NatureServe
# BIOTICS 5

## Conversion Guide

Version 1.0
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NatureServe

# Contents

# 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 | • **Update Biotics to the most recent version**<br>• **Clean up database (DBIC)**<br>• **Provide database to NatureServe** |
| NatureServe | • **Migrate Oracle database**<br>• **Update Oracle tables/views to accommodate changes** |

**Spatial Data**

| Responsibility | Task |
|---|---|
| Member Program | • **Provide managed layer shapefiles**<br>• **Identify reference map layers needed**<br>• **Confirm source and format of hosted map services**<br>• **Prepare Map Document (.mxd) and zipped reference layers to be hosted by NatureServe** |
| NatureServe | • **Import  managed layer shapefiles into Oracle geodatabase**<br>• **Configure reference map services** |

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

# 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.
**To Do:**

1. **Db_upgrade_history.txt**

   The version of Tracker should be 2.3.7 and Mapper should be 4.0.4.  If that is not the case, you will need to run the appropriate upgrade, as found on the Biotics Product Updates web page. You can determine the software version by selecting 'About Tracker' from Tracker's Help menu and 'About Biotics' from Mapper's Help menu.

Database patches are published on the Biotics Product Updates web page.  To determine which patches have been run since your installation, run the following query in Tracker's Query Builder and **_export the results to db_upgrade_history.txt_**:
_SELECT * FROM DB_UPGRADE_HISTORY;_
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, contact the Biotics Help Desk.

2. **Dbic.rpt** - rectify ALL errors/problems/warnings in the Database Integrity Check and provide resulting, clean dbic.rpt; see KB article 186.
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** – Oracle backup of deleted schema
   o **Biotics_user.dmp** – Oracle backup of regular schema

# 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.
- 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:

I.  **As a basemap**.  A basemap is the background upon which all other layers are placed and analyzed. 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.
II.  **As a reference layer**.  Reference layers are drawn on top of the basemap. Features within these layers can be analyzed and filtered as long as the underlying map service provides this functionality. This includes any layers used to calculate spatial attributes if not already contained

in another reference layer. See the Prepare Map Document section for details about supported formats. If you have reference layers that you wish to access in Biotics 5 that are not already published as a map service, commercially, by your agency or by yourself,  you can provide them to NatureServe who in most case will be able to publish them as part of your Biotics installation.

| | **Basemaps** | **Reference Layer** |
|---|---|---|
| **Purpose** | Visual background and geographical context; locational reference | Layers not available within Basemapes; Interactive use, as described below |
| **Use** | ✖ Alter visibility of layers<br>✖ Identify<br>✖ Search<br>✖ Filter<br>✖ Copy feature<br>✖ Spatial Calculation | ✔ Alter visibility of layers<br>✔ Identify<br>✔ Search<br>✔ Filter<br>✔ Copy feature<br>✔ Spatial Calculation |
| **Provided by** | • esri (default)<br>• your agency<br>• Bing (requires valid usage key) | • your agency |

