



## Conversion Guide

Version 2.0  
May 2014



**NatureServe**  
A Network Connecting Science With Conservation

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

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## Overview

Unlike the transitions between many previous major versions of our data management systems the process of converting from Biotics 4 to Biotics 5 is relatively straightforward. Summarized below, the principle tasks involved boil down to a few fundamental Biotics 4 administrative tasks (updating versions and cleaning up your data) and organizing and documenting the spatial data you will be using with Biotics 5.

### Tabular Data

| Responsibility | Task  |
|----------------|---|
| Member Program | <ul style="list-style-type: none"> <li>• Update Biotics to the most recent version</li> <li>• Run Quality Control Procedures</li> <li>• Clean up database (DBIC and other QC tasks)</li> <li>• Provide database to NatureServe</li> </ul> |
| NatureServe    | <ul style="list-style-type: none"> <li>• Migrate Oracle database</li> <li>• Update Oracle tables/views to accommodate changes</li> <li>• Run conversion scripts</li> </ul>  |

### Spatial Data

| Responsibility | Task  |
|----------------|---|
| Member Program | <ul style="list-style-type: none"> <li>• Provide managed layer shapefiles (EOs, MAs,...)</li> <li>• Prepare and provide layers for use in spatial calculations within SpatialCalculations geodatabase</li> <li>• Identify reference map layers needed</li> <li>• Confirm source and format of hosted map services</li> <li>• Prepare Map Document (.mxd) and geodatabase containing reference layers to be hosted by NatureServe</li> </ul> |
| NatureServe    | <ul style="list-style-type: none"> <li>• Import managed layer shapefiles into Oracle geodatabase</li> <li>• Publish spatial calculation map services</li> <li>• Configure reference map services</li> </ul>   |

The following sections provide step by step instructions for completing these tasks.

## Quality Control Procedures

### 1. Verify that no constraints are missing

Download [zip file](#) and follow instructions within the check\_constraint\_readme.doc.

### 2. Clean up Values in Reference Usefulness Fields

Some programs have values in the "usefulness rating" fields in Reference records other than the standard values Y (yes, useful), 1 (very), 2 (moderately), or 3 (not useful). Because of the unusual way these fields are linked to the domain table D\_REFERENCE\_USEFULNESS, we cannot convert nonstandard values such as T, U, 4, etc. Please run the following query in Tracker Query Builder to find References with nonstandard usefulness values.

- If the "Owner\_Code" column in the results contains your subnation's 2-letter code, either fix or null out the nonstandard usefulness values.
- If it does not contain your subnation code, please null out nonstandard usefulness values. Make sure you scroll all the way to the right to look in all the columns returned by the query. Contact the [Biotics 5 Help Desk](#) if you have questions.

**How to fix:** In Tracker the fields with nonstandard values will appear blank, but the data really is there and must be replaced with a value from the dropdown list. If you want to null out the "invisible" value, select the top row of the dropdown, which is blank, and save the record. After fixing the values, run the query again and verify to verify that they are gone.

```
SELECT reference_id, substr(reference_code, 9,2) as owner_code, usefulness_rating,
community_usefulness, terr_comm_usefulness, forest_usefulness, savanna_usefulness,
grassland_usefulness, shrubland_usefulness, desert_usefulness, alpine_usefulness,
other_terr_usefulness, aquatic_comm_usefulness, subterranean_usefulness, palustrine_usefulness,
lacustrine_usefulness, riverine_usefulness, estuarine_usefulness, marine_usefulness, flora_usefulness,
aquatic_flora_usefulness, terr_flora_usefulness, nonvasc_plant_usefulness, vasc_plant_usefulness,
fauna_usefulness, aquatic_fauna_usefulness, terr_fauna_usefulness, molluscs_usefulness,
insects_usefulness, crustacean_usefulness, other_arthropods_usefulness, other_invert_usefulness,
fishes_usefulness, amphibians_usefulness, reptiles_usefulness, birds_usefulness, mammals_usefulness,
phys_science_usefulness, physio_topo_usefulness, hydrology_usefulness, geology_usefulness,
soils_usefulness, climate_usefulness, microorganism_usefulness, site_info_usefulness,
biology_usefulness, ecology_usefulness, ecosys_function_usefulness, nat_diversity_usefulness,
inventory_usefulness, research_tech_usefulness, managed_areas_usefulness, mgmt_plans_usefulness,
mgmt_tech_usefulness, impact_studies_usefulness, protection_org_usefulness,
protection_tools_usefulness
FROM REFERENCE
WHERE usefulness_rating not in ('Y','1','2','3') or community_usefulness not in ('Y','1','2','3')
or terr_comm_usefulness not in ('Y','1','2','3') or forest_usefulness not in ('Y','1','2','3')
or savanna_usefulness not in ('Y','1','2','3') or grassland_usefulness not in ('Y','1','2','3')
or shrubland_usefulness not in ('Y','1','2','3') or desert_usefulness not in ('Y','1','2','3')
or alpine_usefulness not in ('Y','1','2','3') or other_terr_usefulness not in ('Y','1','2','3')
or aquatic_comm_usefulness not in ('Y','1','2','3') or subterranean_usefulness not in ('Y','1','2','3')
or palustrine_usefulness not in ('Y','1','2','3') or lacustrine_usefulness not in ('Y','1','2','3')
or riverine_usefulness not in ('Y','1','2','3') or estuarine_usefulness not in ('Y','1','2','3')
or marine_usefulness not in ('Y','1','2','3') or flora_usefulness not in ('Y','1','2','3')
or aquatic_flora_usefulness not in ('Y','1','2','3') or terr_flora_usefulness not in ('Y','1','2','3')
or nonvasc_plant_usefulness not in ('Y','1','2','3') or vasc_plant_usefulness not in ('Y','1','2','3')
or fauna_usefulness not in ('Y','1','2','3') or aquatic_fauna_usefulness not in ('Y','1','2','3')
or terr_fauna_usefulness not in ('Y','1','2','3') or molluscs_usefulness not in ('Y','1','2','3')
or insects_usefulness not in ('Y','1','2','3') or crustacean_usefulness not in ('Y','1','2','3')
or other_arthropods_usefulness not in ('Y','1','2','3') or other_invert_usefulness not in ('Y','1','2','3')
or fishes_usefulness not in ('Y','1','2','3') or amphibians_usefulness not in ('Y','1','2','3')
or reptiles_usefulness not in ('Y','1','2','3') or birds_usefulness not in ('Y','1','2','3')
or mammals_usefulness not in ('Y','1','2','3') or phys_science_usefulness not in ('Y','1','2','3')
or physio_topo_usefulness not in ('Y','1','2','3') or hydrology_usefulness not in ('Y','1','2','3')
or geology_usefulness not in ('Y','1','2','3') or soils_usefulness not in ('Y','1','2','3')
or climate_usefulness not in ('Y','1','2','3') or microorganism_usefulness not in ('Y','1','2','3')
or site_info_usefulness not in ('Y','1','2','3') or biology_usefulness not in ('Y','1','2','3')
or ecology_usefulness not in ('Y','1','2','3') or ecosys_function_usefulness not in ('Y','1','2','3')
or nat_diversity_usefulness not in ('Y','1','2','3') or inventory_usefulness not in ('Y','1','2','3')
or research_tech_usefulness not in ('Y','1','2','3') or managed_areas_usefulness not in ('Y','1','2','3')
or mgmt_plans_usefulness not in ('Y','1','2','3') or mgmt_tech_usefulness not in ('Y','1','2','3')
or IMPACT_STUDIES_usefulness not in ('Y','1','2','3') or protection_ORG_usefulness not in ('Y','1','2','3')
or protection_TOOLS_usefulness not in ('Y','1','2','3')
ORDER BY owner_code
```

### 3. Check Extensible Tables

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

- a. Please review all your extensible tables and verify that you want to keep them. Extensible tables will be converted exactly as they were built in Biotics 4. If you no longer use an extensible table, now is a good time to delete it. If you want to make modifications to an extensible table, you may want to do so prior to your conversion to Biotics 5 because configuration of extensible tables will not be available in the first Biotics 5 release (it will be available later).
- b. *Indicator (Checkbox) Field Values:* Please review your extensible tables to see if they contain fields that show up as checkboxes on the screen. In Biotics 4, the data in these fields must be either 0 (for a blank checkbox, meaning 'no') or 1 (for a checked box, meaning 'yes'), but the Oracle data type of the field did not matter; it may have been defined as CHAR(1), VARCHAR2(1), or NUMBER. In the conversion to Biotics 5, the data type does matter. To convert correctly, checkbox fields on extensible tabs must be either:
  - defined as a NUMBER data type and contain only 0 or 1, or
  - defined as CHAR datatype and contain only Y or N.

Run the following queries on any "checkbox" fields to find out the content and the data type. If you find any value other than 0 or 1, please remove or change it. If you find that the data type is CHAR or VARCHAR2 instead of NUMBER, please contact the [Biotics 5 Help Desk](#) for advice on fixing it.

Here is a query you can run to check content. Insert actual field names in brackets:

```
select [ext_table_name]_ID, [parent_table_name]_ID, [checkbox_field]
from EXT_TABLE_NAME
where [checkbox_field] is not null and [checkbox_field] not in (0,1)
```

Here is a query to check data type:

```
select data_type, data_length from all_tab_columns where column_name = [checkbox field
name in ALL CAPS]
```

#### 4. D\_STATE\_ID in Managed Area and Conservation Site Records

Please make sure that this field is filled in for all your MA and Site records. The view that lets you export mapped MAs and Sites to a shape file in Biotics 5 depends upon d\_state\_id being populated with your state's ID. *If you do not map MAs or Sites and do not plan to, you can skip this step.*

- a. Check for null values with these queries:

```
select count(MA.managed_area_id) from MA, SHAPE
where MA.shape_id = SHAPE.shape_id and SHAPE.has_shape_ind = 'Y' and MA.d_state_id is null
```

```
select count (cs.conservation_site_id) from CONSERVATION_SITE cs, SHAPE
where cs.shape_id = SHAPE.shape_id and SHAPE.has_shape_ind = 'Y' and cs.d_state_id is null
```

- b. Update null values -- insert your state's two\_letter abbreviation for XX!

```
update MA set rec_last_mod_user = '[your initials]', d_state_id = (select d_state_id from D_STATE
where state_cd = 'XX' and nation_id in (38,225));
commit;
```

```
update CONSERVATION_SITE set rec_last_mod_user = '[your initials]', d_state_id = (select
d_state_id from D_STATE where state_cd = 'XX' and nation_id in (38,225));
commit;
```

#### 5. Location Use Class in Animal Source Feature Records

##### a. *Animal Source Features without Location Use Class in Biotics 4*

As part of the revised spatial methodology, Biotics 5 requires a Location Use Class be assigned for each zoological Source Feature, according to the Location Use Class(es) defined in the EO Specs. As part of the

conversion process, animal Source Features with **null** (blank) Location Use Class values will be populated according to the following rules:

- If the only Location Use Class (LUC) value within the zoological EO Specs record is either "Not Applicable" or null, LUC in the Source Feature will be set to "Not Applicable".
- Otherwise, if the EO Specs record has one or more LUC values defined, LUC in the Source Feature will be populated with "Undetermined".

