NRI Data Collection Instructions

2017

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

Center for CSSM
Survey Statistics and Methodology

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Amendments to Instructions – New in 2017

The guiding principal for collecting data and conducting an accurate longitudinal survey is to collect data from the exact same location each time it is surveyed. The NRI began in 1982 and most of the points and segments have been surveyed multiple times. Recording attributes for points and segments is critical to accurately reporting land use trends.

NEW IN 2017 INSTRUCTIONS (includes items covered in the addendum to the 2016 instructions)

- New Forest Plantings: This issue pertains to a point that has been historically classified as a non-forest LCU, but current imagery indicates the point now lies in a planting of tree seedlings or saplings. SMPT has determined that such plantings will not be classified as forest until these plantings have become established and the canopy has developed to meet the canopy cover requirement established by the NRI definition of forest. This decision ensures that cropland, hayland, and pasture points will be evaluated by local data collectors for possible enrollment in the General CRP program.

- Commercial Solar Arrays: Added "commercial solar arrays" to the list of eligible areas, and added the definition, "any ground mounted solar panel installation, whether a fixed angle system or a single or double axis tracking system, associated with a commercial/industrial enterprise. Excluded are arrays that, via photointerpretation, are clearly associated with agricultural operations."

- Sections in area data collection referring to the second revision year have been removed. We no longer have segments with two revision years.

- Integration instructions have been amended to include a consistency check of Use of Land for local eligible points as a part of integration. Such a check helps ensure that land going into or coming out of general CRP does not have an inappropriate use of land associated with it.

- Flow chart diagrams at the beginning of each data collect section have been edited to remove second revision year steps.

- A graphic has been included with the forestland definition to aide in visualizing 25% canopy cover.

- Figure numbering and labeling has been made consistent throughout the document.

- The link to the National Conservation Practice Standards found on pages 116-117 was an outdated link. The link has been updated.

Chapter 1: NRI Background Information

1.1 Introduction

The National Resources Inventory (NRI) is a statistical survey of land use and natural resource conditions and trends on U.S. nonfederal lands, which include privately owned land, tribal and trust land, and lands controlled by State and local governments. The NRI is conducted by the Natural Resources Conservation Service (NRCS) in cooperation with Iowa State University's Center for Survey Statistics and Methodology.

The NRI is conducted under the authority of a number of legislative acts including the Rural Development Act of 1972, the Soil and Water Resources Conservation Act of 1977, the Federal Agriculture Improvement and Reform Act of 1996, and the Farm Security and Rural Investment Act of 2002. Resources inventory legislative authorities, NRCS policy, and responsibilities for conducting the NRI are contained in NRCS General Manual 290, Part 400.

The NRI plays a key role in development of conservation policy and programs for the Nation. It serves to educate the public regarding natural resource issues and provides a comprehensive nationally consistent source of data for researchers in many fields. Informed and valid decisions are best made when based upon scientifically derived data. The NRI has been developed to supply this type of information.

The NRI is unique as a tool to assess conditions and trends of soil, water, and related resources on the Nation's nonfederal lands, because it:

- Features data gathered and monitored since 1982 by technical and natural resource data collection experts,
- Is directly linked to NRCS Soil Survey Databases permitting analysis of resources in relation to soil resources and conditions, and
- Provides a nationally consistent database that can be used to statistically evaluate trends in natural resources over time for all nonfederal lands.

1.2 NRI Survey Program

NRCS has conducted periodic inventories of the Nation's natural resources throughout its history. The present NRI is the result of several decades of scientific development.

The 1945 Soil and Water Conservation Needs Inventory (CNI) was a reconnaissance study that served as the foundation for the 1958 and 1967 Conservation Needs Inventories, the Agency's first efforts to collect data nationally from a statistical sample of field sites. The 1975 Potential Cropland Study focused on identifying lands best suited for cultivation.

The National Resources Inventory was first conducted in 1977, and every 5 years thereafter through 1997. Several less intensive, special-issue studies were performed during the 1990's to investigate topical matters of concern as supplements to the NRI.

NRI sampling units have been established across all parts of the Nation using a stratified two-stage, unequal probability area sampling scheme. The first-stage-sampling unit is an area segment of land; the second-stage sampling units are points located within the area segments. The national "foundation" or framework sample consists of about 300,000 area segments and 800,000 sample points. Data are collected for both the first- and second-stage sampling units using remote sensing (primarily photo interpretation) supported by administrative records and on-site field investigation.

1.3 Annual NRI

The Annual NRI is currently conducted using a continuous, or annual, inventory process. Annual data collection helps align the NRI with the need for timely information to support development and assessment of agricultural and conservation policies and programs. A continuous inventory approach also distributes the NRI workload more evenly across years and provides efficiencies in the data gathering and quality assurance processes. For the Annual NRI, data are gathered for each year's growing season from a scientifically selected subset of the "foundation" sample segments established for the 1997 NRI. In a fully implemented year, this sub-sample includes about 40,000 "core" sample segments, which are sampled every year, and about 30,000 "rotation" (or "supplemental") sample segments that vary by inventory year and allow an inventory to focus on an emerging issue. Additional on-site data gathering may be conducted for items that cannot be determined remotely, to establish baseline conditions, and for quality assurance purposes.