**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 online by going to http://www.arcgis.com/home/webmap/viewer.html?useExisting=1 and clicking **Basemap.** Select the various basemaps to see how detailed they are within your area.
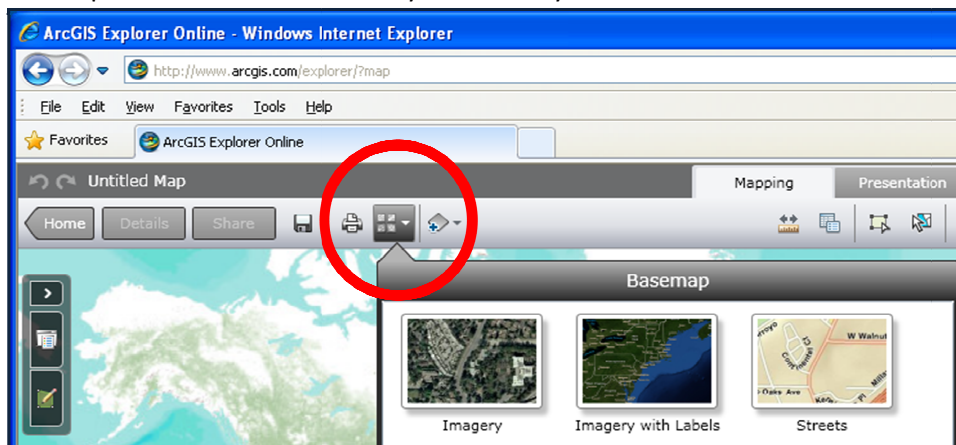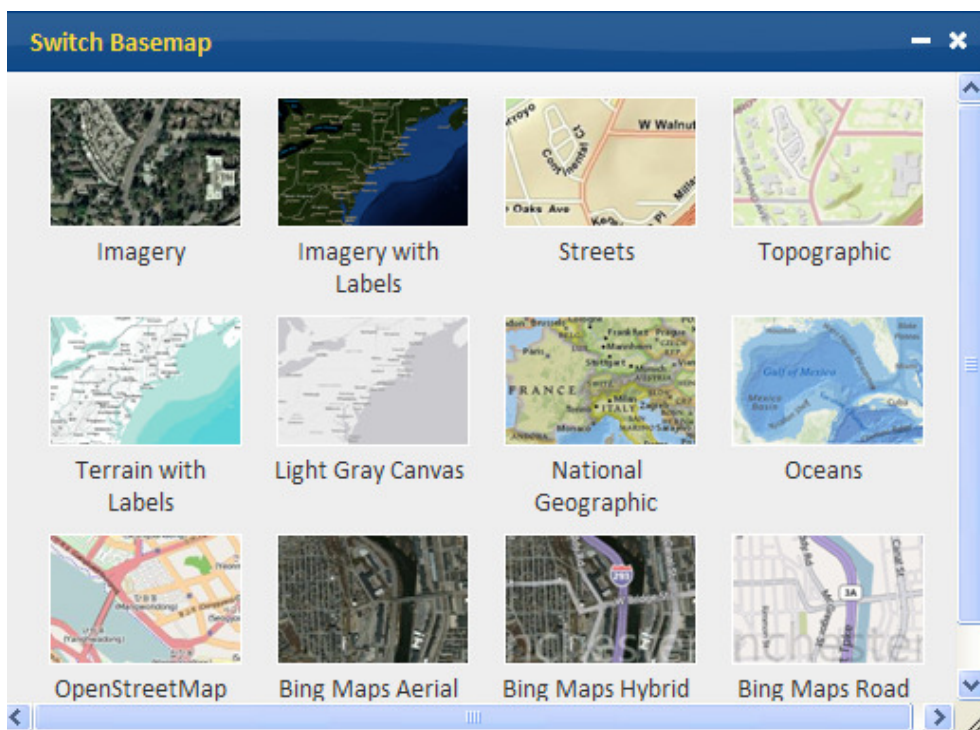
Other map services can be included as basemaps if they:
- Are published as an ArcGIS map service
- Are cached in the WGS 84 Web Mercator (auxiliary sphere) projection

**To Do:**
Please provide the following information for every map service that you wish to include as an additional basemap:
- The map service's URL
- A title to use
- A 200x133 .jpeg or .png thumbnail

**Reference Layers**
Reference layers are spatial data not accounted for in the basemap that can be used within Biotics 5 for a variety of purposes, such as copying features, performing spatial searches, etc.  Each reference layer is a map service that contains a collection of one or more GIS layers. When a map service is included as a reference layer for Biotics, all of its constituent layers are available through Biotics.

Each Biotics 5 installation (instance) will be configured with a library of these reference layers. Users can select layers from this library in order to quickly add them to their map.  In addition, Biotics users will be able to spontaneously include map services that are not included in this library.  To do so they will have to provide individual map service URLs. At this time, only ArcGIS Server map services can be used as reference layers. Support will likely be added for other map service formats such as WMS in future releases.

Map services should be provided to NatureServe as described in the Prepare Map Document section.  If you do not have the capability 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.   All map services published in this manner will be included in the Reference Layer Library.

## 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 use in 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 used in spatial attribute calculation*

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 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*

Any layers to be used for spatial calculation will need to be provided as a reference layer as Biotics 5 cannot perform spatial calculations on layers within a basemap.

