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Outcomes of PAX sapiens-Supported Global Wildlife Data Sharing Conferences for Enhanced One Health Security (GWDSC)

March 2026

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U.S. DEPARTMENT
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Executive Summary of Direct Impacts

Across two consecutive Global Wildlife Data Sharing Conferences supported by PAX sapiens—Year 1 (May 2024) at Pacific Northwest National Laboratory and Year 2 (2025) in Ciudad Real, Spain—the initiative converted wildlife data sharing from aspiration into operational reality, producing measurable impacts in platform development, data mobilization, standards harmonization, and international partnership formation. The conferences addressed a critical gap in global health security: while 75% of emerging infectious diseases affect both humans and animals and over 60% originate in wildlife, wildlife health surveillance has historically lagged behind human and agricultural sectors due to fragmented databases, inconsistent terminology, uneven capacity, and limited cross-border coordination. By convening practitioners, government agencies, international organizations, academic institutions, and NGOs, the GWDC catalyzed trust-based relationships and practical workflows that enable earlier detection, better risk assessment, and more effective prevention of threats at the wildlife–domestic animal–human–environment interface.

Year 1 (2024): Establishing Foundation and Triggering Implementation

The inaugural GWDC brought together stakeholders from 9 government agencies, 11 universities, 11 NGOs, and 8 countries, creating the first broad, cross-sector forum focused specifically on harmonizing wildlife health databases for biosurveillance, signal detection, and early warning. This meeting achieved historic firsts by outlining memorandums of understanding for data sharing among participants who had previously operated in silos. A pivotal technical milestone was the hands-on demonstration of PNNL's TREADS MedINT platform—a medical operations tool using AI, machine learning, predictive algorithms, and natural language processing—which allowed wildlife stakeholders to directly explore how advanced analytics could be translated into their mission areas for faster anomaly detection and credible situational awareness.

This shared understanding produced immediate operational outcomes. The U.S. Geological Survey was sufficiently impressed with PNNL's data science capabilities that USGS contracted PNNL to partner with the National Wildlife Health Center (NWHC) to develop the congressionally mandated (ARPA 2021) National Wildlife Disease Database

(NWDD) system, positioned to replace the legacy WHISPers platform and provide modernized national-scale capability. Because key stakeholders attended the conference in person, PNNL rapidly established trusted data-sharing partnerships with multiple entities including state Departments of Natural Resources (Michigan, Wisconsin, Minnesota), National Park Service, U.S. Fish and Wildlife Service, USDA Wildlife Services, USGS NWHC, the WILD-One rehabilitation patient monitoring system (used across the US, Canada, and Australia), and the Canadian Wildlife Health Cooperative–Ontario. These partners began sharing wildlife health data—including highly pathogenic avian influenza (HPAI) surveillance data—for ingestion into the NWDD platform, creating practical on-ramps for nationwide and cross-border participation.

Additional strategic partnerships formed at the conference proved catalytic. The CEO of the Canadian Wildlife Health Cooperative attended, building relationships of trust and collaboration that enabled wildlife health data sharing across the US–Canada border. The Director of Veterinary Services from the Wildlife Health Center of Virginia attended, initiating the relationship that enabled speedy data sharing from the WILD-One patient management system used internationally by veterinary clinics and rehabilitation centers—a critical longitudinal clinical dataset previously unavailable for surveillance. The associate director of the Wildlife Futures Program at the University of Pennsylvania and lead of their Shared Wildlife Health Information System (SWHIS) tool attended, resulting in a formal partnership between SWHIS and NWDD whereby the teams are working together to onboard state wildlife departments, providing them with local data management capability (SWHIS) while achieving effective nationwide data sharing and early warning of potential health threats (NWDD).

