PLANTS database redesign

Requirements

Version 2.1

14 August 2003

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Document Revision History

Name	Date	Reason for Changes	Version
ÆP	21 March 2002	Beta test for suitability for communicating requirements	"Names" test
ÆP	28 March 2002	Initial release	1.0
ÆP	3 June 2002	Image and state threatened and endangered revision	1.1
KH	7 Feb 2003	Mock-up notes from meeting with NPDC	1.2
ÆP	3 March 2003	Post meeting revision	2.0 Draft
ÆP	13 June 2003	Source and poisonous plants requirements added	2.0
ÆP	14 Aug 2003	Post meeting revision	2.1

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1. Introduction

This document describes the attributes that the redesigned PLANTS database needs to support. These requirements are expressed in a number of emails, discussions, and wish lists transmitted between the National Plants Data Center (NPDC) and the National Information Technology Center (NITC) over the past several years. This document is the central repository for these and future requirements. As such, it will be an evolving expression of the PLANTS database requirements, changing as the requirements change.

1.1. Scope

This work fits within the scope of the redesign vision statement. It is concerned with the operational database in the architecture described in that document. This database has to efficiently store the PLANTS data, while a separate reporting database will be responsible for handling data retrieval.

1.2. Requirement format

Requirements are ordered from general requirements to the more specific ones. Each is described in a sentence or sentence fragment. A description, if necessary to clarify the requirement follows, and then the current status of the requirement is given. A source, if identifiable, will follow along with the requirement's standing. Any changes to the requirement will be listed in a requirement revision history.

1.2.1. Requirement status

Many previously identified requirements have aged, and need confirmation to make sure they are still valid. The date will keep requirements from growing stale between when they are identified and when they are implemented. The status can be one of two values:

Unverified   Potentially a system requirement, but needs NPDC confirmation
Verified   NPDC confirmed requirement

1.2.2. Requirement sources

Requirements have come from the sources listed below. The abbreviation follows each requirement to trace it back to its origin. This section will grow, as the requirements are refined.

BN4/5   Images interview with Bert Noel, 5 April 2002
Diacriticals2/03 Diacritical marks email, 12 February 2003
ER3/02   Draft Entity-Relationship diagram and data dictionary, 11 March 2002
Hidden2/03   Hidden Table in VegSpec email, 21 February 2003
Mark2/03   Mark's redesign tasks email, 26 February 2003
Mtg2/03   NPDC meetings at Fort Collins, 5-7 February 2003
Mtg8/03   NPDC meetings at Fort Collins, 12-14 August 2003
Peet5/03   VegBank reference schema from Bob Peet, 2 May 2003
Photos5/02   Line Drawing and photo processing guidelines
Photos10/02   Line Drawing and photo processing guidelines, 28 Oct 2002 version
PoisonDb3/03   Poisonous Plants database from Scott, 5 March 2003

RD3/01	Redesign Paula Scott Mark Comments March 2001.doc
SPA	Strategic PLANTS Analysis, draft January 23, 1997
TE5/1	Threatened and Endangered Plant Module, DRAFT of May 1, 2002

1.2.3. Requirement standing

The requirement standing reflects how the requirement is being supported in the PLANTS database system. The values are:

New	A newly identified requirement that is not implemented in the PLANTS system
Partial	A requirement that has some, but not all, parts implemented in the database. An explanation of the partial nature will be included in each explanatory note
Current	A currently supported requirement

1.2.4. Requirement revision history

A revision history for each requirement will be maintained. This will track all changes made to that requirement, including changes in status.

1.3. Requirement Language

These requirements are written with a structured language. Certain phrases make the requirements exact. These language cues are listed below:

Must	This is required. The database supports and enforces it.
Should	This must be supported, but it is not required in the data. It is optional, but highly recommended. Candidate for the "must" category.
Can	This is optional. The database supports this feature, but the data is not required to take advantage of this feature. This is for items like 'Federal noxious status', which applies to some, but not all, names.
May	This grants permission for the operation. It is for giving permission to certain users for certain actions, like editing a particular field in the database.

2. General Requirements

[REQ-1] The system must allow multiple data stewards to enter, edit, and delete their data

Description: data stewards include NPDC data development staff, State PLANTS coordinators, and the Plant Materials (PM) Data Administrator. Coordinators are responsible for state common names and associated information (detailed below). NPDC staff is responsible for all data.

Status: verified 5 Feb 2003
Source: RD3/01 pp. 3-4
Standing: partial – currently, state PLANTS coordinators are able to edit state common names. Maintenance of other items is otherwise not well supported.

[REQ-2] The system must allow overlapping data from different sources to be maintained separately

Description: this is to prevent having to update each list against the other when one list is updated. Examples of overlapping data currently include BONAP and non-BONAP vascular data, and the Hawaiian cryptogram list and the North American lichen, liverwort, and hornwort lists.

Status: verified 5 Feb 2003
Source: RD3/01, p. 4
Standing: new

[REQ-98] Plant characteristics data and Plant core attributes data used by VegSpec will reside and be managed in PLANTS.

Status: verified 5 Feb 2003
Source: Mtg2/03
Standing: new

3. Names

[REQ-3] PLANTS must support scientific names, common names, names in unpublished formats, obsolete names, and not validly published names

Status: verified 5 Feb 2003
Source: RD3/01, pp. 2-7
Standing: partial – the PLANTS system supports scientific names well, but is limited in its support of common names, and unpublished names are supported only with great difficulty.

[REQ-4] All names are stored in the operational (production) database but not all names will be displayed through the web site (via the published database).
Description: the published database supports reports on the web site.

Scientific names that may be stored but not made available include typical trinomial synonyms and other database artifacts.

Status: verified 5 Feb 2003
Source: RD3/01, p. 6-7
Standing: new

3.1. Scientific Name

[REQ-5] A scientific name is made of one or more one word names, preceded by an optional indicator, and a taxonomic author

Status: verified 5 Feb 2003
Source: ER3/02
Standing: current

[REQ-6] PLANTS must support monomial names at the genus taxonomic level and above

Status: verified 5 Feb 2003
Source: none specified
Standing: partial – PLANTS has integrated support for names at the genus rank, and supports a separate, but accessible, data tables for families and other upper hierarchy names. None of these elements are integrated together in the system.