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.

**To Do:**
To include a reference layer in the library:
- Prepare the map service as described in the <u>Prepare Map Document</u> section
- Provide the map service's URL
- Provide a title to use

# Prepare Map Document (.mxd)

Following is information regarding how a map document should be prepared for publishing to a map service, for use in Biotics 5.  If you wish to include GIS data that is not available through an existing map service, in most cases NatureServe can publish map services for you containing the data. To do so, provide the GIS layers along with a map document that reflects how you want to see the data layers within the map viewer as detailed below.

- Use relative path names
- Group Layers to organize data layers
- Define Layer Names
- Set appropriate Scale Range
- Fields
  - 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**)
- Symbology
  - Symbolize appropriately
  - Define Legend labels
- Provide Definition queries, as appropriate
- Repeat layers within .mxd with various legends if more than one legend is desired
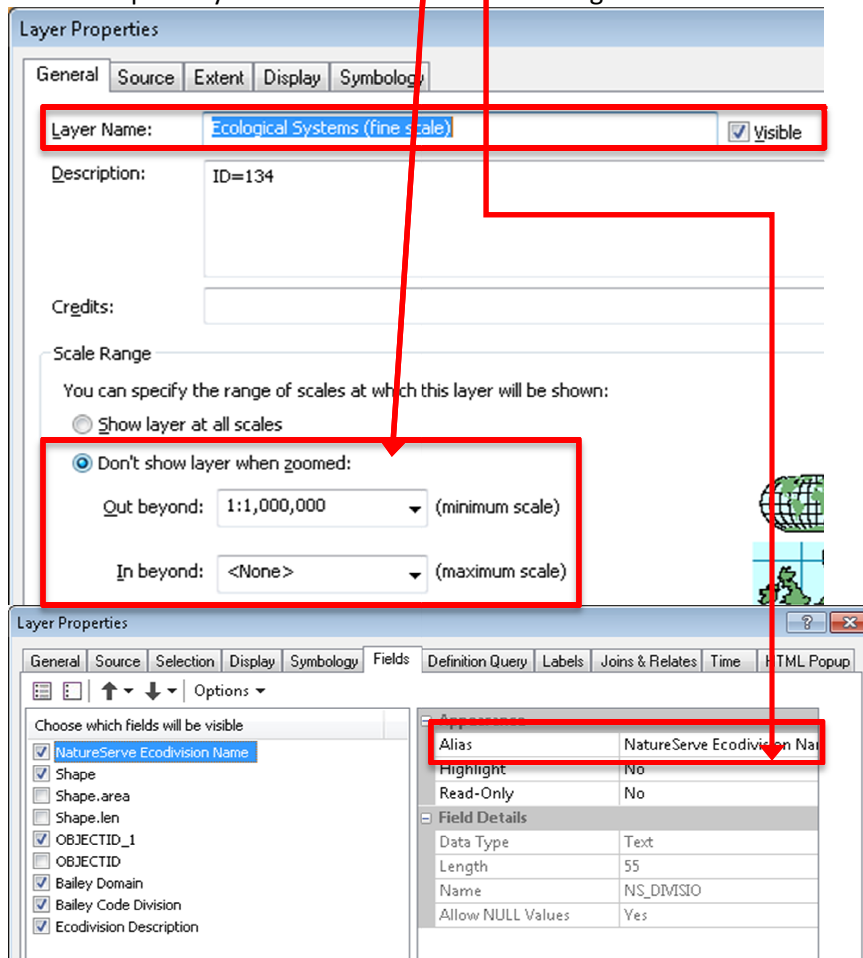
Use the Analyze Map tool within the Map Service Publishing toolbar to ensure that there are no errors that will prevent the map document from being published as a map service. Each MXD will be published as a separate map service, and will also be added to the Reference Layer library.
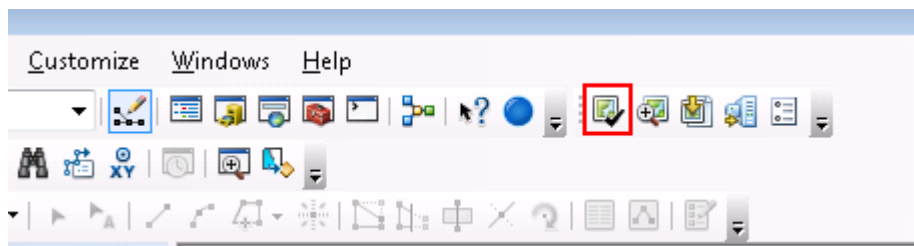


