A flexible, template-driven approach to improving data consistency
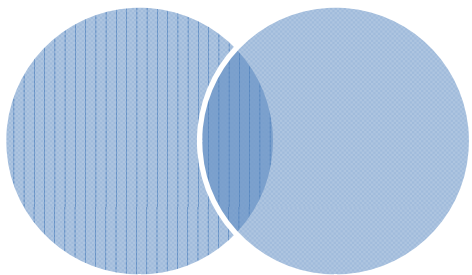
Lori Scott

SESYNC Butterfly Monitoring Workshop
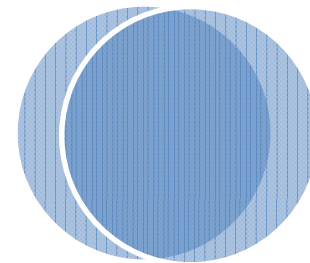*Annapolis, MD*
May 10, 2012
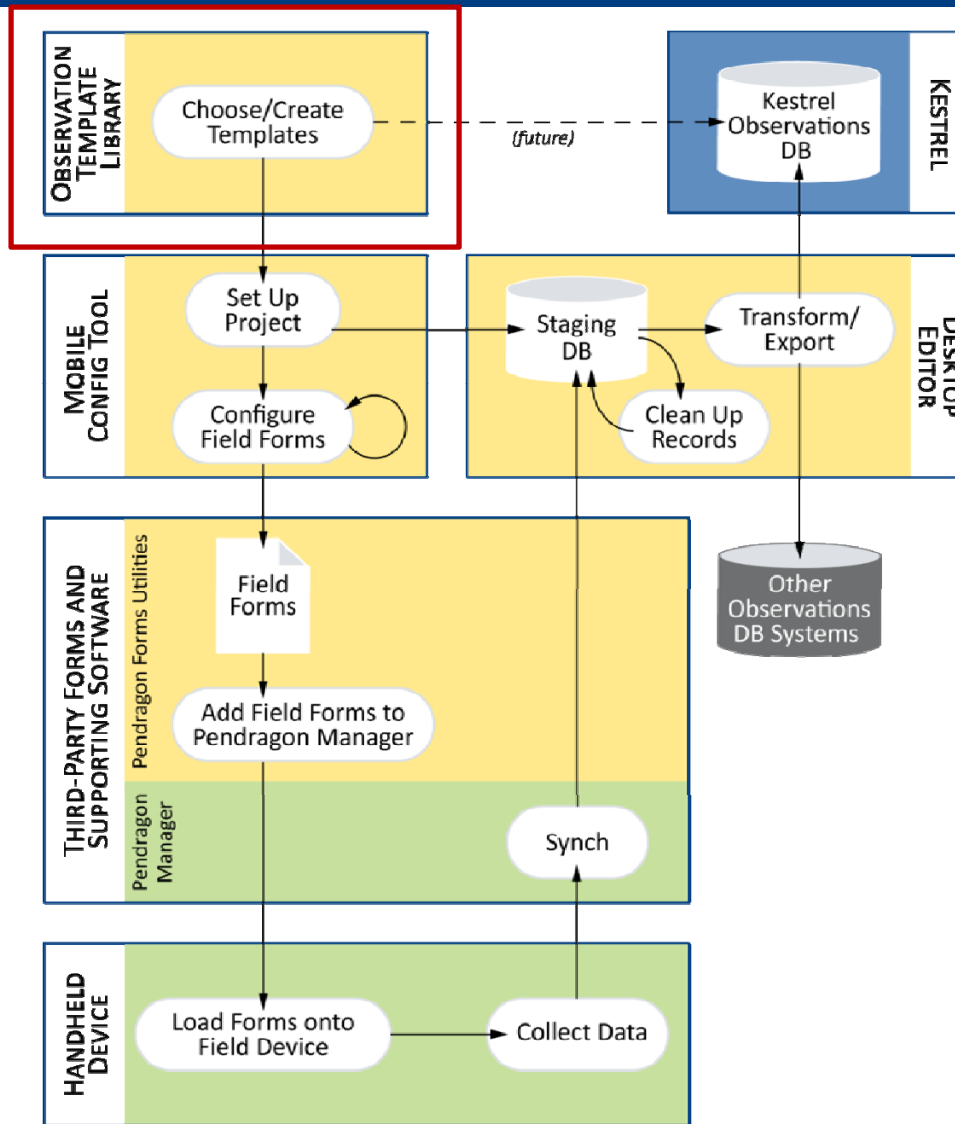
NatureServe

