Annual reports identifying priority research topics; annual reports of number of priority research | projects proposed, funded and completed; annual reports of science-based management interventions undertaken, with outcomes over time; annual summaries of publications and technology transfers resulting from priority research projects; annual milestones to development of the depository of fish and wildlife health management options, territorial surveillance programs and diagnostic laboratories, and promoting complementary growth.

5. Establish and maintain a fish and wildlife disease Web site, uniform training for critical staff of cooperating partners, and communication plans and networks to inform policymakers and citizens about fish and wildlife health.

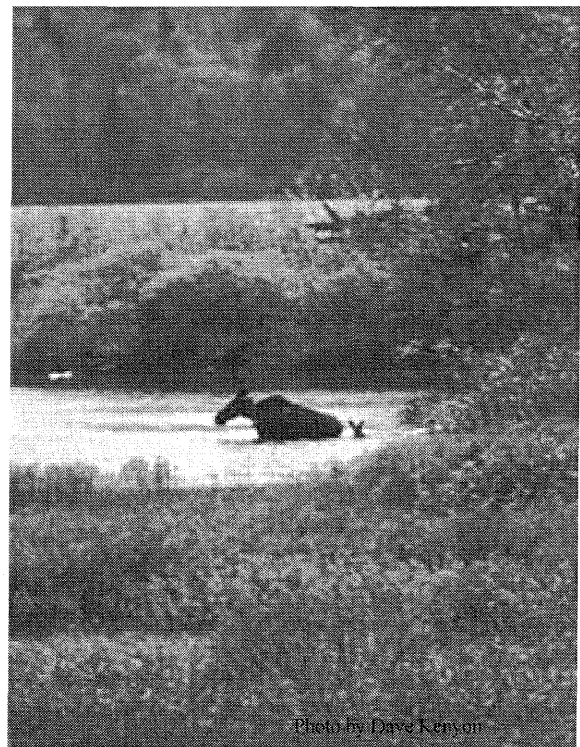
- ⇒ Expedite systematic communication, education, and coordination among partners through a fish and wildlife disease Web site, to:

- Archive accurate, science-based disease agent information for significant diseases;
 - Incorporate existing infrastructure and (hyper)link partners to the Web site and to each other.
 - Inform state, federal, and territorial fish and wildlife agency personnel, including field staff, administrators and policymakers, of health resources and expertise currently available and how to access them; and
 - Inform partners, stakeholders and the public of impending threats and other significant developments in fish and wildlife health.
- ⇒ Train state and territorial fish and wildlife health specialists to build capacity, using a standardized program that provides uniform, basic training with special emphasis on regional issues.
- ⇒ Create, implement and evaluate standardized communication plans to inform varied audiences about general fish and wildlife population biology, ecology and health, as well as specific pathogen and disease topics. These plans must be appropriate for varied audiences to include agency staff, policymakers, stakeholders, media, and the public. The plan will ensure common, consistent, and science-based messages among state, territorial, federal and tribal agencies. Notably, communication planning will be an ongoing priority, receiving sustained attention as issues emerge, peak and wane. Specific tasks include:
- Conduct human dimensions research to better identify what target audiences think, feel and understand about fish and wildlife health issues;
 - Define goals, set measurable objectives, and develop and test messages based on this research;
 - Gather existing case studies and example communication plans in an easily accessible web-based location for education;
 - Assemble researchers and communicators from partner organizations to develop the plans and education materials to communicate the messages successfully, and enact the plans; and
 - Subject the plans to progressive evaluation and revision until research confirms desired outcomes are achieved.

Measures of progress: Milestones to development of the fish and wildlife disease Web site; annual number of fish and wildlife health specialists trained; number of communication plans developed, implemented and re-evaluated each year.

6. Establish a NFWHI Steering Committee to facilitate, oversee, and coordinate interactions among partners and provide the support necessary for effective implementation of the Initiative.

