

WildHealthDat

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Preface

Welcome to the WildHealthDat database documentation. Here, you will find comprehensive information about the database's data structure and its data dictionary. This documentation aims to provide a clear understanding of the database's organization and the meaning of its data.

Data Structure: The following sections provide a detailed explanation of the data structure used in the WildHealthDat database. By understanding the structure, users can efficiently enter, navigate and manipulate the data stored within.

Data Dictionary: The last section of this documentation contains a comprehensive data dictionary. The data dictionary serves as a valuable resource for users, as it provides a complete list and description of all the data elements present in the database. Each data element is defined, including its name, type, and any applicable constraints.

We hope this documentation proves to be a valuable resource, enabling you to effectively utilize the WildHealthDat database. Should you have any further questions or require additional assistance, please don't hesitate to reach out the support team.

Introduction

WildlifeHealthDat is a versatile database designed to manage wildlife health data collected from various surveillance efforts. These efforts encompass a wide range of activities, including citizen observations of dead, injured, or sick animals, specific research studies, national or local wildlife health surveillance initiatives, outbreak investigations, and global wildlife health surveillance projects involving multiple countries, hazards, and host species

The database draws upon the extensive experience of the Wildlife Conservation Society - Health Program, which spans several decades. This experience includes wildlife health surveillance activities conducted in numerous countries with several public and private partners; both cross-sectional and longitudinal studies; the establishment of wildlife health surveillance networks; investigation of diverse biological, chemical, and physical hazards; research on dangerous zoonotic pathogens like Ebola virus disease and SARS-CoV-2; first detection of emerging vector-borne pathogens such as West Nile virus; engagement of rangers in protected areas and nearby communities as key contributors to health surveillance; logistical challenges related to proper management, storage, and tracking of field-collected specimens; expertise in wildlife pathology; the use and development of various types of diagnostic tests, and prior experience in managing wildlife health data using different information management systems.

The wildlife health information is organized within the database using a structured hierarchy of components, starting from the highest level of “Projects” down to “Surveillance Objectives,” “Field Activities,” “Locations,” “Incidents,” “Sources,” “Records,” “Specimens,” and “Diagnostics.” While there are four types of sources in the database, it is modular in nature, allowing for customization and selection of specific components based on the requirements of each surveillance initiative. Detailed explanations of each component are provided in the following sections.

Project

A Project is a surveillance initiative supported by specific entities. For example, the PREDICT Project funded by USAID, an isolated cross-sectional study with a single field visit to a single location (sample collection in a market), or a national or local wildlife health surveillance network led by a government agency. Projects are the highest hierarchical unit in the database and they contain at least one Surveillance Objective.

Surveillance Objective

A Surveillance Objective refers to a set of activities established to collect data with the aim of detecting, quantifying, or assessing trends related to specific health hazards within specific populations, using a standardized methodology. Each Surveillance Objective should specify the target populations, hazard, Source and Specimen collection methods, and Diagnostics. For example, a capture-mark-recapture study targeting lead accumulation in a specific vulture population involving the collection of blood samples and conducting tests using the same Diagnostic for every capture.

Surveillance Objectives include targeted surveillance and scanning surveillance initiatives and they are the most complex component of the database, so it is essential to read this section carefully.

Surveillance Objectives include detailed metadata that describe their objectives and methods. This metadata includes information on the targeted species, populations, and hazards, as well as the types of Sources and Specimens included, collection methods, and case definitions for specific Diagnostics, Specimens, and Sources. Some metadata elements are provided for each Source type, such as Observation, Animal Source, Environmental Source, and Invertebrate Source (see next sections).

Typically, Field Activities, Locations, Incidents, Sources, Records, and Diagnostics belong to a single Surveillance Objective. This Surveillance Objective is the one that initially requested Field Activities at different Locations to record Incidents, collect Sources and Specimens, and perform Diagnostics for a specific hazard. In such cases, the Surveillance Objective is automatically assigned to each corresponding component.

However, there are exceptions to this rule, except for Diagnostics, which have different justifications for each component. Field Activities, Locations, Incidents, Source Records, and Specimens can be originally requested by different Surveillance Objectives planning the same activities and methods but targeting different hazards. For example, rodents trapped in the same Incidents may be sampled using the same methodology and tested for both coronaviruses and *Rickettsia* sp (two Surveillance Objectives). In this scenario, only one of the Surveillance Objectives will be automatically assigned. It is the user's responsibility to add the second Surveillance Objective to the corresponding Field Activities, Locations, Incidents, Source Records, and Specimens.