[REQ-7] The taxonomic author for names at and above the family rank are optional

Status: verified 5 Feb 2003
Source: none specified
Standing: new

[REQ-8] PLANTS must support a hierarchical structure without intermediate ranks

Description: PLANTS has a number of tables for different hierarchy levels, like "ORDERS" and "CLASSES" that support the upper taxonomic hierarchy. This design, however, does not work when a level does not appear in the scientific literature, or when it is unclear where a name may fit into the taxonomy. This has resulted in kluges like the "uncertain lichen family" that bridges some genera to the order "Caliciales."

Status: verified 5 Feb 2003
Source: SPA, p. 29
Standing: new

[REQ-9] PLANTS must support all forms of the scientific name below the species taxonomic level to the subforma level

Description: the ranks below the specific epithet (species) are, in order: subspecific epithet, variety, subvariety, forma, and subforma. In creating a scientific name below the species level, each rank may or may not be part of a legal name, but if they are part of the name must appear in their rank order.

The scientific name at the species level and below can take any of the following 32 forms:

i)	[Genus] [specific epithet]
ii)	[Genus] [specific epithet] [subspecific epithet]
iii)	[Genus] [specific epithet] [variety]
iv)	[Genus] [specific epithet] [subvariety]
v)	[Genus] [specific epithet] [forma]
vi)	[Genus] [specific epithet] [subforma]
vii)	[Genus] [specific epithet] [subspecific epithet] [variety]
viii)	[Genus] [specific epithet] [subspecific epithet] [subvariety]
ix)	[Genus] [specific epithet] [subspecific epithet] [forma]
x)	[Genus] [specific epithet] [subspecific epithet] [subforma]
xi)	[Genus] [specific epithet] [variety] [subvariety]
xii)	[Genus] [specific epithet] [variety] [forma]
xiii)	[Genus] [specific epithet] [variety] [subforma]
xiv)	[Genus] [specific epithet] [subvariety] [forma]
xv)	[Genus] [specific epithet] [subvariety] [subforma]
xvi)	[Genus] [specific epithet] [forma] [subforma]
xvii)	[Genus] [specific epithet] [subspecific epithet] [variety] [subvariety]
xviii)	[Genus] [specific epithet] [subspecific epithet] [variety] [forma]
xix)	[Genus] [specific epithet] [subspecific epithet] [variety] [subforma]
xx)	[Genus] [specific epithet] [subspecific epithet] [subvariety] [forma]
xxi)	[Genus] [specific epithet] [subspecific epithet] [subvariety] [subforma]
xxii)	[Genus] [specific epithet] [subspecific epithet] [forma] [subforma]
xxiii)	[Genus] [specific epithet] [variety] [subvariety] [forma]
xxiv)	[Genus] [specific epithet] [variety] [subvariety] [subforma]
xxv)	[Genus] [specific epithet] [variety] [forma] [subforma]
xxvi)	[Genus] [specific epithet] [subvariety] [forma] [subforma]

xxvii) [Genus] [specific epithet] [subspecific epithet] [variety] [subvariety] [forma]
xxviii) [Genus] [specific epithet] [subspecific epithet] [variety] [subvariety] [subforma]
xxix)   [Genus] [specific epithet] [subspecific epithet] [variety] [forma] [subforma]
xxx)   [Genus] [specific epithet] [subspecific epithet] [subvariety] [forma] [subforma]
xxxi)   [Genus] [specific epithet] [variety] [subvariety] [forma] [subforma]
xxxii) [Genus] [specific epithet] [subspecific epithet] [variety] [subvariety] [forma] [subforma]

Status: verified 5 Feb 2003
Source: RD3/01, p. 2
Standing: partial – currently, the system supports items i), ii), iii), vii), and provides some support for v), ix), and xii).

[REQ-11] Scientific names are either accepted or not accepted

Description: the not accepted usage replaces the synonym designation and expands on it with unacceptability reasons.

Status: verified 5 Feb 2003
Source: none specified
Standing: new

[REQ-12] Not accepted scientific names must have one or more unacceptability reasons associated with a source

Description: the currently identified unacceptability reasons are:

i)   synonym
ii)   superfluous renaming
iii)   later homonym
iv)   rejected name
v)   pro parte synonym
vi)   invalidly published
vii)   misapplied
viii)   nomina anomala
ix)   nomina exclusa
x)   unpublished
xi)   cultivated
xii)   orthographic variant
xiii)   database artifact
xiv)   other (see comments)

Status: verified 5 Feb 2003
Source: RD3/01, p. 7; Mark2/03
Standing: new

[REQ-133] Each "other (see comments)" value from [REQ-12] must have a public comment and may have an internal comment

Status: verified 12 Aug 03
Source: Mtg8/03
Standing: new

[REQ-111] Each scientific name could have a internal comment about its usage

Description: this comment is used internally as a reminder for previous assessment of nomenclature, etc.

Status: verified 12 Aug 03
Source: Mtg8/03
Standing: new

[REQ-132] Each scientific name could have a public comment about its usage

Status: verified 12 Aug 03
Source: Mtg8/03
Standing: new

[REQ-13] Each not accepted scientific name should be associated with one or more accepted scientific name(s)

Description: Nomina anomala and Nomina exclusa names do not require an accepted scientific name.

Status: verified 5 Feb 2003
Source: none specified
Standing: new

[REQ-14] A scientific name can be taxonomically questionable

Description: A taxon may be biologically questionable and indistinct from another taxon.

Status: verified 5 Feb 2003
Source: ER3/02
Standing: new

[REQ-53] A published hybrid scientific name should have a parent formula

Description: the parents are expressed in the form of taxon 'a' × taxon 'b', e.g. [*canadense × grayi*] for *Lilium ×pseudograyi* Grove (pro sp.).

Status: verified 5 Feb 2003
Source: ER3/02
Standing: existing

[REQ-131] A scientific name must be documented with a source

Description: this can be a technical reference or taxonomic database or other source described in section 7.

Status: verified 12 Aug 2003

Source: ED3/02
Standing: partial – supported but not required

[REQ-134] A scientific name must have a data provider

Description: an example of this could be BONAP, NPDC, Stotler, etc.

Status: verified 12 Aug 2003
Source: Mtg8/03
Standing: new

[REQ-135] A scientific name could be documented with a comment regarding its inclusion in PLANTS

Description: reason added or realignment (lumps, splits, etc.).

Status: verified 12 Aug 2003
Source: Mtg8/03
Standing: new

[REQ-48] A scientific name can have a source that is the original description

Status: verified 6 Feb 2003
Source: ED3/02
Standing: new

3.2. Common Names

[REQ-15] Each scientific name can have multiple common names

Status: verified 5 Feb 2003
Source: RD3/01, p. 5
Standing: partial – the PLANTS system does have multiple common names for a plant, but the structure limits accessibility to the multiple names.