- ⇒ The Steering Committee will be assembled with representation from government partner groups (see Governance section) and strive for consensus. Among its specific roles:
- Define needs based on current and emerging fish and wildlife health issues;
 - Establish fish and wildlife health policies based on prioritized needs;
 - Coalition building;
 - Promote necessary interagency agreements to define partner responsibilities in order to effectively address fish and wildlife health issues in a particular state or territory; and
 - Conflict resolution.



Measures of progress: Establishment of the Steering Committee by May 2007; establishment of Steering Committee bylaws and structure for reporting milestones; proceedings of Steering Committee meetings.

Governance

Given the diversity of the state and territorial fish and wildlife management agencies that have spearheaded development of the NFWHI, as well as the scope and complexity of fish and wildlife health issues they face, a central structure for coordination at the national level is essential. A National Fish and Wildlife Health Steering Committee (NFWHSC) and a small support staff will be established to provide this foundation.

STEERING COMMITTEE. The NFWHSC will bear responsibility to facilitate, oversee and coordinate interactions between partners and provide the support structure necessary for effective implementation of the Initiative. The Committee will be comprised of 12 representatives drawn from the partner groups as follows:

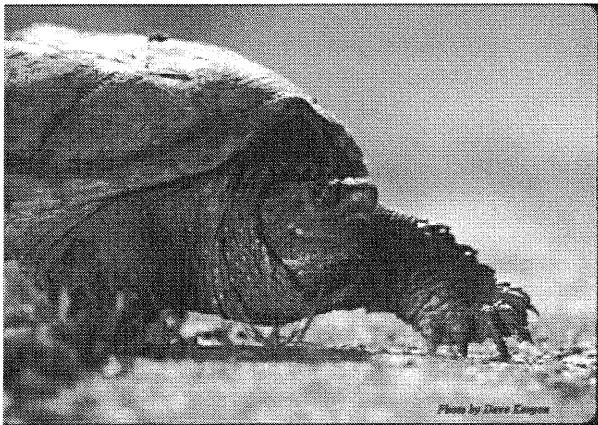
- Chairperson of the AFWA Fish and Wildlife Health Committee (1), Chair;
- Directors from each of the four Regional AFWA Associations (Northeast, Midwest, Southeast and Western) (4);
- Director of US Fish and Wildlife Service (1);
- Associate Director of Biology, USGS (1);
- Deputy Administrator of USDA APHIS VS (1);
- Deputy Administrator of USDA APHIS WS (1);
- State Veterinarian (1);
- Academic Institution (1);
- Tribal fish and wildlife management entity (1);

Initially, the Steering Committee will be named by AFWA from nominations submitted by AFWA members and partners. A Charter specifying bylaws, terms of service, procedural rules, specific responsibilities of membership and other matters will be developed by the NFWHSC. In addition, the Steering Committee will also be charged with selecting the appropriate entities from non-government organizations, associations, industry, and other private organizations to serve on a Non Governmental Organization Caucus.

Core administrative support will initially be provided by the states, through AFWA. Minimal permanent staff positions will be filled as needed during implementation of the Initiative. Funding for these staff positions will be provided by a combination of federal appropriations, intergovernmental personnel agreements, and partner contributions.

FEDERAL CAUCUS. A Federal Caucus will be named as a key advisory body to the Steering Committee. The Caucus will provide a vehicle through which federal partners can (1) jointly identify strategies and resources to support actions under the NFWHI, (2) ensure that the Initiative reflects the priorities of federal agencies, and (3) provide a communication link among cooperating federal partners. The Caucus will work to promote federal agency policy consistent with the

NFWHI. The Caucus will effectively serve as a forum for articulation and refinement of federal perspectives concerning fish and wildlife health issues, and a channel for information flow between federal partners and the NFWHSC.