Another exception occurs when Source Records and Specimens collected during past surveillance efforts are included in future surveillance initiatives. For instance, using pangolin Speci-

mens collected by rangers patrolling a protected area in 2017 as part of a scanning surveillance strategy, which are then tested in 2023 for SARS-CoV-2 as part of a targeted surveillance initiative. In this case, the latter Surveillance Objective does not generate new Field Activities, Locations, or Incidents, but the Specimens tested for SARS-CoV-2 and their Sources will have multiple Surveillance Objectives. One corresponds to the original Surveillance Objective that mandated the Field Activity for collecting the Source Records and Specimens, and the other is the new Surveillance Objective targeting SARS-CoV-2.

Moreover, new Necropsies might be conducted during the Surveillance Objective targeting SARS-CoV-2, new Specimens could be created (from larger stored Specimens, such as a carcass or an organ), or new Pooled Specimens could be produced. All these components receive the Surveillance Objective targeting SARS-CoV-2 only. Again, it is the user's responsibility to add the second Surveillance Objective to the new Source Records and Specimens.

Each diagnostic remains linked to a single Surveillance Objective (new Diagnostics targeting SARS-CoV-2 will be associated with the SARS-CoV-2-related Surveillance Objective exclusively). Surveillance Objectives added to a Diagnostic will be automatically assigned to the corresponding Specimen, Source Record, and Source.

Therefore, Surveillance Objectives can be interconnected for various reasons, such as belonging to the same Project, sharing common Field Activities, Locations, and Incidents, or having common Sources and Specimens. If Surveillance Objectives are connected for the latter two reasons, then these connections must be specified in the metadata of the corresponding Surveillance Objectives. These connections will also be evident in the exported data, where each component with multiple Surveillance Objectives (e.g., Field Activity, Specimen) will be represented by one row per Surveillance Objective.

Outbreak Investigation

All outbreak investigations are considered Surveillance Objectives, although the information regarding the outbreak (name and diagnosis) can be provided after the creation of the Surveillance Objective in the database.

Field Activity

A Field Activity represents a visit to the field conducted within a specific timeframe, including a start and end date. Each Field Activity can encompass multiple Surveillance Objectives (as described above) and involve visits to various types of Locations, such as markets, natural areas, rehabilitation centers, caves, and more.

Location

A Location refers to a general place where Incidents, Source Records, and Specimens are collected. It represents an area where data is gathered. For example, during a single Field Visit, data may be collected from various Locations, such as two rehabilitation centers, a cave within a protected area, and three different areas within another protected area. In this case, there would be a total of six Locations. A Location serves as a way to group data in a more generalized manner compared to the exact latitude and longitude coordinates of the data collection (which are captured within the Incident component), but it provides more specificity than the overall 'Field Activity'.

In the examples provided in the previous paragraph, a 'market' could be a 'Location' or an 'Incident' by itself depending on what the user considers the best choice for the corresponding Surveillance Objective. More detail about what an Incident represents is provided in the next section.

Incidents

An Incident refers to a distinct wildlife health event that occurs at a specific longitude and latitude on a particular date.

The definition of a wildlife health event, and thus the concept of an ‘Incident,’ varies depending on the Surveillance Objective methodology. In targeted surveillance efforts, an Incident may involve sampling healthy animals within a specific time and space to test them for a specific hazard. The inclusion of non-sampled individuals, as well as injured, sick, or dead animals, may or may not be considered part of the Incident.

If samples are collected from a river, the ‘Incident’ can be considered the location where the water is extracted. In the case of surveillance for vector-borne diseases, an Incident might represent a specific point in time and space where one or several traps for vectors have been placed. In scanning surveillance, an Incident could require the presence of at least one injured, sick, or dead animal, or a stranded individual. Additionally, healthy individuals found in the vicinity can also be included as part of the ‘Incident.’

In the case of beached fish, an Incident can represent each individual dead fish at one extreme, or the total count of dead fish across the beach as a single point in time and space at the other extreme. However, neither of these strategies is ideal. The former is not suitable for logistical purposes, while the latter results in the loss of valuable information regarding the distribution of dead fish across the beach. Therefore, an Incident should represent a unit between these two extremes.