Observation System Goals

- Improve field data collection efficiency
- Increase mapping accuracy with GPS
- Promote interoperability through reusable data structures

How similar are the data models used by two organizations for the same type of observation?
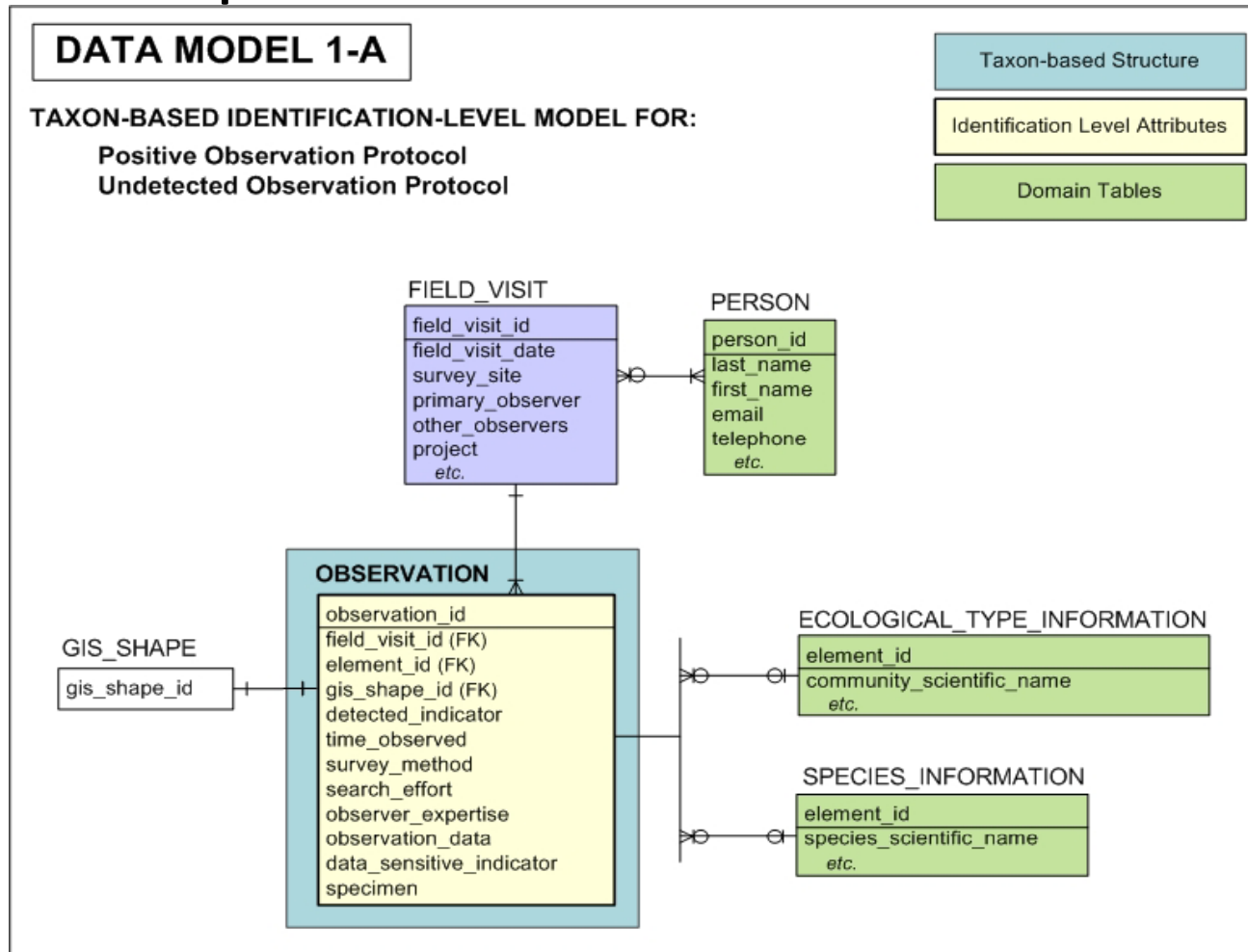
System Overview