The following query (which you can copy and paste into Tracker Query Builder) will tell you how many records will have LUC set to Undetermined during the conversion. You should review these Source Feature records and eventually update the LUC to one of the valid values defined for that element (also shown in the query results). **You do not have to make any changes prior to conversion**, but you can if you have time. We recommend that you export the results of this query so you have a list of the Source Features affected:

```
SELECT egt.element_global_id, est.element_subnational_id, sn.scientific_name as SNAME,
eo.eo_id, sf.source_feature_id, sf.d_location_use_class_id as "LUC of Source Feature",
delimlist('select luc.location_use_class_desc from eo_specs_detail eosd, d_location_use_class luc, eo_specs eos' ||
' where luc.d_location_use_class_id = eosd.d_location_use_class_id and eosd.eo_specs_id = eos.eo_specs_id
and eos.element_global_id=' || egt.element_global_id, ' | ') as "Species LUCs Defined",
delimlist('select luc.location_use_class_desc from eo_specs_detail eosd, d_location_use_class luc, eo_specs eos,
element_group_membership egm' || ' where luc.d_location_use_class_id = eosd.d_location_use_class_id
and eosd.eo_specs_id = eos.eo_specs_id and eos.element_group_id = egm.element_group_id
and egm.element_global_id=' || egt.element_global_id, ' | ') as "Group LUCs Defined"
```

```
FROM ELEMENT_GLOBAL egt, ELEMENT_NATIONAL ent, ELEMENT_SUBNATIONAL est,
SCIENTIFIC_NAME sn, D_NAME_CATEGORY dnc, EO, SOURCE_FEATURE sf, EO_SOURCE_FEATURE eosf
```

```
WHERE egt.element_global_id = ent.element_global_id
and ent.element_national_id = est.element_national_id
and est.sname_id = sn.scientific_name_id
and sn.d_name_category_id = dnc.d_name_category_id
and est.element_subnational_id = eo.element_subnational_id (+)
and est.element_subnational_id = sf.element_subnational_id
and eo.shape_id = eosf.eo_shape_id (+)
and eosf.source_feature_shape_id = sf.shape_id (+)
and sf.d_location_use_class_id is null
and dnc.name_type_cd = 'A'
and (exists (select 'x' from eo_specs, eo_specs_detail
where egt.element_global_id = eo_specs.element_global_id
and eo_specs.eo_specs_id = eo_specs_detail.eo_specs_id
and eo_specs_detail.d_location_use_class_id <> 1)
or exists (select 'x' from element_group_membership egm, element_group eg,
eo_specs, eo_specs_detail eosd
where egt.element_global_id = egm.element_global_id
and egm.element_group_id = eg.element_group_id
and eg.element_group_id = eo_specs.element_group_id
and eo_specs.eo_specs_id = eosd.eo_specs_id
and eg.d_element_group_type_id = 2
and eosd.d_location_use_class_id <> 1))
```

```
order by est.element_subnational_id, eo.eo_id
```

NOTE: The column labeled **Species LUCs Defined** shows the Location Use Classes in EO Specs written for individual species; the column labeled **Group LUCs Defined** shows the Location Use Classes in EO Specs written for the Element Group to which the species belongs. Either one or the other of these columns will be populated, not both.

**b. Animal Source Features with Location Use Class in Biotics 4**

The following query will show you the Location Use Class in Source Features which have a value in your Biotics 4 database, as well as the LUC values defined in the EO Specs, either for the individual species or a species group. **None of these values will be changed by the conversion.** However, you may find that the value in the Source Feature is not among the location use classes defined for the Element. If the value in the column “LUC of Source Feature” does not match one of the values in the columns “Species LUCs Defined” or “Group LUCs Defined”, it should be changed to a valid value. If you do not have time to review and/or change the values now, we recommend that you export the results of this query so that you can correct the LUC values in the Source Feature after conversion. (NOTE: This query will not return any results if your program has not populated the Location Use Class field in Source Features.)

```
SELECT egt.element_global_id, est.element_subnational_id, sn.scientific_name as SNAME,
eo.eo_id, sf.source_feature_id, luc.location_use_class_desc as "LUC of Source Feature",
delimlist('select luc.location_use_class_desc from eo_specs_detail eosd, d_location_use_class luc, eo_specs eos' ||
' where luc.d_location_use_class_id = eosd.d_location_use_class_id and eosd.eo_specs_id = eos.eo_specs_id
and eos.element_global_id=' || egt.element_global_id, ' | ') as "Species LUCs Defined",
delimlist('select luc.location_use_class_desc from eo_specs_detail eosd, d_location_use_class luc, eo_specs eos,
element_group_membership egm' || ' where luc.d_location_use_class_id = eosd.d_location_use_class_id
and eosd.eo_specs_id = eos.eo_specs_id and eos.element_group_id = egm.element_group_id
and egm.element_global_id=' || egt.element_global_id, ' | ') as "Group LUCs Defined"

FROM ELEMENT_GLOBAL egt, ELEMENT_NATIONAL ent, ELEMENT_SUBNATIONAL est,
SCIENTIFIC_NAME sn, D_NAME_CATEGORY dnc, EO, SOURCE_FEATURE sf, EO_SOURCE_FEATURE eosf,
D_LOCATION_USE_CLASS luc
```

```
WHERE egt.element_global_id = ent.element_global_id
and ent.element_national_id = est.element_national_id
and est.sname_id = sn.scientific_name_id
and sn.d_name_category_id = dnc.d_name_category_id
and est.element_subnational_id = eo.element_subnational_id (+)
and est.element_subnational_id = sf.element_subnational_id
and eo.shape_id = eosf.eo_shape_id (+)
and eosf.source_feature_shape_id = sf.shape_id (+)
and sf.d_location_use_class_id = luc.d_location_use_class_id
and sf.d_location_use_class_id is not null
and dnc.name_type_cd = 'A'
and (exists (select 'x' from eo_specs, eo_specs_detail
where egt.element_global_id = eo_specs.element_global_id
and eo_specs.eo_specs_id = eo_specs_detail.eo_specs_id
and eo_specs_detail.d_location_use_class_id <> 1)
or exists (select 'x' from element_group_membership egm, element_group eg,
eo_specs, eo_specs_detail eosd
where egt.element_global_id = egm.element_global_id
and egm.element_group_id = eg.element_group_id
and eg.element_group_id = eo_specs.element_group_id
and eo_specs.eo_specs_id = eosd.eo_specs_id
and eg.d_element_group_type_id = 2
and eosd.d_location_use_class_id <> 1))
```

```
order by est.element_subnational_id, eo.eo_id
```

**6. Invalid MAPPEDDATE values**

Determine if your managed themes (EOs, Sites, MAs, Source Features) contain invalid MAPPEDDATE values by running the following query in ArcView (or Mapper), on each of the managed themes (**Theme** menu, **Query**). The 1900 date can be changed, as appropriate.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

```
((([Mappeddate].GetDayOfMonth < 1) or ([Mappeddate].GetDayOfMonth > 31)) or  
((([Mappeddate].getmonthofyear < 1) or ([Mappeddate].getmonthofyear > 12)) or (([Mappeddate].getyear  
< 1900)))
```

To fix dates identified by the query, utilize the backdoor method for updating data and then posting the changes to the master shapefiles, as outlined in the document attached to KB article 186, found on page 3, step 4. Instead of deleting the features as mentioned in step e, however, you will change the data value within the MAPPEDDATE column to an appropriate date.

#### 7. Dbic.rpt

Rectify ALL errors/problems/warnings in the Database Integrity Check and provide resulting, clean dbic.rpt; see KB article 186.

## Providing Biotics 4 to NatureServe

Complete the following steps, as indicated in bold and in the order specified, to update Biotics, clean up your database, and provide the appropriate files. **NOTE: Apart from step 1 below, the remaining 3 steps should be done after all data entry and changes to the database have been completed. Of course, you'll undoubtedly want to run the DBIC multiple times to make sure it is clean and so that you're not scrambling at the last minute.**

#### 1. Db\_upgrade\_history.txt

Determine which patches have been run since your installation, run the following query in Tracker's Query Builder and **export the results as a comma delimited file to db\_upgrade\_history.txt**:  
`SELECT * FROM DB_UPGRADE_HISTORY;`

Compare the results with those listed below.

| <b>APPLICATION_MODULE</b> | <b>DB_VERSION</b> | <b>SCRIPT_NAME</b>                           |
|---------------------------|-------------------|--|
| BIOTICST                  | Version 1.0002a   | biotics_update_0002a.sql                     |
| BIOTICST                  | Version 1.0003    | biotics_update_0003.sql                      |
| BIOTICST                  | Version 1.0004    | biotics_update_0004.sql                      |
| BIOTICST                  | Version 1.0005    | biotics_update_0005.sql                      |
| BIOTICST                  | Version 1.0006    | biotics_update_0006.sql                      |
| BIOTICST                  | Version 1.0007    | biotics_update_0007.sql                      |
| BIOTICST                  | Version 1.0008    | biotics_update_0008.sql                      |
| BIOTICST                  | Version 1.0009    | biotics_update_0009.sql                      |
| BIOTICST                  | Version 1.0010    | biotics_update_0010.sql                      |
| BIOTICST                  | Version 1.0010    | biotics_update_0010_mini.sql                 |
| BIOTICST                  | Version 1.0011    | biotics_update_0011.sql                      |
| Biotics                   | 6                 | b4_0_7-d6-g2.sql                             |
| Biotics                   | 7                 | Create_BCD_ET_View.Sql                       |
| Biotics                   | 7                 | Create_SOURCE_View.Sql                       |
| Biotics Tracker           | 1.7.0             | 3082_Create_EO_WL_VW.Sql                     |
| Biotics Tracker           | 1.7.0             | 3146_COMM_CAL_REF_NEXT_SEQ.Sql               |
| Biotics Tracker           | 1.7.0             | 3150_Messages.Sql                            |
| Biotics Tracker           | 1.7.0             | CleanUpDBVersion.Sql                         |
| Biotics Tracker           | 1.7.2             | 3203_ALTER_COMM_EO_STD_ELEMENT_REL_1.7.2.Sql |
| Biotics Tracker           | 1.7.7             | 3034_Alter_Observation_1.7.7.Sql             |

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

|                        |       |  |
|------------------------|-------|--|
| <i>Biotics Tracker</i> | 1.7.7 | <i>3069_Alter_EO_1.7.7.Sql</i>                                   |
| <i>Biotics Tracker</i> | 1.7.7 | <i>3083_Create_Managed_Area_WL_VW_1.7.7.Sql</i>                  |
| <i>Biotics Tracker</i> | 1.7.7 | <i>3083_Create_SITE_WL_VW_1.7.7.Sql</i>                          |
| <i>Biotics Tracker</i> | 1.7.9 | <i>3059_UpdateSystemControlEntries_1.7.9.Sql</i>                 |
| <i>Biotics Tracker</i> | 2     | <i>3350_alter_eo_table.sql</i>                                   |
| <i>Biotics Tracker</i> | 2     | <i>3444_alter_sf_table.sql</i>                                   |
| <i>Biotics Tracker</i> | 2     | <i>3445_alter_el_ma_table.sql</i>                                |
| <i>Biotics Tracker</i> | 2     | <i>492_alter_est_table.sql</i>                                   |
| <i>Biotics Tracker</i> | 2.2.4 | <i>1712_AddDefaultFolderOptionForQB.sql</i>                      |
| <i>Biotics Tracker</i> | 2.2.4 | <i>3190_IndexWorkingListUserID.Sql</i>                           |
| <i>Biotics Tracker</i> | 2.2.4 | <i>3350_AddNewFieldsForTrackingComplianceToSpecs.sql</i>         |
| <i>Biotics Tracker</i> | 2.2.4 | <i>3444_RepresentationAccuracyChanges.sql</i>                    |
| <i>Biotics Tracker</i> | 2.2.4 | <i>3445_TrackElementDistributionInformationInManagedArea.sql</i> |
| <i>Biotics Tracker</i> | 2.2.4 | <i>492_AddTextFieldToEOTrackingComment.sql</i>                   |
| <i>Biotics Tracker</i> | 2.2.4 | <i>881_FindReferenceByID.sql</i>                                 |
| <i>Biotics Tracker</i> | 2.2.4 | <i>Messages.Sql</i>  |
| <i>Biotics Tracker</i> | 2.3.2 | <i>3504_USESA_COSEWIC_Changes.sql</i>                            |
| <i>Biotics Tracker</i> | 2.3.2 | <i>3519_TrackExternalElementIdentifiers.sql</i>                  |
| <i>Biotics Tracker</i> | 2.3.2 | <i>Messages_2_2_5.Sql</i>  |

If you are missing any of the patches, you will need to run the appropriate upgrade, as found in the [Biotics 4 Transfer Site](#) web page. Depending on your installation date, some patches may have been included in the database that was delivered at your installation. If you are uncertain about which patches are required for your system, submit a ticket to the [Biotics 4 Help Desk](#), attaching the **Db\_upgrade\_history.txt**.

Determine the software version by selecting **About Tracker** from Tracker's Help menu and **About Biotics** from Mapper's Help menu. The current versions should be **2.3.7** and **4.0.4**, respectively.