Similarly, in the context of a wet market, the market can represent simultaneously an Incident and a Location. This Incident can gather data from multiple vendors, cages, and animals within the cages. On the other hand, a market could be considered a Location only, and each individual vendor within the market could be considered an Incident.

A structured study can have multiple levels of hierarchy (zone, grid, area, trap, etc.) and one level receives the temporal-spatial coordinates (Incident). Another similarly structured study may provide the spatial coordinate to a different unit (e.g., area in one case and trap in another case).

Consequently, an Incident can represent a wide range of units depending on the methodology used to record health data. Therefore, it is crucial to allow flexibility in what an Incident represents within a surveillance design and to explicitly declare its meaning as part of their data.

In the case of markets or structured studies, it may be desirable to group Incidents more specifically than simply under the general ‘Location’ category. For example, a market can be considered a ‘Location,’ and each cage could be treated as an ‘Incident.’ Users might want to further group cages by vendors and vendors by specific areas within the market. Similarly, in a structured study, the ‘Incident’ could represent a trap, and researchers may wish to group these Incidents based on areas, grid cells, zones, and seasons. Therefore, the database includes multiple ‘Incident’ tags to enable grouping on a finer scale than just the general ‘Location.’ Users can request specific tags as needed.

Incidents can lack of any Sources (see below) if nothing is captured or sampled, but they can also have multiple Source Records of any type, depending on the specific findings and the interests of the corresponding Surveillance Objective.

Sources and Source Records

Observation

An Observation corresponds to the observed-only animal(s) present at one Incident grouped by species. For example, a wildlife health event involving a single isolated injured animal. If this individual is observed only, then the Incident has a single Observation representing a single species. The animal count for that single species is one.

Another example: five animals are found in a wetland, two of them of species “A” and three of them of species “B”. One animal of species “A” is sick. If they are only observed and the Surveillance Objective is not interested in individual animal-level data, then this set of findings is a wildlife health ‘Incident’ with two ‘Observations’. One ‘Observation’ represents species “A” (one healthy individual and one sick animal), and another ‘Observation’ represents species “B” (three healthy individuals).

Incidents can include Observations (species) with healthy animals only, as long as they are part of a wildlife health event.

Each Observation generates one and only one Source Record with immutable data. In that unique Source Record animals are categorized by sex, age, and health status. The captivity categories of the corresponding animals; their anomalies; and potential causes of injury, disease, or dead can be provided.

If the same set of only-observed animals is believed to be found five days later, then a new Observation must be created because there is no certainty that they are the same individuals. If users want to track the animals longitudinally, they should be added singly to the database as ‘Animal Source’ (see below).

Animal Source

An Animal Source represents an individual animal. Animal Sources can be added because the Surveillance Objective aims to collect individual-level health information (e.g., individual findings in stranded pilot whales), because the Animal Sources provide Specimens to perform Diagnostics or to be stored (carcass, body parts, tissue, organs, samples, etc), or because a Diagnostic is conducted in individual animals that do not necessarily provide Specimens (e.g., evident hair loss in a free-ranging red fox).

Immutable data from Animal Sources are the sex, the species, and the date of death. Previous marking codes (if any have been used) are immutable; however, current marking codes are considered mutable and are provided in the corresponding Animal Source Record (see below).

Animal Source Record

Each Animal Source has at least one Source Record. This first Source Record corresponds to the unique record of an unidentified individual animal or to the first record of an individually identified animal. Individually identified animals can potentially be tracked over time and have as many Source Records as needed.

Mutable data of an Animal Source over time needs to be provided for each Source Record. Mutable data includes the captivity category, the health status, the age, and the marking code. These are one-option features per Animal Source Record. Other mutable data for Animal Sources that can have multiple values in each Animal Source record are the anomalies found and the potential causes of injury, disease, or death. Obviously, the time t when the Animal Source is recorded is also mutable.

The last Animal Source Record for an animal is not necessarily the last time t when it was found dead because it is possible to collect Specimens from the carcass (dead Animal Source) over a period of time while the carcass is rooting.

Necropsy

Necropsies are associated with the specific Animal Source Record when the carcass was collected. However, the Necropsy date can be any date since the corresponding Animal Source Record creation.

Necropsies can be primary or secondary. Primary necropsies usually start with an intact carcass (not previously used in a necropsy). Secondary necropsies are usually conducted by a veterinarian pathologist using pictures of the primary necropsy or using a carcass already necropsied.