[REQ-16] Each common name remains with its scientific name

Status: verified 5 Feb 2003
Source: none specified
Standing: new

[REQ-18] Each common name must be documented with a source

Description: All existing common names will be assigned to the source "PLANTS 200*X*".

Status: verified 5 Feb 2003
Source: RD3/01, p. 4

Standing: new

[REQ-19] Each common name should have one or more designated languages

Description: the list of languages should be derived from the ISO 639-2 standard maintained at http://www.loc.gov/standards/iso639-2/. If the language is not in the ISO 639-2 standard, the language will be designated with the standard's "local use" codes defined as "qaa" to "qtz".

Status: verified 5 Feb 2003
Source: RD3/01, p. 4
Standing: new

[REQ-20] Each common name can be in a non-English language, and should be supported in that language, including diacritical marks

Description: The supported languages are: Carolinian, Chamorro, Chuukese, English, French, Kapingamarangi, Kosraean, Marshallese, Mokilese, Mortlockese, Namonuito, Ngatic Men's Circle, Nukuoro, Paafang, Palauan, Pingelapese, Pohnpeian, Puluwatese, Rotanese Chamorro, Samoan, Satawalese, Sonsorol, Spanish, Tanapag, Tobian, Ulithian, Woleaian, and Yapese.

TBD: determine if the language support needs to go beyond Western European character sets.

Status: verified 5 Feb 2003
Source: RD3/01, p. 4; Diacriticals2/03
Standing: new

[REQ-21] Each common name should be associated with a geographical entity

Description: the geographical component can be national, state, Pacific Island or Island group, or other level for example.

Status: verified 5 Feb 2003
Source: RD3/01, p. 4
Standing: new

[REQ-17] Each scientific name with more than one common name must have one designated as the default common name. This is the PLANTS preferred common name

Status: verified 5 Feb 2003
Source: RD3/01, p. 4
Standing: new

[REQ-22] Each scientific name associated with a geographical entity with more than one common name should have a preferred common name for that geographical entity

Status: verified 5 Feb 2003
Source: RD3/01, p. 4
Standing: new

[REQ-23] Each combination of scientific name, geographic entity, and language can have multiple common names

Status: verified 5 Feb 2003
Source: RD3/01, p. 4
Standing: new

[REQ-25] Each common name can be associated with a specific status and geopolitical unit

Description: the status may include wetlands, threatened and endangered, federal and state noxious status, and others.

Status: verified 5 Feb 2003
Source: RD3/01, p. 4
Standing: current

3.3. Other Names

Other names include hybrid formulae, cultivars, crops, unknown plants such as "Tree" and "Bare ground", obsolete names, unpublished names, and other designations that are used but not valid published names. The latter includes items like "*Gastroboletus* #7515". These are summarized in the table below:

Unpublished Name	Published Scientific Name	Common Name	Symbol (maximum 8 characters)
Hybrid formulae	No	Yes	"3" + first letter of each part up to 6 name parts + tiebreaker
Cultivars	Yes	Yes	No
Crops	Yes	Yes	No
Unknowns	No	Yes	"2" + up to 4 characters from name
Unpublished/Unnamed plants	No	No	"4" + first 5 characters + tie breaker

[REQ-136] 'Other Names' can be included in the hierarchy

Status: verified 12 Aug 2003
Source: Mtg8/03
Standing: new

[REQ-27] PLANTS must support hybrid formulae as names

Description: when the hybrid is unpublished, the hybrid formula becomes the name.

Status: verified 12 Aug 2003
Source: Mtg2/03
Standing: new

[REQ-107] PLANTS must support cultivar names

Status: verified 12 Aug 2003
Source: Mtg2/03
Standing: new

[REQ-108] PLANTS must support crop names

Status: verified 12 Aug 2003
Source: Mtg2/03
Standing: new
Action: Paula will review earlier information on crops she has collected during the final modeling.

[REQ-109] PLANTS must support unknown names

Status: verified 12 Aug 2003
Source: Mtg2/03
Standing: new

[REQ-110] PLANTS must support other unpublished names

Description: this would include obsolete names and other name designations.

Status: verified 12 Aug 2003
Source: Mtg2/03
Standing: new

4. Attributes

[REQ-28] Attributes can be associated with any name/taxon in the database

Description: note that this does include common names and unpublished format names

Status: verified 6 Feb 2003
Source: RD3/01, p. 7
Standing: new
Action: Paula will investigate issues of supporting both taxon-based data and name-based data in the same system.

[REQ-29] Attributes for a name should be documented with a source

Status: verified 6 Feb 2003
Source: RD3/01, p. 9
Standing: new

[REQ-30] Attributes for a name can be associated with one or more geographic entries

Description: nativity is one example of an attribute associated with a geographic entity.

Status: verified 6 Feb 2003
Source: RD3/01, p. 6
Standing: new

[REQ-31] Attributes stay with their scientific name (can be synonym or accepted name)

Description: We maintain most attributes with our accepted names, and maintain the common names, legal status, and photos for all names including synonyms. All attributes can be associated with synonyms, but aside from the three attributes mentioned (common names, legal status, photos), they would have to be recorded with the accepted name to be actively used.

Status: verified 6 Feb 2003
Source: none specified
Standing: new

[Rule-1]: Incoming data stays with the name with which it is associated

4.1 Characteristics

As noted in section 2, General Requirements, [REQ-98], plant characteristics associated with the VegSpec tool are managed in the Plants database described in this document.

[REQ-66] A scientific name can have an indicator that identifies it as a VegSpec plant for reporting PLANTS characteristics.