The 2005 Annual NRI survey process involved three significant changes relative to previous years. First, photo interpretation data collection was conducted in three regional Remote Sensing Laboratories (RSLs) by contract data collectors. Second, area feature data such as waterbody boundaries were digitally recorded using specialized survey software. Third, administrative data gathered by state staff were collected using a standardized questionnaire. Because of these transitions, data for the 2005 Annual NRI were restricted to the core sample from the coterminous 48 states. The 2006 Annual NRI returned to the usual Annual NRI sample design with the full core sample and a rotation sample.

Beginning in 2007, segments from Hawaii (HI), and the Caribbean (Puerto Rico and US Virgin Islands) were re included as part of the Annual NRI. The current Annual NRI contains the full core for the coterminous 48 states, Hawaii, and the Caribbean and rotation segments.

1.4 Data Collection for the Annual NRI

The Annual NRI involves collecting data on NRI sample segments and on 1-3 sample points selected within the segment. Area segments range in size from about 40 to 640 acres in size, with most being about 160 acres (Public Land Survey quarter section). Data are collected by RSL staff through photo interpretation of aerial photography taken in several different years and by state staff from administrative records. NRI data are collected for both area features and points located within the segments. Area data are collected for waterbodies and streams, road and railroad transportation, and built-up land using the specialized survey software to delineate and attribute area features. Point data primarily involve classification of conditions at the sample point.

The Annual NRI digital data collection process has five distinct steps, each of which is guided by specialized survey software systems:

1. Aerial photographs not scanned during acquisition are scanned by RSL staff,

2. Scanned images are registered (orthorectified) by RSL staff using a process that supports accurate trend detection,

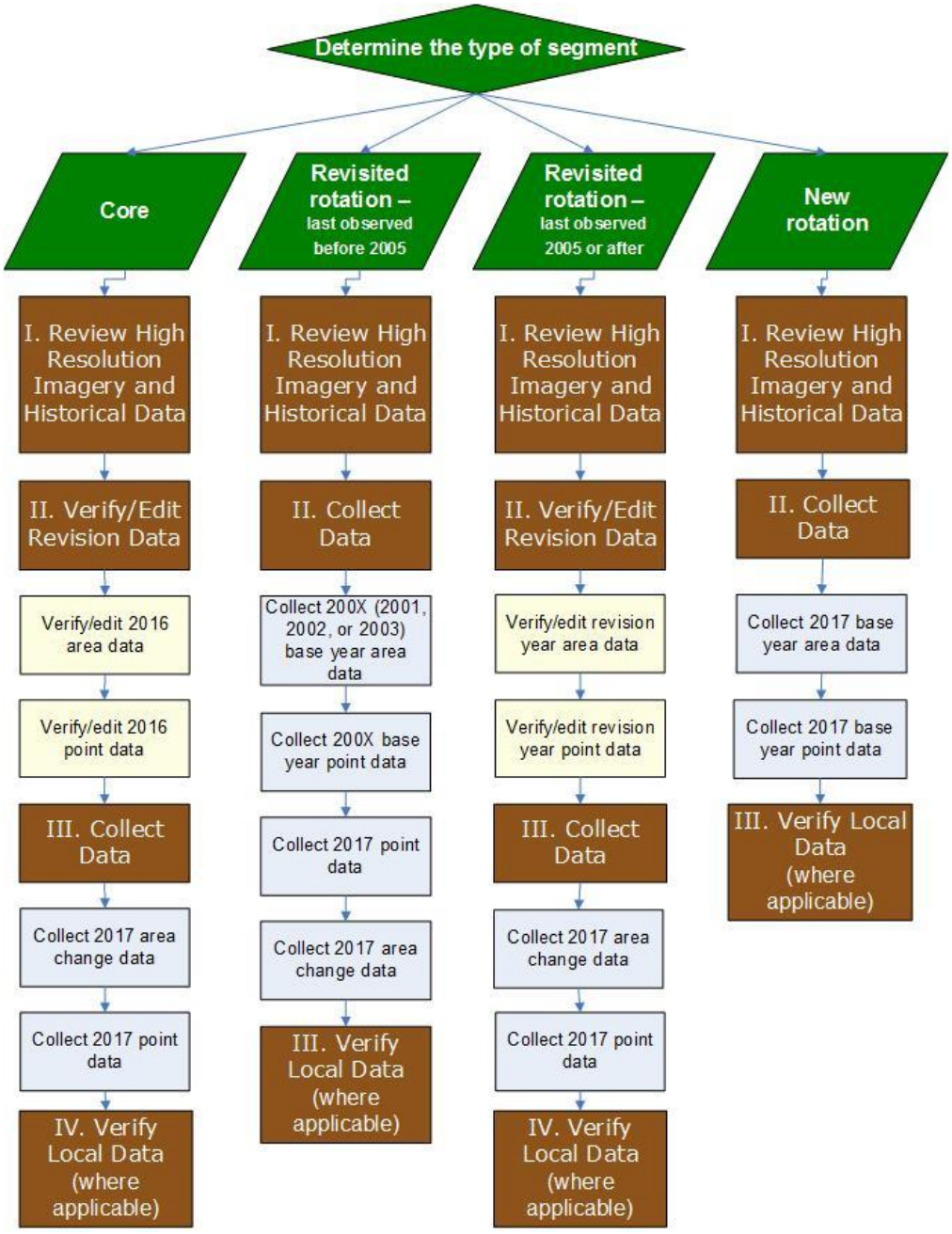
3. Digital segment boundaries and point locations are compared by RSL staff with prior data collection records to certify they represent the location of prior NRI data collection,

4. Conditions and trends for each area segment and its points are reviewed by RSL staff using analog and digital photographs and data are recorded in survey software, and

5. Points with cropland, grassland (other than rangeland), hayland, or Conservation Reserve Program (CRP) from general sign ups in the current survey are automatically sent to state staff for administrative record data collection.