Template Library

- Online collaboration tool to define and share observation surveys
- Supports the re-use of individual attributes or common groupings (clusters) of attributes
- Discover how others collect and organize observation data
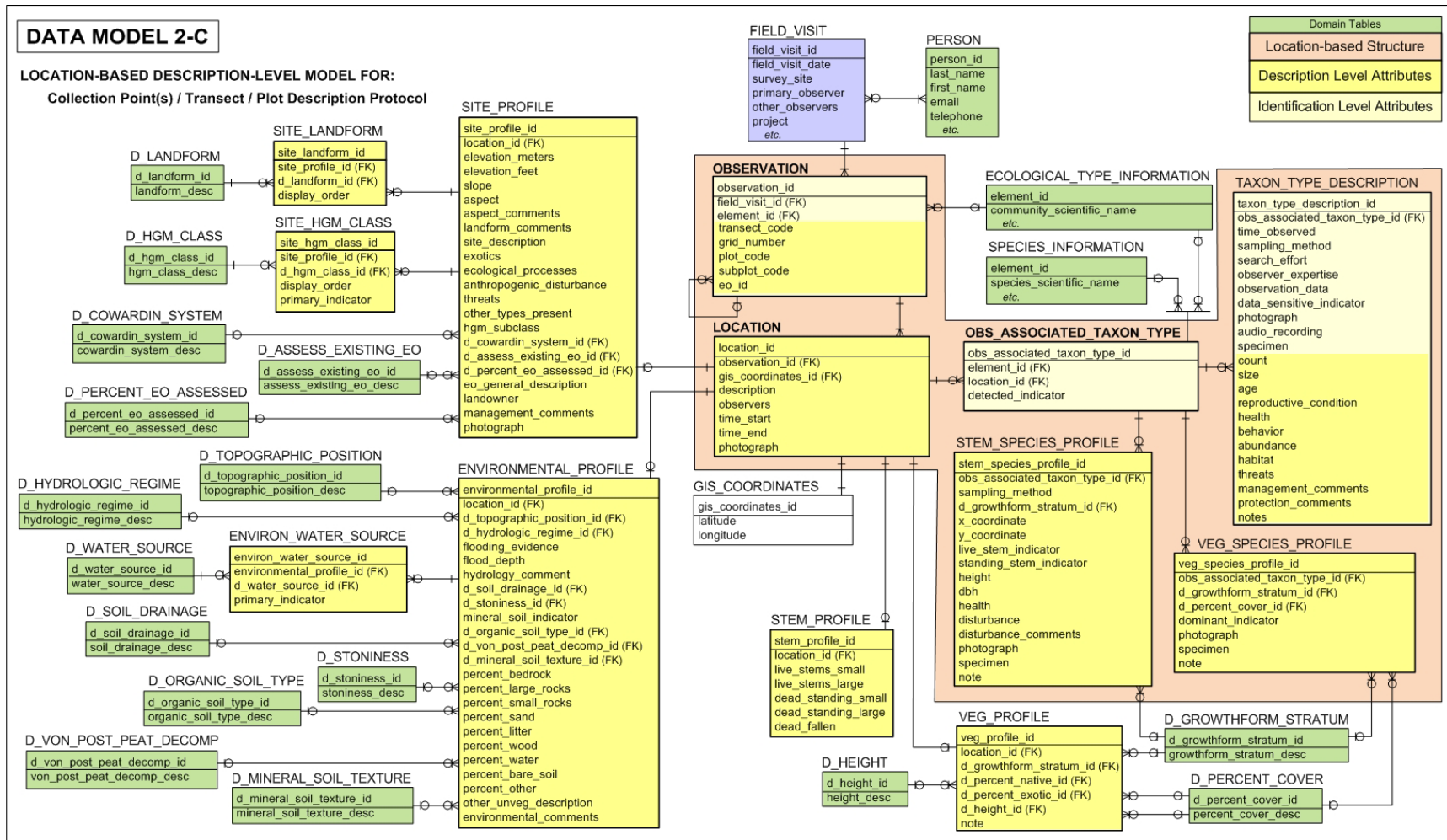- Promote use of common standards to improve data consistency

