Overview of WYNDD's Central Information System

WYNDD 2017 Partners Meeting

The Old System

Biotics

- Species Observations/ Occurrences
- Taxonomy
- Rank/Status Information

Range Maps and Data

Distribution Models & Maps

Species Accounts

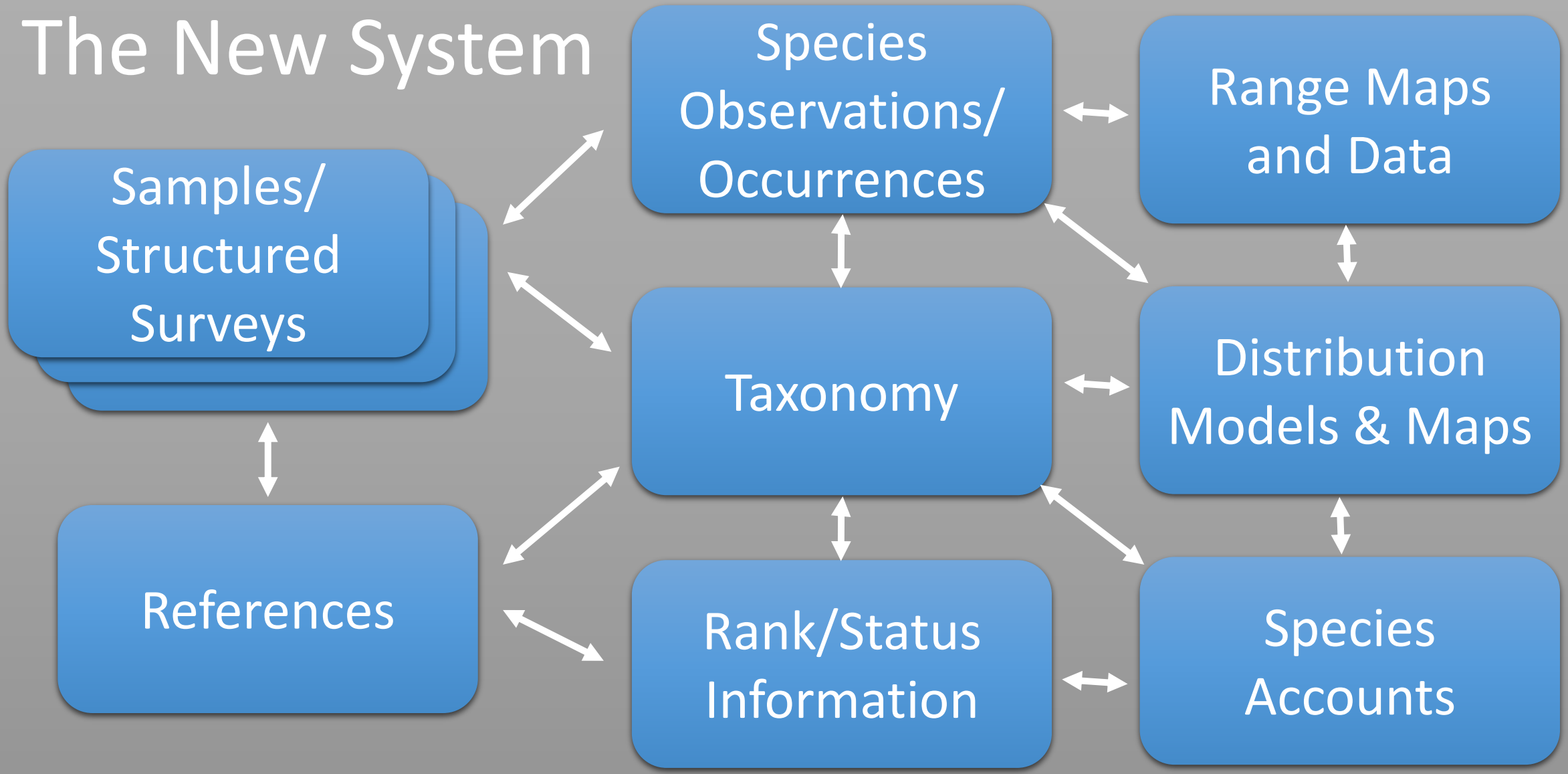
References

Samples/ Structured Surveys

Goals for New System:

- A single, centralized clearinghouse of information **specific to Wyoming** biodiversity… (e.g., integration w/ WGFD)
- Richer, more *expressive* datasets
- Continual, simplified maintenance and updating
- Better QA/QC for observation records and associated data
- Online applications for upload, query, and download
- Effective storage of negative (absence) data, vegetation plot data, and structured survey data