2. **Dbic.rpt**  
Provide Database Integrity Check report run after ALL errors/problems/warnings have been rectified.
3. **Tablespace\_sizes.log**  
Run query attached to KB article 464 while logged into SQLPlus as the system user and provide resulting log.
4. **Biotics backup zip file**  
Create a brand new Biotics backup according to the instructions in KB article 465. This is the standard backup procedure that you should be using to create routine backups, so it should be familiar. **Make sure to indicate 'Save full path info' when zipping the BIOTICS folder.** The backup zip file must include the following components:
  - o **BIOTICS folder** – Mapper server component, including master shapefiles and configuration
  - o **Biotics\_del.dmp & .log file** – Oracle backup of deleted schema and corresponding log file
  - o **Biotics\_user.dmp & .log file** – Oracle backup of regular schema and corresponding log file

## Methodology change to scale/minimum mapping unit/procedural buffer distance

### Background

The mapping scale used in Biotics 4 was based on a 1:24,000 USGS topo map for U.S. programs and, typically, a 1:50,000 NTS map for Canadian programs. The minimum mapping units associated with these map scales were 12.5 m and 25 m, respectively. The mmu was applied as a procedural buffer to the Source Feature to ensure visibility of the spatial feature at a map of the given scale. In contrast, Biotics 5 utilizes Esri basemaps, available at standard scales used by commercial public map services, which do not include the scales used in Biotics 4. Given that the basemaps in Biotics 5 will be used to digitize the managed feature and are available at a more detailed and accurate scale, it makes sense to take advantage of the improved data. As such, the default map scale used within Biotics 5 is 1:18,056 with a minimum mapping unit/procedural buffer distance of 9 m.

### Application

Communicating the scale and hence minimum mapping unit (mmu) distance applied within the Biotics 5 instance is integral to data collection and mapping within Biotics 5. The minimum mapping unit is used to determine whether the Field Observation represents a small area (<mmu in every direction), a linear area (<mmu in one direction, >mmu in the other direction) or large area (>mmu in every direction). Collecting information regarding the area of the observed element while in the field is therefore critical, as it is the first step in the [spatial feature development](#) and indicates the Conceptual Feature Type. Likewise, Locational Uncertainty Type of Negligible is defined as uncertainty that falls within half the minimum mapping unit distance (i.e.  $\leq \frac{1}{2}$  mmu; for a map scale of 1:18,046 with a minimum mapping unit of 9 m,  $\leq 4.5$  m). Finally, a Procedural Buffer is applied to Source Features with Negligible or Linear locational uncertainty to ensure that the resulting EO is visible at a map of the given scale.

The procedural buffer is applied to any SF smaller than the mmu purely for the purpose of visualization. However, it is not reflected in the actual SF (as evident by exporting the SF shapefile from Biotics 5), nor in the resulting EO, except in the case of SFs with Locational Uncertainty Type of Negligible or Linear. For a visual of this, please see the [Summary of Spatial Feature Development](#).

Further information can be found within the related help topics:

- [Minimum Mapping Unit](#)
- [Conceptual Feature Type](#)
- [Negligible Locational Uncertainty](#)
- [Linear Locational Uncertainty](#)
- [Procedural Buffer](#)
- [Summary for Spatial Feature Development](#)

Unless otherwise indicated in writing prior to your conversion, Biotics 5 will utilize the default 1:18,056 map scale with minimum mapping unit/procedural buffer distance of 9 m.

## Converting Biotics 4 spatial data

Following is an explanation of how the spatial data will be converted to align with new aspects of NatureServe's spatial methodology included in Biotics 5, namely, inclusion of locational uncertainty in the mapped representation of a Source Feature with Areal - Estimated uncertainty type:

- **Areal – Estimated:** For conversion, current SF is used as the Pre-SF, which is then buffered with AE distance to become the 'new' SF. Observation Feature can be created from current SF, in different application, if desired.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

- Negligible: No conversion is needed. Observation Feature can be created from current SF, in different application, if desired.
- Linear: No conversion is needed. Observation Feature cannot be created from current SF since it includes locational uncertainty.
- Areal – Delimited: No conversion is needed. Observation Feature cannot be created from current SF since it includes locational uncertainty.

## Spatial data for use with Biotics 5 map viewer

As an online application Biotics 5 now provides access to GIS data published as a map service. There are two ways in which GIS data can be utilized: as a basemap and as a reference layer.

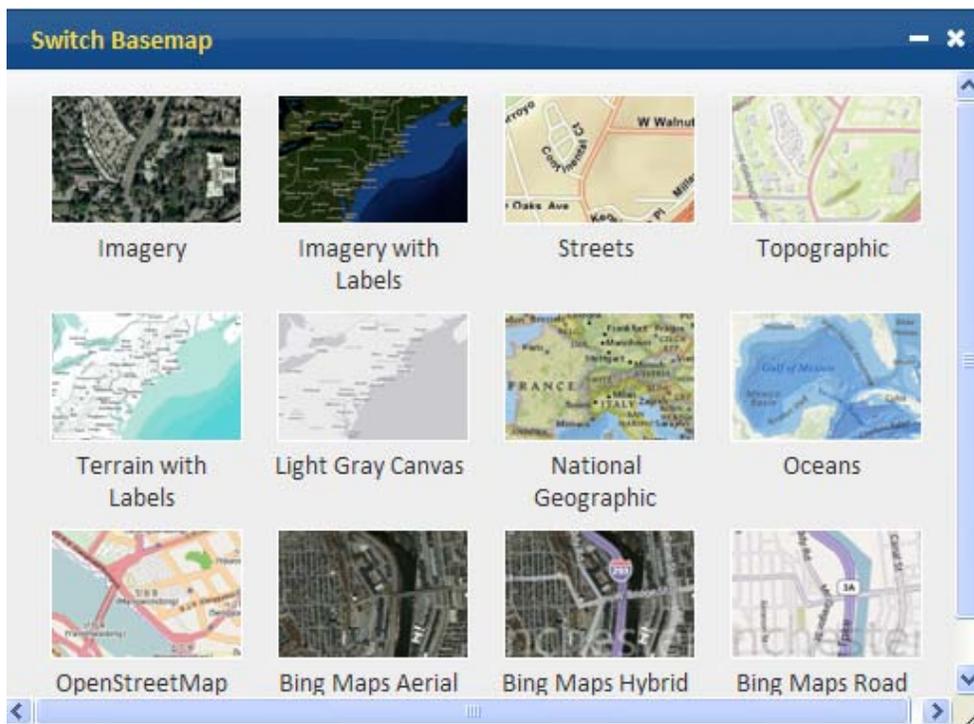
|                    | Basemaps  | Reference Layer   |
|--------------------|---|---|
| <b>Purpose</b>     | Visual background and geographical context; locational reference  | Layers not available within Basemaps; Interactive use, as described below   |
| <b>Use</b>         | <ul style="list-style-type: none"> <li>✗ Alter visibility of layers</li> <li>✗ Identify</li> <li>✗ Search</li> <li>✗ Filter</li> <li>✗ Copy feature</li> <li>✗ Spatial Calculation</li> </ul> | <ul style="list-style-type: none"> <li>✓ Alter visibility of layers</li> <li>✓ Identify</li> <li>✓ Search</li> <li>✓ Filter</li> <li>✓ Copy feature</li> <li>✓ Spatial Calculation</li> </ul> |
| <b>Provided by</b> | <ul style="list-style-type: none"> <li>• esri (default)</li> <li>• your agency</li> <li>• Bing (requires valid usage key)</li> </ul>  | <ul style="list-style-type: none"> <li>• your agency</li> </ul>   |

### Basemaps

Basemaps provide a visual background and geographical context for the content that you want to create and display in the map. They are used for locational reference and often show a wide variety of features, such as roads, rivers, buildings, contours, etc. By default, Biotics provides access to the Esri basemaps available through ArcGIS.com. Bing basemaps can be included if your organization has a valid usage key through Microsoft. The following screenshots show those basemaps offered by default within Biotics 5. You can view these within the [Biotics 5 pilot](#) by choosing to **View Map**, clicking **Map Resources**, and then **Switch Basemap**. Alternatively, you can view them in [ArcGIS Online](#) by clicking **Basemap**. Select the various basemaps to see how detailed they are within your area. Information (metadata) regarding the esri map services can be accessed by clicking on the specific map service on the [ArcGIS Online Map and Geoservices](#) web page and clicking the “details” link in the dialog.

The map viewer can only display a single basemap at a time, but users are free to switch between different basemaps. Basemaps are pre-generated images and cannot be further customized by turning layers or individual features on and off. The Biotics analysis tools such as search and identify do not work on features contained within basemaps.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate



Other map services can be included as basemaps if they:

- Are published as an ArcGIS map service
- Are cached in the WGS 84 Web Mercator (auxiliary sphere) projection

Although current functionality does not allow this, in a future version of Biotics you will be able to add custom basemaps to the Switch Basemap dialog. To configure the addition of custom basemaps, the following will be needed:

- Title - user-friendly title to display within Library (can contain spaces, etc.)
- URL - URL of a map service published on ArcGIS Online, on GIS servers that are available on a local machine or network, or from servers publicly available on the Internet (i.e., [http://gis.landscape.org/arcgis/rest/services/LandScopeLayers/Biotics5\\_NYLayers/MapServer](http://gis.landscape.org/arcgis/rest/services/LandScopeLayers/Biotics5_NYLayers/MapServer)). Individual layers within a map service cannot be published.
- A 200x133 .jpeg or .png thumbnail

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

**NOTE:** A default thumbnail is available for ArcGIS 10.1 map services through the entry in the REST services directory - follow the Info link (found in Child Resources, near the bottom of the page) and then select Thumbnail. The URL will look like

<https://bioticspilot.natureserve.org/arcgis/rest/services/quads/MapServer/info/thumbnail>

Alternatively, thumbnails can be created by taking a screenshot of the map service and using any image editing program (i.e. Paint in Windows 7 allows for this; or paint.net is freely downloadable) to create a correctly sized image.

## Reference Layers

Reference layers are drawn on top of the basemap and therefore include spatial data not accounted for in the basemap that can be used within Biotics 5 for a variety of purposes, including filtering, copying features, performing spatial searches, calculating spatial attributes, etc. Each reference layer should be contained within a map service that comprised of one or more GIS layers. All layers contained within the map service will be available through Biotics 5. At this time, only ArcGIS Server map and image services can be used as reference layers. Support will likely be added for other map service formats such as WMS in future releases.

Prior to adding map services to the Library, test the layers by adding them to the map viewer using [Add Resource](#). This is imperative, because if the map service fails to successfully load via [Add Resource](#), adding it to the Map Library will cause the map viewer to hang for every user: [Map Resources](#) will not respond and the various map

tools will be unavailable . Map services can be configured for inclusion within the map Library via the [Map Library](#) tool. This allows users to select map services from the Library in order to quickly add them to their map. Map services not configured in the Library will still be accessible via the [Add Resource via URL](#) tool. To do so they will have to provide individual map service URLs.

Map services should be prepared as described in the [Prepare Map Document](#) section. If you do not have the capacity to publish a needed map service, in most cases NatureServe will be able to publish and host this service on your behalf for use with Biotics 5 and will work with you early on to determine the suitability of any individual layer for publication this way. Please contact [Rob Solomon](#) to discuss this and receive approval.

## Identify reference map layers needed

### *Layers referenced currently in Mapper's Navigator*

To determine which layers are currently referenced within Mapper's Navigator and which you may wish to add to the Library within Biotics 5, run the query below. Please note that you will not need to provide us with layers in the resulting list if they are no longer used, are among the layers that will be provided within the basemaps, or are already accounted for within an existing map service that you have identified for use with Biotics 5. However, prior to excluding any layers, verify that any layer which you are considering excluding is not used for spatial attribute calculation.

```
SELECT THEME.*, THEME_LOCATION.LOCATION FROM THEME, THEME_LOCATION WHERE  
THEME.LOCATION_KEY = THEME_LOCATION.LOCATION_KEY
```

### Layers to include in Library:

In Biotics 5, from the *Configuration* menu, choose **Map Library** to add map services to [Administer Map Library](#).

- Prepare the map service(s) as described in the [Prepare Map Document](#) section
- For each map service, the following information is needed:
  - **Title:** user-friendly title to display within Library (can contain spaces, etc.)
  - **URL:** URL of a map service published on ArcGIS Online, on GIS servers that are available on a local machine or network, or from servers publicly available on the Internet (i.e.,

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

[http://gis.landscape.org/arcgis/rest/services/LandScopeLayers/Biotics5\\_NYLayers/MapServer](http://gis.landscape.org/arcgis/rest/services/LandScopeLayers/Biotics5_NYLayers/MapServer)).