Chapter 2: General Data Collection Information

View the diagram below to see the order of operation for each data collection step.



2.1 General Data Collection Information

Core, Revisited Rotation, and New Rotation segments

Core Segments: Core segments are observed as part of the survey every year. For each Annual NRI, the data collector reviews the data collected for the previous year ("revision" year) to determine if these data must be edited before evaluating and recording changes between the revision and current years. Revision of incorrect data is an important step that ensures recorded changes between the revision and current years reflect real change in features or conditions during that time interval.

Revisited Rotation Segments: Revisited rotation segments are of two types: (1) segments last observed before the 2005 Annual NRI; and (2) segments observed since the 2005 Annual NRI. Revisited rotation segments of the first type were most recently observed in 2001, 2002, or 2003. The base year for these segments is 2001, 2002, or 2003. Data collectors will delineate area features for the base year before delineating any changes in area features between the base year and current year. Point data for the base year will be verified or corrected for the base year and additional point data will be collected for the current year. Revisited rotation segments of the second type were most recently observed since the 2005 Annual NRI. Depending on the sample history for the segment, data collectors may need to review/revise the data for one or two previous revision years. Data is then collected for changes in area and point data between the revision and current years.

New Rotation Segments: Segments that have not been observed since 1997 are referred to as new rotation segments. The current year serves as the base year for new rotation segments. Data collectors will delineate area features and collect point data for the current year.

Base, Revision, and Change Years

Base Year: In earlier surveys data collectors were instructed to delineate area feature data such as waterbody boundaries in colored ink on acetate templates overlaying the photo-base or slide projection. The 2005 Annual NRI introduced a process of recording area feature data using specialized survey software. The base year for a segment is the first year that it is observed in a survey beginning with the 2005 Annual NRI. Area data are digitally recorded for the base year. In subsequent years only changes in area data area recorded for these segments.

Revision Year: Each data element recorded for a segment in an Annual NRI must be verified and edited in the subsequent Annual NRI. The year for which data must be verified and edited (revised) is the revision year.

Change Year: Any year a segment is observed subsequent to the base year is a change year. For area feature data, only changes are recorded between the base year and change year or between two change years. Point data are recorded for each change year.

Types of Photo Interpretation Data

Two types of photo interpretation data are collected in the RSL's: area data and point data.

Area data are collected for Waterbodies, Streams, Transportation, Eligible Areas, and Eligible Structures by delineating features and recording attribute information. Area data must be collected in sequence:

1. Waterbodies,
2. Streams,
3. Eligible areas,
4. Transportation, and
5. Eligible structures.

Point data are collected for sample points located within the segment by recording the required resource information. Point data are not delineated. Point data for Land Cover/Use must be collected before other types of point data including: Cowardin Wetlands and Deepwater Habitats, Erosion, Use of Land, Conservation Practices, and Resource Concerns.

Local Data

Local data information related to cropping history, irrigation, and erosion are generally obtained from administrative field office records by state NRCS staff. Local data collection follows photo interpretation data collection. Points for which a land cover/use of cropland, grassland that is not rangeland, hayland, or Conservation Reserve Program (CRP) from general sign-ups are automatically sent for local data collection. Following local data collection, integration is completed. Data collectors in the RSL compare land cover/use and conservation practices recorded for local data with that recorded in photo interpretation data collection to determine consistency and inconsistent data are reconciled.

2.2 Segment Collection Information

Imagery

High Resolution Imagery: Uncompressed, unrectified reference imagery that includes both the NRI analog photograph (prior to survey year 2015) and the high resolution digital image (survey year 2015 onward).

2.2.1 Core Segments

I. Review Aerial Images and Historical Data

1. **Open segment information resources:**
   - 1.1 Open the segment in NRI_Collect.
   - 1.2 View the high resolution image for the revision year. If one or more high resolution images are missing, this is a nonstandard case.
     - Stop data collection on this segment.
     - Notify the designated RSL contact.
2. **Review segment information resources:**
   - 2.1 Look at the high resolution images for the revision year.
   - 2.2 Check that the revision year high resolution images are the same as the images displayed in the NRI_Collect survey software.
     If not, this becomes a non-standard case.
     - Stop data collection on this segment.
     - Notify the designated RSL contact.

II. Verify/Edit Data for Revision Years

Before collecting any new data, review data for the revision years. Also review notes (historical and in Collect) and any tickets referenced in Collect to ensure you are familiar with past data issues and their resolution.

If any errors are detected in the previously recorded data, correct the data before new data are collected and describe the correction in the segment notes. This is done to ensure that recorded changes represent real change in features or conditions during the correct time interval.

3. **Verify/edit area data for the revision years.**
   - 3.1 Select the Area Data revision year phase in NRI_Collect.
   - 3.2 Verify/edit the revision year area data in the following order:
     - Waterbodies
     - Streams
     - Eligible areas
     - Transportation
     - Eligible Structures

For each area data type inspect the previous delineations and attributes and determine if they accurately represent the historical extent of the feature.

If not, this becomes a non-standard case.

- Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
- Seek guidance following RSL standard procedure.