The Caucus will be comprised of all federal agencies interested in fish and wildlife health issues and willing to facilitate the implementation and maintenance of the Initiative. In order to obtain comprehensive and varied input, the number of members participating in the Federal Caucus will not be limited. Initially, the Caucus will be comprised of representatives from the following U.S. Departments: Agriculture (Animal and Plant Health Inspection Service - Veterinary Services [APHIS-VS] and Wildlife Services [APHIS-WS], Agricultural Research Service, Forest Service), Commerce (National Oceanic and Atmospheric Administration - National Marine Fisheries Service), Health and Human Services (Centers

for Disease Control and Prevention, Public Health Service, Food and Drug Administration), Interior (Bureau of Land Management, Fish and Wildlife Service, Geological Survey, National Park Service, Bureau of Indian Affairs), and Environmental Protection Agency. Affiliates of the U.S. Departments of Defense and Homeland Security will also be invited to participate. One representative from the Department of the Interior and one representative from the Department of Agriculture will serve as Federal Caucus Co-Chairs and will function as liaisons to the Steering Committee.

Exhibits

1. EXAMPLES OF SUCCESSFUL FISH AND WILDLIFE HEALTH PROGRAMS:

State Fish and Wildlife Health Programs,
Regional Fish and Wildlife Health Cooperatives,
The Great Lakes Fish Health Committee,
The Epizootic Hemorrhagic Disease Project, and
Federal Support of State Fish and Wildlife Health Programs

2. SAMPLE OF INITIATIVE PARTNERS

3. NATIONAL FISH AND WILDLIFE HEALTH INITIATIVE MILESTONES

4. NATIONAL FISH AND WILDLIFE HEALTH INITIATIVE LEADERSHIP

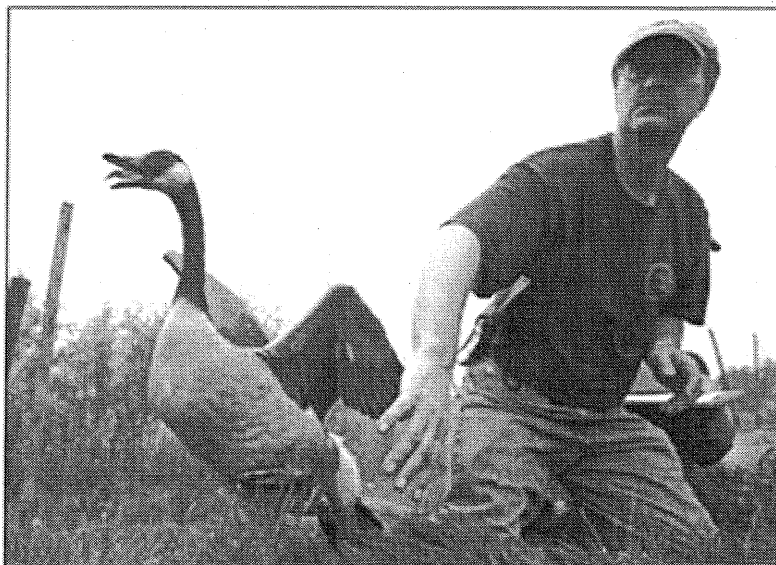


EXHIBIT 1: EXAMPLES OF SUCCESSFUL FISH & WILDLIFE HEALTH PARTNERSHIPS

Currently, the ability of state and territorial fish and wildlife management agencies to prevent, detect, monitor, and manage disease and other health problems impacting free-ranging wild animals is highly variable. To progress towards the NFWHI's goal of adequate capacity in each and every state and territory (capacity under state and territorial control), improvement in funding, cooperation and outreach are all necessary. While building capacity is a common need, the numerous and diverse examples of flourishing fish and wildlife health programs shows that a variety of routes can be taken to arrive at the same successful programmatic outcome.

STATE FISH AND WILDLIFE HEALTH PROGRAMS

A cornerstone of the research and management of wildlife health is strong programs under the authority of state and territorial fish and wildlife management agencies. Such programs have been established and maintained over time in a number of states, including Alaska, California, Colorado, Michigan, New York, Wisconsin and Wyoming, among others. In 1927, the increases, and as the deliberate manage- groundwork was laid for the pioneering U.S. program in Michigan:

As the value of our wild life resources increases, and as the deliberate management of those resources is intensified, we shall no doubt parallel the previous experience with domestic birds and mammals, and shall have to contend with an unending series of diseases and parasites. Under these circumstances it is highly desirable that Michigan should develop at home, first class facilities for research in connection with the pests, parasites and diseases of ... wild life forms. It should not be necessary for us to depend upon Washington, or upon laboratories in other states, for the service of this sort.