The New System

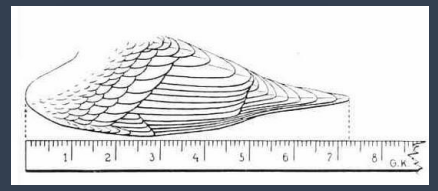


Observation Data

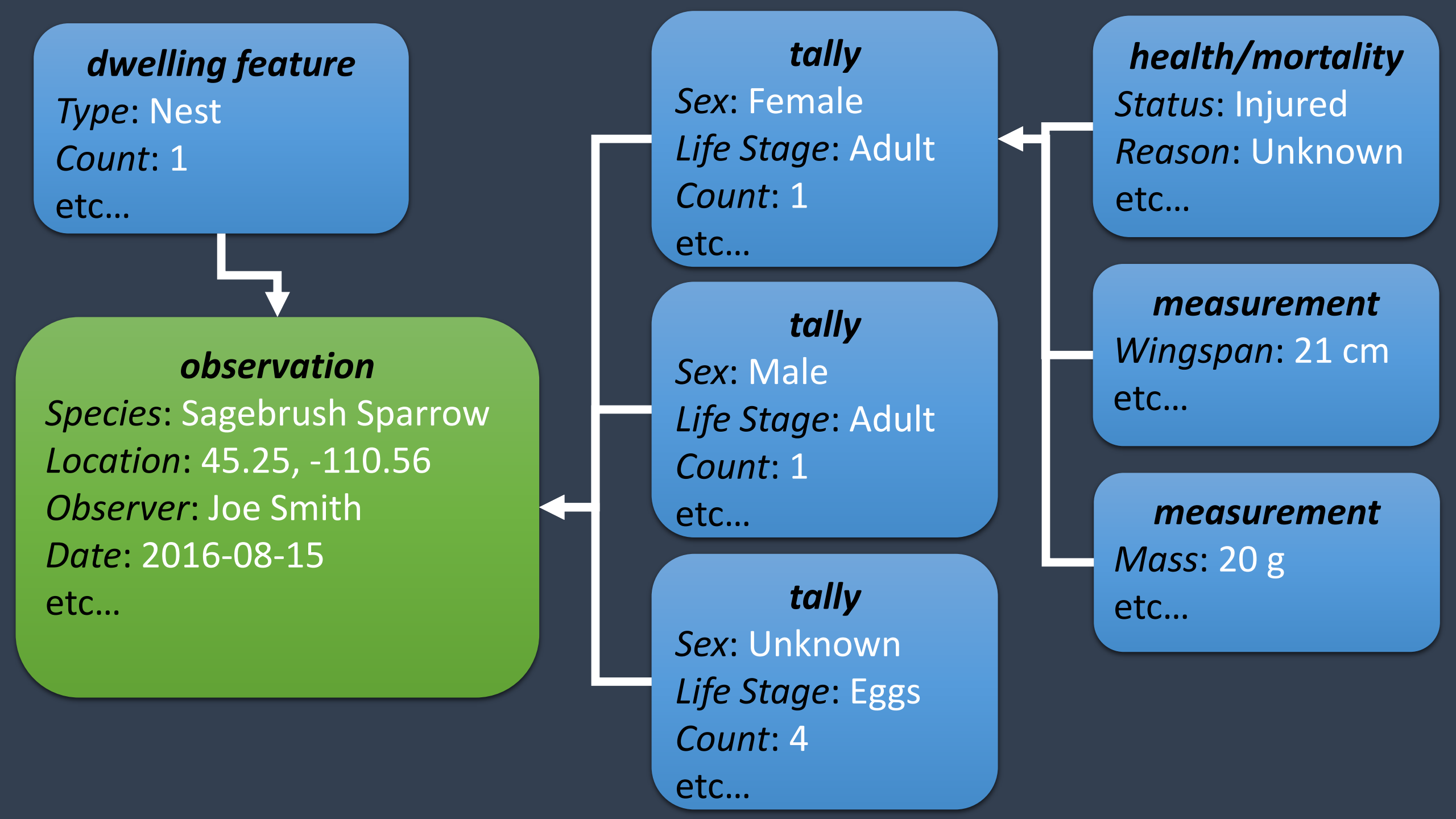
Record of one species, at one place, at one time…

…plus other useful attributes

- counts by sex, life stage
- activity
- health/mortality
- measurements
- dwelling features
- sampling info (effort, method)



- Over 110 (and counting) attributes available in new database
- Indexed to appropriate species, for quality assurance/control
- Searchable in a structured way


dwelling feature
Type: Nest
Count: 1
etc…
observation
Species: Sagebrush Sparrow
Location: 45.25, -110.56
Observer: Joe Smith
Date: 2016-08-15
etc…
tally
Sex: Female
Life Stage: Adult
Count: 1
etc…
tally
Sex: Male
Life Stage: Adult
Count: 1
etc…
tally
Sex: Unknown
Life Stage: Eggs
Count: 4
etc…
health/mortality
Status: Injured
Reason: Unknown
etc…
measurement
Wingspan: 21 cm
etc…
measurement
Mass: 20 g
etc…

Quality Assurance/Quality Control

- Records flagged for review when there is apparent issue with:
  - Location and Date
  - Activity or other attributes (Nesting, Flying, Pregnancy, etc.)
  - Count
- Checks are based on other datasets in the database:
  - Seasonal range maps and detectable date ranges
  - Allowable activities, by species, or group of species
  - Plausible ranges for counts
- Automated checks will trigger evaluation by biologist

Avg. ~24,000 new records/ year (plus big game)!

Just give me the points!!!

WYNDD distributes *ALL* observation records as polygons

- Many observations – especially older records – recorded as a polygon
  - Section, county, hunt area, etc.
- Some records *extremely* imprecise (“15 miles west of Casper”)
- Even when recorded via GPS, there is *some* uncertainty

An Example…

Point mapped via description:

“Green River Basin…About 12 miles Northwest of town of Green River”