4. Verify/edit point data for the revision year.

For segments with a revision year,

4.1 Select the Point Data revision year phase in NRI_Collect.

4.2 Verify/edit revision year point data for Land Cover/Use.

4.3 Verify/edit revision year point data for:

- Wetlands and Deepwater Habitats,
- Erosion,
- Use of Land,
- Conservation Practices, and
- Resource Concerns

For each point data attribute, check previous determination and determine if it accurately represents the historical extent. For corrections to LC/U or wetlands in the revision year:

- Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
- Seek guidance following RSL standard procedure.

III. Collect New Data

5. Collect area change data.

5.1 Select the Area Data phase in NRI_Collect.

5.2 Check the alignment of the current and revision year's imagery.

5.3 Collect area change data in the following order:

- Waterbodies
- Streams
- Eligible areas
- Transportation and
- Eligible structures

6. Collect point data.

6.1 Select the Point Data phase in NRI_Collect.

6.2 Check the alignment of the current and revision year's imagery.

6.3 Collect point data for Land Cover/Use.

6.4 Collect point data for:

- Wetlands and Deepwater Habitats,
- Erosion,
- Use of Land,
- Conservation Practices, and
- Resource Concerns

2.2.2 Revisited Rotation Segment - Last Observed Prior to the 2005 Annual NRI

I. Review Aerial Images and Historical Data

1. Open segment information resources:

1.1 Open the segment in NRI_Collect.

1.2 Select the high resolution images for 200X (i.e., 2001, 2002, or 2003), and current survey year.

If one or more high resolution images is missing, this is a nonstandard case.

- Stop data collection on this segment.
- Notify the designated RSL contact.

1.3 Open the segment in DataView.

2. Review segment information resources:

2.1 Look at the high resolution images for 200X and current survey year.

2.2 Check that the 200X and current survey year photos are the same as the photos displayed in the NRI_Collect survey software.

If not, this becomes a non-standard case.

- Stop data collection on this segment.
- Notify the designated RSL contact.

II. Collect New Data

If you have not already done so, review historical notes to ensure you are familiar with past data issues and their resolution.

3. Collect area data for the 200X Base Year:

3.1 Select the Area Data - 2001, 2002, or 2003 phase in NRI_Collect.

3.2 Collect 200X area base year data in the following order:

- Waterbodies
- Streams
- Eligible areas
- Transportation
- Eligible structures

4. Collect current year area change data:

4.1 Select the Area Data - current survey year phase in NRI_Collect.

4.2 Check the alignment of the current and revision year's imagery.

4.3 Collect area change data in the following order:

- Waterbodies
- Streams
- Eligible areas
- Transportation
- Eligible structures

5. Verify/edit 200X point data:

5.1 Select the Point Data - 2001, 2002, or 2003 phase in NRI_Collect.

5.2 Verify/edit 200X point data for Land Cover/Use.

5.3 Verify/edit 200X point data for:

- Wetlands and Deepwater Habitats,
- Erosion,
- Use of Land,

- Conservation Practices, and
- Resource Concerns

6. Collect current year point data:

6.1 Select the Point Data - current year phase in NRI_Collect.

6.2 Check the alignment of the current and revision year's imagery.

6.3 Collect current year point data for Land Cover/Use.

6.4 Collect current year point data for:

- Wetlands and Deepwater Habitats,
- Erosion,
- Use of Land,
- Conservation Practices, and
- Resource Concerns

2.2.3 Revisited Rotation Segment - Observed Since the 2005 Annual NRI

I. Review Aerial Images and Historical Data

1. Open segment information resources:

1.1 Open the segment in NRI_Collect.

1.2 Select the high resolution images for the revision year and current survey year. If one or more high resolution images is missing, this is a nonstandard case.

- Stop data collection on this segment.
- Notify the designated RSL contact.

2. Review segment information resources:

2.1 Look at the high resolution images for the revision year and current survey year.

2.2 Check that the revision years and current survey year high resolution images are the same as the photos displayed in the NRI_Collect survey software.

If not, this becomes a non-standard case.

- Stop data collection on this segment.
- Notify the designated RSL contact.

II. Verify/Edit Data for Revision Years

Before collecting any new data, review data for the revision year. Review the notes (historical and in Collect) and any tickets referenced in Collect notes to ensure you are familiar with past data issues and their resolution. If any errors are detected in the previously recorded data, correct the data before new data are collected. This is done to ensure that recorded changes represent real change in features or conditions during the correct time interval.

3. Verify/edit area data for the revision years.

3.1 Select the Area Data - revision year phase in NRI_Collect.

3.2 Verify/edit revision year area data in the following order:

- Waterbodies
- Streams
- Eligible areas
- Transportation
- Eligible structures

For each area data type inspect the previous delineations and attributes and determine if they accurately represent the historical extent of the feature.

If not, this becomes a non-standard case.

- Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
- Seek guidance following RSL standard procedure.

4. Verify/edit point data for the revision years.

4.1 Select the Point Data - revision year phase in NRI_Collect.
4.2 Verify/edit revision year point data for Land Cover/Use.
4.3 Verify/edit revision year point data for:

- Wetlands and Deepwater Habitats,
- Erosion,
- Use of Land,
- Conservation Practices, and
- Resource Concerns

For each point data attribute, check previous determination and determine if it accurately represents the historical extent. For corrections to LC/U or wetlands in the revision year:

- Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
- Seek guidance following RSL standard procedure.