(Michigan Department of Conservation, Game Division, Fourth Biennial Report, 1927-1928, pp. 265-267).



With that independent vision, the Michigan Department of Conservation's Wildlife Disease Laboratory (WDL) was established in 1933, the first of its kind. Its initial stated role was to study starvation, nutrition and diseases of Michigan wildlife. And for over seven decades the WDL has trained veterinary and wildlife biology students at Michigan State University, monitored causes of death and illness for the multitude of game and non-game Michigan wildlife species, and carried out research and management of several significant animal diseases including bovine tuberculosis, Type E botulism, and epizootic hemorrhagic disease. This success story was possible in large measure because of substantial and sustained funding from both state (hunting and fishing license fees, State Building Authority bond funds, and general fund monies) and federal (Pittman-Robertson grants) sources. The Michigan Department of Natural Resources (MDNR) WDL is an example of how strong state wildlife health programs can benefit not only wildlife, but domestic animal and public health as well.

REGIONAL FISH AND WILDLIFE HEALTH COOPERATIVES

Several states and Canadian provinces have pooled their resources to form cooperatives. Wildlife management agencies in the Midwestern, Southeastern, and Western Associations of Fish and Wildlife Agencies have formed regional wildlife health cooperatives. The Midwestern and Western Wildlife Health Cooperatives are consortia of individual state wildlife health programs, several of which have long invested in staff positions and other dedicated infrastructure. In a similar fashion, the veterinary colleges and several governmental and non-governmental organizations in Canada have formed and support the Canadian Cooperative Wildlife Health Center. As exemplified by the Great Lakes Fish Health Committee, described below, these co-ops may bridge not only agency, but national boundaries.

The oldest of the cooperative programs is the Southeastern Cooperative Wildlife Disease Study (SCWDS). The SCWDS program began in response to a number of severe white-tailed deer mortality events in the 1950s, eventually determined to be due to hemorrhagic disease. The SCWDS program was founded at the University of Georgia, College of Veterinary Medicine by the Southeastern Association of Fish and Wildlife Agencies in 1957, with eleven original state members. Through a cooperative approach, the funds of individual SCWDS member states, which currently number sixteen plus the Commonwealth of Puerto Rico, are leveraged with dollars from each other, from the U.S. Departments of Interior (USDI) and Agriculture (USDA), and grants obtained by SCWDS faculty, to develop and disseminate wildlife health information of use to all partners. This approach allows the individual agencies supporting SCWDS to obtain much more for their investments than would otherwise be possible if working independently.

All of the above cooperatives, whatever their structure, allow for better information sharing and, in many cases, have promoted a more uniform approach to common disease problems affecting a number of different states or provinces.

THE GREAT LAKES FISH HEALTH COMMITTEE

Established in 1973 under Article VI of the Great Lakes Fishery Commission (GLFC) Convention between the United States and Canada (1955), the Great Lakes Fish Health Committee serves as the instrument of the Commission in coordinating regional efforts in the Great Lakes basin to prevent introduction and dissemination of communicable fish diseases. The Committee carries out this role by: recommending and fostering conduct of research and studies related to fish health and disease control; recommending and coordinating measures among member agencies which minimize risk of introduction and dissemination of communicable fish disease; and preparing for publication scientific and other information related to fish health protection.

The Committee consists of two representatives appointed by each agency formally cooperating with the Great Lakes Fishery Commission. Currently, these agencies represent the eight Great Lakes states, the Province of Ontario, the American and Canadian federal governments, and the tribal authorities. All positions and policies are adopted by the consensus of the member agencies. Technical advisors approved by the Committee are periodically invited to provide specialist expertise as required to enhance the conduct of the Committee's work.