New Specimens can be generated during a Necropsy (e.g., samples from organs). In this case, the date of Specimen collection is not the date of the Animal Source Record when the carcass was collected, but the date of the Necropsy (primary or secondary). It is possible to track if a Specimen was collected during the primary or secondary Necropsy based on the information collected in Specimens (see below).

Environmental Source

An Environmental Source represents an entity that provides Specimens that: i) are abiotic (e.g., a location of a frozen pond that is sampled for Avian influenza), or ii) are biotic but it is not possible to identify the corresponding Animal Source (e.g., feces found in the field). Environmental Sources do not have sex or date of death.

Immutable data for Environmental Sources are the species (in the case of biotic Environmental Sources) and the Environmental Source type. Setting the Environmental Source type determines the Specimen type provided for those Sources (see ‘Specimens’ below). For example, feces can only yield feces as Specimens, and water in a pond can only provide water.

Environmental Source Record

Each Environmental Source has at least one Source Record. This first Source Record corresponds to the unique collection from an unidentified Environmental Source (e.g., feces on the ground) or to the first record of an individually identified Environmental Source (e.g., water collected at a specific place in the pond). Individually Environmental Sources can potentially be tracked over time and have as many Source Records as needed.

Environmental Sources do not have mutable data except for the time t when they are sampled.

Invertebrate Source

An Invertebrate Source is an invertebrate trap (e.g., CO₂ traps, flag traps, etc.) placed in specific coordinates. Invertebrate Sources can be added because the Surveillance Objective aims to collect invertebrates and potentially test them for vector-borne diseases.

The only immutable data of Invertebrate Sources is the trap. If the same type of trap is placed in the same coordinates, then Invertebrate Sources can be tracked longitudinally; however, the invertebrate species collected each time the trap is set can be different. Invertebrate Sources do not have sex, age, captivity category, anomalies, health status, potential cause of death, etc.

An Invertebrate Source contains data from a collection of invertebrates. If the interest is at the individual level (e.g., bees with problems in their wings), then the user should add Animal Sources.

Invertebrate Source Record

Each Invertebrate Source has at least one Source Record. This first Source Record corresponds to setting the type of trap in specific coordinates. As mentioned in the previous section, if the same type of invertebrate trap is placed in the same coordinates, then Invertebrate Sources can be tracked over time and have as many Source Records as needed. If the type of trap changes, then it is a different Invertebrate Source.

Mutable data needs to be provided for each Invertebrate Source Record. The mutable data of Invertebrate Sources is the species captured (probably more than one). Obviously, the time t when the Invertebrate Source is recorded is also mutable.

Final Comment on Sources and Source Records

Users can group Source Records from different Sources beyond the Incident they belong to. For example, a Surveillance Objective involves sampling animals and cages in a market as part of targeted surveillance efforts. One of the potential options to structure these data is to set the market as the Location and set each vendor within the market as an ‘Incident’. Let’s pretend that in one of the Incidents (a vendor), a sample of feces is collected from the bottom of a cage, the cage has three animals of the same species, and only one of those animals is sampled (one oral swab sample).

Under this scenario, the cage is providing three Source Records. Firstly, an Environmental Source with a single Environmental Source Record containing the feces sampled from the bottom of the cage. Secondly, an Observation with the two animals in the cage that are only observed (Observations always have a single Record). And thirdly, an Animal Source with a single Animal Source Record containing the oral swab.

How to track that these Source Records belong to the same cage? The database provides tags per user request that allow to label Sources Records that belong to units lower than Incidents and keep them linked. In the example, the three Source Records can receive the same tag (“cage1”) in order to track that they have a more specific origin than Incident.

Specimens

Specimens refer to the materials collected from Source Records for the purpose of conducting Diagnostics to identify hazards (biological, chemical, physical) or physiological problems. Specimens can range from the entire body of a living animal for conducting an ultrasound on to a minimal amount of tissue to perform advanced assays.

Specimens are characterized by an identifier, the type of material (water, hair, kidney, animal), the original amount (e.g., ‘full animal’ or 0.35 mm), the solution used for preservation, and the storage type in the field and in the storage location. Additionally, the database tracks the storage location of the Specimens (building, laboratory name, refrigerator name, etc.), their availability, ownership, and current amount. It is important to note that the original amount and the current amount of a Specimen may differ if a portion of the original Specimen has already been used for Diagnostics.

