

The State of the MJData: Content and Currentness



Cameron Scott – Conservation Data Analyst

NatureServe, Arlington

Cameron_Scott@NatureServe.org

(703) 908-1848

State of the MJData: Session Goals

- Introduction to the Multi-Jurisdictional Database – what data do NatureServe manage?
- State of the data – how current are these data?
- What are the Benchmark Data Content Standards (BDCS) for Element and EO data?
- Importance of BDCS to the Network.
- BDCS implementation and roles.
- Meeting Key Standards – current and past goals.



Introduction to the NatureServe Multi-Jurisdictional Database

- NatureServe manages an aggregated database that currently includes:
 - 80,397 species Element records
 - 10,555 community Element records
 - 705,819 species Element Occurrence (EO) records



Species Element Records

Element Group	Number Standard or Provisional	Number Nonstandard
Vertebrate Animal	14,857	34
Invertebrate Animal	23,975	34
Vascular Plant	32,273	2,154
Nonvascular Plant	2,353	159
Fungus	4,355	79
Alga	121	3
TOTAL	77,934	2,463



Species Element Occurrence (EO) Records

Element Group	Number of EOs
Vertebrate Animal	267,746
Invertebrate Animal	77,225
Vascular Plant	351,422
Nonvascular Plant	6,489
Fungus	2,818
Alga	119
TOTAL	705,819



Pseudo-EOs and Observations

- Divergence from EO methodology
- Member program need to track / manage different types of data
- Working with those programs on best approaches for aggregating and using data in MJD products.



Other Data

- Vertebrate Distribution Maps - all Western Hemisphere birds, mammals, and amphibians; North American (U.S. and Canadian) reptiles, crocodiles, and turtles
- Watershed Distribution Databases - freshwater and anadromous fishes and freshwater mussels
- Invasiveness Ranking
- <http://www.natureserve.org/getData/index.jsp>



MJData Currentness

- NatureServe strives to complete a data exchange with each member program on a regular basis.
- Most recent data exchange:
 - <1 year – 14 programs
 - 1-2 years – 16 programs
 - 2-3 years – 25 programs
 - >3 years – 4 programs



New! EO Update

- Quick update of EOs without the need for taxonomic reconciliation by science staff.
- Keep the MJD more up-to-date.
- Updates whenever a member program has new EO data to provide to NatureServe.
- Has been run for 3 programs: IL, KY & WA



Benchmark Data Content Standards: Origins

- 1994 – need for regional and global biodiversity data products and services was highlighted at the ABI Annual Meeting.
- 1998 – First BDCS iteration developed by the ABI Data Standards Committee.
- 2004 – Revised to establish goals for:
 - Element and EO MJD products and services.
 - Element and EO standardized dataset fields.
 - GIS standards to facilitate aggregation.
 - Metadata documentation.



What BDCS Helps Us Do

Establish priorities and network-wide content goals for customer needs:

- Standardized dataset for regional, national and international data products and services.

Guidance for high-quality data:

- Content standard ~ based on current methodology.

Data sharing, aggregation, and products:

- Facilitate data exchange and the aggregation of spatial (i.e. EO) data.

Measure the state of the data:

- Measure and report on the completeness, currentness, and quality of our data for internal and external uses.



Why Have Data Standards?

- Define our high priority / core datasets (both records and fields).
- Framework to measure and report on the currency, consistency, and completeness of our data.
- Identify data development and management priorities.
- Credibility ~ demonstrate to partners and clients that our data meet documented quality standards.