Year 1 also generated immediate adoption interest in the Department of Homeland Security-funded One Health TREADS (OH-TREADS) platform, designed to integrate wildlife, human, domestic animal, agricultural, and environmental data into a single early warning system. Washington State Department of Fish and Wildlife, present at the meeting, became the first data sharer for Washington State and encouraged collaboration with the Washington State Departments of Health and Agriculture, forming the first operational use case for OH-TREADS centered on HPAI and informed by public and non-public data streams from federal, state, and local jurisdictions. The Wildlife Futures Program co-director followed up after the conference indicating that Pennsylvania is very interested in joining the OH-TREADS pilot case study, demonstrating growing momentum toward cross-sector One Health integration and automated early warning systems for rapid outbreak detection and response.

The conference also positioned PNNL strategically within emerging global efforts. The Wildlife Conservation Society (WCS), which has global outreach programs in 60 countries, recently launched the Wildlife Health Intelligence Network (WHIN)—a community of practice linking wildlife expertise to create a comprehensive, sustainable, and globally accepted wildlife health data management system. WCS formally invited Dr. Charles to serve on their Data Task Force to help design and implement a global data collection tool founded on a standardized data model called HAWK. Critically, PNNL has already adapted relevant parts of the standardized data model for use in the TREADS framework, which will enable simple integration of the WHIN collection tool into the NWDD platform and support global interoperability.

Year 2 (2025): Expanding Reach and Advancing Standardization

Building on North American momentum, Year 2 expanded the coalition to Europe with 40 international experts from 16 countries, testing the emerging standards and governance principles against European realities while preventing a predictable next risk: proliferation of incompatible databases and bespoke schemas that would lock the community into long-term fragmentation. The conference deepened shared problem definition—mapping what data exist where, identifying legal and technical hurdles that prevent exchange, and clarifying incentives that enable sustained participation—and translated this understanding into actionable alignment on governance principles, interoperability requirements, and practical next steps.

Participants converged on a formal set of core values necessary for a trusted global system: data integrity, honesty, and transparency; protection of privacy and respect for national laws and data sovereignty; equitable access to intelligence regardless of economic standing; ethical use of data, especially regarding vulnerable species and appropriate credit/inclusion for all data providers (including smaller organizations, rehabilitation centers, rangers, and Indigenous communities); and trustworthiness backed by scientific rigor and robust governance. These principles directly address barriers that have historically prevented data sharing, such as concerns about misuse, attribution, geopolitical manipulation, and neo-colonial research frameworks.

Year 2 advanced the technical "how" of interoperability through continued progress on standardized terminology and a shared data model/taxonomy developed over 18 months with input from multiple international organizations including Smithsonian Global, FAO, UC Davis, Wildlife Health Australia, and engagement from NWHC, SWHIS, CWHC, FAO, and WOA. The model structures wildlife surveillance data around key components: project

information (timeframes, funders, responsible parties), surveillance activities and methodologies, and standardized data collection formats. Critically, the model is designed to enable federated, cross-talking systems rather than forcing all countries and organizations onto a single platform—respecting sovereignty and existing investments while still producing actionable trend intelligence. To reduce the operational burden of standardization, the PNNL development team is creating automated helpers using large language model (LLM) technologies to tag various data types (lab reports, agency spreadsheets, news reports) and plans to open-source these components as Python libraries, making them freely available for partners to extract structured information from unstructured text data.

The conference also reinforced the urgency of coordinating standardization before organizations develop incompatible systems, drawing lessons from biodiversity monitoring where lack of early standardization created persistent compatibility issues. A survey conducted by the World Organisation for Animal Health (WOAH) with wildlife focal points revealed strong global demand for national centralized databases for wildlife disease data, online repositories for national data management, and guidance for developing national information systems—underscoring the timeliness of the GWDS effort.