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-102] A scientific name can have numerous characteristics traditionally associated with the VegSpec tool

Description: The characteristics currently associated with VegSpec are:

Characteristic	Current column name
Plant cultivar name	PLNT_CLTVR_NM
Is the plant known to be an allelopath	ALEPTH_IND
Relative tolerance of anaerobic conditions of the growth medium	ANERB_TOLR_CD
Relative potential to cause bloat in livestock	BLOAT_POT_CD
Seasonal period in the U.S. does the plant bloom the most	BLOOM_PRD_CD
Relative tolerance of calcium carbonate in the growth medium	CACO3_TOLR_CD
Carbon to nitrogen ratio	C_N_RATIO_CD
Is the plant suitable for the Christmas tree market	XMAS_TREE_SUIT_IND
Does this plant require cold stratification for seed germination	COLD_STRAT_IND
New growth response from coppicing	COPPICE_POT_IND
Relative tolerance to drought conditions compared to other plants in the same region	DRGHT_TOLR_CD
Conspicuous in the fall due to leaf or fruit characteristics	FALL_CSPC_IND
Relative fertility requirements needed for growth	FERT_RQMT_CD
Resistance to burning	FIRE_RESIST_IND
Relative tolerance to fire	FIRE_TOLR_CD
Predominant color of the plant's flower	FLWR_COLOR_CD
Is the flower conspicuous	FLWR_CSPC_IND
Is the plant known to be utilized as fodder material	FODDR_SUIT_IND
Predominant color of the foliage	FOLG_COLOR_CD
How porous is the foliage during the summer months	FOLG_PRSTY_SUMR_CD
How porous is the foliage during the winter months	FOLG_PRSTY_WNTR_CD
General texture of foliage	FOLG_TXT_CD
Minimum number of frost-free days required for growth	FROST_FREE_DAY_MIN
Does the plant have a berry, nut, or seed that would lend itself to being a commercial product	FRUT_BODY_SUIT_IND
Relative abundance of seed produced	FRUT_SEED_ABUND_CD
Predominant and conspicuous color of the fruit or seed	FRUT_SEED_COLOR_CD
Are the fruit or seed conspicuous	FRUT_SEED_CSPC_IND
Season in which the majority of fruiting or seed production ends	FRUT_SEED_END_CD
Are the fruit or seed generally recognized as being persistent	FRUT_SEED_PRST_IND
Season in which the majority of fruiting or seed production begins	FRUT_SEED_START_CD
Relative suitability of this plant for producing fuelwood	FUEL_WOOD_SUIT_CD
Does grass have a low growing point	GRAS_LOW_GRW_IND
How does the plant grow on the landscape	GRWTH_FORM_CD
<Is this being used?>	GRWTH_HABIT_CD
Seasonal period for the most active growth	GRWTH_PRD_ACTV_CD
Growth rate relative to other plant species	GRWTH_RATE_CD
Tolerance to hedging by livestock or wildlife	HEDG_TOLR_CD
Height at maturity in feet	HT_AT_MTRTY
Maximum height at 20 years in feet	HT_MAX_BASE_AGE
Does the plant retain its leaves	LEAF_RETNT_IND
Lifespan relative to most other plants	LFSPN_CD
Is the plant suitable for producing lumber products	LMBR_SUIT_IND
Relative moisture requirements for growth	MOIST_USE_CD
Is the plant suitable for producing naval store products	NAVL_STOR_SUIT_IND
Amount of nitrogen fixed relative to other species	N_FIX_POT_CD
Is this plant known to be suitable for nursery stock	NURS_STK_SUIT_IND
Are parts of this plant known to be palatable to humans	PALAT_HUMAN_IND
Relative palatability to browsing animals	PALAT_ANIML_BRS_CD
Relative palatability to grazing animals	PALAT_ANIML_GRZ_CD
<Is this being used?>	PLNT_CLTVR_SEL_IND
Recommended maximum number of individuals to plant per acre	PLNT_DEN_HIGH

Characteristic	Current column name
Recommended minimum number of individuals to plant per acre	PLNT_DEN_LOW
Is this plant suitable for veneer production	PLYWD_VNR_SUIT_IND
Is this plant recommended for producing post products	POST_SUIT_IND
Maximum precipitation in inches tolerated for good growth	PRECIP_TOLR_MAX
Minimum precipitation in inches required for good growth	PRECIP_TOLR_MIN
Can the plant be propagated as a bare root product	PRPG_BARE_ROOT_IND
Can the plant be propagated as bulbs	PRPG_BULB_IND
Can the plant be propagated as corms	PRPG_CORM_IND
Can the plant be propagated as cuttings	PRPG_CUT_IND
Can the plant be propagated by seed	PRPG_SEED_IND
Can the plant be propagated as sod	PRPG_SOD_IND
Can the plant be propagated by sprigs	PRPG_SPRIG_IND
Can the plant be propagated by tubers	PRPG_TUBR_IND
Can the plant be propagated in containers	PRPG_CTNR_IND
Potential as a protein producer	PROTEIN_POT_CD
Is this plant suitable for pulpwood production	PLPWD_SUIT_IND
Relative rate of regrowth after harvesting	RGRWTH_RATE_CD
<Is this being used?>	RSPRT_ABLE_IND
Minimum depth in inches of soil required for good growth	ROOT_DPTH_MIN
Tolerance to saline soil conditions	SLIN_TOLR_CD
Relative capability to spread through seed production	SEED_SPRD_RATE_CD
Relative vigor in seedling stage	SEEDLING_VGOR_CD
Number of seeds per pound in an average seed lot	SEED_PER_LB
Relative tolerance to grow in shade conditions	SHADE_TOLR_CD
Is this plant's propagule a small grain	SM_GRAIN_IND
Can this plant establish and grow in coarse textured soils	SOIL_ADP_C_TXT_IND
Can this plant establish and grow in fine textured soils	SOIL_ADP_F_TXT_IND
Can this plant establish and grow in medium textured soils	SOIL_ADP_M_TXT_IND
Maximum pH under which this plant can maintain good growth	SOIL_PH_TOLR_MAX
Minimum pH under which this plant can maintain good growth	SOIL_PH_TOLR_MIN
Minimum temperature in degrees F under which the plant will survive	TEMP_TOLR_MIN
Relative toxicity to livestock	TOX_CD
Relative rate of vegetative spread	VEG_SPRD_RATE_CD
Availability of plant propagules in the commercial marketplace	VS_COMM_AVAIL
Seeding/planting dates	ESTB_SEED_PLANT.REC_PLNT_MAT

Status: unverified 27 Feb 2003
Source: Mtg2/03
Standing: new

[REQ-103] Characteristics can be associated with a geographic entity

Status: verified 12 Aug 2003
Source: Mtg2/03; Hidden2/03
Standing: new

4.2. Culturally Significant

[REQ-63] A scientific name could represent a plant that is culturally significant

Status: verified 6 Feb 2003
Source: none specified
Standing: current

4.3. Duration

[REQ-32] Each scientific name at the species level or lower should have one or more duration values

Status: verified 6 Feb 2003
Source: RD3/01, p. 6
Standing: current

[REQ-33] Duration has a finite set of values

Description: the duration values, identified on 30 May 2000, are:

Duration Code in PLANTS	Duration FGDC
AN	Annual
BI	Biennial
PR	Perennial
UN	Unknown

Status: verified 6 Feb 2003
Source: RD3/01, p. 6
Standing: current

4.4. Group

The group attribute replaces the category attribute in the FAMILY table and may include new values. A group is defined as an informal subdivision by major plant taxonomic category/group.