Supports Variable Data Models

Taxon-based protocols:

Supports Variable Data Models

Location-based protocols:

Template Library

Template Definitions

Show values in: English ▾

Can't find what you're looking for? Create a new template.

Search by Title: [   ] Name: [   ] Type: [Any ▾] Organization: [Any ▾] [Search] [Clear]

Title	Unique Name	Organization	Type
American Kestrel Nest Box	AmericanKestrelNestBox	New Jersey Endangered & Nongame Species Program	Observation
Banff Mortality Observation Template	BanffMortalityObservation	Parks Canada	Observation
Bruce Peninsula Fathom Five Observation Template	BrucePeninsulaFathomFiveObservation	Parks Canada	Observation
Cape Breton Highlands Observation Template	CapeBretonHighlandsObservation	Parks Canada	Observation
CBH Plant Records Observation Template	CBHPlantRecordsObservation	Parks Canada	Observation
Critical Habitat Template	CriticalHabitat	Parks Canada	Observation
Darwin Core Observation Template	DarwinCoreObservation	Parks Canada	Observation
DELETE ME	WapuskIncidentalObservation	Parks Canada	Observation
Demo Template - Location-based	TestTemplate	Parks Canada	Observation
Ecological Integrity Assessment- Level 2 Metrics	EIALevel2Metrics	NatureServe	Observation
Ecological Integrity Assessment- Level 2 Stressors	EIALevel2Stressors	NatureServe	Observation
Field Visit	FieldVisit	Washington Department of Natural Resources	Field Visit
FNP Species Observation Cards Observation Template	FNPSpeciesObservationCardsObservation	Parks Canada	Observation
General Information	GeneralInformation	Washington Department of Natural Resources	Observation
GNP Invasive and Exotic Plants	GNPInvasivesExotics	Parks Canada	Observation
GNP invasive and exotic plants - to be deleted	GNPinvasives	Parks Canada	Observation
GNP Rare Plants	GNPRarePlants	Parks Canada	Observation
GNP Song Birds Observation Template	GNPSongBirdsObservation	Parks Canada	Observation
GNP Wildlife Observation Template	GNPWildlifeObservation	Parks Canada	Observation
Insect Field Data Collection	InsectCO2PitfallTrapping	National Ecological Observatory Network	Observation
Kestrel Compatible	SaskTest	Saskatchewan Conservation Data Centre	Observation
Kestrel Survey	KestrelSurvey	NatureServe	Survey
Longleaf Rapid Assessment Metrics	LongleafRapidAssessmentMetrics	NatureServe	Observation
Mortality Observation Template	MortalityObservation	Parks Canada	Observation
Nahanni Wildlife Observations	NahanniWildlifeObservations	Parks Canada	Observation
NatureServe Observation Standard	NatureServeObservationStandard	Parks Canada	Observation
Newfoundland Martin Telemetry Observation Template	NewfoundlandMartinTelemetryObservation	Parks Canada	Observation
Nunavut Field Unit Wildlife Observation Template	NFUWildlifeObservations	Parks Canada	Observation
Nunavut Polar Bear Observations and Interactions	NFUPolarBearObservations	Parks Canada	Observation
NWT Amphibians and Reptiles	NWTAmphibianReptile	Parks Canada	Observation
NWT Observation Template	NWTObservations	Parks Canada	Observation
NWT Telemetry Observation Template	NWTTelemetry	Parks Canada	Observation

Template Definition

Attribute Definition

Attribute Definition Details

Show values in: English ▾   **Unique Name** BreedingEvidence   **Organization** Parks Canada   **Data Type** String   **Version** 2