Year 2 also expanded PNNL's operational partnerships into Europe and internationally. In the short few months since the conference, Serbia and the Baltic region expressed interest in OH-TREADS; ENETWILD (funded by the European Food Safety Authority to support harmonized wildlife data collection and analysis for One Health risk assessment) invited PNNL to join as a consortium member in their next proposal round (FY27) to help develop a TREADS platform for their needs and enable global data sharing; the Canadian Animal Health Surveillance System (CAHSS), in collaboration with CWHC and Environment and Climate Change Canada, invited PNNL to present the NWDD to stakeholders establishing a new wildlife surveillance network; and ENETWILD invited expert participation in foresight workshops on long-term wildlife health preparedness. These invitations position PNNL as a trusted, neutral technical partner capable of connecting jurisdictions and disciplines that historically have not coordinated.

Direct, Measurable Impacts

The two PAX-supported conferences produced concrete deliverables that demonstrate value:

1. *National-Scale Platform Build*: USGS partnered with PNNL to develop the congressionally mandated National Wildlife Disease Database (NWDD) with NWHC,

operationalizing wildlife disease data sharing at national scale and modernizing/replacing the legacy WHISPer system. The platform includes governance structures such as a steering committee and working groups to ensure sustained stakeholder engagement.

2. *Expanded Data Mobilization*: Multiple US agencies programs (6) and states (8) began sharing wildlife health data, including HPAI surveillance data, with concrete data-sharing relationships established with CWHC (Canada), WILD-One (global wildlife rehabilitators), state DNRs (Honolulu, Michigan, Minnesota, Nebraska, Tennessee, Washington DC, Washington State, Wisconsin), National Park Service, USFWS, USDA Wildlife Services, USGS NWHC, and DHS NBIC. These partnerships mobilize previously siloed datasets—including rehabilitation center clinical data and cross-border Canadian data—into a common analytic environment.

3. *One Health Pilot Implementation*: Washington State launched the first OH-TREADS use case with multi-agency data (wildlife, human health, agriculture) centered on HPAI, demonstrating that cross-sector integration can move from concept to execution. Pennsylvania expressed strong interest in joining the pilot, indicating growing state-level demand for integrated One Health early warning capabilities.

4. *Interoperability Package*: Advanced standardized terminology and a shared data model/One Health taxonomy (aligned with global efforts such as WHIN/HAWK constructs) developed through multi-organizational collaboration (NWHC, SWHIS, CWHC, FAO, WOAHA). Automated validation and normalization tools using LLM technology are being developed and will be open-sourced to reduce manual burden and enable broader participation.

5. *Data Sharing Agreements and Governance Frameworks*: Initiated memorandums of understanding among participants, established core values and principles (integrity, privacy protection, sovereignty respect, equitable access, ethical use), and created templates for secure, tiered data sharing that protect ownership while enabling actionable intelligence.

6. *International Network Formation*: Established durable relationships across 16+ countries with growing partnerships in Europe (ENETWILD, ESFA, Serbia, Baltics, UK/CEFAS), Canada (CWHC, CAHSS), and globally (FAO, WOAHA, WCS/WHIN), positioning PNNL as a trusted connector and creating momentum toward sustainable, multilateral governance structures. This growth in international partnerships has influenced a more global construct for the TREADS framework, which will lead to enhanced situational awareness across the countries to date involved in the GWDSC events.

7. Tool Creation and Technology Transfer: Development and planned open-sourcing of Python libraries for automated data tagging and standardization; integration of advanced analytics (AI/ML, NLP, predictive algorithms) into wildlife workflows; and creation of user-friendly onboarding capabilities that accept novel data formats (LIMS, Excel spreadsheets, images) and transform them into standardized structures.

Conclusion

The PAX-supported GWDS effort demonstrates measurable return on investment: operational platforms (NWDD, OH-TREADS) with active data flows; practical standards and automation tools that prevent fragmentation; and a growing international coalition aligned around shared values and interoperability. By building trust-based relationships before crises occur, establishing governance frameworks that respect sovereignty while enabling collaboration, and providing technical solutions that reduce burden rather than increase it, the conferences created pathways for wildlife health data to function as a global public good—enabling smarter surveillance for healthier people, wildlife, and planet, and positioning the international community to detect and respond to emerging threats with pandemic potential before local outbreaks become global catastrophes.

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