The underlying GIS layers and any additional GIS layers used for spatial attribute calculations may be stored within either a File geodatabase or shapefiles. Personal geodatabases are not recommended.

The MXD and all GIS layers should be provided within a single zip file.

**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 84 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)
- 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
  - 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.

|  | Cached | Dynamic |
|---|---|---|
| **Performance** | ✔ Improved performance | ✖ Decreased performance because needs to draw map on the fly |
| **Limitations** | ✖ Alter visibility of layers<br>✖ Filter | ✔ Alter visibility of layers<br>✔ Filter |

## Conversion Checklist

☐ db_upgrade_history.txt

☐ DBIC.rpt

☐ Tablespace_sizes.log

☐ Backup zip file:
 ☐ BIOTICS folder with path info
 ☐ biotics_del.dmp
 ☐ biotics_user.dmp

☐ Basemap (optional):
 ☐ Map service URL
 ☐ Title
 ☐ Thumbnail: 200x133 .jpeg or .png

☐ Reference:
 ☐ Map service URL or zip file containing .mxd & all layers
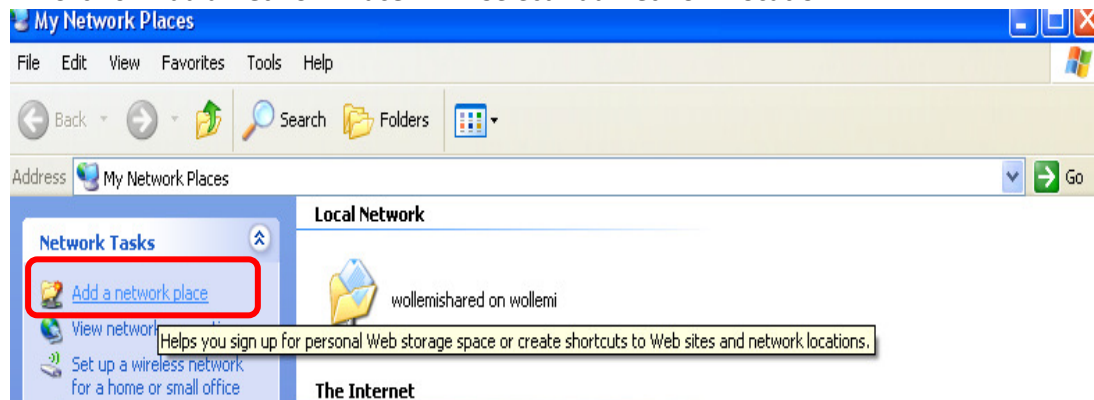 ☐ Title
 ☐ Thumbnail: 200x133 .jpeg or .png