III. Collect Current Year Data

5. Collect current year area change data.

5.1 Select the Area Data - current year phase in NRI_Collect.
5.2 Check the alignment of the current and revision year's imagery.
5.3 Collect area change data in the following order:

- Waterbodies
- Streams
- Eligible areas
- Transportation
- Eligible structures

6. Collect current year point data.

6.1 Select the Point Data - current year phase in NRI_Collect.
6.2 Check the alignment of the current and revision year's imagery.
6.3 Collect current year point data for Land Cover/Use.
6.4 Collect current year point data for:

- Wetlands and Deepwater Habitats,
- Erosion,
- Use of Land,
- Conservation Practices, and
- Resource Concerns

2.2.4 New Rotation Segment

I. Review Aerial Image and Historical Data

1. Open segment information resources:

1.1 Open the segment in NRI_Collect.

1.2 Select the high resolution image for the current survey year. If the high resolution image is missing, this is a nonstandard case.

- Stop data collection on this segment.
- Notify the designated RSL contact.

1.3 Open the segment in DataView.

2. Review segment information resources:

2.1 Look at the high resolution image for the current survey year.

2.2 Check that the current survey year high resolution image is the same as the photo displayed in the NRI_Collect survey software. If not, this becomes a non-standard case.

- Stop data collection on this segment.
- Notify the designated RSL contact.

II. Collect New Data

Review historical notes to ensure you are familiar with past data issues and their resolutions

3. Collect area data for the Current (Base) Year:

3.1 Select the Area Data phase in NRI_Collect.

3.2 Collect area base year data in the following order:

- Waterbodies
- Streams
- Eligible areas
- Transportation
- Eligible structures

4. Collect current year point data:

4.1 Select the Point Data - current year phase in NRI_Collect.

4.2 Check the alignment of the current year's imagery.

4.3 Collect current year point data for Land Cover/Use.

4.4 Collect current year point data for:

- Wetlands and Deepwater Habitats,
- Erosion,
- Use of Land,
- Conservation Practices, and
- Resource Concerns

2.3 Determine If Alignment Is Required

An image adjustment process, called alignment in the NRI, may be required for registered NRI images. In alignment the registered image from a current year is compared to the image from a prior year for the same segment. The geographic relationship between certified points, segment boundary locations, and important features on the images must be the same, or nearly so, on the current year image as on the revision year's image. Some examples of important features are boundaries of eligible areas, waterbodies, roads, and fields. The geographic relationship of points, segment boundaries, and features should be maintained during image preparation. For example, a data collector correctly classified the land cover/use of a point as transportation in

the prior year and the data are collected in the right-of-way. If nothing changed between the prior and current year with respect to the road, then data collection for this year should be in the right-of-way. If the merging of the current year image with the point locations makes the point appear to be in an adjacent crop field, the land cover/use would appear to change from a road to cropland. Because nothing really changed on the ground, this is an example of an image that may require alignment if re-registering the image does not fix the problem.

Steps to determine if alignment is required:

1. Use the swipe tool to compare distances for points, segment boundaries, and features on current and revision years' images.
2. Image alignment is required if:
    - The distance between points, segment boundaries, or features on current and revision years' images is greater than 33 feet, or
    - The land cover/use for a point changes only because the location of the point on the revision and current years' images appears to change.

Chapter 3: Data Collection Protocols and Software

3.1 General Information

NRI Aerial Imagery

Conduct all photo interpretation by examining the high resolution image(s) for the appropriate year(s).

Segment Notes

NRI_Collect provides a single segment note sheet for all data collection phases and protocols. Type all notes pertaining to a segment on the note sheet. Include the following information with each recorded note:

1. Phase (e.g., Area Data - 2005, or Point Data - 2005)
2. Protocol (i.e., Waterbodies, Streams, Transportation, Eligible Areas and Structures, Land Cover/Use, Erosion, Use of Land, Wetlands and Deepwater Habitats, or Resource Concerns)
3. Item number within the protocol
4. Information specific to the item
5. Name of bookmark that provides a view of the specific item or problem

How to Write a Helpful NRI Note

The primary purpose of an NRI note is to document decisions made by data collectors or reviewers during the data collection and review processes. There may be conflicting information in the support file, or in the notes themselves. Documentation of a decision is essential in those cases. Secondarily, an NRI note can aid data collectors or reviewers in interpreting images and data for future surveys. For example, documentation of non-intuitive features can clarify decisions and save future data collectors time. Documentation based on proper use of ancillary information should also be put in the notes when it clarifies historical or recent decisions in data collection.

Notes should not simply restate collected data, e.g., "point 1 is palustrine forested." Such a note is not helpful since the data collected for point 1 carries that information. Similarly, notes should not contain extraneous information, e.g., information from a QA/QC session. Conversely, a helpful note carries information that is not otherwise quickly available to future data collector or reviewers, e.g., "NOAA salinity data confirms waterbody is estuary" and "This wetland is freshwater and has been incorrectly coded historically. NWI verifies palustrine and soil is Kenner muck (freshwater)."

Notes should also be used to document decisions made when there are conflicting ancillary materials, e.g., "small stream was collected as perennial based on determination from NHD" or "marsh land cover use is not consistent with steep topography on DRG".

A note is also required when correcting a revision year. In such cases, please document whether the change was due to real change (i.e. LC/U changed from forest (342) to developed land (745) in 2011 but was missed.) or whether there was no real change (i.e. 53/4 wetland added to point 3 based on hydric soils and NWI – no real change).