General Information

Title Breeding Evidence 🗨 (English, French)

Help Text Reports the class of any observations that may provide evidence that the species was breeding at that location. 🗨 (English, French)

Documentation 🗨 (None)

Validation Rules

Domain Values

Code	Display Value	
X	No evidence of breeding	🗨 (English, French)
H	Seen or heard singing in nesting habitat during breeding period	🗨 (English, French)
P	Pair seen in nesting habitat	🗨 (English, French)
T	Territorial nesting behaviour in nesting habitat for >1 week	🗨 (English, French)
C	Courtship between male and female	🗨 (English, French)
V	Visiting possible nest site	🗨 (English, French)
NB	Nest building	🗨 (English, French)
DD	Distraction display	🗨 (English, French)
UN	Used nest or egg shells found	🗨 (English, French)
FI	Recently fledged or downy young	🗨 (English, French)
ON	Occupied nest	🗨 (English, French)
CF	Adult carrying food or fecal sac	🗨 (English, French)
NE	Nest with eggs	🗨 (English, French)
NY	Nest with young	🗨 (English, French)

Are templates allowed to add additional values or remove values from this list? No

[Edit] [Create a Copy] [Download XML]
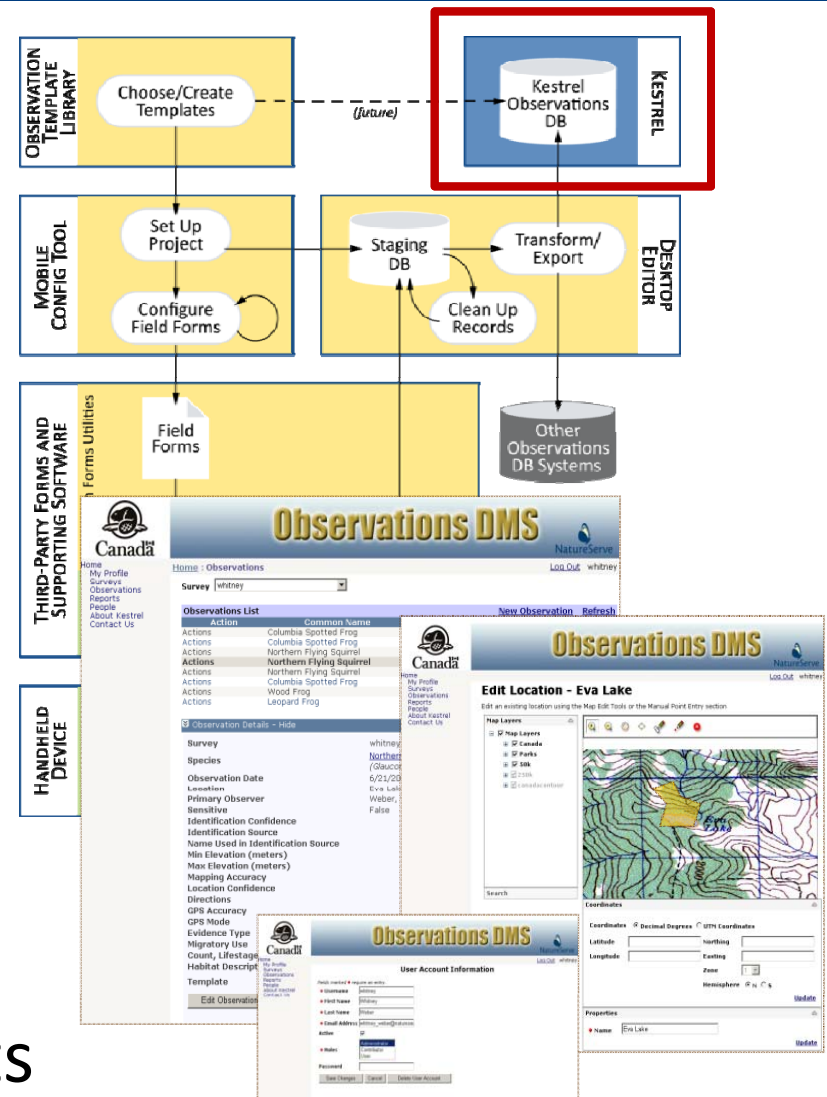
Implications for Citizen Science?