[REQ-34] Each scientific name at the genus level or lower must belong to a group. Other levels can belong to a group

Description: the group replaces category in the current PLANTS system.

Status: verified 6 Feb 2003
Source: RD3/01, p. 6
Standing: new

[REQ-80] Group has a finite set of values

Description: the groups currently in the PLANTS category table are:

Code	Group
DI	Dicot
FN	Fern
GY	Gymnosperm
HN	Hornwort
HS	Horsetail
LC	Lichen
LV	Liverwort
LY	Lycopod
MO	Monocot
MS	Moss
PS	Psilophyte
QU	Quillwort

Status: verified 6 Feb 2003

Source: RD3/01, p. 6
Standing: current

4.5. Growth Habit

[REQ-35] Each accepted scientific name at the species level or lower must have one or more growth habits

Status: verified 6 Feb 2003
Source: RD3/01, p. 6
Standing: partial – currently, the system supports three growth habits for each accepted name, which is inadequate in some cases. There may be four growth habits, and possibly more, associated with each scientific name.

[REQ-36] Growth habit has a finite set of values

Description: the growth habits, identified on 30 May 2000, are:

Growth Habit Code in PLANTS (new)	PLANTS description (new)
FB	Forb/herb
GR	Graminoid
LC	Lichen
LI	Liana
NP	Nonvascular
SH	Shrub
SS	Subshrub
TR	Tree
UN	Unknown
VI	Vine

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-96] One of the growth habits in the list above can be designated as the dominant growth habit

Description: For the VegSpec plants, the dominant exists in data field "grwhabt1"

Status: verified 6 Feb 2003
Source: Mtg2/03
Standing: new

4.6. Growth Habit Modifier

[REQ-37] Each plant growth habit can have one or more growth habit modifiers

Description: the growth habit modifiers, identified on 30 May 2000, are:

Modifier Code in PLANTS (new)	PLANTS description (new)
BL	Broad-leaved
BG	Bunch grass
CS	Caespitose
CB	Climbing
CO	Conical-crowned
CG	Creeping
CR	Crustose
CP	Cushion plant
CY	Cylindrical-crowned
DE	Deciduous
DT	Decumbent
DD	Drought-deciduous
EP	Epiphyte
ER	Erect
EV	Evergreen
FD	Facultatively deciduous
FO	Foliose
FR	Fruticose
HS	Hemi-sclerophyllous
HY	Hygromorphous herbs
IR	Irregular
KR	Krummholz
LF	Low forb
MT	Matted
MP	Microphyllous
MU	Multi-stem
NL	Needle-leaved
OV	Oval
PR	Prostrate
PM	Pulvinate mosses
RH	Rhizomatous
RL	Rosulate
RO	Rounded-crowned
SL	Scale-leaved
SP	Sclerophyllous
SE	Semi-erect
SC	Single crown
SI	Single stem
SG	Sod grass
SN	Stoloniferous
ST	Succulent
SF	Suffruticose
TF	Tall forb
TT	Tuft-tree
TS	Tussock
UM	Umbellate crown
UR	Umbrella crown
VS	Vase
WP	Woody plant

Status: verified 6 Feb 2003
Source: RD3/01, p. 6
Standing: new

[REQ-38] Certain growth habit modifiers only apply to certain growth habits

Description: these limitations have not been identified.

Status: verified 6 Feb 2003
Source: RD3/01, p. 6
Standing: new

4.7. Invasive

[REQ-78] A scientific name can represent a plant that is considered to be invasive

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-79] A scientific name can represent a plant that is considered to be invasive in one or more sources

Status: verified 6 Feb 2003
Source: none specified
Standing: current

4.8. ITIS Taxonomic Serial Numbers (TSNs)

[REQ-10] ITIS Taxonomic Serial Numbers (TSNs) will be associated with every scientific name in PLANTS

Status: verified 5 Feb 2003
Source: RD3/01, p. 2
Standing: new

[REQ-95] PLANTS will be as compatible as possible with ITIS

Status: verified 5 Feb 2003
Source: Mtg2/03
Standing: new

4.9. Links

There are several other accounts of species and other plant related information on the PLANTS web site and elsewhere on the Web.

[REQ-100] Plant guides and fact sheets can be characterized by topic

Description: Currently done for culturally significant. Could be expanded to wetlands, invasives, etc.

Status: verified 7 Feb 2003
Source: Mtg2/03
Standing: new

[REQ-64] A scientific name can have a fact sheet available on the PLANTS web site

Description: this could be in either PDF or DOC format.

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-65] A scientific name can have a plant guide sheet available on the PLANTS web site

Description: this could be in either PDF or DOC format.

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-97] A scientific name can have a Plant Materials publication available from the PLANTS web site.

Description: We will store the PM pub documents in the PLANTS database as PDF.

Status: verified 6 Feb 2003
Source: Mtg2/03
Standing: new

[REQ-70] PLANTS must support external links in Universal Resource Identifier (URI) format

Description: URIs are a superset of Uniform Resource Locators (URLs) and include provisions for passing parameters to a web server. Strictly speaking, http://plants.usda.gov/index.html is a URL, and http://plants.usda.gov/cgi_bin/plant_profile.cgi?symbol=GLORI is a URI.

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-71] Links can be categorized in an hierarchy

Description: some links are of interest to the PLANTS user community, but are not necessarily associated with an individual plant. These are the likely candidates for categorization.

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-72] NPDC data developers may modify Link categories

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-40] A scientific name can have Universal Resource Identifiers (URIs) that associate it with another web site

Description: there can be cases where a web site will have multiple URIs associated with a single name. See the Native Plants Network propagation protocols linked off the current PLANTS profile for one example of this.

Status: verified 6 Feb 2003
Source: none specified
Standing: current

4.10. Noxious

[REQ-73] A scientific name can represent a plant that is considered to be noxious at the federal level

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-74] A scientific name can represent a plant that is considered to be noxious in one or more state level geographic entities in the United States

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-99] Each scientific name with a state level noxious status can have one or more associated common names for that state

Status: verified 6 Feb 2003
Source: Mtg2/03
Standing: new

[REQ-75] Each state level geographic entity in the United States can have one or more sources associated with noxious plants

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-77] Each state level geographic entity in the United States has a finite set of values for denoting the noxious status of a plant

Description: each state has its own set of status values.