Individual layers within a map service cannot be published.

**NOTE:** Cached map services must be in the WGS 84 Web Mercator (Auxiliary Sphere) projection, because ArcGIS Server cannot reproject cached services, and use the standard scale levels supported by Google, Bing, and ESRI's arcgis.com. See the [Conversion Guide](#) for more details.

- **Opacity:** decimal value representing the opacity at which the map service should be displayed (i.e. **0.5** indicates 50% opacity).
- **Visible:** indicate this if the map service should be visible by default. If not marked, the user will have to manually indicate to display the map service one it has been added to the map viewer.
- **Add to Map:** indicate this if the map service should always be added to the map viewer. If not marked, the user will have to manually [add the map service to the map viewer via the Library](#).

### *Layers used in spatial attribute calculation*

Biotics 5 does not provide a tool for configuring spatial attribute calculation as of version 5.3, so you need to make any changes to the spatial attribute configuration in Biotics 4 prior to submitting the backups to NatureServe for conversion.

To determine the themes referenced by Mapper's Designer Admin, which defines the themes that are used in spatial calculations, run the following query:

```
SELECT THEME.THEME_ID, THEME.THEME_NAME, THEME.THEME_SRC, THEME_LOCATION.LOCATION FROM  
THEME, THEME_LOCATION WHERE THEME_ID>4999 AND THEME_ID IN (SELECT SOURCE_THEME_ID FROM  
AD_CALC_SPAT_ATT WHERE SOURCE_THEME_ID IS NOT NULL) AND THEME.LOCATION_KEY =  
THEME_LOCATION.LOCATION_KEY
```

Some layers have been joined to tables or views within the database. Calculation of spatial attributes are sometimes based on fields which are dependent on these joins and can come from either source – the Oracle table/view or the layer. These joins are defined within the Navigator Admin but can also be identified by running the following query:

```
SELECT THEME_ID, SRCE_TABLE, SRCE_FIELD, DEST_FIELD from THEME_DATA WHERE DEST_FIELD !=  
'feature_id';
```

Verify that the field identified within DEST\_FIELD is contained within the spatial layer. Failure to include the field will result in the join failing, hence an error every time the spatial attribute is calculated.

Now that you have identified the SRCE\_TABLE of all joins, verify that the fields defined within the Designer Admin for spatial calculation are contained within either the SRCE\_TABLE (i.e. d\_county\_id) or the layer to which its being joined (which is the layer(s) you will provide to NatureServe). Run the following query to determine the fields necessary in each layer for successful calculation. Failure to include these fields will result in an error every time the spatial attribute is calculated.

```
SELECT SOURCE_THEME_ID, ATTRIBUTE_NAME, SOURCE_FIELDS FROM AD_CALC_SPAT_ATT WHERE  
SOURCE_FIELDS IS NOT NULL ORDER BY ATTRIBUTE_NAME
```

If you plan on deleting any of the spatial attribute configurations, you will need to consider what should be done with the current data calculated for that spatial attribute as going forward it will no longer be recalculated and refreshed when an EO is edited.

Unlike in Biotics 4, Biotics 5 only allows for one join between the layer and table or view within the Biotics database. Verify that your spatial attribute layers don't have more than one join defined by running the following query in Tracker's QueryBuilder:

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

SELECT THEME\_ID, COUNT(THEME\_ID) FROM THEME\_DATA HAVING COUNT(THEME\_ID)>1 GROUP BY THEME\_ID  
If the response to the query is “no rows selected”, then you have nothing to worry about!

Layers for use in Spatial Attribute Calculations:

The layers must be provided according to the following instructions. See Appendix I for more detailed instructions.

- In a single file geodatabase named **SpatialCalculations**
- In your Biotics projection
- Named according to the THEME\_SRC value defined in the query above (i.e. QUADNHP.SHP should be named **QUADNHP**)
- Provide geodatabase to NatureServe

## Prepare Map Document (.mxd)

### Background

Map services in ArcGIS Server 10.2 (AGS) revolve around the map document (MXD). In AGS, it is the MXD that forms the exact specification of the contents, symbology, scale dependencies, etc, that are exposed via a map service. The MXD also influences the functionality that is exposed by the service.

This section specifies the required features of map services for consumption by Biotics 5.

### Map Organization

#### Number of layers per MXD

There is no technical problem with publishing an MXD with multiple layers. Doing so, however, means that each layer appears as a ‘sub-layer’ within the resulting service. The main disadvantages of sub-layers are the inability to either alter the drawing order (move up/down) of the sub-layers or independently control their transparency.

To see how this actually applies in Biotics 5, add a map resource (i.e.

[http://gis.landscape.org/arcgis/rest/services/LandScopeStaging/LS1\\_Protected\\_Areas/MapServer](http://gis.landscape.org/arcgis/rest/services/LandScopeStaging/LS1_Protected_Areas/MapServer)) to the [Biotics 5 Pilot](#) (login according to username and password in attachment in [How can we access the Biotics 5 Pilot topic?](#)).

See how the various tools/tasks associated with the service added apply. Specific instructions regarding this can be found in the Biotics 5 Help under the [Map Resources](#) topic.)

We recommend against the creation of a single ‘convenience’ map document that includes lots of disparate layers for quickly publishing en masse. This could result in a map service that provides an unwieldy mass of sub-layers, each having very little relation to any other.

There are cases, however, where carefully designed multiple layer MXDs make great sense, such as when there is a lot of tightly related data. For instance, a single ‘Water Bodies’ service could include sub-layers providing different levels of detail at different zoom levels. Zoomed way out, the sub-layer for large lakes and rivers is visible. Zooming further in, smaller rivers become visible as lines, still further and they become polygons, and so on. In such cases, where each sub-layer represents one scale view of a coherent set of data, a multiple layer MXD is entirely appropriate.

#### Extent

The map service’s initial extent will equal that which was current when the MXD was last saved. This subsequently controls where the **Zoom To** tool will take you. Care should be taken to set this extent sensibly before saving and publishing.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

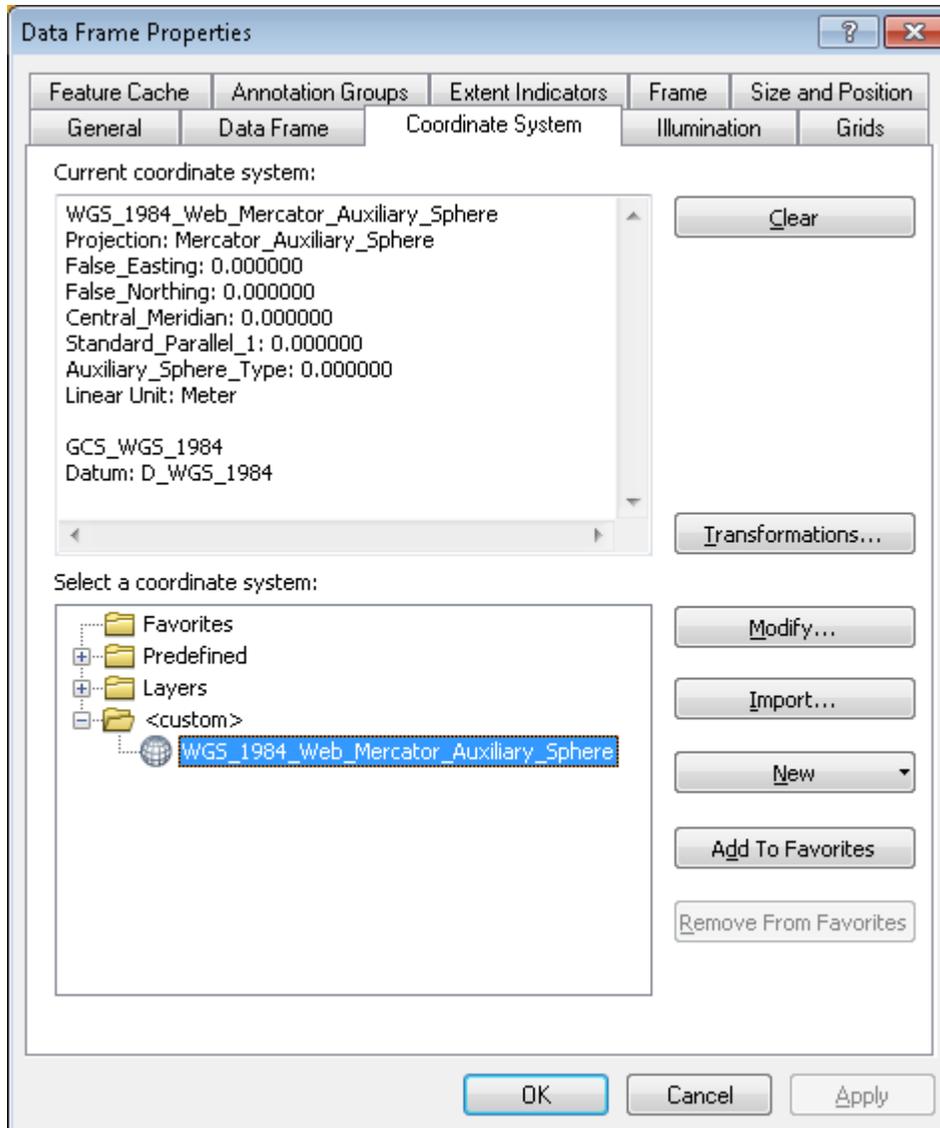
### Coordinate system

The Biotics 5 map viewer displays data using the **WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere** (EPSG code/spatial reference ID 3857) projection, which is the 'standard' coordinate system used by most online basemap services, including ArcGIS, Bing, and Google. Any map services that will be displayed within Biotics 5 as reference layers must be capable of being displayed in this projection. Dynamic ArcGIS map services can be reprojected on-the-fly; however, this does negatively impact performance. Performance will be best if you use map services published in the Web Mercator projection. Cached map services are typically only available in the projection in which they were cached.

If you plan to frequently digitize Biotics spatial features by copying features from a reference layer, you may wish to keep it in its native projection to prevent a loss of precision. You should test such map services ahead of time to ensure that performance will be acceptable. One way to do this is through ArcGIS.com's map viewer. The layer's performance when included in an ArcGIS.com map should be comparable to Biotics 5.

Please note that when calculating measures we reproject to the projection of your Biotics 4 managed layers, in order to ensure accuracy.

Define the map projection Coordinate System - View menu, Data Frame Properties, Coordinate System tab. Utilizing the **WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere** (found in ArcMap as 'Projected Coordinate Systems/World/WGS 1984 Web Mercator (auxiliary sphere)' (WKID = 3857)) coordinate system will reduce the server load involved in reprojecting the source data.



### Data source

File geodatabases are strongly recommended for publishing services and are the *required* data format if NatureServe will host the service. File geodatabases provide access to advanced AGS query functionality not available if published from an ESRI shapefile, and also seem to have improved performance for larger datasets

Other geodatabase solutions such as ArcSDE or native spatial data accessed with a query layer also give access to such advanced functionality, but these can only be used for user published services.