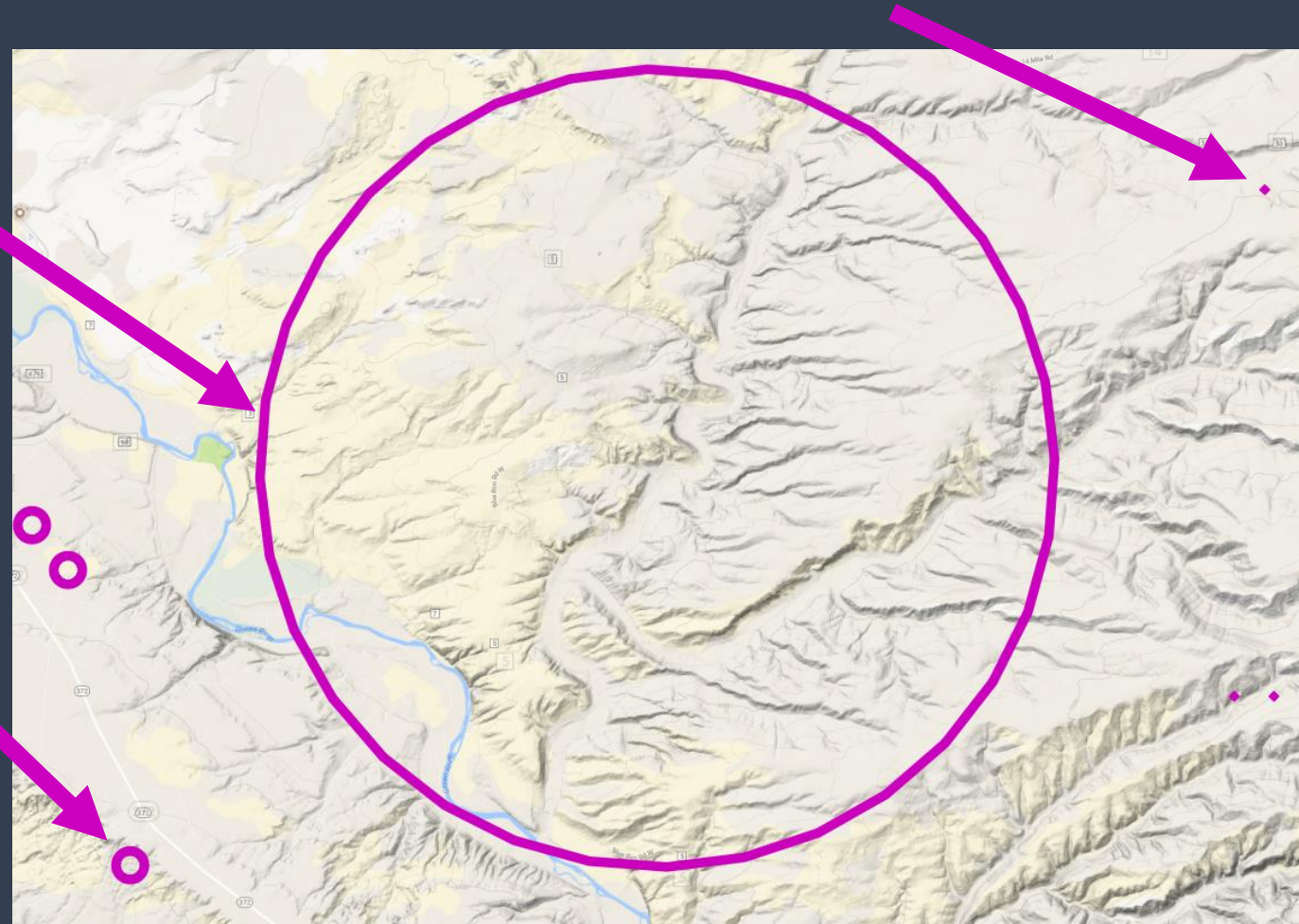
Potential Mapping Error: ~20 km

Point mapped onto paper topo map

Potential Mapping Error: ~100 m

Point mapped via GPS

Potential Mapping Error: ~10 m



Data Sensitivity

Observation records may be “sensitive” due to:

1. Request by data submitter (e.g., research data)
2. Land ownership (private land records)
3. Biological sensitivity/vulnerability (e.g., rattlesnake dens, raptor nests)

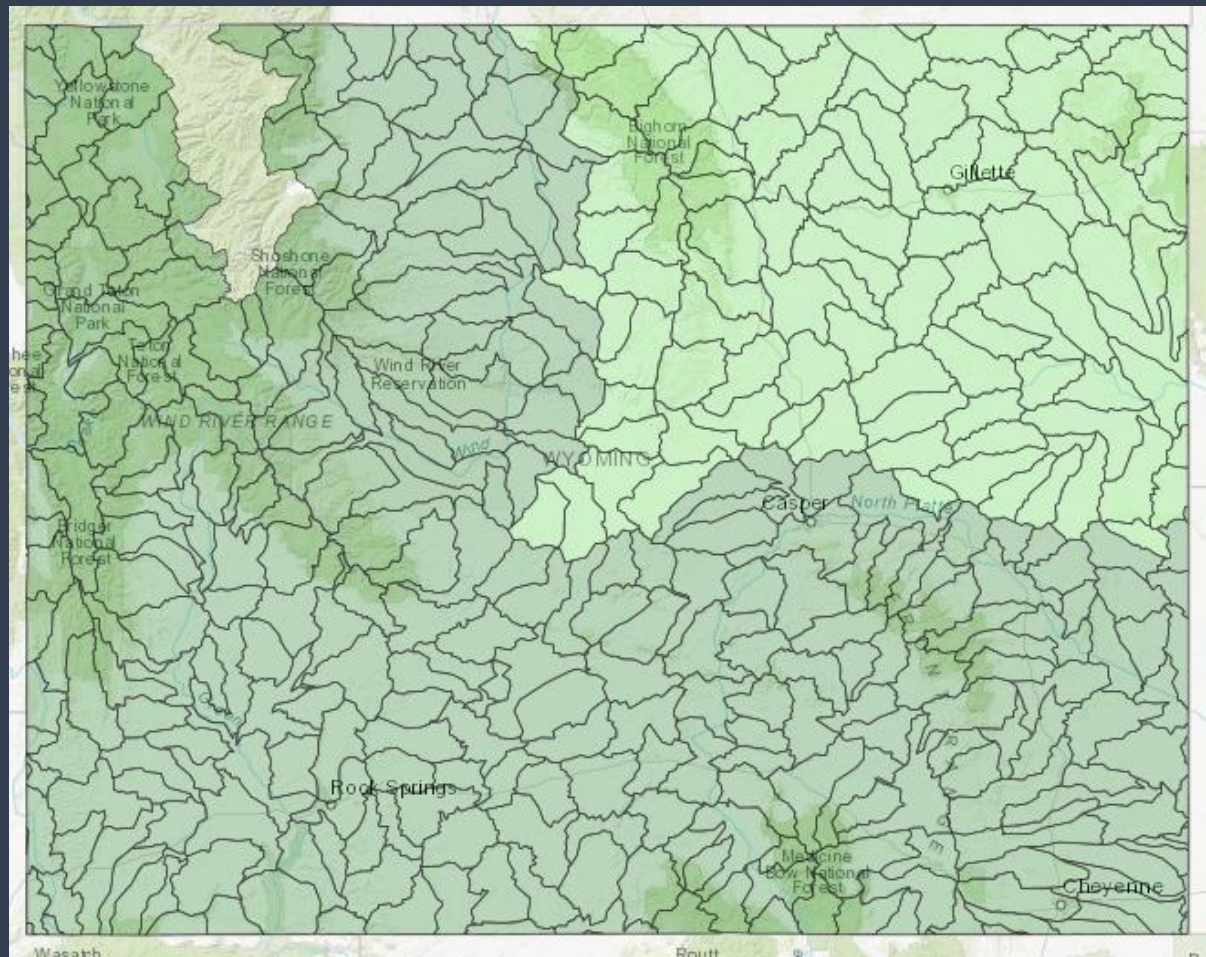
- Sensitive records generalized to township, with most attributes hidden

  Only the organization that contributed the record will see it at the precise scale, with all attributes

Questions…?