In the past two decades, the Committee has made considerable progress in improving fish health management in the Great Lakes basin. Some of the achievements include:

- Development and publication of policies and protocols to reduce the risk of introducing or transferring serious disease agents into or within the Great Lakes basin (e.g. the "Great Lakes Fish Disease Control Policy and Model Program" and "Protocol to Minimize the Risk of Introducing Emergency Disease Agents with Importation of Salmonid Fishes from Enzootic Areas");

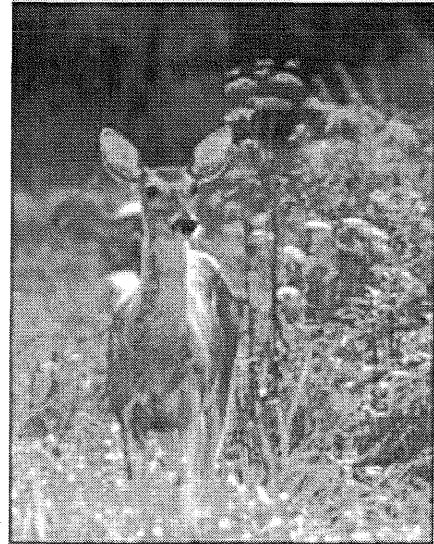
- Providing a forum for member agencies to discuss and recommend ways to manage serious disease outbreaks and associated fisheries management decisions (e.g., where and if to stock or destroy infected hatchery fish) along with providing support for these actions;
- Increasing awareness of the importance of fish health in both wild and cultured fish through participation at GLFC and Lake Committee meetings, and through development of educational tools such as the publication "A Guide to Integrated Fish Health Management in the Great Lakes Basin" and information sheets for such pathogens as *Heterosporis* sp.; and
- Providing a focus for the development and transfer of new fish health science and technology that is in turn used to update Committee policies and protocols, as well as in the development or revision of member agency legislation and policies.

The Great Lakes Fishery Commission operates a Science Transfer Program to promote partnerships through the communication of information about Great Lakes ecosystems and their fish communities, sea lamprey control, and emerging ecological concepts and technologies to fishery researchers and managers, to governments, and to the public. The program provides a source of funding to support the Joint Strategic Plan for Management of Great Lakes Fisheries, which includes support for the Committee's research priorities. In addition, the Committee formulates a priority list of research and information needs annually and achieves increased awareness and understanding of fish health issues through extension and education efforts.

THE HEMORRHAGIC DISEASE SURVEILLANCE PROJECT: A LONG-TERM NATIONAL DATABASE

Bluetongue and epizootic hemorrhagic disease are the most important viral diseases of white-tailed deer in the United States. Clinically indistinguishable from each other in deer, they are often collectively referred to as hemorrhagic disease (HD). The importance of HD was realized in the 1950s, when focally extensive mortalities of free-ranging deer jeopardized deer restoration programs in which wildlife agencies had invested significant financial and human resources. Since first recognized, HD has caused focal but severe mortality across much of the whitetail's range in the U.S. However, understanding HD epidemiology was complicated by underreporting, inconsistent diagnostic criteria, and lack of coordinated communication between states experiencing die-offs.

Since 1980, the Southeastern Cooperative Wildlife Disease Study has sent questionnaires every year to administrators and biologists of fish and wildlife management agencies, as well as veterinary diagnosticians, in all U.S. states. The questionnaires solicited information on HD occurrence, based on four consistent diagnostic criteria, at the country level. Preliminary results were compiled, and follow-up contact was made when clarification was necessary and with non-respondents to obtain nationally complete information. Each year, an interim report was prepared and sent to participating states for review and corrections, with the final annual report later delivered to all participants. The major advantages of this system were its simplicity, continuity over a long period of time, and its national scope. Above all, the benefits that participants received were greater than their contributions to the project.



Through this surveillance project, 1608 HD cases in 880 counties in 31 states were independently recorded by more than 380 state wildlife biologists in the first ten years. The data accumulated in the 25 years since inception have elucidated the geographic and temporal distribution HD across the entire nation and facilitated the identification of variable clinical response to infection first on a geographic basis and later as a function of the frequency of viral exposure and the development of resistance. In addition, HD Project surveillance has provided data for disease modeling, focused research, and efficient resource allocation. Perhaps most importantly, the Project provided opportunities for cooperative interactions among states to address a common wildlife health problem, resulting in improved training, communications, and a template for regional and national collaboration for other diseases involving wildlife.