BDCS – How to get a copy

- Download from:

<http://www.natureserve.org/prodServices/heritagemethodology.jsp>

- Contact Lynn Kutner
NatureServe, Boulder, CO:
lynn_kutner@natureserve.org
(703) 797-4804



BDCS Implementation – Roles and Duties

- U.S. Section Council
 - Goals, U.S. program representation
- NatureServe
 - BDCS Documentation
 - FY planning goals: setting, measuring and reporting on progress
- Member Programs
 - Data Stewards



BDCS Implementation – Beyond U.S. Species

- **Canadian Section Council**
 - No formal adoption, but unofficially work towards same standards and meeting same targets as U.S. Section.
- **Ecology data**
 - Standards currently being developed outside of BDCS
 - Focus of standards: classification, mapping, status & EO ranking.



BDCS: Priority Element Subset

- “Species at Risk”
 - Global conservation status (Grank) = GH, G1, G2, G3, or
 - U.S. Endangered Species Act (USES), or
 - Canadian Species at Risk Act (SARA).
- Number of species Elements = **42,364**



BDCS: Element Indicators

1) Completeness:

- All should have a Grank and a corresponding Grank reviewed date.
- Species at risk should have a reason for the Grank and should have information about range extent; number, size, or viability of populations; population trend; and threats.

2) Currentness:

- Granks for the core data set should be reviewed at least every 5 years.