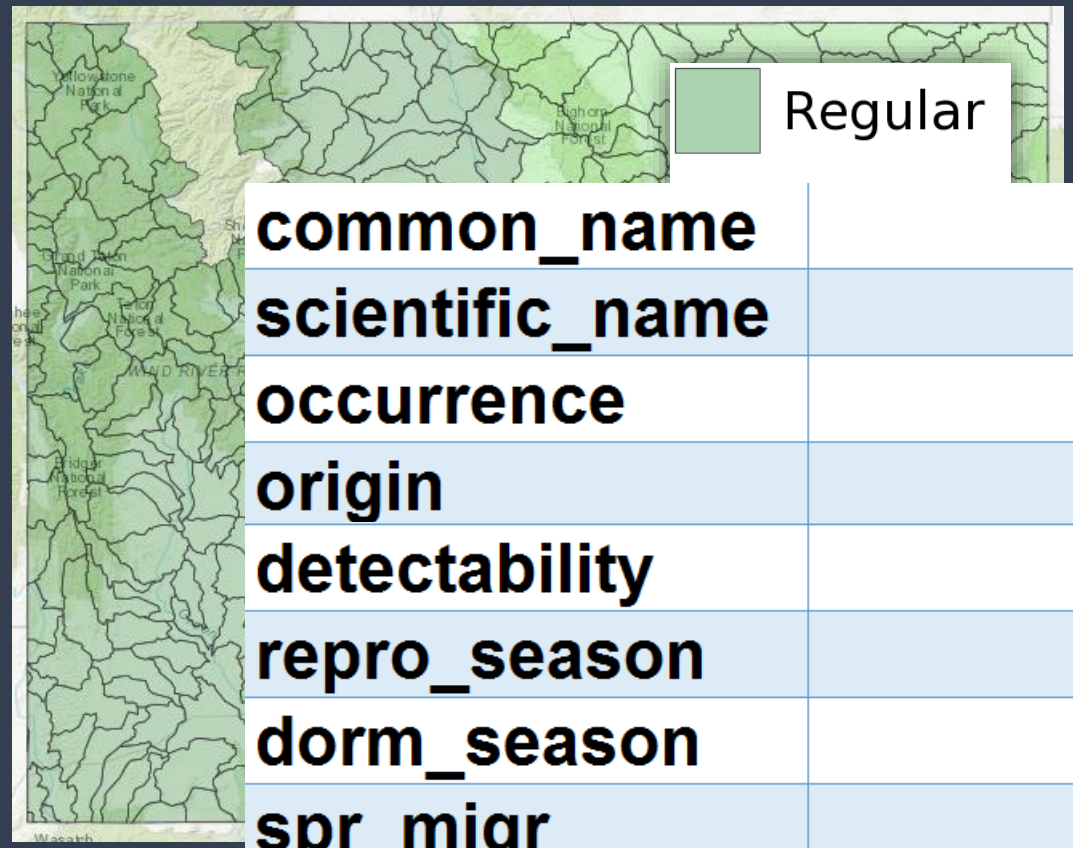
Range Maps & Data

- **Spatial and temporal occupancy patterns**
  - Where is the species?
  - During what periods?
  - Native? Introduced?
  - Reproduction? When?
  - Migration?
  - Dormancy?

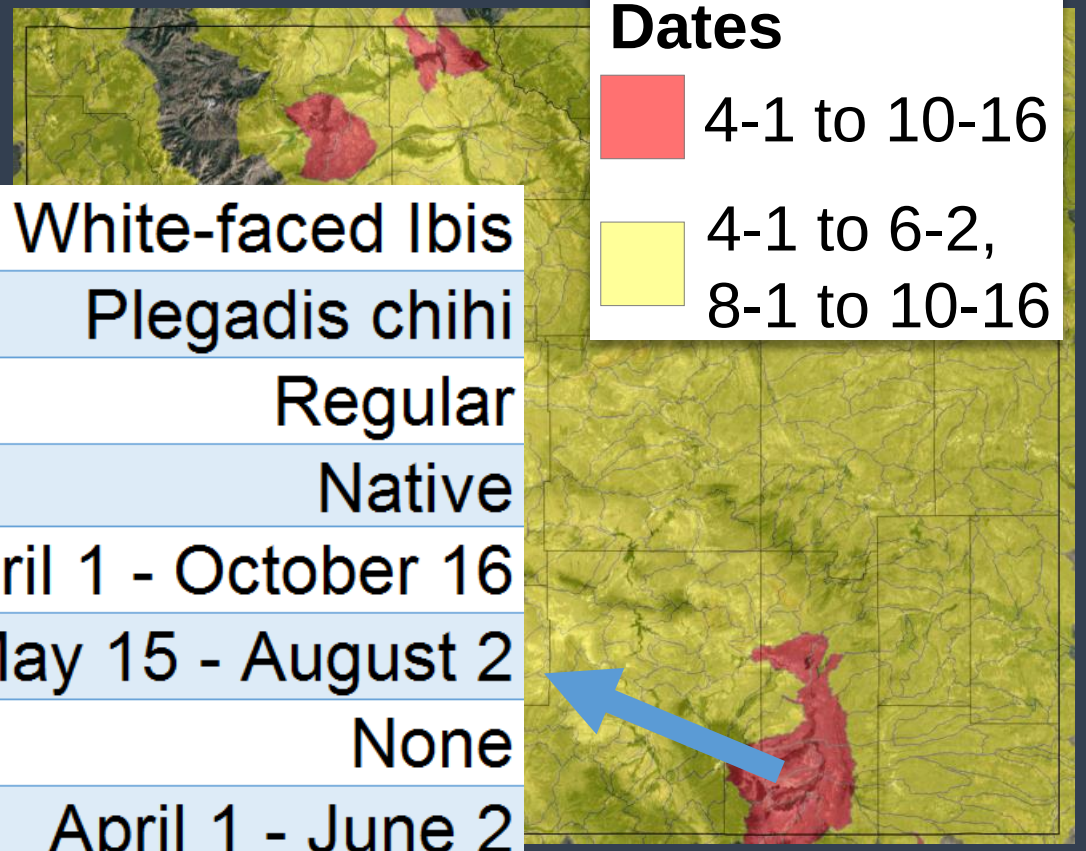


Range Map Example: White-faced Ibis

Occurrence:



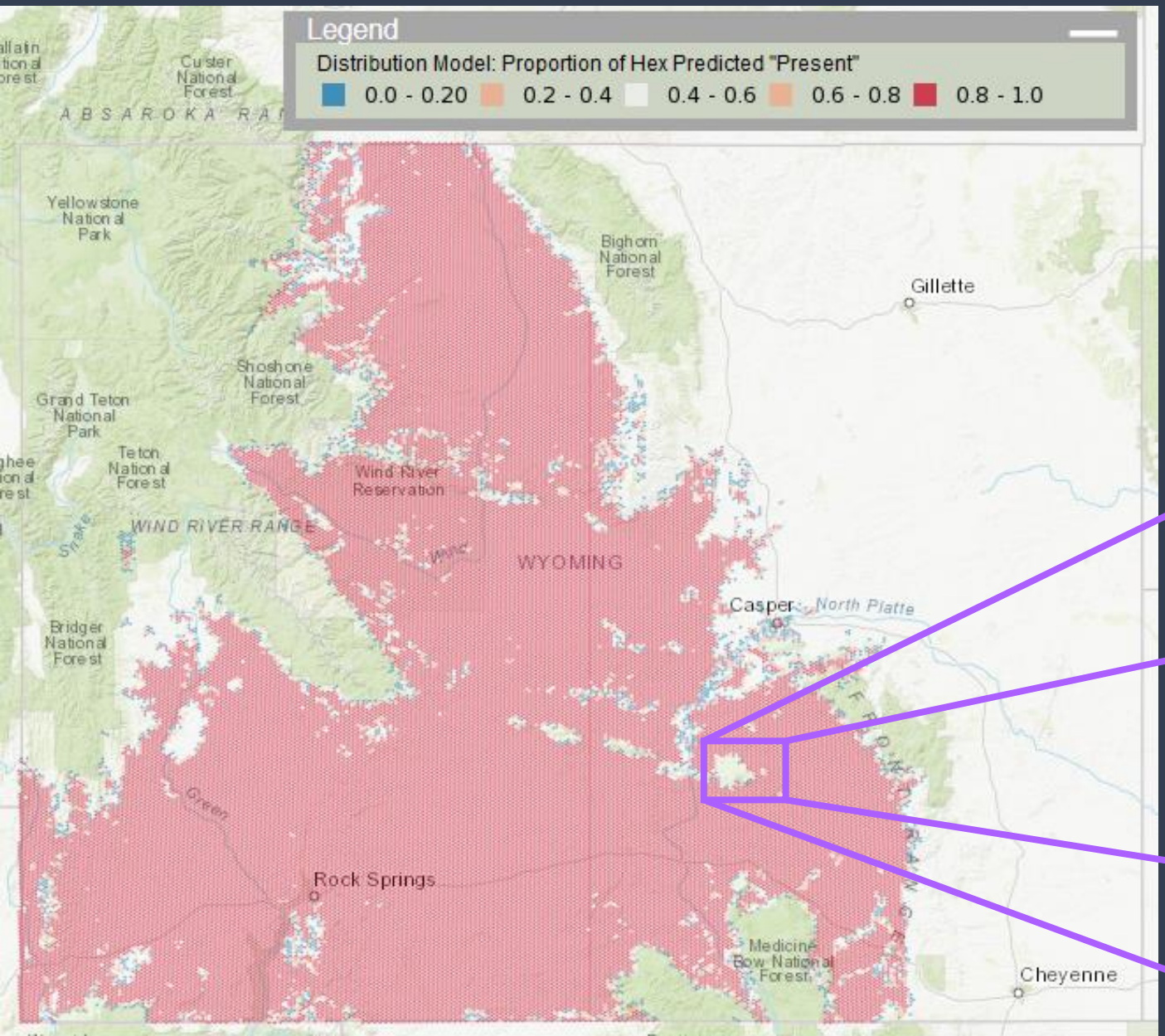
Detectability:

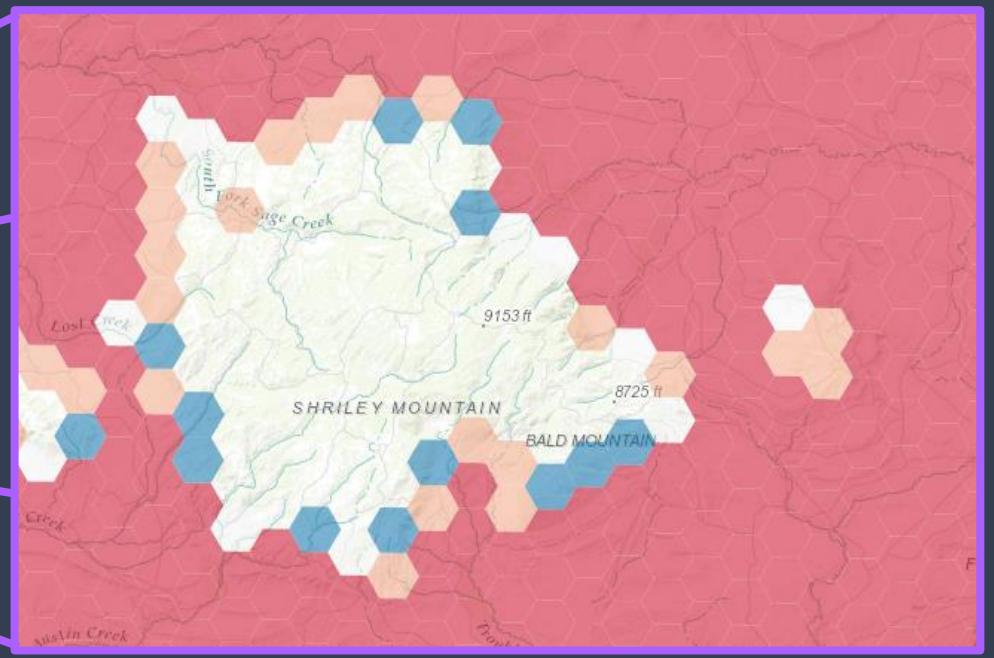


common_name	White-faced Ibis
scientific_name	Plegadis chihi
occurrence	Regular
origin	Native
detectability	April 1 - October 16
repro_season	May 15 - August 2
dorm_season	None
spr_migr	April 1 - June 2
fall_migr	August 1 - October 16

Distribution Models

- Models summarized to 1 mi. hexagons
- Colors represent the proportion of hexagon predicted “Present”
- Clipped to current range