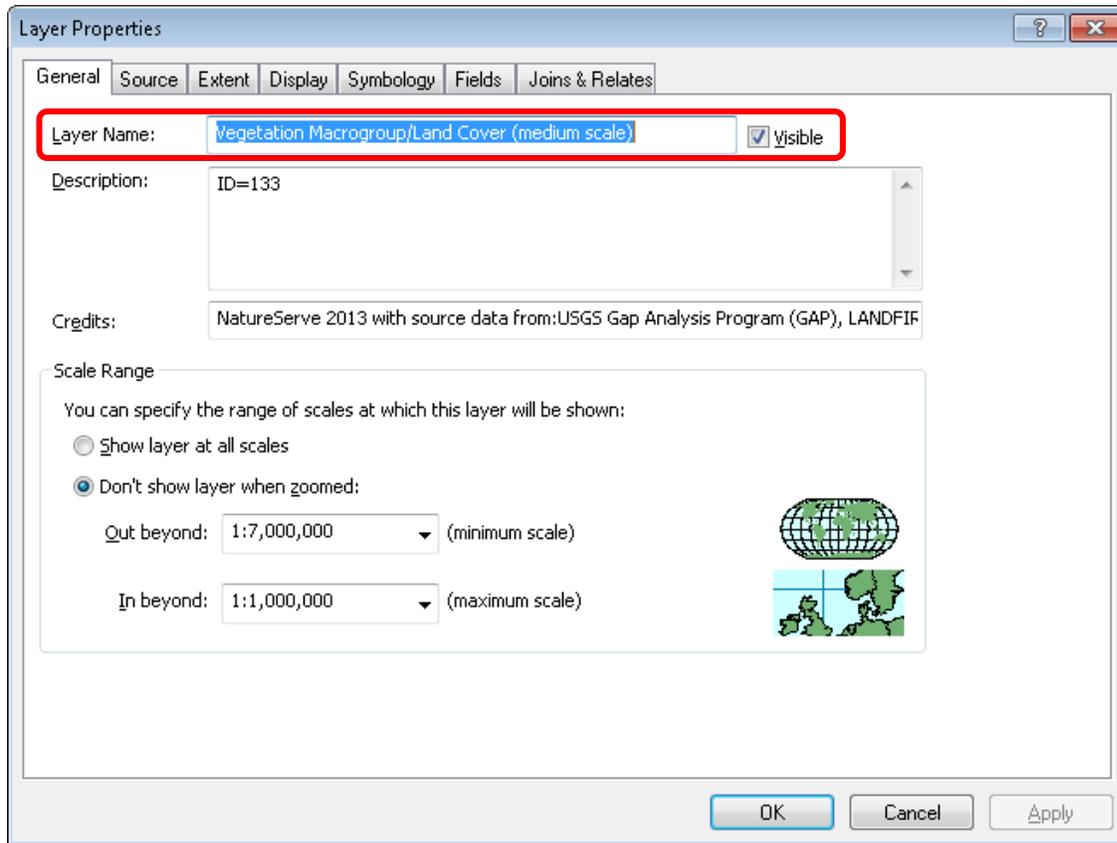
If a service is hosted by NatureServe, a file geodatabase should be zipped and provided with the MXD and other required components.

### Defining the Layers

#### Layer Names

Define (user friendly) Layer Names. Failing to do so results in the layer name reflecting its source name, which is rarely user-friendly and often not descriptive of the layer contents.

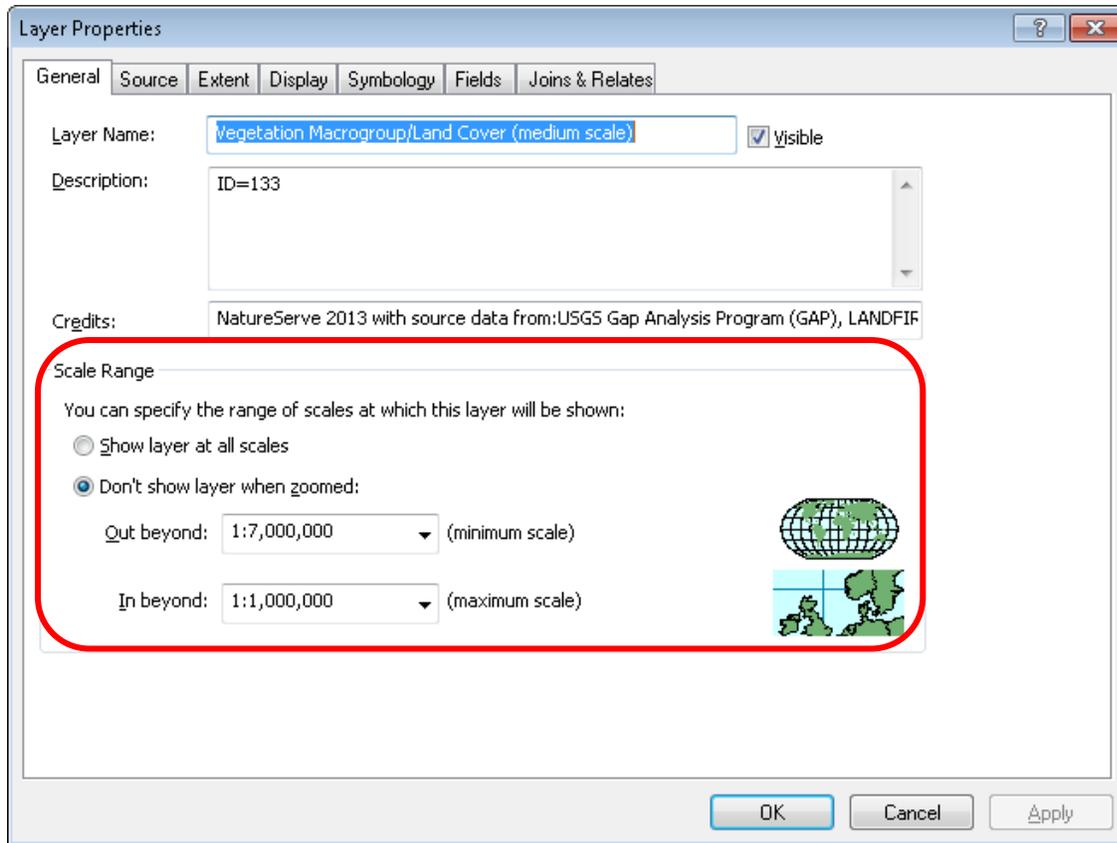
Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate



### Scale dependencies

Layer scale dependencies must be set appropriately, where it does not make sense to show a layer at a certain scale. This will reduce server load and web traffic to the web map viewer, resulting in improved performance.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

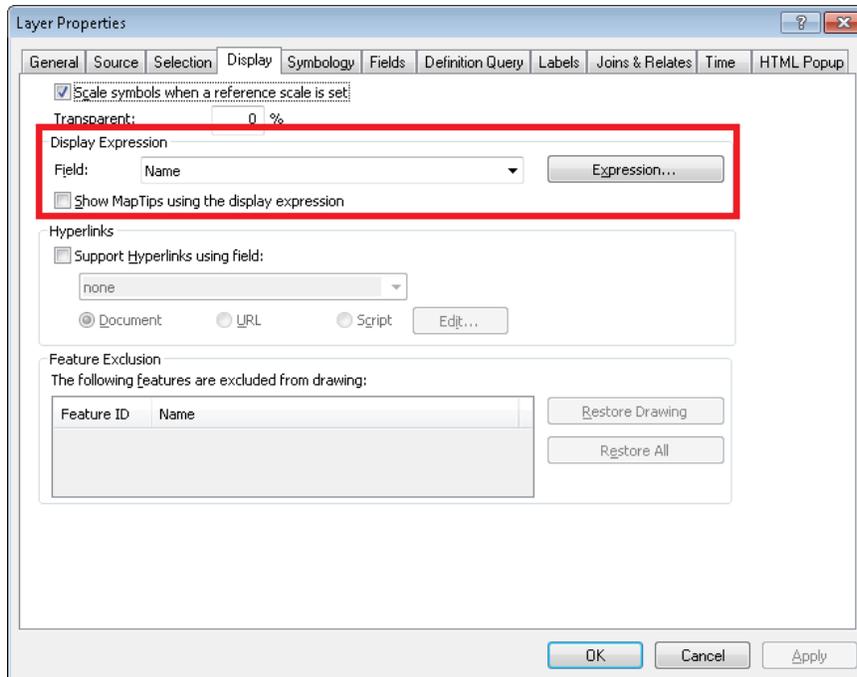


### Display Field

When viewing a list of features returned from a web service query, the Display Expression Field is the default attribute field returned. This should therefore be something which distinguishes one record from another such as a unique identifier.

In order to avoid issues with display, the Display Expression Field must be set in the Layer Properties dialog within the Display tab, under Display Expression. Further, it should be ensured that the field chosen is one of those marked as **Visible** on the Fields tab of the same dialog.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate



In Biotics 5, the Display Field will be shown in the header of the Details dialog as such: **Details: Service Name-Layer name- value of display field for the given record.**



## Symbology

The map service will duplicate as closely as possible the symbology provided in the MXD. Ensure that color ramps, legend labels, etc, are just as you would like them published.

Ensure that your symbologies overlay well across all the layers you publish. For instance, if you have 'vascular plants' in two layers which might be overlaid, the symbologies must be at least minimally distinct.

- Symbolize appropriately
- Define Legend labels
- Repeat layers within .mxd with various legends if more than one legend is desired

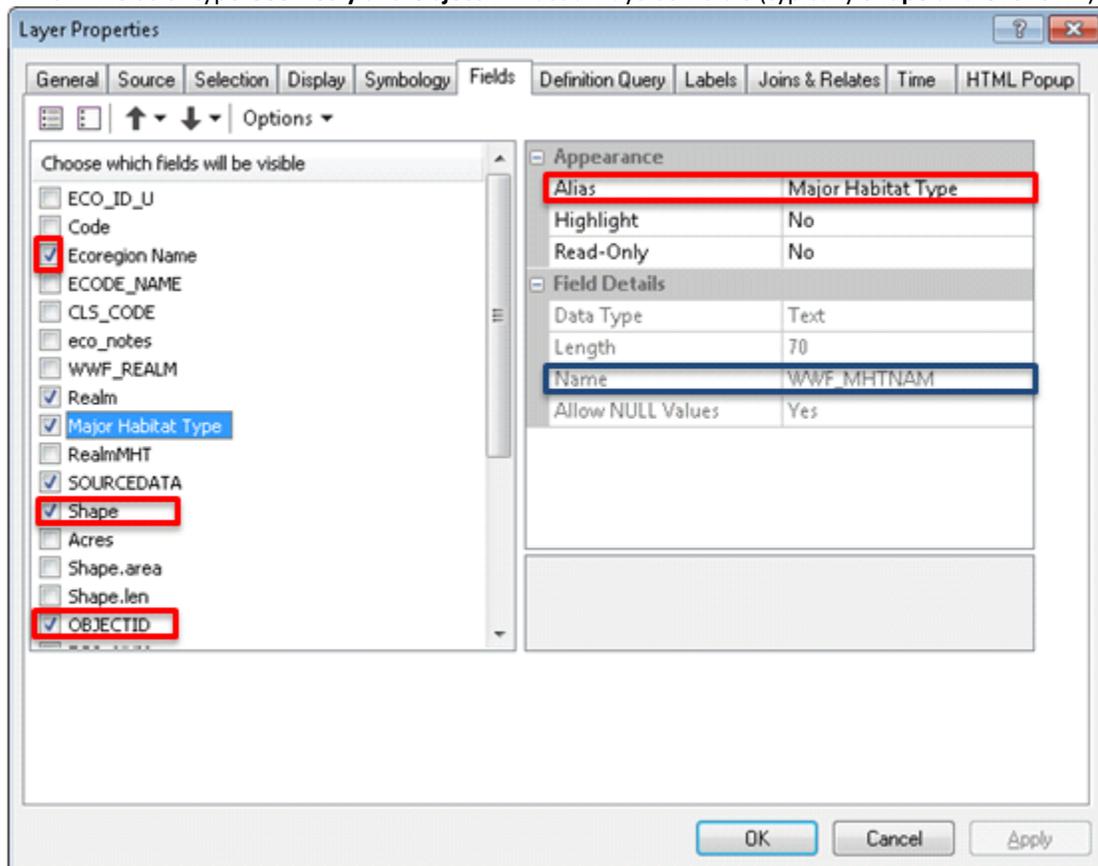
## Field Aliases & visibility

Layer attributes can have very terse names, such as CONSID. You must provide field aliases for **Visible** attributes so that the user friendly alias is displayed, for instance with the **Identify** tool. To use the above example, CONSID might be aliased to 'Conservation Site ID', which is much more meaningful for the user.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

Fields of type **Geometry** and **ObjectID** must always be visible (typically **Shape** and **OBJECTID**). Other fields should only be marked **Visible** if they should be displayed. Fields lacking data or with coded data which is not meaningful should not be marked **Visible**. Field aliases and visibility are set via the Fields tab of the Layer Properties dialog in ArcMap.