# 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**.
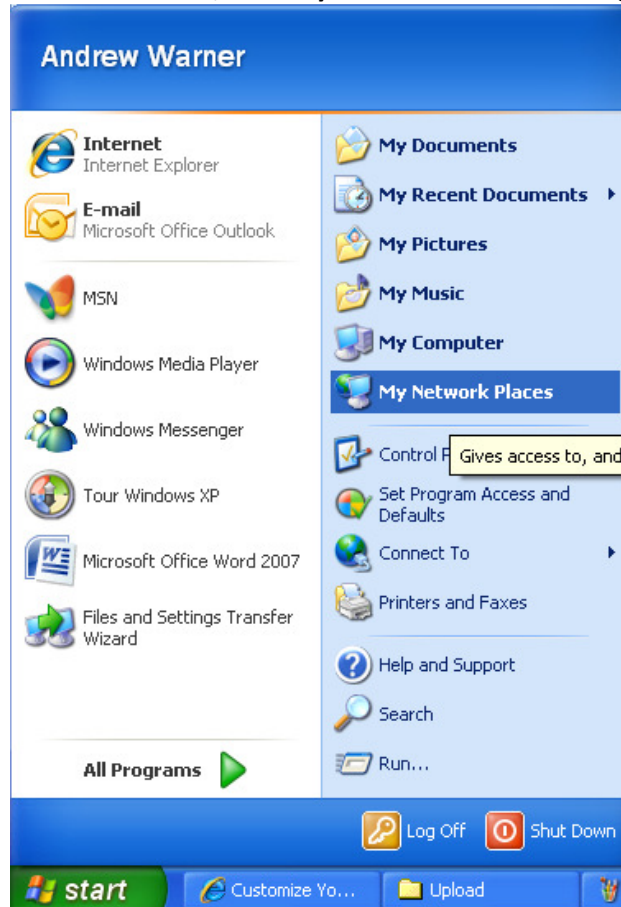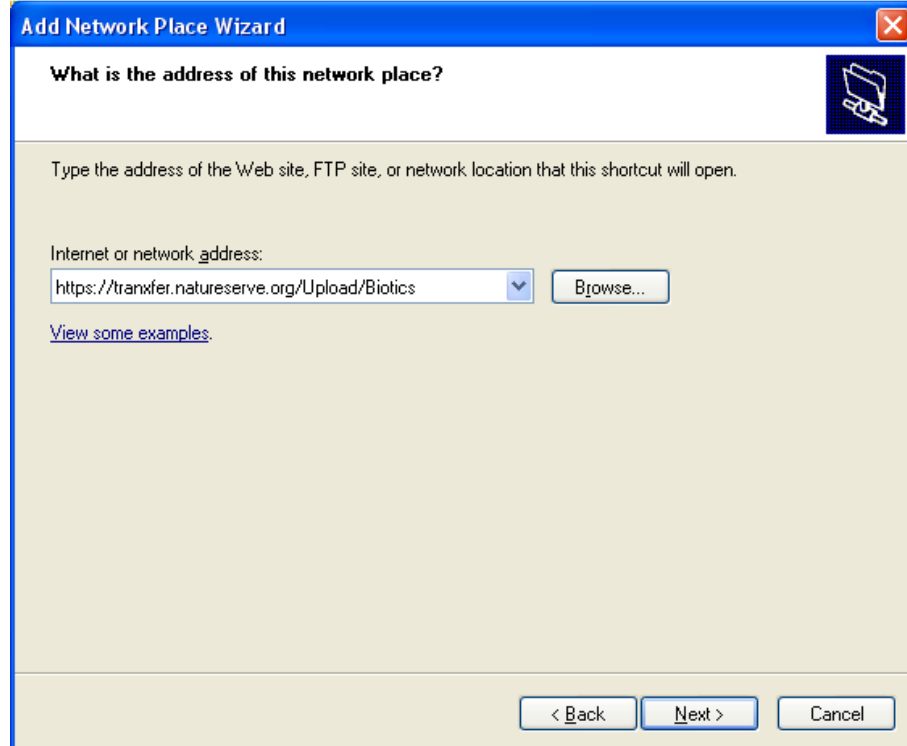


2. *XP*: Click on **Add a Network Place**. *W7*:  Select **Add Network Location.**