Taxonomy

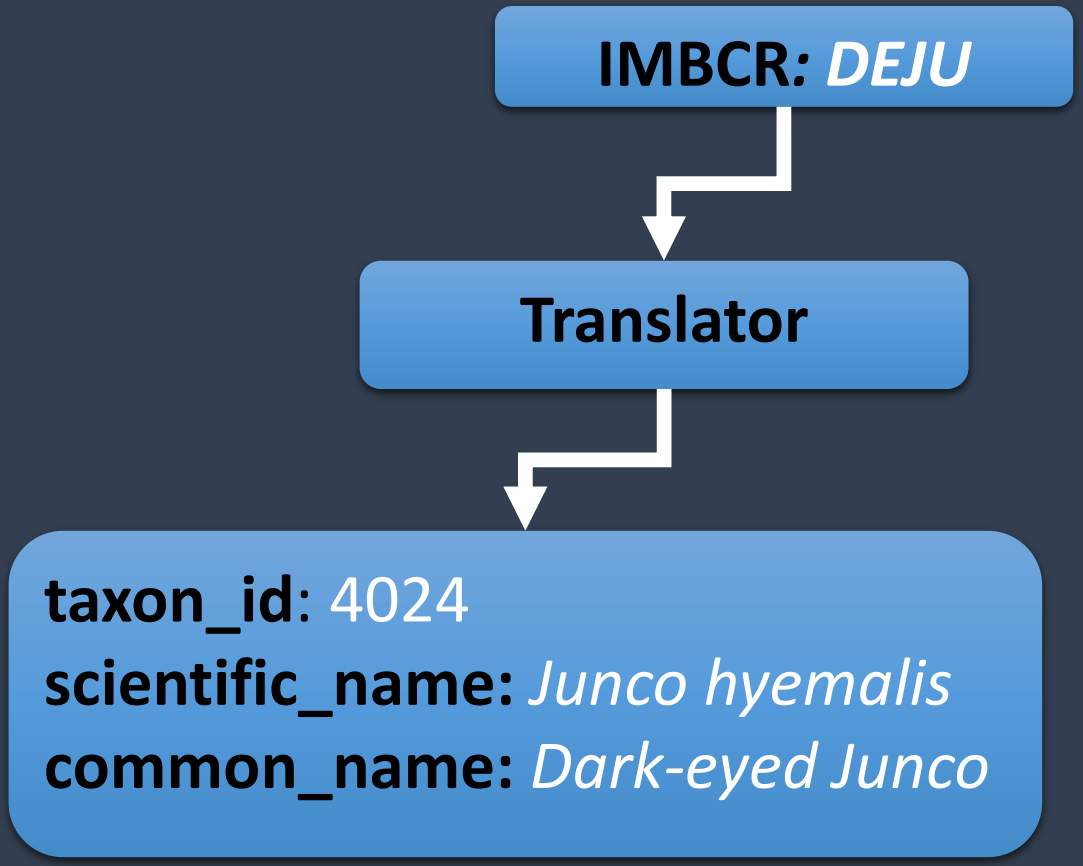
taxon id	parent taxon id	scientific name	common name	level
0		Organism	Organism	
1	0	Animalia	Animals	Kingdom
6	1	Chordata	Vertebrate Animals	Phylum
35	6	Reptilia	Reptiles	Class
106	35	Serpentes	Snakes	Order
357	106	Viperidae	Vipers and Pit Vipers	Family
1012	357	Crotalus	Rattlesnakes	Genus
3899	1012	Crotalus oreganus	Western Rattlesnake	Species
9955	3899	Crotalus oreganus concolor	Midget Faded Rattlesnake	Subspecies

- Each taxon is linked to a taxonomic “parent,” allowing us to move up and down in the hierarchy

Taxonomy: Crosswalks

- Translator table in database allow us to translate species names or codes from outside organizations to our taxonomy

- Currently, we have codes for:
  - WGFD/WOS
  - IMBCR
  - NatureServe
  - PLANTS Database



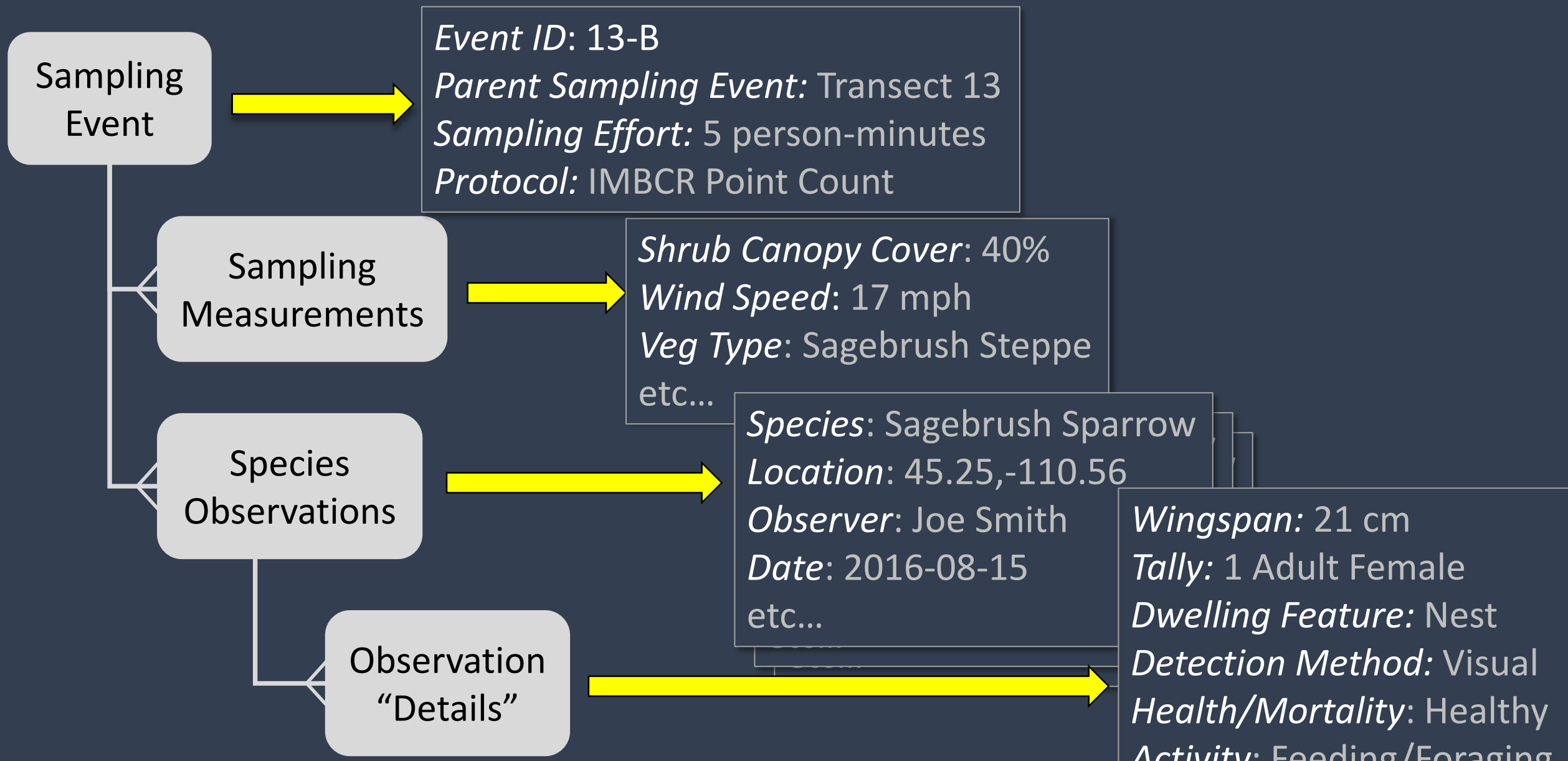
Samples and Surveys:

Database extension for vegetation samples and structured survey data

Intent is to capture information beyond observations

- Sampling measurements (vegetation, weather, etc.)
- Sampling effort
- Sampling results through time, linked via location or sampling event (e.g., long-term monitoring)

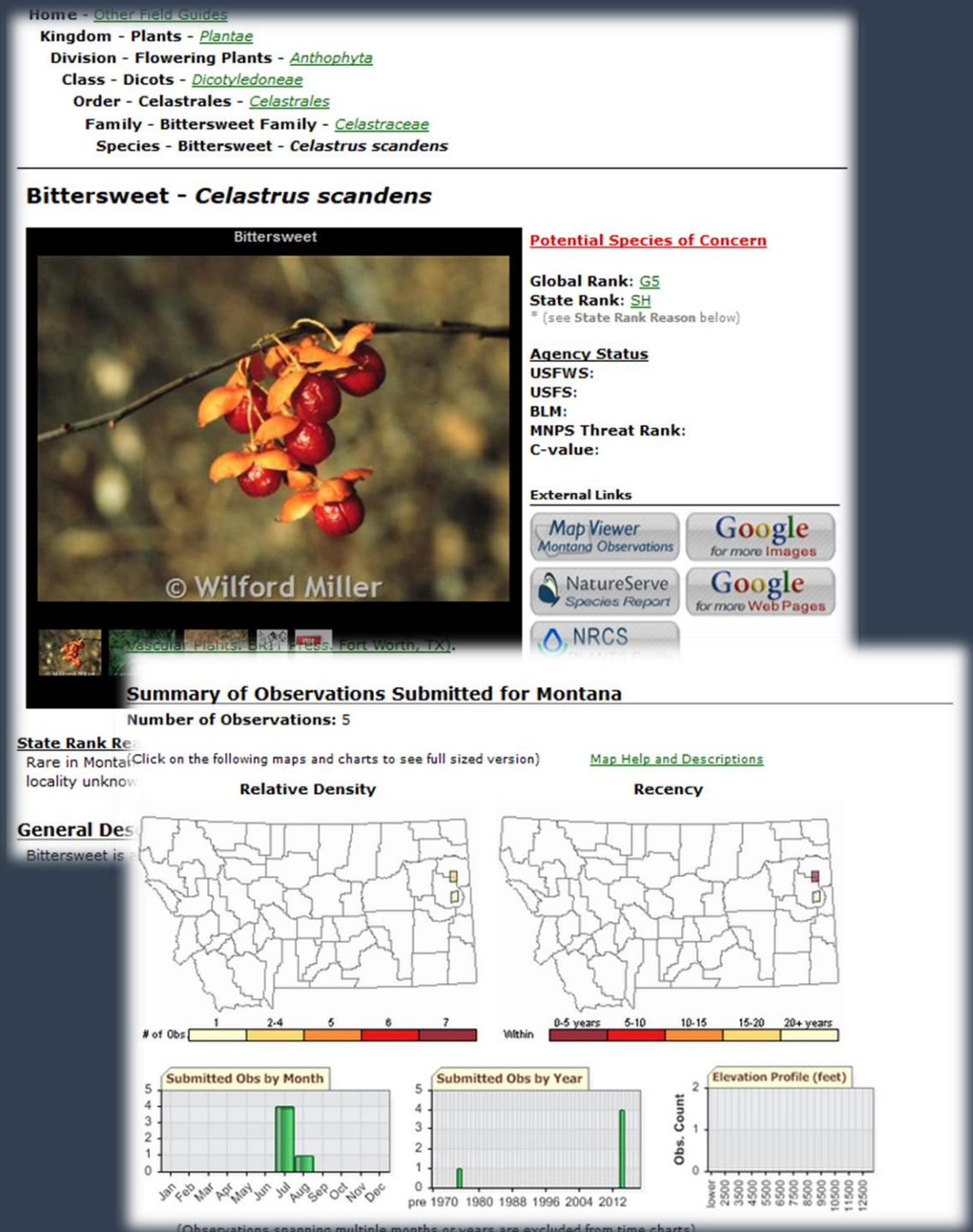
Sample System: Simplified Overview



Online Species Accounts

A Common Field Guide Platform for State-Specific Species Accounts

- In collaboration with other heritage programs, NatureServe
- Editable online
- Will draw on other core products
- Building upon existing framework from MTNHP Field Guide Platform