FEDERAL SUPPORT FOR STATE FISH AND WILDLIFE HEALTH PROGRAMS

First, since the passage of the Federal Aid in Wildlife Restoration (Pittman-Robertson) Act of 1937, billions of dollars generated by an eleven percent excise tax on sporting firearms, ammunition, and archery equipment have been collected by the federal government and distributed as grants to state fish and wildlife agencies to fund wildlife conservation programs. A similar program, the Federal Aid in Sport Fish Restoration (Dingell-Johnson) Act of 1950, has generated federal grants for wild fish conservation through an excise tax on fishing equipment and small boat fuels, and import duties on fishing tackle, yachts and pleasure craft. Management and research of fish and wildlife health issues form a fundamental component within the framework of conservation. Dingell-Johnson and Pittman-Robertson monies have been put to good use in many states to supplement state funds, or to leverage state funds and allow their application to other needs.

Another excellent example of federal financial support for state wildlife management agencies to conduct disease surveillance and management has come through the USDA's Animal and Plant Health Inspection Services - Veterinary Services (APHISVS). Beginning in fiscal year 2003 and continuing to date, APHIS-VS has provided \$4 to 5 million each year in direct support of state activities related to chronic wasting disease (CWD). Additionally, APHIS-VS dramatically increased the number of approved laboratories and their testing capacity for transmissible spongiform encephalopathy (TSE) in 2002 by providing equipment, reagents, training, consultation, and quality control and assurance to a total of 26 facilities. The provision of federal funds through APHIS-VS for CWD surveillance and management activities directed and conducted by state wildlife management agencies should serve as a model for cooperative federal support of state wildlife health programs.

The provision of federal personnel to assist state fish and wildlife management staff in times of peak need provides a third example. Beginning in 2004, USDA's APHIS-VS hired several wildlife disease biologists with the primary mission of assisting the states with disease surveillance. The MDNR WDL incorporated fifteen of these biologists into its bovine tuberculosis and CWD testing programs in November 2004. That help was in addition to services provided by four APHISVS veterinarians and technicians as part of a cooperative program in place now for nearly a decade. The capable assistance of these federal personnel saved MDNR an estimated \$120,000 in labor costs.



EXHIBIT 2 : SAMPLE OF INITIATIVE PARTNERS (AS OF MARCH 2007)‡

FEDERAL/TRIBAL	STATE/UNIVERSITY	
Bureau of Land Management	Alabama Wildlife and Freshwater Fisheries	New Hampshire Departments of Health and Human Services, and Fish and Game
Centers for Disease Control and Prevention	Arizona Game and Fish Department	New Mexico Departments of Game and Fish, and Health
Department of Homeland Security	Arkansas Game and Fish Commission	New York State Department of Environmental Conservation
Great Lakes Fishery Commission	Association of Fish and Wildlife Agencies	North Carolina Wildlife Resources Commission
Great Lakes Fish Health Committee	Clemson University	North Dakota Departments of Health, and Game and Fish Department
National Park Service	Colorado Division of Wildlife	Pennsylvania Game Commission
U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services	Connecticut Department of Environmental Protection, Wildlife Division	South Carolina Department of Natural Resources
U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services	Florida Department of Health, Department of Agriculture, and Fish & Wildlife Conservation Commission	South Dakota Department of Game, Fish and Parks
U.S. Fish and Wildlife Service	Georgia Department of Agriculture, Division of Public Health, and Wildlife Resources	State Environmental Health Directors
U.S. Geological Survey	Idaho State Department of Agriculture, Department of Fish and Game	Tennessee Wildlife Resources Agency
NON GOVERNMENTAL	Indiana State Board of Animal Health	Texas Animal Health Commission, Parks and Wildlife Department
American Association of Wildlife Veterinarians	Iowa Department of Natural Resources	University of Georgia, Southeast Cooperative Wildlife Disease Study
American Fisheries Society	Kansas Department of Wildlife and Parks	Utah Division of Wildlife Resources
American Sportfishing Association	Kentucky Department of Fish and Wildlife Resources	Utah State University, Jack H. Berryman Institute
Association of State and Territorial Health Officials	Louisiana Department of Wildlife and Fisheries	Vermont Departments of Fish & Wildlife, and Department of Health
National Assoc. of State Public Health Veterinarians	Maryland Department of Natural Resources, and Department of Health and Mental Hygiene	Virginia Department of Game & Inland Fisheries
National Wildlife Federation	Massachusetts Department of Fish and Game	West Virginia Division of Natural Resources
Native American Fish and Wildlife Society	Michigan Departments of Agriculture, Community Health, and Natural Resources	Wisconsin Departments of Agriculture, Natural Resources, and Division of Public Health
Quality Deer Management Association	Michigan State University	Wyoming Department of Health, Game and Fish Commission, and Livestock Board
Rocky Mountain Elk Foundation	Mississippi Department of Wildlife	
U.S. Animal Health Association	Montana Department of Fish, Wildlife and Parks	
The Wildlife Society	Nebraska Department of Agriculture, and Game & Parks Commission	
Wildlife Conservation Society	Nevada Department of Wildlife	
Wildlife Disease Association		