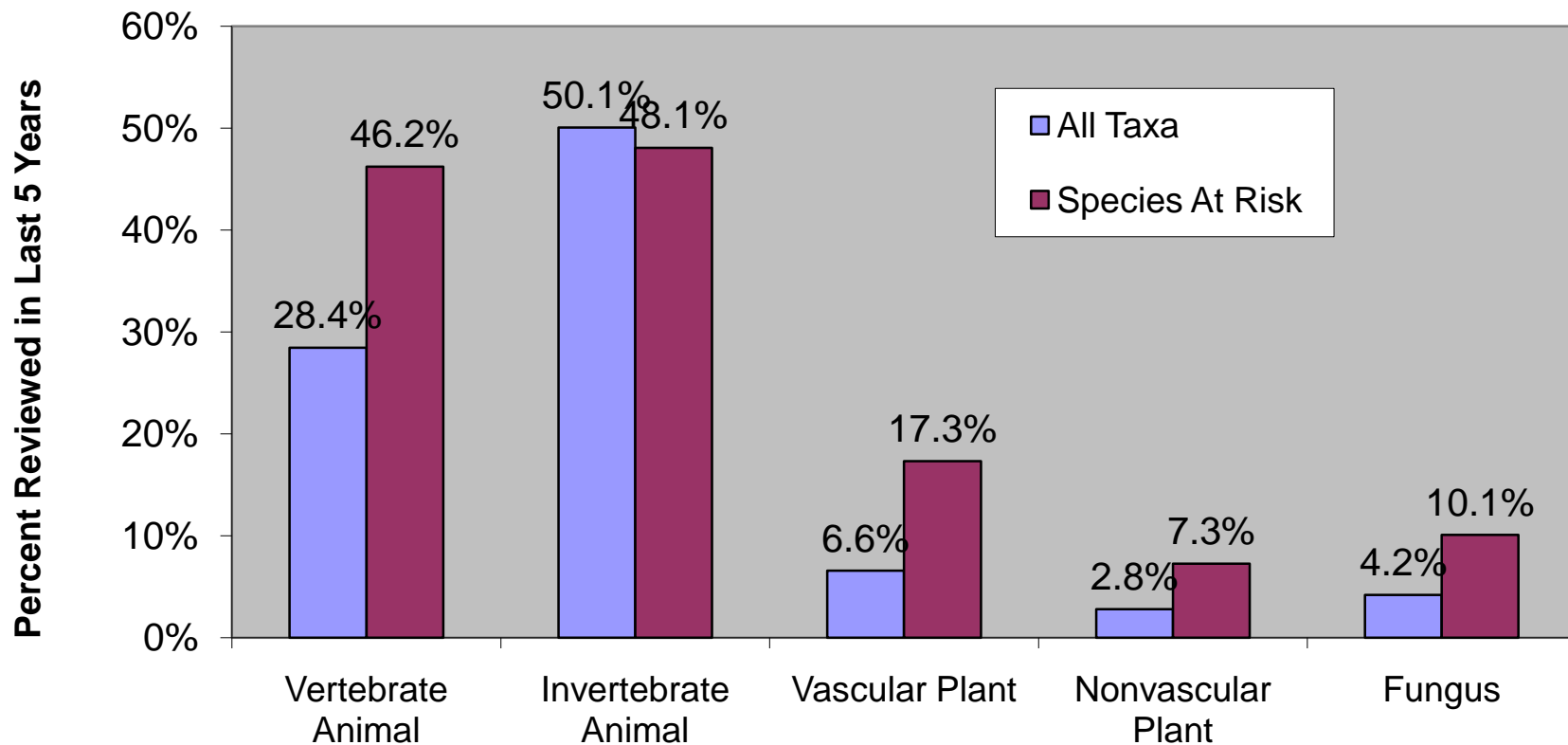


Core Data: Completeness of Grank

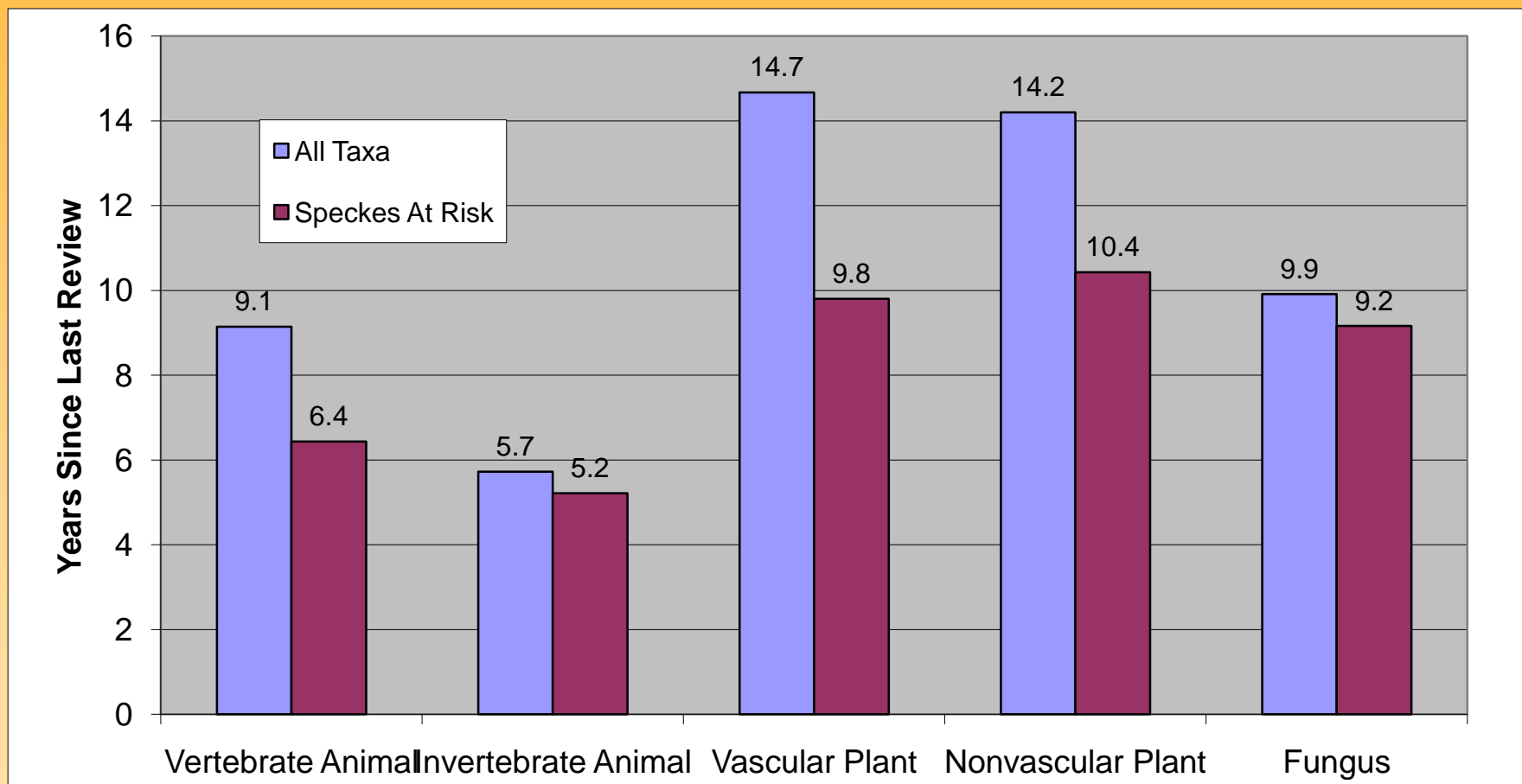
Element Group	Grank (%)	Grank Review / Change Date (%)
Vertebrate Animal	96.4	96.1
Invertebrate Animal	99.6	99.6
Vascular Plant	81.6	97.7
Nonvascular Plant	94.3	99.1
Fungus	62.8	99.3
ALL TAXA	85.0	98.0