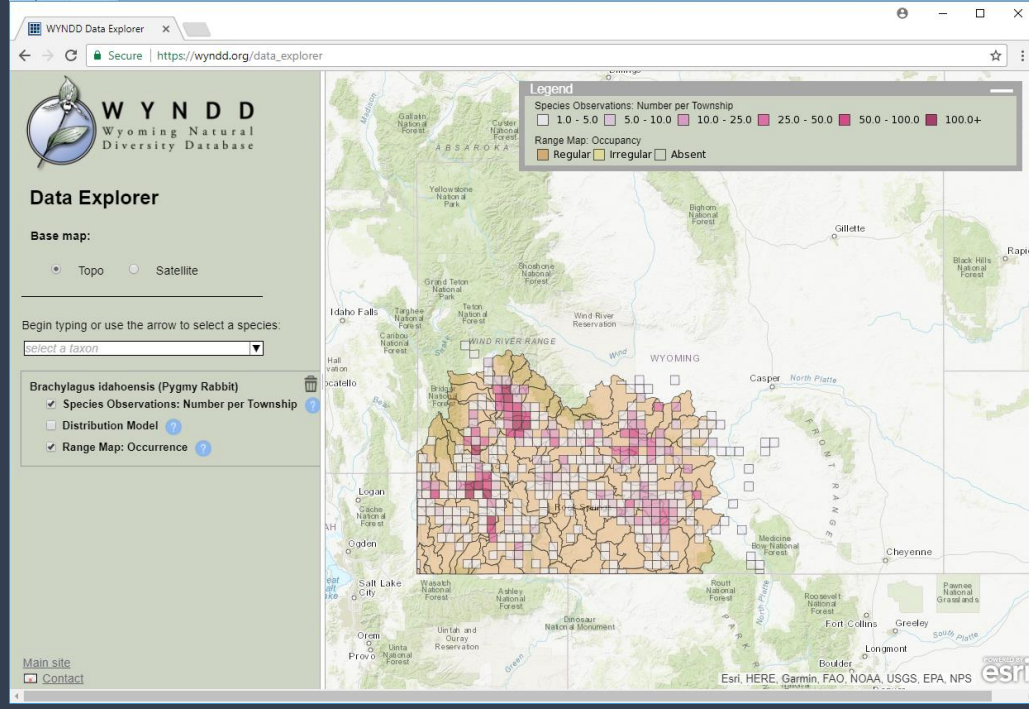


Database Stats

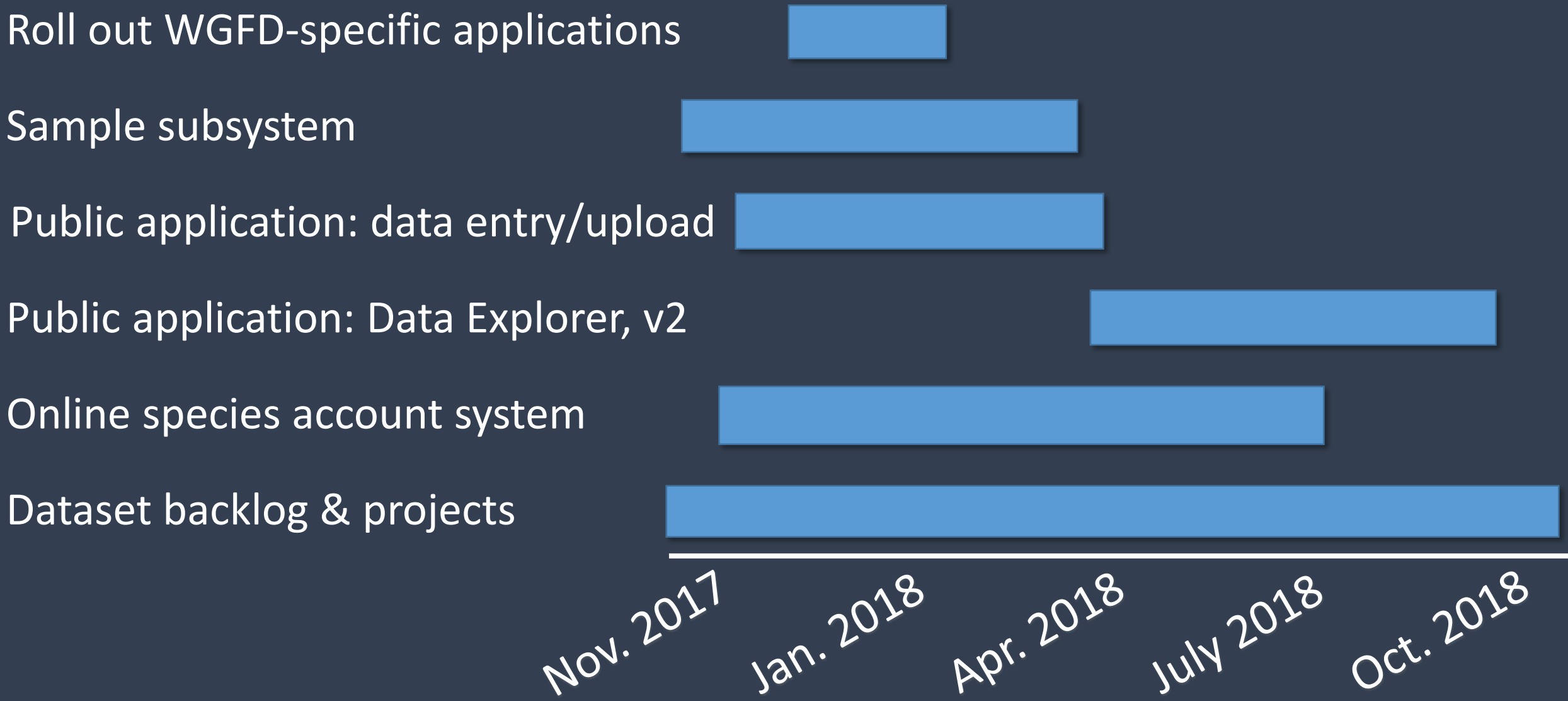
- 6,250 accepted species, ~1,180 subspecies/populations
- All ~7,400 accepted species/subspecies/populations have range maps & associated data
  - Approx. 1,000 are watershed-based
  - Remainder – state boundary
- ~1,853,000 observations
- ~160 distribution models
  - ~300 more waiting to be processed and included

Going Forward…

- Full rollout of applications for WGFD
- Samples/surveys system, and associated web applications
- Public applications for dataset entry/upload, and data exploration
- Online species account system
- Various data-gathering projects and database enhancements



Timeline


Roll out WGFD-specific applications
Sample subsystem
Public application: data entry/upload
Public application: Data Explorer, v2
Online species account system
Dataset backlog & projects
Nov. 2017
Jan. 2018
Apr. 2018
July 2018
Oct. 2018

Questions...?