Code	Description	States
ADW	"A" designated weed	OR
AW	A list (noxious weeds)	CA
BDW	"B" designated weed	OR
BW	B list (noxious weeds)	CA
CAT1	Category 1 noxious weed	MT
CAT2	Category 2 noxious weed	MT
CAT3	Category 3 noxious weed	MT
CAW	Class A noxious weed	NC, NM, WA
CBW	Class B noxious weed	NC, NM, WA
CCW	Class C noxious weed	NM, WA
CW	C list (noxious weeds)	CA
NPQ	Noxious Plant Quarantine	WA
NUW	Nuisance weed	WI
NW	Noxious weed	CO, DE, FL, HI, ID, IL, IN, KS, KY, LA, MA, MD, MO, ND, NE, NV, OK, PA, SC, SD, TN, UT, VA, WI, WV, WY
PAP1	Prohibited aquatic plant, Class 1	FL
PAP2	Prohibited aquatic plant, Class 2	FL
PNW	Prohibited noxious weed	AZ, OH
PRNW	Primary noxious weed	IA, MN
QNW	Quarantined noxious weed	OR
QW	Q list (temporary "A" list noxious weed, pending final determination)	CA
RGNW	Regulated noxious weeds	AZ
RNPS	Regulated non-native plant species	SD
RNW	Restricted noxious weed	AZ
SNW	Secondary noxious weed	IA, MN
WAWQ	Wetland and Aquatic Weed Quarantine	WA

Status: verified 6 Feb 2003
Source: none specified
Standing: current

[REQ-76] Each state level geographic entities in the United States can have one or more Universal Resource Identifiers URIs associated with noxious plants

Status: verified 6 Feb 2003
Source: none specified
Standing: current

4.11. Nativity

[REQ-55] For each geographic entity, a name can have a nativity

Status: verified 6 Feb 2003
Source: ER3/02
Standing: partial – PLANTS recognizes nativity at the US level only. Plan to add state level nativity for some plants.

[REQ-56] Nativity has a finite set of values

Description: currently, these values are:

Nativity Code in PLANTS	PLANTS description
IN	Introduced
I?	Possibly Introduced
NA	Native
NI	Native and Introduced
N?	Possibly Native
UN	Unknown Origin
XU	Cultivated or not in this geographic entity

Status: verified 6 Feb 2003
Source: ER3/02
Standing: current

4.12. Poisonous

[REQ-101] A scientific name represents a plant that can be poisonous

Status: verified 7 Feb 2003
Source: Mtg2/03
Standing: new

[REQ-127] A plant can cause different types of poisoning

Description: Some examples are cyanide, nitrate, alkaloid poisoning, etc.

Status: verified 12 Aug 2003
Source: PoisonDb3/03
Standing: new

[REQ-128] A plant can have poisons that affect many different bodily systems

Description: Examples include poisons that affect skin, blood, mammary glands, the cardiovascular system, the digestive system, the nervous system, the musculoskeletal system, respiration, reproduction, and cause photosensitivity or kidney failure.

Status: verified 12 Aug 2003
Source: PoisonDb3/03
Standing: new

[REQ-129] A plant's toxicity must be documented with a source

Status: verified 12 Aug 2003
Source: PoisonDb3/03
Standing: new

[REQ-130] A plant can have poisons that affect humans and other animals

Description: Other animals include, but are not limited to livestock, cattle, sheep, horses, goats, pigs, rabbits, poultry, ostriches, deer, dogs, and/or ruminants.

Status: verified 12 Aug 2003
Source: PoisonDb3/03
Standing: new

4.13. Symbol

Symbols are associated with many names. Symbols are created for most scientific names, hybrid formulae, unknown plants, and unpublished or unnamed plants. Symbols are not created for common names, cultivars, or crops.

[REQ-39] Each scientific name at the family level and below must have a unique symbol

Description: For generic level scientific names, the symbol is the first five characters of the genus name. For family level scientific names, the symbol is the first six characters of the family name. If this does not result in a unique symbol, a numeric tiebreaker, starting with the digit "2", will be appended to the basic symbol

For names with more than one term (i.e., species and below), the symbol is the first two characters of the genus, the first two characters of the species, and the first character of the terminal infraspecific name, if any. If this does not result in a unique symbol, a numeric tiebreaker, starting with the digit "2" will be appended to the basic symbol.

This follows the Garrison-Skovlin-Poulton system.

Status: verified 6 Feb 2003
Source: RD3/01, p. 2
Standing: partial – currently, family symbols are unique among families, but are duplicated in the multiple term symbols.
Action: Generate new family symbols by using first 6 characters + tiebreaker.

[REQ-104] Each hybrid formulae must have a unique symbol

Description: The symbol for a hybrid formula is the digit "3" followed by the first letter of each name that makes up the hybrid formulae up to four characters, e.g "3ERPS" for "*Elytrigia repens* × *Pseudoroegnania spicata*", and "3SPSRR" for "*Salix purpurea* × *Salix repens* ssp. *rosmarinifolia*". If this does not result in a unique symbol, a numeric tiebreaker, starting with the digit "2" will be appended to the basic symbol.

Status: verified 12 Aug 2003
Source: Mtg2/03
Standing: new – There are a few hybrid formulae with reserved symbols from PEAS that do not follow this symbol requirement. If resurrected, these formulae will need new symbols and their currently reserved symbols retired.

[REQ-105] Each unknown plant must have a unique symbol

Description: The symbol for unknown plants is the digit "2" followed by up to four characters from the unknown plant's name, e.g. "2TREE" for "Tree", and "2AG" for "Alga, Green". If this does not result in a unique symbol, a numeric tiebreaker, starting with the digit "2" will be appended to the basic symbol.

Data maintainers manually specify the basic symbol (i.e., without a tiebreaker) of an unknown plant name rather than using the symbol generator. The symbol generator will determine the uniqueness of the basic symbol and recommend any tiebreaker required.

Status: verified 12 Aug 2003
Source: Mtg2/03
Standing: current – the unknown symbols need to be incorporated into the symbol generator.

[REQ-106] Each unpublished, or unnamed, plant name must have a unique symbol

Description: The symbol for unpublished or unnamed plants is the digit "4" followed by the first five characters of the name, e.g "4GASTR" for "*Gastroboletus* #7515. If this does not result in a unique symbol, a numeric tiebreaker, starting with the digit "2" will be appended to the basic symbol.

Status: verified 12 Aug 2003
Source: Mtg2/03
Standing: new – There are a few unpublished/unnamed plant names with reserved symbols that do not follow this symbol requirement. These names will need new symbols and their currently reserved symbols retired.