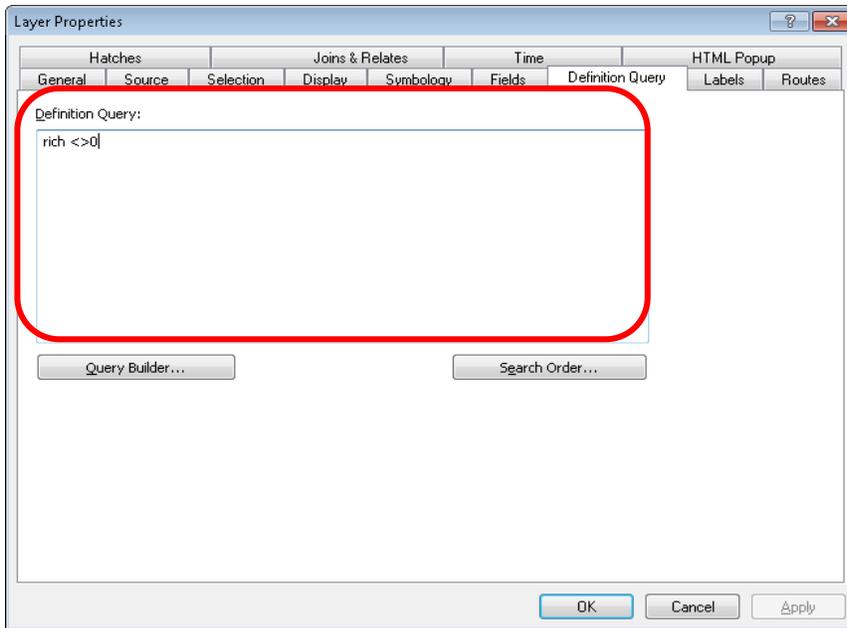
- Define Aliases for fields
- Only make those fields **VISIBLE** which you would like available via the Identify/Query tools.
- Fields of type **Geometry** and **ObjectID** must always be visible (typically **Shape** and **OBJECTID**)



### Definition Query

Define a Definition Query to limit the data displayed within the layer, as appropriate.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate



### Packaging of Data for Publication by NatureServe

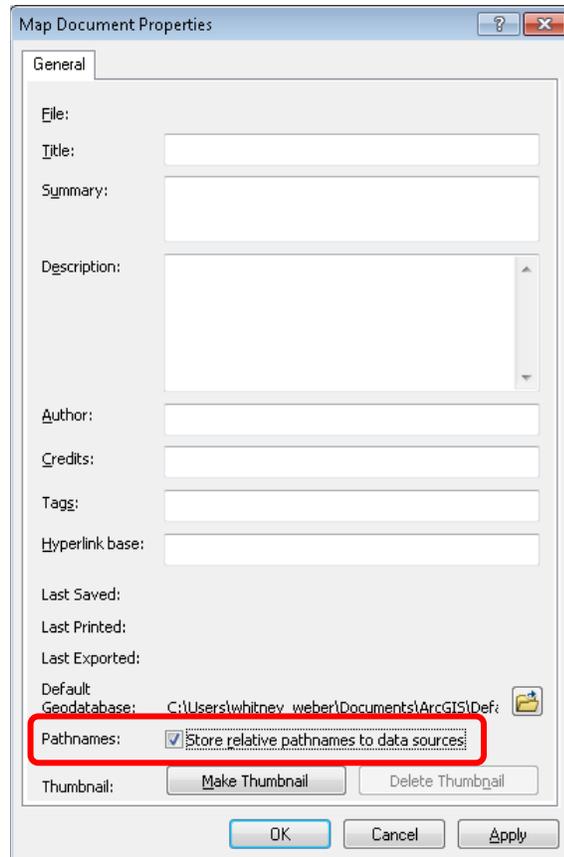
Prior to packaging the data for publication by NatureServe, use the Analyze Map tool within the Map Service Publishing toolbar (Customize menu, Toolbars, Map Service Publishing) to ensure that there are no errors that will prevent the map document from being published as a map service. Each MXD will be published as a separate map service, and will also be added to the Reference Layer library.



A zip file per service should be produced which includes:

- File geodatabase with source data
- Map document(s) (.mxd)
  - Use relative path names (*File menu, Map Document Properties, Pathnames: **Store relative pathnames to data sources***)

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate



- Readme.txt, including:
  - Indication of whether the service(s) can be made publicly available or is restricted to certain groups of users
  - Contact information for any questions on file contents

## Investigating Map Services for use with your Biotics 5 installation

The following overview of map services includes some things to keep in mind when investigating map services published by you or others, that you may wish to include in Biotics 5.

### Projection

The Biotics 5 map viewer displays data using the **WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere** (EPSG code/spatial reference ID 3857) projection, which is the map projection used by most online basemap services, including ArcGIS, Bing, and Google. Any map services that will be displayed within Biotics 5 as reference layers must be capable of being displayed in this projection. Dynamic ArcGIS map services can be reprojected on-the-fly; however, this does negatively impact performance. Performance will be best if you use map services published in the Web Mercator projection. Cached map services are typically only available in the projection in which they were cached.

If you plan to frequently digitize Biotics spatial features by copying features from a reference layer, you may wish to keep it in its native projection to prevent a loss of precision. You should test such map services ahead of time to ensure that performance will be acceptable. One way to do this is through ArcGIS.com's map viewer. The layer's performance when included in an ArcGIS.com map should be comparable to Biotics 5.

### Cached Map Services

The best way to create fast map services is to cache them. With a cached map service, the server draws the map at a set of predefined scale levels and saves the images. When the server receives a request for a map, it's much quicker to return one of these cached images than to draw the map again. Caching is appropriate for basemaps and maps that don't change often.

- Benefit:
  - improved performance
- Limitation:
  - does not allow filtering
  - does not allow layer visibility to be altered (ie. can't be turned on or off)
  - Cached map services published from ArcGIS Online will not be available with the Filter, Identify, or Feature Search tools.
- Projection: Must use same projection as basemaps – ArcGIS Server cannot reproject cached services.
  - WGS 84 Web Mercator (Auxiliary Sphere) projection enables the map services to be used in conjunction with any of the major online base maps (Esri, Bing, Google).
  - Cached services in the WGS 84 Web Mercator (Auxiliary Sphere) projection will provide the best performance
  - Cached maps must use the standard scale levels supported by Google, Bing, and ESRI's arcgis.com.
  - If cached services are in a different projection, they can be created as dynamic services, which will allow them to be reprojected; however, we don't know enough about the underlying data sets to know what performance will be like. It's possible that this won't be sufficient, and you'll still need to provide cached services in the target projection.
  - It is not necessary to reproject all of the individual layers but just alter the projection of the map documents. Then republish the map documents as a second service (second to what you're using for your purposes), and build the cache.

### Dynamic map services

Layers delivered to Biotics 5 as dynamic map services can be rescaled and re-projected on the fly.

- Benefit:
  - Allows filtering
  - Allows layer visibility to be altered (ie. can be turned on or off)
- Limitation:
  - Decreased performance because needs to draw map on the fly
- Projection: any projection for which there is a built-in Esri transformation from the source projection to the target projection. This can be verified through ArcMap - if ArcMap can handle it, it should be fine. Performance will be better, though, if the source projection already matches the target projection.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

|                    | Cached   | Dynamic  |
|--------------------|--|--|
| <b>Application</b> | Base maps  | Reference Layers   |
| <b>Performance</b> | ✔ Improved performance                             | ✘ Decreased performance because needs to draw map on the fly                     |
| <b>Projection</b>  | ✘ Typically cannot be reprojected                  | ✔ Can be reprojected on the fly<br>✘ Reprojection negatively affects performance |
| <b>Limitations</b> | ✘ Alter visibility of layers<br>✘ Filter<br>✘ Copy | ✔ Alter visibility of layers<br>✔ Filter<br>✔ Copy                               |

## Conversion Checklist

- Rectify ALL errors/problems/warnings in the Database Integrity Check
- Clean up values in Reference usefulness fields
- Review/clean up extensible tables
- Run Source Feature Location Use Class queries and save results
- Rectify Invalid MAPPEDDATE values

### Provide to NatureServe in a zip file via the NatureServe transfer site:

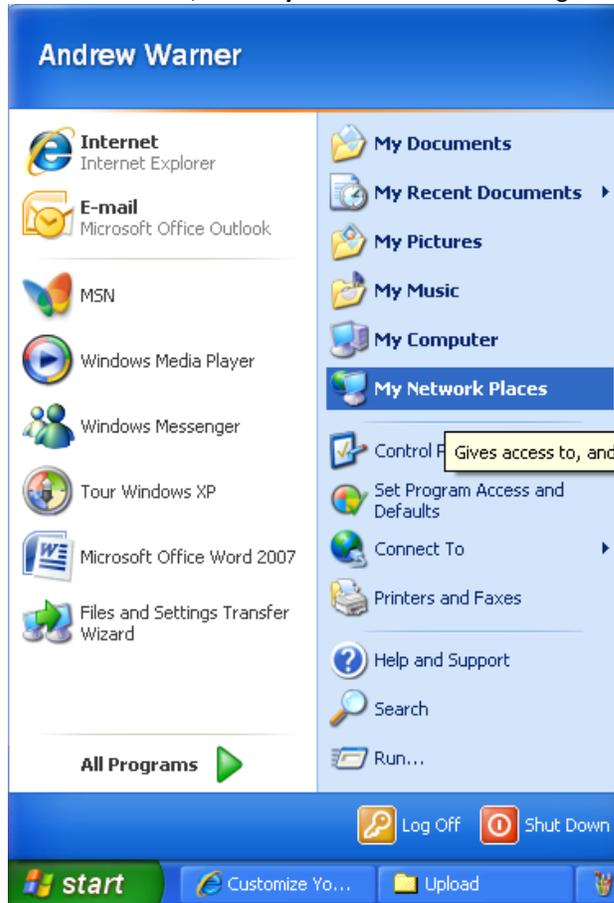
- db\_upgrade\_history.txt
- DBIC.rpt
- Tablespace\_sizes.log
- Backup zip file:
  - BIOTICS folder with path info
  - biotics\_del.dmp & .log files
  - biotics\_user.dmp & .log files
- Layers used in spatial attribute calculation
  - In a single file geodatabase named **SpatialCalculations**
  - In your Biotics projection (NOT WGS...)
  - Layers named according to THEME\_SRC value (i.e. QUADNHP.SHP should be named **QUADNHP**)
- OPTIONAL: Map Service(s) to be published by NatureServe – (only if agreement has previously been made with NatureServe to publish map services on your program’s behalf)
  - Zip file containing:
    - 1) file geodatabase with source data
    - 2) map document (.mxd) – according to Prepare Map Document instructions
    - 3) readme.txt document
  - Title

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

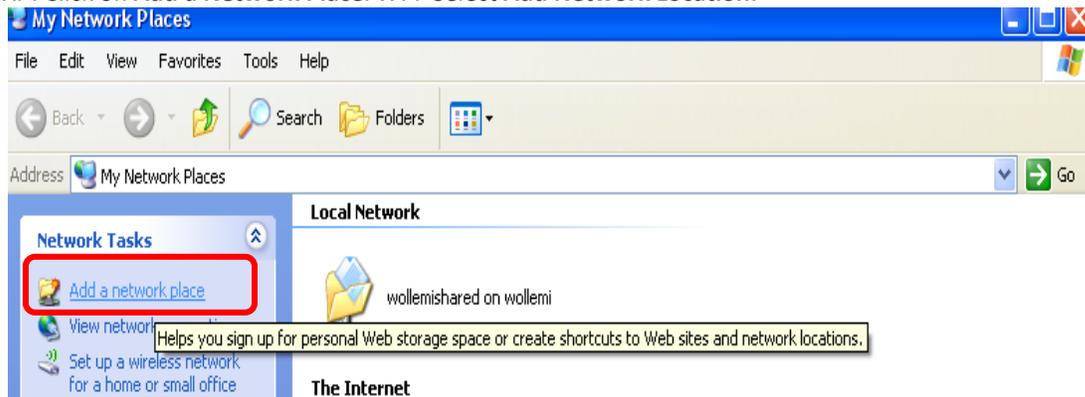
## Instructions for uploading data to NatureServe's transfer site

[screenshots show Windows XP (XP); screens and wording differ slightly in Windows 7 (W7)]

1. *XP*: Click on Start, then **My Network Places**. *W7*: Right click **My Computer**.