3.  *XP*: Select **Choose another network location** and click **Next.** *W7*:  Select **Choose a custom network location** and click **Next.**
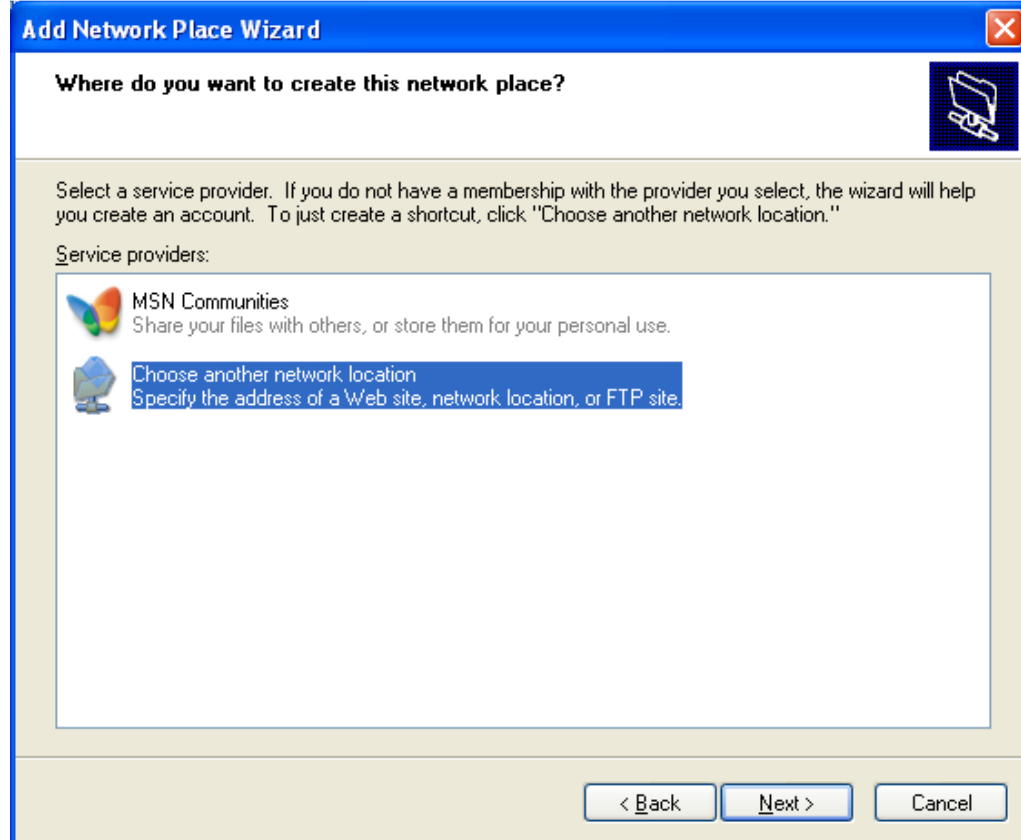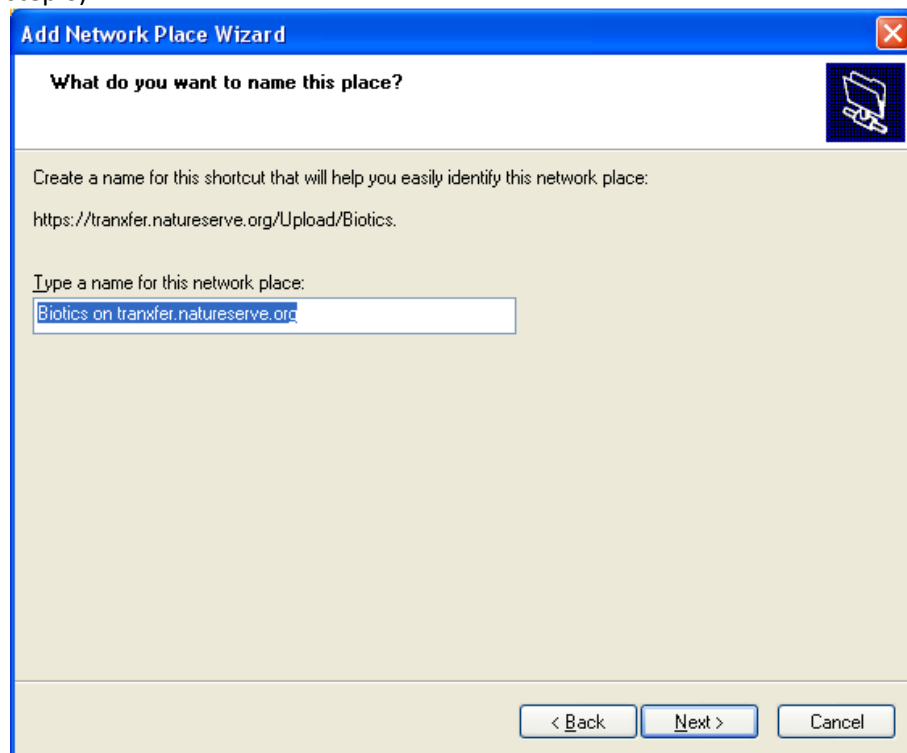
4.  Type **https://tranxfer.natureserve.org/Upload/Biotics** for the Internet or Network Address and click **Next**.