4.14. Threatened and Endangered

[REQ-41] Each scientific name can have Federal Threatened and Endangered status

Description: the status does not include candidate or proposed taxa.

Status: verified 6 Feb 2003

Source: RD3/01, p. 7
Standing: current

[REQ-62] Federal Threatened and Endangered status has a finite set of values

Description: currently these values are:

Federal T&E Code in PLANTS	PLANTS description
E	Endangered
T	Threatened

Status: verified 6 Feb 2003
Source: ED3/02
Standing: Current

[REQ-42] Each scientific name can have one or more Threatened and Endangered status values associated with a state

Description: conceptually, the threatened and endangered data requirements are similar to the state noxious plant list data requirements.

Status: verified 6 Feb 2003
Source: TE5/1
Standing: new

[REQ-94] Each state level geographic entity in the United States has a finite set of values for denoting the threatened status of a plant

Description: each state has its own set of status values.

Code	Description	States
CE	Commercially Exploited	FL, TN
CY	Protected as a Cactus, Yucca, or Christmas tree	NV
E	Endangered	AR, CA, CT, FL, GA, IA, IL, IN, KY, MA, MD, ME, MI, MN, MO, NC, NE, NH, NJ, NM, NY, OH, OR, PA, PR, RI, TN, TX, VA, VT, WA, WI
EV	Exploitably Vulnerable	NY
FP	Fully Protected	NV
H	Historical	KY, RI
HR	Harvest Restricted	AZ
HS	Highly Safeguarded	AZ
PE	Proposed Endangered	TN
PREX	Probably Extirpated	MI
PRX	Presumed Extirpated	OH
PX	Possibly Extirpated	ME, TN, WA
R	Rare	CA, GA, IN, NY, PA
RI	Reintroduced	IN
S	Sensitive	WA
SA	Salvage Assessed	AZ
SC	Special Concern	CT, KY, MA, ME, NC, TN
SR	Salvage restricted	AZ
T	Threatened	AR, CA, CT, FL, GA, IA, IL, IN, KY, MA, MD, ME, MI, MN, NC, NE, NH, NY, OH, OR, PA, TN, TX, VT, WA, WI
U	Unusual	GA
V	Vulnerable	PA
WL	Watch list	IN
X	Extirpated	IN, MD, PA, TN

Status: verified 6 Feb 2003
Source: TE5/1
Standing: new

[REQ-92] Each state level Threatened and Endangered status value is available in one or more publications associated with that state

Description: besides the usual publication attributes, a threatened and endangered publication has a state and a URL.

Status: verified 6 Feb 2003
Source: TE5/1
Standing: new

[REQ-93] Each scientific name with a state level Threatened and Endangered status can have one or more associated common names for that state

Status: verified 6 Feb 2003
Source: TE5/1
Standing: new

4.15. Wetlands

[REQ-57] Each scientific name at the species level or lower can have Federal Wetlands status

Status: verified 6 Feb 2003
Source: none specified
Standing: Current

[REQ-58] Each name with Federal Wetland status must have a national status

Status: verified 6 Feb 2003
Source: none specified
Standing: Current

[REQ-59] Each name with Federal Wetland status must have a wetland status for each region

Description: there are thirteen wetland regions in the United States and its territories.

Status: verified 6 Feb 2003
Source: none specified
Standing: Current

[REQ-60] Federal Wetland status has a finite set of values

Description: these values are:

Federal Wetland Code in PLANTS	PLANTS description
OBL	Obligate Wetland
FACW	Facultative Wetland
FAC	Facultative
FACU	Facultative Upland
UPL	Obligate Upland
NO	Does not occur in that region
NA	No agreement
NI	No indicator

Status: verified 6 Feb 2003
Source: none specified
Standing: Current

[REQ-61] Each Federal Wetland status can have a modifier

Description: the modifier values are:

Federal Wetland Code modifier in PLANTS	PLANTS description
+	Tends toward the upper frequency bound
-	Tends toward the lower frequency bound
?	Possibly
*	Tentatively

Status: verified 6 Feb 2003
Source: ED3/02
Standing: Current

5. Distribution

[REQ-43] A name and a specified attribute can be associated with one, or more geographic entities

Description: Currently specified attributes include nativity, wetlands, noxious, and T&E.

Status: verified 6 Feb 2003
Source: RD3/01, p. 5
Standing: partial – in the current PLANTS system, currently accepted names can be associated with a geographic entry.

[REQ-44] Geographic entries can be based on geo-political entities, represented by FIPS codes

Status: verified 6 Feb 2003
Source: RD3/01, p. 5
Standing: current
Action: Paula to check with Dave Butler on web farm master reference tables. There are state, county, and possible congressional district information in the web farm. Contact Kevin Willey from more information.

[REQ-45] Geographic entries can be based on non geo-political entities, like individual Pacific islands, or concepts like "Great Plains"

Status: verified 6 Feb 2003
Source: RD3/01, p. 5
Standing: new

[REQ-46] A plant may be indicated as extirpated in a particular geographic or geopolitical entity.

Status: verified 6 Feb 2003
Source: RD3/01, p. 5
Standing: new

6. Images

[REQ-81] Each name can have one or more images

Status: verified 6 Feb 2003
Source: Photos5/02
Standing: current

[REQ-82] An image is a photo or a line image

Status: verified 6 Feb 2003
Source: Photos5/02
Standing: partial – photos are currently supported

[REQ-83] A photo should be attributed

Description: Attribution information includes copyright, photographer, photo date, and geographical location.

Status: verified 6 Feb 2003
Source: BN4/5
Standing: partial – the system supports copyright and photographer information

[REQ-84] A line image should be attributed to its source

Description: Line images can come from published works such as books and periodical articles. The system should record this citation.

Status: verified 6 Feb 2003
Source: BN4/5
Standing: new

[REQ-90] A name can have a preferred image

Description: When there are both line drawings and photos, a line drawing is the preferred image.

Status: verified 6 Feb 2003
Source: Photos5/02
Standing: new

[REQ-85] An image can be associated with various habitats like wetlands, rangelands, forestlands, or depicting invasive characteristics, or depicting use

Description: An image may be particularly well suited for activities such as invasive plant identification or depict a plant in a wetland environment, or used for making a basket, cover crop, etc.

Status: verified 6 Feb 2003
Source: BN4/5
Standing: new

[REQ-86] An image can have descriptive attributes for growth stage

Description: An image may depict a plant in seed, or dormant, or as a juvenile or mature plant, or any of a number of different values.

Status: verified 6 Feb 2003
Source: BN4/5
Standing: new

[REQ-87] An image can have descriptive attributes for morphology

Description: The plant parts include: leaves, bark, stems, flower, auricle, floret, root, etc.