Data Types

Two types of data are collected for the NRI:

- Collect area data for Waterbodies, Streams, Eligible Areas, Transportation, and Eligible Structures by delineating features and recording attribute information.
- Collect point data for sample points located within the segment by recording attribute information. Point data area not delineated.

Delineation Scale

Perform delineation at a scale of between 1:1000 and 1:2000, but never at a smaller scale than 1:2000. When delineating changes in waterbodies, streams, or islands, use a scale of 1:500. A scale larger than 1:1000 may also be needed when delineating complex or partially obscured features such as tree-lined waterbodies, streams, or roads.

3.2 Data Collection Software

Data collection is enabled by an application called *NRI_Collect* that has been developed by the Statistical Unit, Center for Survey Statistics and Methodology, to assemble and present orthoimages, digital maps, geographic coordinate data, and historic NRI survey data. *NRI_Collect* provides a set of tools to view imagery and collect data by both delineation and attribution. The main screen of *NRI_Collect* version 3.0 is displayed in figure 1. *NRI_Collect* version 3.0 allows the user to collect data for the 2017 Annual NRI in two modes: (1) Training; and (2) Production. The application opens with the default production mode displayed on the main view in figure 1. The user may change to training mode by selecting File from the main menu and checking the Training box in the Choose Mode pop-up window (see figures 2 and 3).

NRI_Collect Main Screen

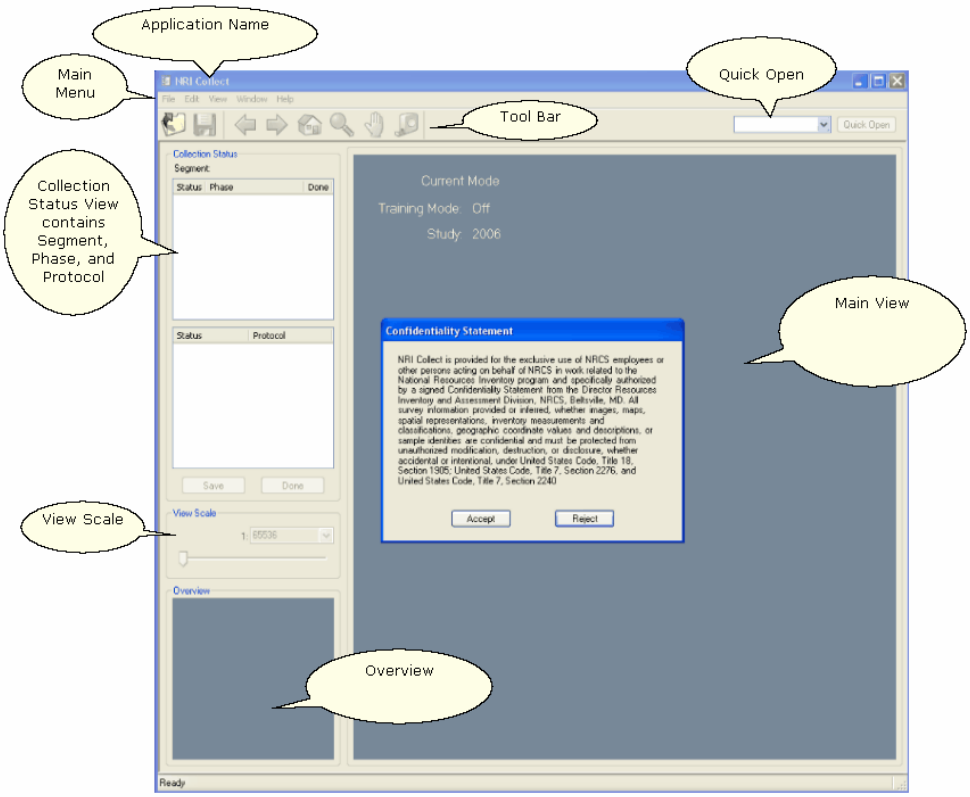


Figure 1. Main Screen for NRI_Collect

Table 1. Features of the Main Screen for NRI_Collect

Main Screen: The main screen contains the Main Menu, Tool Bar, Main View, Collection Status View, Overview, and View Scale.
Main Menu: Drop-down lists are provided for File, Edit, View, Window and Help.
Tool Bar: Icons provide tools for opening segments, saving work, navigation, zooming, panning, and creating and modifying delineations.
Main View: The Main View is for delineating features and viewing those previously delineated. See the View and Edit menus. Use the View menu to change the extent being viewed; use the Edit menu and tools on the bar to select and modify geometry. The slider for Geometry Opacity controls the segment boundary and points in the Main View.
Overview: The Overview box shows the full extent of the segment geometry and image. Drag the inset box in the Overview Box to center the main view on a different part of the image.
View Scale: View Scale controls the Main View. Scale may be selected from a picker, entered as a value, or adjusted by a slider. A bar scale (in English units) adjusts to the zoom level.
Quick Open: The Quick Open text box offers a fast way to open a segment. Type the segment's full ID in the box and click "Quick Open."