Grank reviewed within last 5 years



Average time since Grank reviewed



BDCS: Priority EO Subset

- Global conservation status (Grank) = G1 or G2 (inclusive of infrataxa), or
 - U.S. Endangered Species Act (USES), or
 - Canadian Species at Risk Act (SARA).
-
- Number of species EOs = **140,005**



BDCS: EO Indicators / Top Priorities

- Element Occurrence Rank (EO Rank)
- EO Last observed date
- Subnational Protection Status
- Redigitizing spatial data
- Representational Accuracy value



BDCS EO Priority: EO Rank

- Element Occurrence Rank
(d_basic_eo_rank_id)
 - Highest priority to indicate if the EO is there or not ~ indicate E (extant) vs. X / H (extirpated / historical) or F (failed to find)
 - If information is available, rank with range ranks
 - Reduce degree of uncertainty in range ranks ("AC")



BDCS EO Priority: Last Obs Date

- Last Observation Date (last_obs_date)
 - Used as criteria to select "current extant" EOs
 - Indicate most recent observation in a jurisdiction
- Incremental Progress
 - Enter missing lastobs dates;
 - enter the first four characters as a numerical year for search & analyses.



BDCS EO Priority: S Protection

- Subnational Protection Status
(s_protection_status)
 - Important for analyses of "state / province listed taxa"
 - Standard value / approach for "none"?
 - all OTHER statuses entered (when possible) in "Other Status"



BDCS EO Priority: Redigitizing Spatial Data

- Creating more accurate EO rep polygons
 - Replacing the large circles of “M” and “G” precision when converted from Biotics.



BDCS EO Priority: Representational Accuracy

- EO Representational Accuracy (d_est_rep_accuracy_id)
 - Important to provide standard way to categorize EO polygons by precision for MJD products.
 - Replaces older methodologies: precision_bcd (from BCD) and Source Feature Location Uncertainty (Biotics4)



BDCS in Network Goals: U.S. Section FY07 Goal

- Goal: Improve EO Rank field completeness by 15%
 - Improvement across U.S. Section (not per program) for the priority EO subset
 - “E” for extant is acceptable when data does not exist to rank A-D
- Baseline (July 2006):
 - 77,520 EOs ranked.
- Result (July 2007):
 - 103,140 EOs ranked.
 - 25,620 increase in EOs ranked.
 - 33% increase, smashing goal of 15%.