‡ Partners list is incomplete and provided here as an illustration of the breadth of partners who have participated in the regional Initiative meetings or have provided written comments on the Initiative.

EXHIBIT 3: NATIONAL FISH & WILDLIFE HEALTH INITIATIVE MILESTONES

In view of the increasing need for fish and wildlife managers to effectively address disease issues, a National Fish and Wildlife Health Initiative (NFWHI) was developed under the leadership of the Association of Fish and Wildlife Agencies (AFWA) and in cooperation with governmental agencies and non-governmental organizations. The NFWHI is nested within AFWA's infrastructure and process and is under the formal direction of the AFWA.

Development of the National Fish and Wildlife Health Initiative began in 2005 when an ad hoc group met to discuss the Initiative's core concepts. The Guiding Principles presented earlier were devised from these core concepts. During fall 2005, resolutions were passed by the AFWA and USAHA supporting development and implementation of a National Fish and Wildlife Health Initiative under AFWA leadership. The AFWA also adopted the Guiding Principles for the NFWHI. In January 2006, a core work group met in Lansing, Michigan to develop a framework for the Health Initiative. In an effort to gather input on the draft Initiative, add content, and build a collaborative process, a series of four regional meetings were held during spring and summer 2006. Professionals from federal and state agriculture, public health, and fish and wildlife management agencies were invited to attend these meetings and provide comments on the Initiative. A fifth meeting was held in Washington, D.C. to gather input from various non-governmental organizations. During January 2007, a small work group gathered in Washington, DC to further refine the Initiative specifically focusing on the Governance section.

EXHIBIT 4: NATIONAL FISH & WILDLIFE HEALTH INITIATIVE LEADERSHIP

Core Work Group

Gregg Arthur, Wyoming Game and Fish Commission

Jordan Burroughs, Michigan State University

David Cobb, North Carolina Wildlife Resources Commission

John Fischer, Southeastern Cooperative Wildlife Disease Study

Dan Forster, Georgia Department of Natural Resources, Wildlife Resources Division

Rebecca Humphries, Michigan Department of Natural Resources

Terry Mansfield, Idaho Department of Fish and Game

Mike Miller, Colorado Division of Wildlife

Bruce Morrison, Nebraska Game and Parks Commission

Dan O'Brien, Michigan Department of Natural Resources

Steve Schmitt, Michigan Department of Natural Resources

Gary Taylor, Association of Fish and Wildlife Agencies

Gary Whelan, Michigan Department of Natural Resources



ASSOCIATION *of*
FISH & WILDLIFE
AGENCIES

The Association of Fish and Wildlife Agencies—the organization that represents all of North America’s fish and wildlife agencies—promotes sound management and conservation, and speaks with a unified voice on important fish and wildlife issues.