Main Menu Drop-Down Lists

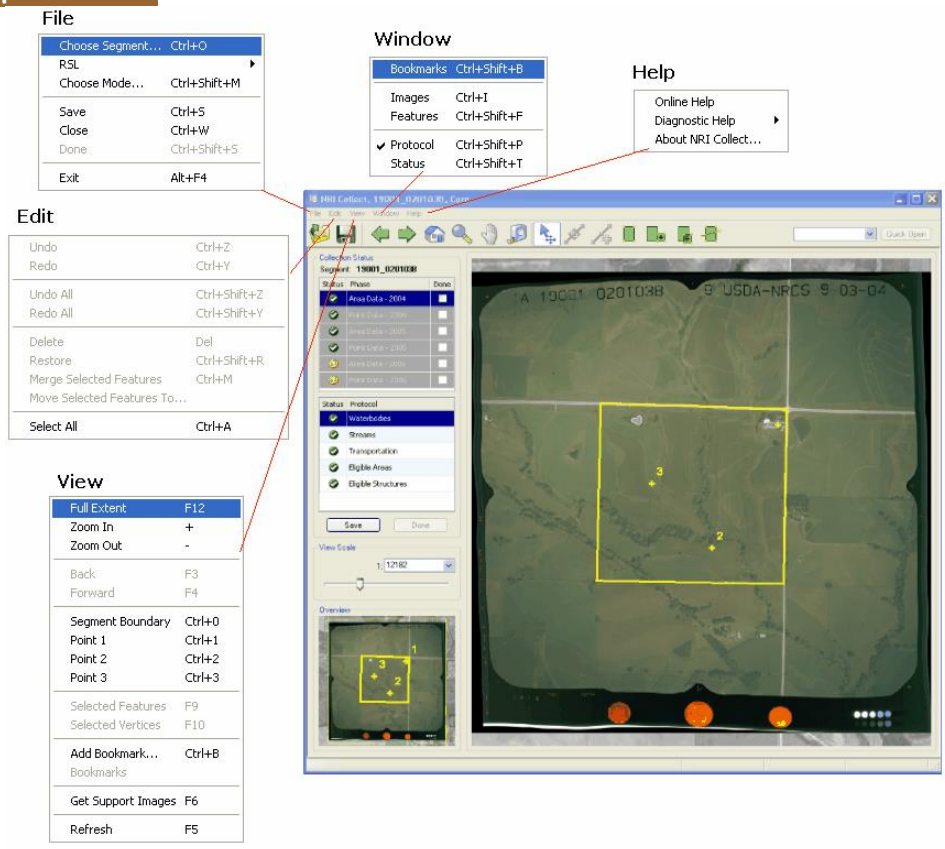


Figure 2. Drop-down choice lists for items on the main menu.

Table 2. Items in the drop-down choice list on the main menu.

Choice Lists from Main Menu	
File Menu	
Choose Mode (CTRL+Shift+M)	Choose Mode is used to select from three data collection parameters: Training, Study, and Task.
Choose Segment (CTRL+O)	Choose Segment is used to pick a segment by state, county, and segment ID. Segments may be listed by three combinations of certification status.
RSL	Limit the choice list of segments to one RSL or view all
Save (CTRL+S)	Save changes.
Close (CTRL+W,CTRL+F4)	Close session of work on a segment. Be sure to save any changes before closing.
Done (CTRL+Shift+S)	When all data collection for a segment is complete, select Done.
Exit (Alt+F4)	Exit *NRI_Collect*.
Edit Menu	
Undo (CTRL+Z)	
Redo (CTRL+Y)	
Undo All (CTRL+Shift+Z)	
Redo All (CTRL+Shift+Y)	
Delete Selected Features (Del)	
Select All (CTRL+A)	
Restore (CTRL+Shift+R)	
Merge Selected Features (CTRL+M)	
View Menu	
Full Extent (F12, Home, Number Pad 7)	View full extent
Zoom In (+)	
Zoom Out (-)	
Back (F3)	Toggle backward to a previous zoom level
Forward (F4)	Toggle forward to a previous zoom level
Segment Boundary (CTRL_D0)	Center the segment boundary in the Main View.
Point 1 (CTRL_D1)	Center Point 1 in the Main View.
Point 2 (CTRL_D2)	Center Point 2 in the Main View.
Point 3 (CTRL_D3)	Center Point 3 in the Main View.
Selected Features (F9)	Zoom to Selected Features

Selected Vertices (F10)	Zoom to Selected Vertices
Add bookmark (CTRL_B)	Save a spatial location and zoom level to view again. Bookmark names may be edited to convey an issue or question about the location. Bookmarks save the spatial context, but are not unique to the image.
Bookmark (CTRL+Shift+B)	View bookmark list
Get Support Images (F6)	Get support images or refresh Image Window.
Refresh All WMS (F7)	Refreshes all WMS images available in the segment. Must be done each time zoom extent is changed.
Refresh (F5)	Refresh drawing.
Window Menu	
Bookmark (CTRL+Shift+B)	Open the bookmark window. Bookmarks may be added or deleted. Bookmark names may be edited to convey an issue or question regarding a location. Bookmarks save the spatial context, but are not unique to the image.
Images (CTRL+I)	The Image Window is used to select (toggle on) and promote images or layers (NRI images, DOQ, and DRG) and to swipe the top layer to reveal the layer beneath. Brightness and contrast sliders affect the top layer but have no permanent effect on sources materials. The DRG, DOQ and Certification Image are selected automatically; the Image for any other year must be selected (checked) for viewing.
Features (CTRL+Shift+F)	Select boxes next to features (i.e., Waterbodies, Streams, Transportation, Eligible Areas, or Eligible Structures) to display delineations concurrently. Two sliders are available to adjust the opacity for Points and Lines, and Fill.
Protocol (CTRL+Shift+P)	Select the Data tab in the protocol window to collect tabular data for each data collection phase. Select the Segment Notes tab to record notes. For point data, a Local Data Summary tab provides access to data collected in the local field offices for points with a cropland, pastureland, Conservation Reserve Program (CRP) or wetland history or identified as one of those categories during the current inventory.
Status (CTRL+Shift+T)	Error and warning details are listed by protocol and year in the Status table.  **Error** All errors must be resolved before the data collection phase is complete.  **Warning** Warnings indicate possible problems that should be reviewed.  **Green check** No errors or warnings are associated with an item marked with a green check.
Help	
Online Help	Access the 2017 Annual NRI Data Collection Instructions in PDF format.
Diagnostic Help	Access list of current servers.
About NRI Collect	Access *NRI_Collect* version and copyright information.