For Animal Specimens that are equivalent to the Animal Source Record (both representing the ‘full animal’), information should be provided at both the Source Record and Specimen levels. The Source Record and Specimen can have the same identifier or different identifiers, and the amount of the Specimen in such cases should be indicated as ‘full animal’.

Invertebrate Source Records may include multiple species; however, it is expected that the Specimens associated with these Records only contain invertebrates of the same species.

Specimens with a current amount of zero should not be deleted from the database, and their last known storage location should be retained.

In situations where space or materials are limited, it is possible that multiple Specimens are stored in the same container. This approach is not ideal because it can lead to cross-contamination and make actual Specimen tracing more complex. To address the tracing of these Specimens, a unique container identifier, such as a jar identifier, can be added in the database. Specimens sharing the same container will have the same container identifier. Although individual Specimens within the same container may not be labeled individually, each Specimen should be given a unique Specimen Code in the database. This Code can be the same as the container identifier, followed by the “organ name” or a numeric string (e.g., “1”, “2”, etc.). Specific details for each individual Specimen within the container, such as type, quantity, etc, should allow their visual identification within the container.

Diagnostics

Diagnostics encompass various techniques used to identify hazards (biological, chemical, physical) or physiological problems in Specimens obtained from Source Records. Each Diagnostic is designed for a specific targeted hazard, such as a viral family or a particular virus species. Diagnostics include three main components: type, method, and result.

The type of Diagnostic refers to a general category of diagnostic techniques, such as histopathology, serology, or imaging. Within each type, there are specific methods available, such as biopsy, ELISA assays, or X-rays. These methods can be applied at different levels, such as organs, serum, or specific body areas, respectively. This variability causes Specimens to range from full animals to a small sample.

Each diagnostic method should provide a single result. However, it is possible to modify a diagnostic result in the database and provide a reason for the change.

The result of a Diagnostic should adhere to the case definition criteria established in the corresponding Surveillance Objective metadata for each declared method. Whenever possible, it is ideal to include supporting information such as digital images or files to corroborate the entered result in the database. If Diagnostics are performed under a new Surveillance Objective, such as testing a Specimen collected 50 years ago, this information must be provided in the Diagnostic data. As mentioned in the Surveillance Objective section, when a new Diagnostic is added, the corresponding Specimen, Source Record, and Source will be automatically assigned the new Surveillance Objective.

Data Dictionary

Component	Variable
Project_Table	WildlifeHealth_ProjectID
Project_Table	ProjectName
Project_Table	ProjectCrossID
Project_Table	WildlifeHealth_ProjectFunder
Project_Table	WildlifeHealth_ProjectCountry
Project_Table	WildlifeHealth_ProjectLeadingOrganization
Project_Table	WildlifeHealth_ProjectOtherOrganization
Project_Table	WildlifeHealth_ProjectLeader
Project_Table	ProjectPurpose
Project_Table	ProjectNewFieldActivities
Project_Table	WildlifeHealth_ProjectAnimalTaxa
Project_Table	WildlifeHealth_ProjectEnvironmentalSource
Project_Table	WildlifeHealth_ProjectInvertebrateSource
Project_Table	WildlifeHealth_ProjectHazardType
Project_Table	WildlifeHealth_ProjectHazardName
Project_Table	ProjectStartDate
Project_Table	ProjectEndDate
Project_Table	WildlifeHealth_ProjectUrl
Surveillance_Objective	WildlifeHealth_SurveillanceObjectiveID
Surveillance_Objective	SurveillanceObjectiveName
Surveillance_Objective	SurveillanceObjectiveCrossID
Surveillance_Objective	WildlifeHealth_SurveillanceObjectiveType
Surveillance_Objective	WildlifeHealth_SurveillanceObjectiveOrganizationInvolved
Surveillance_Objective	WildlifeHealth_SurveillanceObjectiveCountry
Surveillance_Objective	SurveillanceObjectivePurpose
Surveillance_Objective	WildlifeHealth_SurveillanceObjectiveHazardType
Surveillance_Objective	WildlifeHealth_SurveillanceObjectiveHazardName
Surveillance_Objective	SurveillanceObjectiveStartDate
Surveillance_Objective	SurveillanceObjectiveEndDate
Surveillance_Objective	SurveillanceObjectiveOrganizationAICUC
Surveillance_Objective	SurveillanceObjectiveAICUCCode
Surveillance_Objective	SurveillanceObjectiveNewFieldActivityAdded
Surveillance_Objective	SurveillanceObjectiveObservationsIncluded