Status: verified 6 Feb 2003
Source: none specified
Standing: new

[REQ-89] Images can be stored in different sizes, resolutions, and image formats

Description: Identified image formats are JPG and TIFF.

Status: verified 6 Feb 2003
Source: Photos5/02
Standing: new

[REQ-91] Images have naming conventions

Description: The image name, (which can be used as the image file name), follows a specific naming convention. This convention is a concatenation of the following fields in lowercase characters:

Symbol	This may be an accepted name's symbol or a synonym name's symbol
Underscore	"_"
Tie breaker	Unique, three-digit sequential number (starting with 001) for this symbol
Underscore	"_"
Image Size	General class of image size: "t" – thumbnail; "s" standard; "l" – large; "p" – publication; "a" archive
Orientation	Image's orientation, values: "v" – vertical; "h" – horizontal
Type	Image type, values: "p" – photo; "d" – line drawing

Status: verified 7 Feb 2003
Source: Photos10/02
Standing: new

7. Sources

[REQ-47] The system must support documentation in the form of books, journal articles, chapters or book sections, edited books, manuscripts, reports, theses, conference proceedings, presentations, databases, websites, gray literature, specimens, and personal communication

Status: verified 12 Aug 2003
Source: RD3/01, p. 8; Peet5/03
Standing: partial – the PLANTS system supports books and articles, but does not handle the other sources well.

[REQ-112] Each source can have multiple authors and editors

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

[REQ-113] Each source can have a title, a short name, and additional information such as a comment

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

[REQ-114] Each source can be related to another source
Description: A manuscript can be for a book, and a book or article may have a related website.

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

7.1. Published Print Sources – books, articles, chapters, reports, theses, conference proceedings

[REQ-115] Each printed source can have a publisher, publication place, and a publication date

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

[REQ-116] Each source contained within another source can have a superior title

Description: Sources contained in another source includes articles, chapters/sections and conference presentations.

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

7.2. Books

[REQ-117] Each book can have a total number of pages, an ISBN, an edition and a number of volumes

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

7.3. Journal Articles

[REQ-118] Each journal article can have a volume number, an issue number, and a range of pages that it appears in a journal

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

[REQ-119] Each journal article must have a journal name

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

[REQ-120] Each journal can have an ISSN and a standard B-P-H abbreviation

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: partial – the system currently supports an ISSN.

7.4. Chapters and Sections

[REQ-121] A chapter or section can have a chapter or section number

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

7.5. Theses

[REQ-122] Each thesis can have a degree that the thesis satisfies

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

7.6. Conference Proceedings

[REQ-123] Each conference can have a conference date

Status: unverified 11 Jun 2003
Source: Peet5/03
Standing: current
Action: Review during modeling for compatibility with Peet's system – Paula H.

7.7. Personal Communications

[REQ-124] Each personal communication can have a type such as conversation, email, letter, memo, or transcript

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

7.8. Electronic Sources – websites, databases

[REQ-125] Each electronic source should have an access date

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

[REQ-126] Each website must have a URL

Status: verified 12 Aug 2003
Source: Peet5/03
Standing: current

7.9. Specimens

[REQ-50] Each scientific name can have one or more specimens

Status: verified 7 Feb 2003
Source: ER3/02
Standing: current

[REQ-49] Each specimen can have a field collector number

Description: this is a "Plant collector's sequential number from herbarium sheets or field notebooks." It is a seven character alphanumeric field.

Status: verified 7 Feb 2003
Source: RD3/01, p. 6
Standing: new

[REQ-51] Each specimen is from an herbarium

Status: verified 7 Feb 2003
Source: ER3/02
Standing: current

[REQ-52] An herbarium has an acronym, location, and name

Description: DU has choice list for herbariums.

Status: verified 7 Feb 200303
Source: ER3/02
Standing: new

8. Alternative Crops

An unpublished name could be an alternative crop. There are special associations with alternative crops.

[REQ-67] An alternative crop must be associated with a crop type

Status: verified 7 Feb 2003
Source: none specified
Standing: current

[REQ-68] Alternative crop types have a finite set of values that may be modified by NPDC data development staff

Description: the currently identified alternative crop types are:

CROP_TYPE	CROP_TYPE_DESCRIPTION
Biomass	Biomass, energy production
Fiber	Fiber crop
Forage	Forage
Fruit	Fruit crop
Grain	Grain legume for human consumption
Herb	Herb
Nut	Nut crop
Oil	Oil crop
Ornamental	Ornamental or flower crop, or floriculture
Root	Root
Seed Production	Seed production as a business
Timber	Timber crop
Vegetable	Vegetable crop
Other	Other uses, such as beverages, insecticide, etc.

Status: verified 7 Feb 2003
Source: none specified
Standing: current

[REQ-69] An alternative crop must be associated with a United States state level geographic entity

Status: verified 7 Feb 2003
Source: none specified
Standing: current

9. Potential Changes

There are a number of requirements that will potentially be supported in the future. Ones that have been identified to date are listed below.

9.1. Ecological Restoration Module

The system may be extended to include an ecological restoration module, including ethno-botanical information. (RD3/01, p. 10; verified 7 Feb 2003)

9.2. Multiple Classifications

The system should be flexible to accommodate a future requirement to implement multiple, or alternative classifications. This could happen if requested and funded. (RD3/01, p. 3; verified 7 Feb 2003)

9.3. New Attributes

The system may start supporting characteristics for various conservation practices, erosion prediction, and other uses. Some of these attributes may be associated with crops. (RD3/01, p. 4; verified 7 Feb 2003)

The system may in the future support plant suitability for backyard conservation, bioremediation, and other purposes (RD3/01, p. 8; verified 7 Feb 2003)

9.4. Standard Crop List

The system may support a standardized crop list (RD3/01, p. 8; verified 7 Feb 2003)

10 Deleted Requirements

[REQ-24] Each combination of scientific name, geographical entity, language and common name must have a source

[REQ-26] Each common name should have a status

[REQ-54] A scientific name can represent a plant that is economically important

[REQ-88] A scientific name can represent a plant that is considered to be invasive at the state level

11 Discarded Potential Changes

9.1. Agro-forestry Module

The system may be extended to include an agro-forestry module, including guides. (RD3/01, p. 10; discarded, verified 7 Feb 2003)

9.5. New Symbols

A new encoding scheme for symbols, based on the first three letters of the genus and species may be implemented (RD3/01, p. 1; discarded, verified 7 Feb 2003)