U.S. Section FY08 Goals

1) EO Last Observation Date

- Goal 1: Reduce “Lastobs Errors” to zero.
- Result: Errors were reduced by almost 90%
- Goal 2: Reduce “Lastobs Nulls” by 50%, from ~5,000 records to 2,500.
- Result: “Nulls” were reduced by 19%

2) Subnational Protection Status (SPROT)

- Goal: Should only contain official endangerment status or level of legal protection.
- Result: Survey of member programs - 35 U.S. member programs responded. Almost 95% using the field correctly; almost 89% reviewed and/or updated in the last year.



U.S. Section FY08 Goals (cont.)

3) Basic EO Rank

- No specific metric for FY08; continued to report current status from Central database

4) Redigitizing spatial data

- No specific metric for FY08.

5) Representation Accuracy

- No specific metric for FY08, but ultimate goal is to complete field for all new and updated records, and to start going back to complete older records.
Can/should be done in conjunction with redigitizing spatial data.



U.S. Section FY09 Goals

Member programs worked towards one or more of the following for G1-G2 or listed species occurrences (meant to accommodate differences in strengths and weaknesses between programs).

1) Improve EO Rank completeness and quality

- Goal: at least 7,500 species EOs
- Result: total improved = 9,523 (127% of goal)

2) Improve spatial precision of mapped data

- Goal: at least 27,600 species EOs (focus on “G” and “M” precision records)
- Result: remapped = 17,684 (64.1% of goal)

3) Improve representational accuracy

- Goal: 22,500 species EOs
- Result: total improved = 9,620 (42.8% of goal)



U.S. Section FY2010 Goal

- Improve Representational Accuracy (RA) field for the priority EO subset (G1, G2 or federally listed species EO's).
- Goal is to improve completeness of field by 18,000 species EO records.
- *Programs that have complete data in the RA field are encouraged to continue to work on improvements to EO Rank, Subnational Protection Status (SPROT), and Redigitizing General and Minute Precision GIS records.*



Current Status of Priority EO Fields

	Total Number of Eos	Number EO Rank not Null and not "NR"	% EO Rank not Null and not "NR"	Number Last Obs Date not Null	% Last Obs Date not Null	Number RA not Null	% RA not Null
TOTALS	140,005	101,140	72.2%	134,924	96.4%	30,598	21.9%
CANADA	12,681	9,615	75.8%	11,028	87.0%	3,359	26.5%
U.S.	127,324	91,525	71.9%	123,896	97.3%	27,239	21.4%



How do we meet these goals?

- Need commitment from Member Programs to improve the targeted data.
- Assistance from NatureServe central with queries, documentation, and funding.
- Not a one time data improvement, keep these in mind when updating or adding new records!



Data Improvements – Small Grants

- NatureServe data improvement grants - 2008 and 2009
- Funding from MJD surplus
- Eight member programs
- Awards of \$3,500 to \$10,000
- Total over 2 years - \$72,000
- We hope to continue this in the future ...



RA queries

- Developed by NatureServe
- Automatically calculates RA where possible
- Required field: HECTARE
- Uses TOra database tool
- Instructions and SQL available at:
 - https://transfer.natureserve.org/download/long-term/Benchmark_standards/FY10/



QC Tools from NatureServe

- Data checks in Data Exchange prep memo.
- Sample SQL queries in the knowledgebase:
<http://support.natureserve.org/customer/default.htm>
USESAs functions
EO latitude / longitude QC
EO_RANK / S_RANK QC (srank “SH” or “SX” and eorank not “H” or “X”)
- SQL for BDCS goals:
https://transfer.natureserve.org/download/longterm/Benchmark_standards/



Points of Contact

- NatureServe
 - Lynn Kutner – *BDCS Lead*
lynn_kutner@natureserve.org
 - Cameron Scott
cameron_scott@natureserve.org
- U.S. Section Council
 - DJ Evans– *Chair*
djevans@gw.dec.state.ny.us
- Canadian Section Council
 - R.A. Lautenschlager – *Chair*
rlautenschlager@mta.ca