- Template Library supports a wide array of protocol types
- Organized citizen science efforts can find, create and disseminate protocol templates
- Use of common data structures improves compatibility across multiple projects
- Previously distinct data collection efforts can now be compared and combined for broader impacts

Ways to use these tools now

- Publish the various monitoring network protocols
- Define commonly used data fields to share the same attribute definitions (can still have unique field name labels, language, or value options)
- Encourage new protocols to use shared data definitions for interoperability
- Download template / attribute definitions as XML
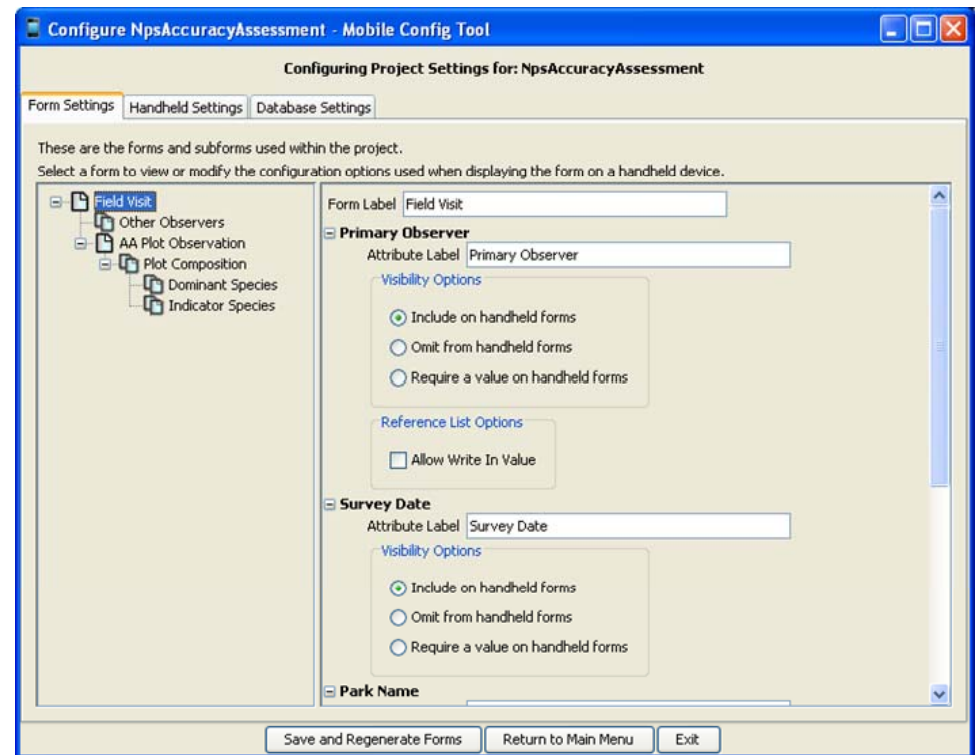- "Reverse engineer" legacy survey data into a shared database platform?

Kestrel observation database

- Secure, web-based access
- ArcGIS Server mapping
- Extensible, template-driven data model
- Localizable user interface (English, French, Spanish)
- Links to NatureServe's taxonomic web service
- Bulk upload of spatial and tabular observation data
- Bulk export in several formats

Desktop Application Suite

- Configure projects
- Process data collection templates for field work
- Clean up and QC field data
- Export field data to long-term observation database

Handheld Device

- Current version is compatible with Windows mobile hardware
- 3rd party software used:
  - Pendragon forms builder
  - Esri ArcPad
- Captures GPS location
- Source code available at:

http://code.google.com/p/ns-mos/

- Could be adapted for iOS or Android

Acknowledgments

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  - Cornell Lab of Ornithology
  - New York Natural Heritage Program
  - Washington Natural Heritage Program
  - University of New Mexico
  - University of Wyoming