Surveillance_Objective	SurveillanceObjectiveAnimalSourcesIncluded
Surveillance_Objective	SurveillanceObjectiveEnvironmentalSourcesIncluded
Surveillance_Objective	SurveillanceObjectiveInvertebrateSourcesIncluded
Surveillance_Objective	SurveillanceObjectiveNewObservationsAdded
Surveillance_Objective	SurveillanceObjectiveNewAnimalSourceRecordsAdded
Surveillance_Objective	SurveillanceObjectiveNewEnvironmentalSourceRecordsAdded
Surveillance_Objective	SurveillanceObjectiveNewInvertebrateSourceRecordsAdded
Surveillance_Objective	SurveillanceObjectiveNewPooledSpecimensAdded
Surveillance_Objective	WildlifeHealth_SurveillanceObjectiveLab
Surveillance_Objective	SurveillanceObjectiveOtherSurveillanceObjectiveAssociated
Surveillance_Objective	SurveillanceObjectiveReasonOtherSurveillanceObjectiveAssociated
Surveillance_Objective	SurveillanceObjectiveMetadataRelevantUrl
Surveillance_Objective	SurveillanceObjectiveMetadataPublication
Surveillance_Objective	SurveillanceObjectiveMetadataIncidentGrouping
Surveillance_Objective	SurveillanceObjectiveMetadataIncidentGroupingStructure
Outbreak	OutbreakName
Outbreak	OutbreakDiagnosis
Field_Activity	WildlifeHealth_FieldActivityID
Field_Activity	FieldActivityCode
Field_Activity	FieldActivityCrossID
Field_Activity	WildlifeHealth_FieldActivityLeaderName
Field_Activity	WildlifeHealth_FieldActivityType
Field_Activity	FieldActivityHistory
Field_Activity	FieldActivityStartDate
Field_Activity	FieldActivityEndDate
Field_Activity_Location	WildlifeHealth_FieldActivityLocationID
Field_Activity_Location	FieldActivityLocation
WildlifeHealth_Incident	WildlifeHealth_IncidentID
WildlifeHealth_Incident	IncidentCrossID
WildlifeHealth_Incident	IncidentDate
WildlifeHealth_Incident	WildlifeHealth_IncidentType
WildlifeHealth_Incident	IncidentUnit
WildlifeHealth_Incident	WildlifeHealth_IncidentFinding
WildlifeHealth_Incident	WildlifeHealth_IncidentLandscapeType
WildlifeHealth_Incident	WildlifeHealth_IncidentBy
WildlifeHealth_Incident	WildlifeHealth_IncidentBySector
WildlifeHealth_Incident	IncidentSmartSource
WildlifeHealth_Incident	IncidentLongitude
WildlifeHealth_Incident	IncidentLatitude
WildlifeHealth_Incident	IncidentUTMZone
WildlifeHealth_Incident	WildlifeHealth_IncidentCountry
WildlifeHealth_Incident	WildliHealth_IncidentState
WildlifeHealth_Incident	WildlifeHealth_IncidentProvince