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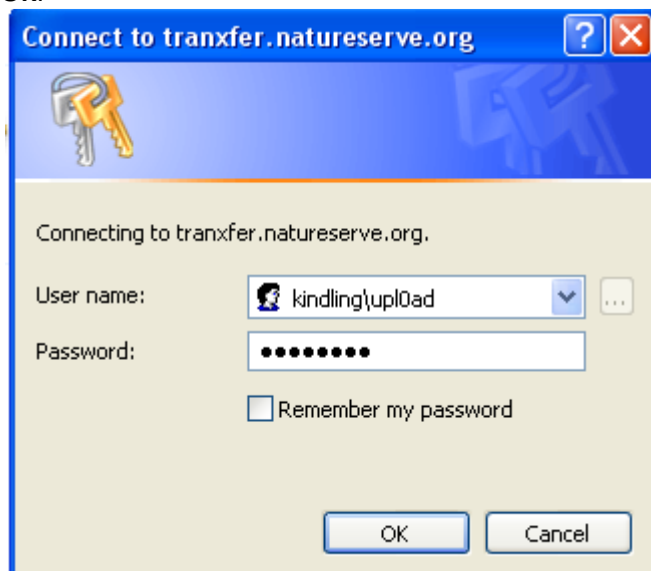
6.  Click **Finish** and the new window should open.
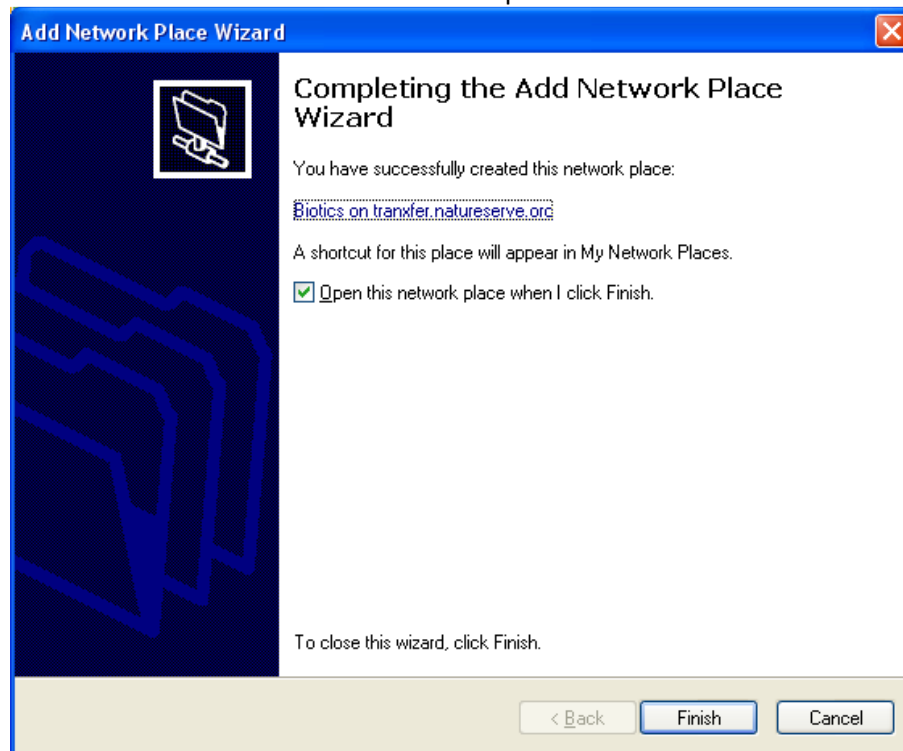


NOTE: You MAY be re-prompted for network credentials.  If you get the rolling flashlight; look for the authentication window.   Enter User name: **Kindling\upl0ad** and Password: **welcome2** and click **OK**.

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