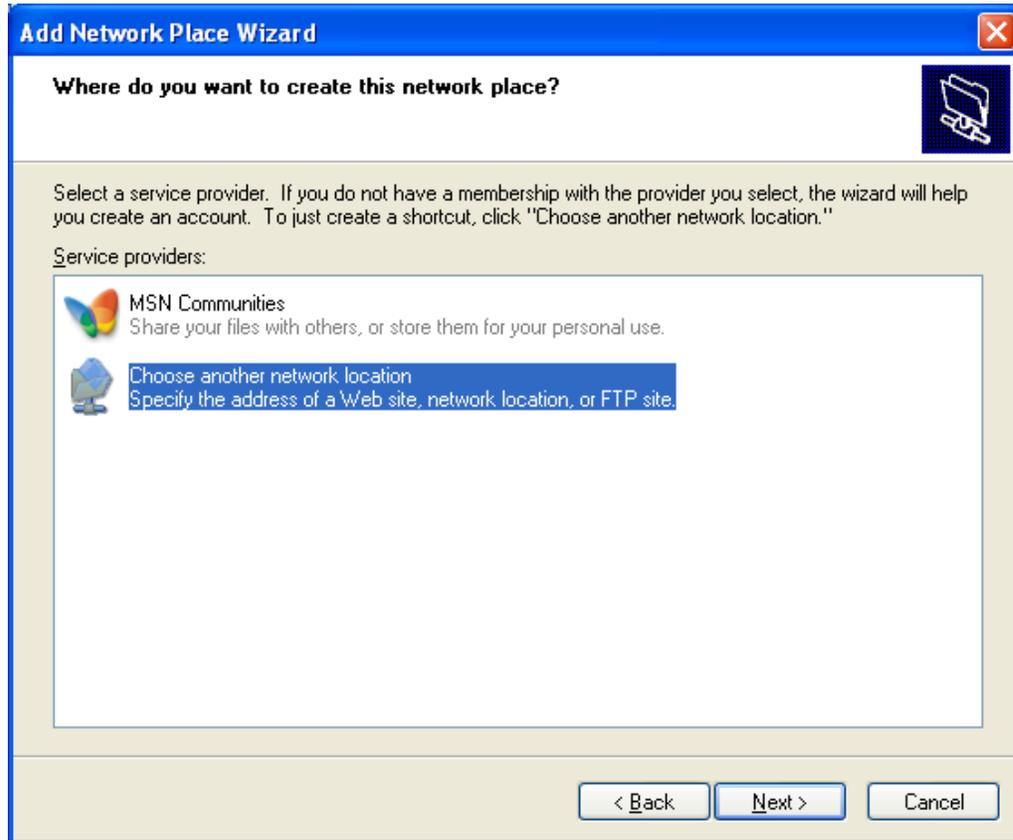


2. *XP*: Click on **Add a Network Place**. *W7*: Select **Add Network Location**.



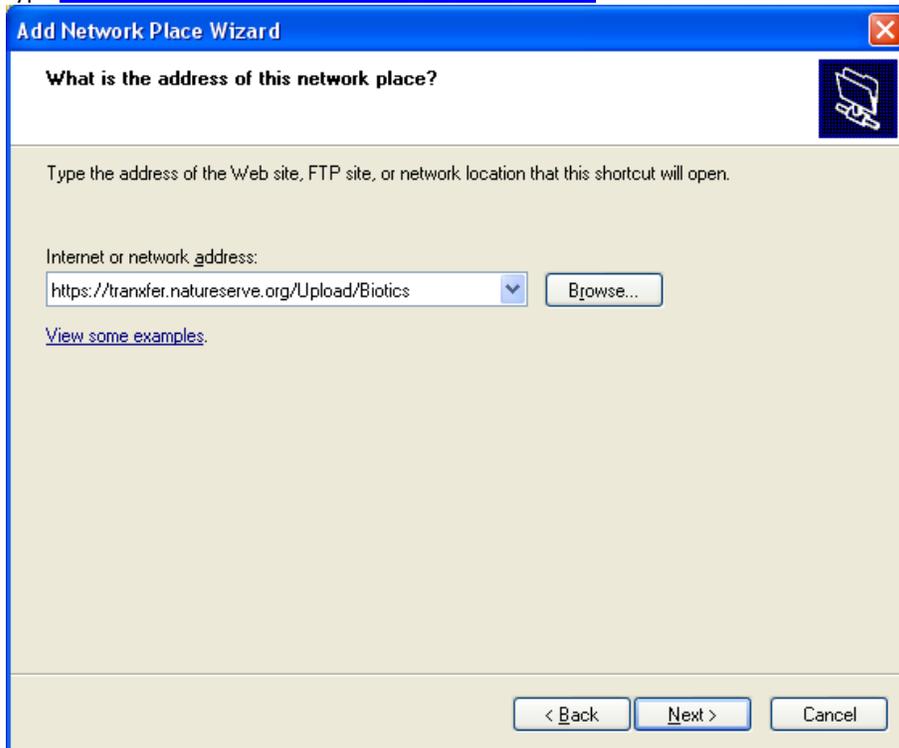
Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

3. *XP*: Select **Choose another network location** and click **Next**. *W7*: Select **Choose a custom network location** and click **Next**.

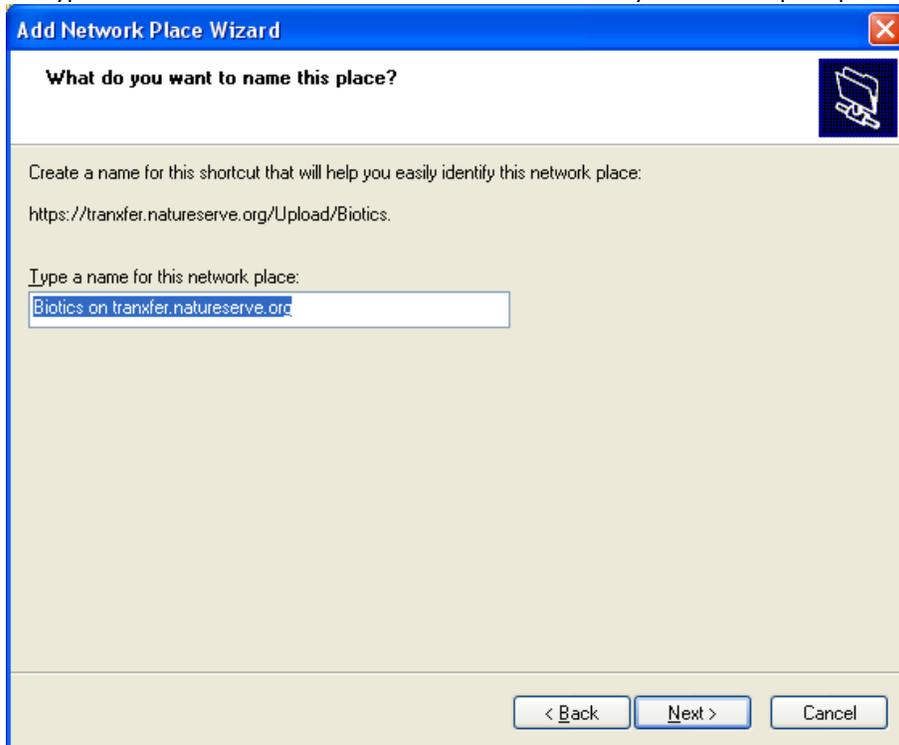


Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

4. Type <https://transfer.natureserve.org/Upload/Biotics> for the Internet or Network Address and click **Next**.

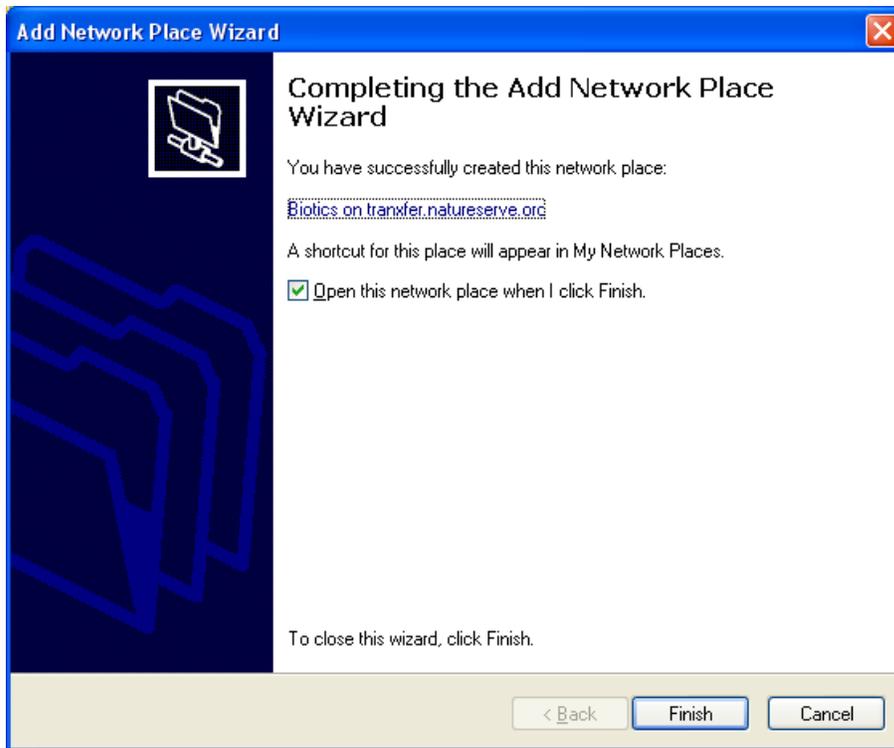


5. **XP:** Type in a Name for Network Place and click Next. **W7:** you'll first be prompted for the login - see step 6).



6. Click **Finish** and the new window should open.

Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

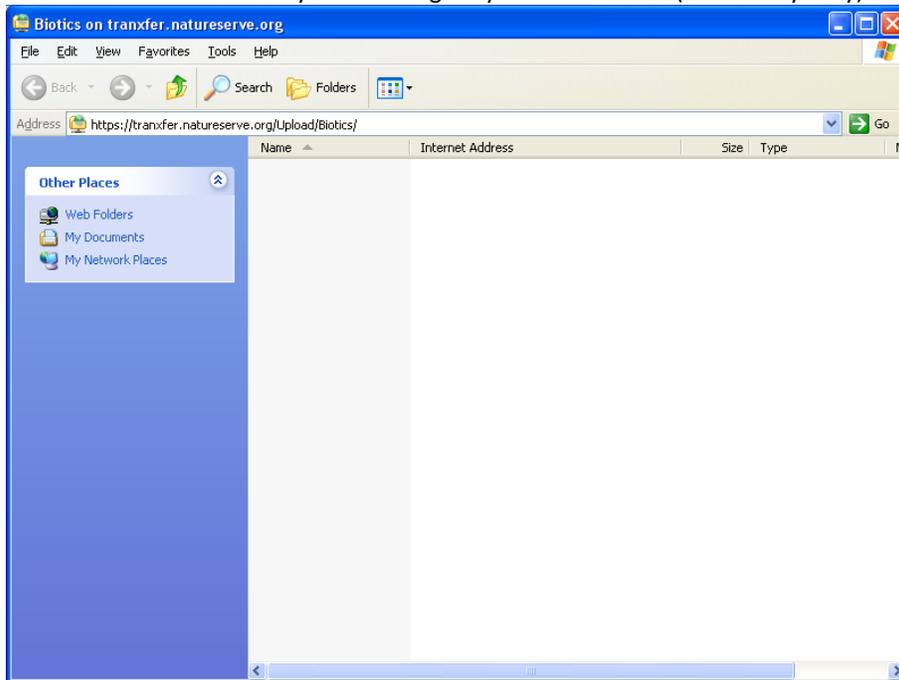


NOTE: You MAY be re-prompted for network credentials. If you get the rolling flashlight; look for the authentication window. Enter User name: **kindling\upl0ad** and Password: **welcome2** and click **OK**.



Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

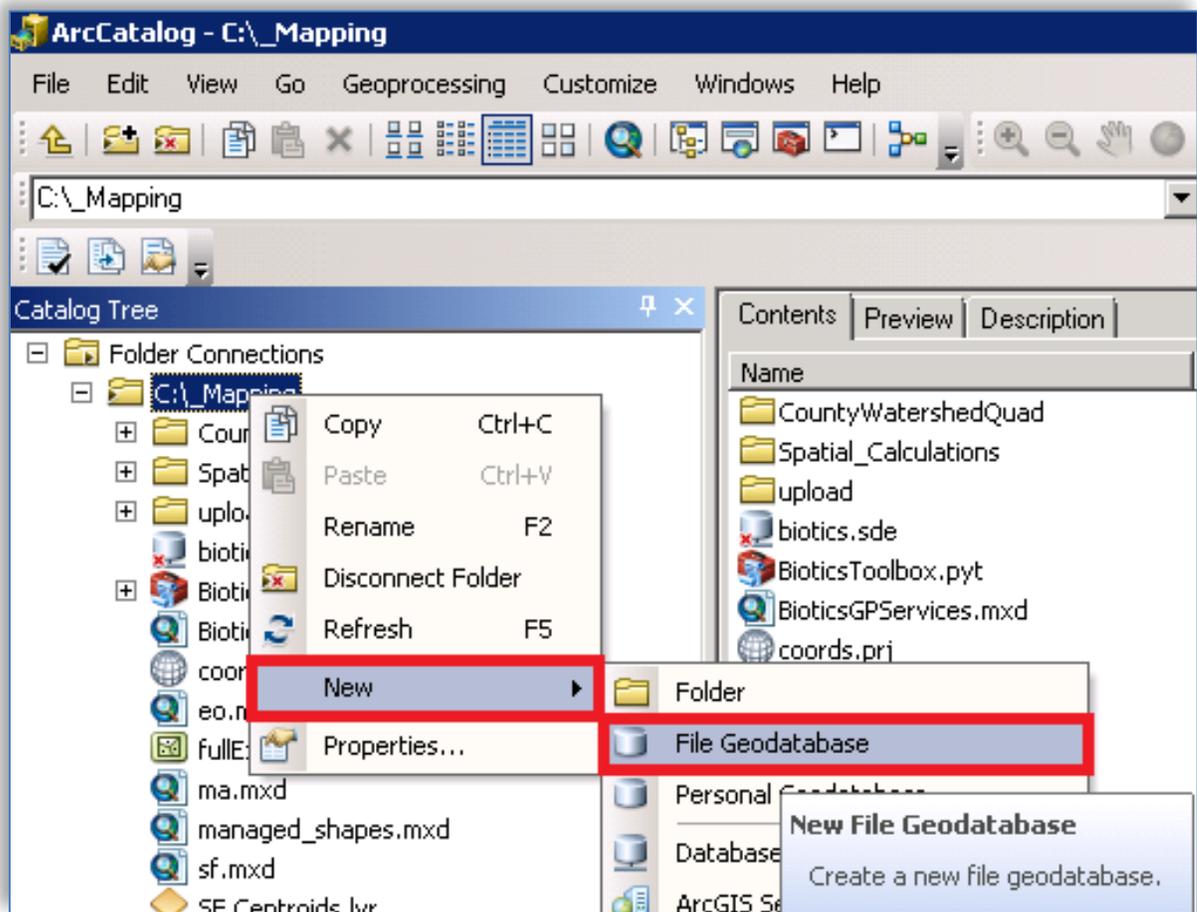
7. Access Network Place at any time through My Network Places (Name May Vary).



## Appendix I: Create File Geodatabase

### Create File Geodatabase

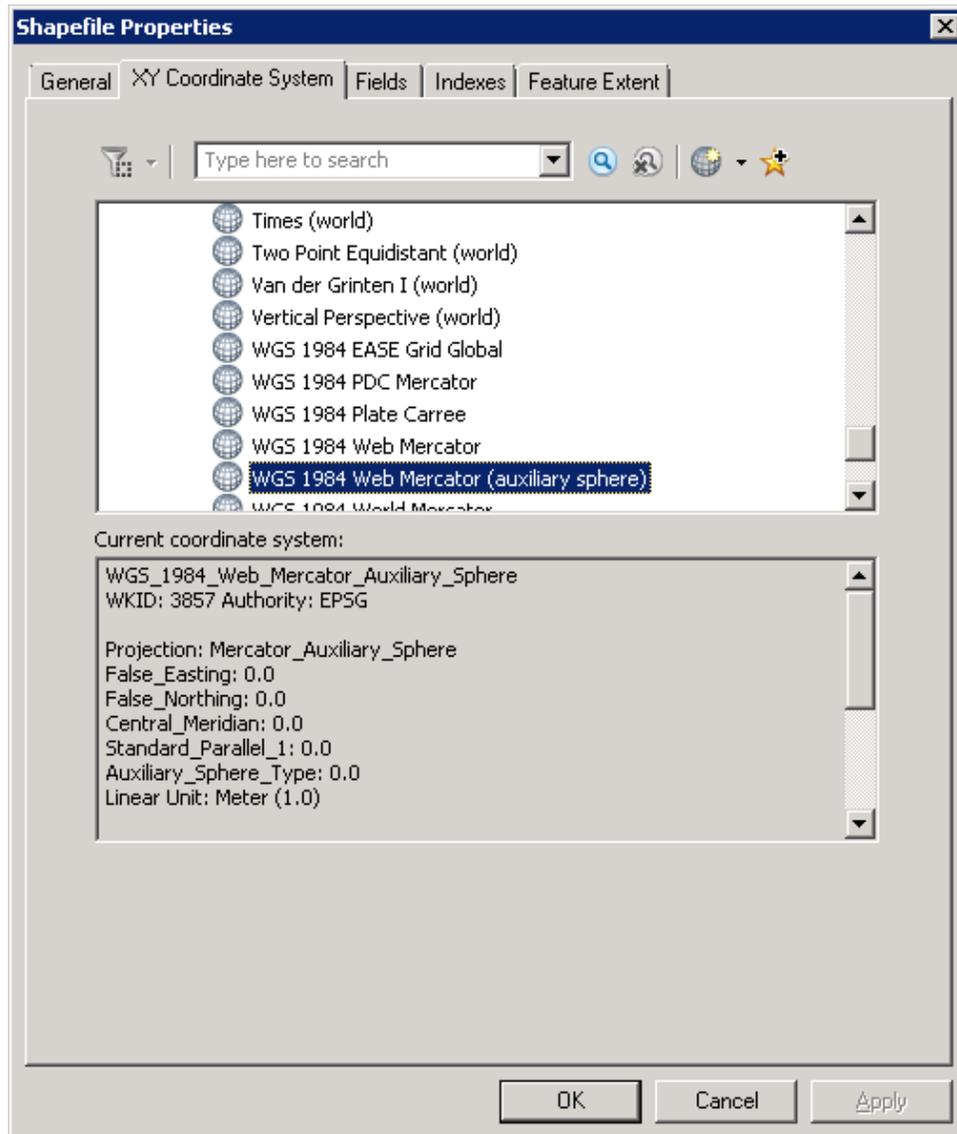
1. In ArcCatalog\*, right click on folder in which to create the file geodatabase
2. Choose **New**
3. **File Geodatabase**
4. Name the geodatabase **SpatialCalculation**



Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

### Verify Projection of Shapefile

1. In ArcCatalog, right click on shapefile
2. Choose **Properties**
3. Navigate to **XY Coordinates System** tab
4. Verify correct projection



Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

### Project, if necessary

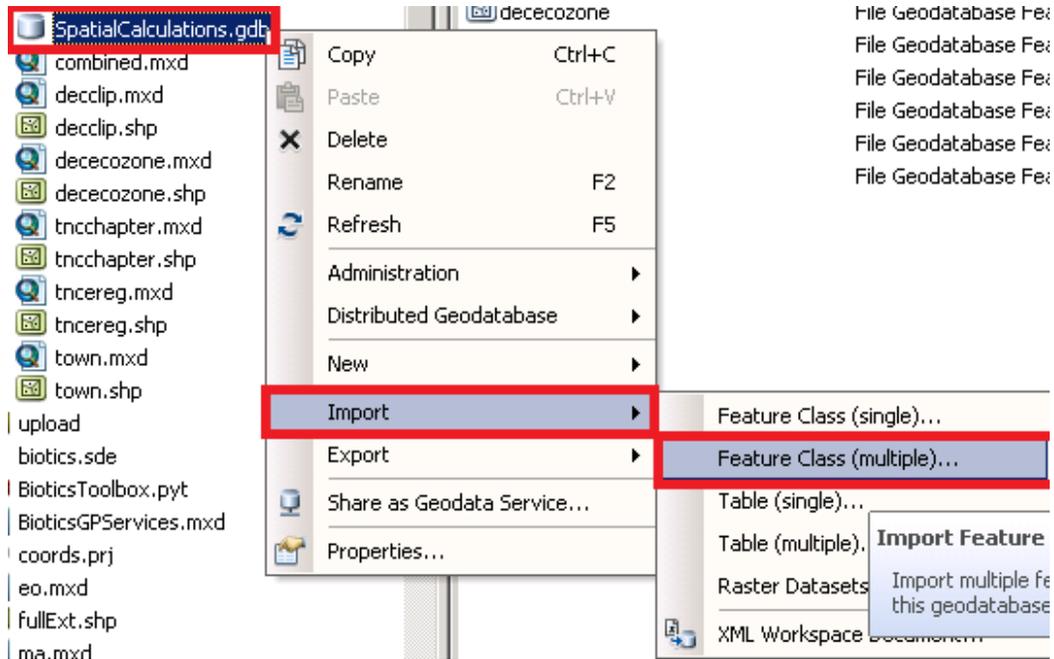
1. In ArcCatalog, open the ArcToolbox
2. Navigate to **Data Management Tools, Projections and Transformations**
3. If no projection has been defined, double-click **Define Projection**
4. If the shapefile needs to be reprojected, the **Project** & **Batch Project** tools are found within the **Feature** subfolder



Questions? Submit a Ticket to the [Biotics 4 Help Desk](#) or [Biotics 5 Help Desk](#) (i.e. Contact Support), as appropriate

### Import into Geodatabase

1. In ArcCatalog, right-click on the SpatialCalculations.gdb file
2. Choose **Import**
3. **Feature Class (multiple)**
4. If the shapefile needs to be reprojected, the **Project** & **Batch Project** tools are found within the **Feature** subfolder



Rename Feature Classes in geodatabase, if necessary

1. In ArcCatalog, right-click on the feature class to be renamed within the SpatialCalculations.gdb file
2. Choose **Rename** to rename the feature class to reflect the THEME\_SRC name

## Appendix II: New Element Rank Factors and Domain Values

***The section is for your information only. No action is required.***

The Element Ranking records at all levels (global, national, and subnational) have undergone some changes in Biotics 5 to bring them into line with the information used in the Rank Calculator. For an in-depth explanation of the changes, please see [NatureServe Conservation Status Assessments: Factors for Evaluating Species and Ecosystem Risk](#). The majority of changes involve re-evaluation of existing rank factor fields and the addition of new fields, but there are four fields where the changes required conversion of data to use new or revised domain tables (i.e., pick lists). Those fields are:

- Area of Occupancy
- Linear Distance of Occupancy
- Short-term Trend
- Long-term Trend

**Area of Occupancy:** This field has been replaced with ratings fields that differ for species and ecological communities. For species, the new field is called "Area of Occupancy Rating (as Number of 4sq-km Grid Cells)." For communities, the field that will be filled out depends on the spatial pattern of the community: either "Area of Occupancy Rating for Large Patch Spatial Pattern" or "Area of Occupancy Rating for Small Patch Spatial Pattern" or "Area of Occupancy Rating for Matrix Spatial Pattern." However, for conversion, all Area of Occupancy values for communities were converted to the Large Patch field, which is the default choice. These new fields have a different range of domain values than the original Area of Occupancy field. The corresponding old and new values are shown in the tables on pp. 61-62 of the above-referenced document. The original field and data still exist in the database for the time being, so if you have existing queries or reports that reference the "old" Area of Occupancy field, they will still work.

**Linear Distance of Occupancy:** This field has also been replaced with ratings fields that differ for species and ecological communities. For species, the new field is called "Area of Occupancy Rating (as Number of 1sq-km Grid Cells)." For communities, data from Linear Distance of Occupancy was converted to a value in the new field "Area of Occupancy Rating for Large Patch Spatial Pattern" if the "old" Area of Occupancy was blank. If both Area of Occupancy and Linear Distance of Occupancy were populated in Biotics 4, then Area of Occupancy was converted and Linear Distance of Occupancy was not. The original field and data still exist in the database for the time being, so if you have existing queries or reports that reference the "old" Area of Occupancy field, they will still work.

**Short-term Trend:** The values in the domain table linked to this field were revised because the scale was made finer. The field name remains the same. The conversion from old to new data values is shown in the chart on p. 63 of the above-referenced document.

**Long-term Trend:** The values in the domain table linked to this field were revised because the scale was made finer. The field name remains the same. The conversion from old to new data values is shown in the chart on p. 63 of the above-referenced document.

For additional information on the revised ranking methodology, please see [NatureServe Conservation Status Assessments: Methodology for Assigning Ranks \(June 2012\)](#).