WildlifeHealth_Incident	WildlifeHealth_IncidentSiteCode
WildlifeHealth_Incident	WildlifeHealth_IncidentZoneCode
WildlifeHealth_Incident	WildlifeHealth_IncidentMarketCode
WildlifeHealth_Incident	WildlifeHealth_IncidentGridCode
WildlifeHealth_Incident	WildlifeHealth_IncidentGridCellCode
WildlifeHealth_Incident	WildlifeHealth_IncidentStationCode
WildlifeHealth_Incident	WildlifeHealth_IncidentTransectCode
WildlifeHealth_Incident	WildlifeHealth_IncidentVendorCode
WildlifeHealth_Incident	WildlifeHealth_IncidentTrapCode
WildlifeHealth_Incident	WildlifeHealth_IncidentMistNetCode
WildlifeHealth_Incident	IncidentOtherSpatialUnitCode
WildlifeHealth_Incident	WildlifeHealth_IncidentStudyYear
WildlifeHealth_Incident	WildlifeHealth_IncidentStudySeason
WildlifeHealth_Incident	WildlifeHealth_IncidentStudyMonth
WildlifeHealth_Incident	WildlifeHealth_IncidentStudyWeek
WildlifeHealth_Incident	WildlifeHealth_IncidentStudyDayPeriod
WildlifeHealth_Incident	WildlifeHealth_IncidentStudyHour
WildlifeHealth_Incident	IncidentOtherTemporalUnit
WildlifeHealth_Incident	IncidentTimeAssembled
WildlifeHealth_Incident	IncidentTimeDisassembled
WildlifeHealth_Source	SourceID
WildlifeHealth_Source	SourceCode
WildlifeHealth_Source	SourceCrossID
WildlifeHealth_Source	SourceType
WildlifeHealth_Source	SourceSpecies
WildlifeHealth_Source	SourceComments
WildlifeHealth_Source	WildlifeHealth_SurveillanceObjective
WildlifeHealth_ObservationSource	WildlifeHealth_ObservationSourceID
WildlifeHealth_ObservationSource	ObservationNumberAdultMaleHealthy
WildlifeHealth_ObservationSource	ObservationNumberAdultFemaleHealthy
WildlifeHealth_ObservationSource	ObservationNumberAdultUnknownSexHealthy
WildlifeHealth_ObservationSource	ObservationNumberAdultMaleSickOrInjured
WildlifeHealth_ObservationSource	ObservationNumberAdultFemaleSickOrInjured
WildlifeHealth_ObservationSource	ObservationNumberAdultUnknownSexSickOrInjured
WildlifeHealth_ObservationSource	ObservationNumberAdultMaleDead
WildlifeHealth_ObservationSource	ObservationNumberAdultFemaleDead
WildlifeHealth_ObservationSource	ObservationNumberAdultUnknownSexDead
WildlifeHealth_ObservationSource	ObservationNumberJuvenileHealthy
WildlifeHealth_ObservationSource	ObservationNumberJuvenileSickInjured
WildlifeHealth_ObservationSource	ObservationNumberJuvenileDead
WildlifeHealth_ObservationSource	ObservationNumberFetusHealthy
WildlifeHealth_ObservationSource	ObservationNumberFetusSickInjured
WildlifeHealth_ObservationSource	ObservationNumberFetusDead

WildlifeHealth_ObservationSource	ObservationNumberUnknownAgeSexHealthy
WildlifeHealth_ObservationSource	ObservationNumberUnknownAgeSexSickInjured
WildlifeHealth_ObservationSource	ObservationNumberUnknownAgeSexDead
Animal_Source	WildlifeHealth_AnimalSourceID
Animal_Source	WildlifeHealth_AnimalSourceSex
Animal_Source	AnimalSourceDateOfDeath
Animal_Source	AnimalSourceAnyPreviousMarkingCode
Animal_Source	AnimalSourcePreviousMarkingCode
Environmental_Source	WildlifeHealth_EnvironmentalSourceID
Environmental_Source	WildlifeHealth_EnvironmentalSourceType
Invertebrate_Source	WildlifeHealth_InvertebrateSourceID
Invertebrate_Source	WildlifeHealth_InvertebrateSourceTrapType
Source_Record	WildlifeHealth_SourceRecordID
Source_Record	SourceRecordNumber
Source_Record	SourceRecordSpecimensCollected
Source_Record	WildlifeHealth_SourceRecordInvertebrateSpecies
Source_Record	SourceRecordInvertebrateNumberOfIndividuals
Source_Record	WildlifeHealth_SourceRecordCaptivityCategoryID
Source_Record	WildlifeHealth_SourceRecordAnomaly
Source_Record	OtherAnomalies
Source_Record	WildlifeHealth_SourceRecordPotentialCauseInjuryDisease
Source_Record	WildlifeHealth_SourceRecordPotentialCauseDeath
Source_Record	Grouping1
Source_Record	Grouping2
Source_Record	Grouping3
Source_Record	Grouping4
Source_Record	Grouping5
Source_Record	SourceRecordComments
Source_Record	WildlifeHealth_SurveillanceObjective
Animal_Source_Record	WildlifeHealth_AnimalSourceRecordID
Animal_Source_Record	WildlifeHealth_AnimalSourceRecordAgeCategory
Animal_Source_Record	WildlifeHealth_AnimalSourceRecordInitialHealthStatus
Animal_Source_Record	WildlifeHealth_AnimalSourceRecordHealthConditionReleased
Animal_Source_Record	WildlifeHealth_AnimalSourceRecordEuthanasiaMethod
Animal_Source_Record	AnimalSourceRecordCarcassCollected
Animal_Source_Record	WildlifeHealth_AnimalSourceRecordFieldStorageCarcass
Animal_Source_Record	AnimalSourceRecordMarkingCode
Animal_Source_Record	AnimalSourceRecordMarkingCodeChange
Animal_Source_Record	AnimalSourceRecordMarkingCodeChangingReason
Animal_Necropsy	WildlifeHealth_NecropsyID
Animal_Necropsy	NecropsyCrossID
Animal_Necropsy	NecropsyDate
Animal_Necropsy	WildlifeHealth_PrimarySecondaryNecropsy

Source_Record_Specimen	SourceRecordSpecimenOriginalQuantityUnit
Source_Record_Specimen	SourceRecordSpecimenQuantityStored
Source_Record_Specimen	SourceRecordSpecimenReasonQuantityDifference
Source_Record_Specimen	WildlifeHealth_SourceRecordSpecimenFieldStorage
Source_Record_Specimen	WildlifeHealth_SourceRecordSpecimenLabStorage
Source_Record_Specimen	SourceRecordSpecimenInContainer
Source_Record_Specimen	SourceRecordSpecimenContainerCode
Source_Record_Specimen	WildlifeHealth_SourceRecordSpecimenLocation
Source_Record_Specimen	WildlifeHealth_SourceRecordSpecimenBuilding
Source_Record_Specimen	SourceRecordSpecimenRoom
Source_Record_Specimen	SourceRecordSpecimenStorage
Source_Record_Specimen	SourceRecordSpecimenShelf
Source_Record_Specimen	SourceRecordSpecimenRack
Source_Record_Specimen	SourceRecordSpecimenBox
Source_Record_Specimen	SourceRecordSpecimenRow
Source_Record_Specimen	SourceRecordSpecimenAvailable
Source_Record_Specimen	SourceRecordSpecimenOwner
Source_Record_Specimen	SourceRecordSpecimenComments
Source_Record_Specimen	WildlifeHealth_SurveillanceObjective
Source_Record_Specimen_Diagnostic	WildlifeHealth_SourceRecordSpecimenDiagnosticID
Source_Record_Specimen_Diagnostic	SourceRecordSpecimenDiagnosticWithinLabCode
Source_Record_Specimen_Diagnostic	WildlifeHealth_SourceSpecimenDiagnosticTargetedHazardType
Source_Record_Specimen_Diagnostic	WildlifeHealth_SourceSpecimenDiagnosticTargetedHazardName
Source_Record_Specimen_Diagnostic	WildlifeHealth_SourceSpecimenDiagnosticTargetedHazardName
Source_Record_Specimen_Diagnostic	WildlifeHealth_LaboratoryID
Source_Record_Specimen_Diagnostic	WildlifeHealth_DiagnosticMethod
Source_Record_Specimen_Diagnostic	WildlifeHealth_DiagnosticType
Source_Record_Specimen_Diagnostic	SourceRecordSpecimenDiagnosticDateSentForTesting
Source_Record_Specimen_Diagnostic	SourceRecordSpecimenDiagnosticResultsReceived
Source_Record_Specimen_Diagnostic	SourceRecordSpecimenDiagnosticDateResultsReceived
Source_Record_Specimen_Diagnostic	WildlifeHealth_SourceRecordSpecimenDiagnosticResult
Source_Record_Specimen_Diagnostic	SourceRecordSpecimenDiagnosticResultModified
Source_Record_Specimen_Diagnostic	SourceRecordSpecimenDiagnosticDateResultModified
Source_Record_Specimen_Diagnostic	SourceRecordSpecimenDiagnosticReasonResultModified
Source_Record_Specimen_Diagnostic	SourceRecordSpecimenDiagnosticComments
Source_Record_Specimen_Diagnostic	SourceRecordSpecimenDiagnosticSupportingInformation
Source_Record_Specimen_Diagnostic	WildlifeHealth_SurveillanceObjective
Laboratory	LabName
Laboratory	WildlifeHealth_LabCountryID
Laboratory	LabAddress
Laboratory	LabManager
Laboratory	LabManagerEmail
Laboratory	LabPointContactName

Laboratory	LabPointContactEmail
Laboratory	LabPointContactAffiliation
Laboratory	WildlifeHealth_LabDiagnosticMethodAvailable
Laboratory	WildlifeHealth_LabMaxBiosafetyLevel
Laboratory	WildlifeHealth_LabCertification
Laboratory	LabStorageCapacity
Laboratory	LabDataManagementSystem