NRI_Collect Windows

Figure 3. NRI_Collect windows

Selecting a Segment

Select the correct **RSL** (East, Central, or West) from the choice list under File on the Main Menu. Next, select **Choose Segment** from the File menu of the *NRI_Collect* instrument.

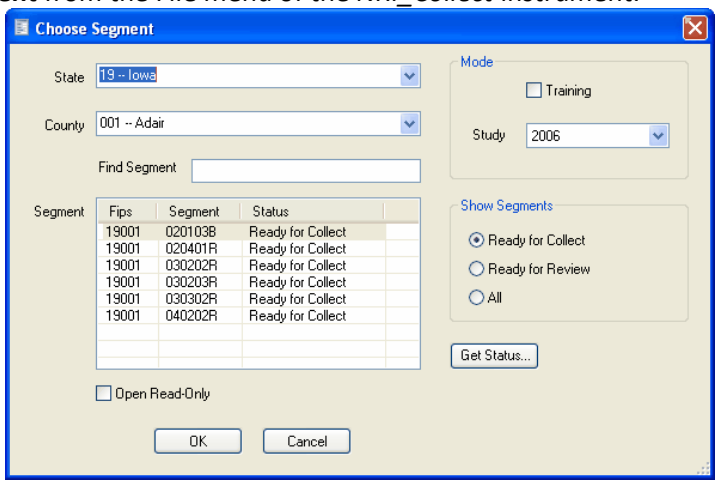


Figure 4. Selecting a segment

NRI sample segments for this survey are accessed by selecting a state, county and then a segment from choice list on the Choose Segment window. In the Show Segments view, choose **Ready for Collect** to limit the choice list to only those segments that have not been completed. Highlight the segment ID and click on **ok** to select the segment. Once you have selected the segment, the NRI image for a selected segment will be displayed on the screen.

Table 3. Keyboard and Mouse Shortcuts

Navigation	
Pan	Middle Mouse Button + Mouse Move
	F1 + Mouse Move
	Number Pad 2, 4, 6, 8
	Drag View Box in Overview
Zoom	Mouse Wheel
	F2 + Mouse Move
	+ / -
Back (Previous Extent)	F3
Forward (Next Extent)	F4
Go to Point 1	CTRL + 1
Go to Point 2	CTRL + 2
Go to Point 3	CTRL + 3
View All Selected Features	F9
Get (Refresh) Image Window	F6
View All Selected Vertices	F10
View Full Extent	F12
	Home
	Number Pad 7
Editing	
Select All	CTRL + A
Move Feature or Vertex	Arrow Keys (in appropriate tool)
Delete Selected Feature or Vertex	Del
Undo	CTRL + Z
Redo	CTRL + Y
Undo All	CTRL + Shift + Z
Redo All	CTRL + Shift + Y
Revert to Original Geometry	CTRL + Shift + R
Get Support Images	F6
Tool Toggle Keys	
Toggle Zoom Tool	M
Toggle Pan Tool	Space
Toggle Add Vertex Tool	N (in Move Vertex Tool)

Table 4. General Tool Functions

 The Choose Segment form is used to pick a segment by state, county, and segment ID (Ctrl+O).
 Save changes (Ctrl+S).
 Back (F3) to prior extent.  Forward (F4) to prior view/extent.
 Show full extent in the Main View window (F12).
 Zoom: Click on an area of interest to zoom in. Multiple clicks in the same location zoom in on a single point. Control-click will zoom out around that point. Drag a marquee around an area of interest to zoom to that area and center it on screen. From any tool switch temporarily to the Zoom Tool by holding the "M" key.
 Pan: Click anywhere in the scene and drag the scene around in Main View. From any tool switch temporarily to the Pan Tool by holding the space bar.
 Measure: Measure distances, perimeters, and areas. Clicking starts a line that is stretched from the point clicked to the current position of the mouse. Successive clicks add line segments. The status bar (bottom right edge of Main View) reports the length of the current segment, the total length of the lines, and the area of the polygon that would result if the lines were closed from the current mouse position. Double-clicking finishes the line drawing; Esc removes it.
 Select and Move Features: Select whole features (a point or the segment boundary) and move them. Select items by clicking them or by dragging a marquee around them. Add items by selecting them while holding the Shift key. Once selected, move by clicking and dragging. Double-clicking on a segment boundary will switch temporarily to the Move Vertices Tool.
 Move Vertices: Move vertices on the selected feature. Select a vertex by clicking on or dragging a marquee. Multiple vertices may be selected by holding the shift key while clicking on the desired marquees or select all (Ctrl-A). From within Move Vertices, delete a selected vertex by right-clicking and choosing “Delete Vertices” from the contextual menu, or use the delete key. Holding the N key temporarily toggles from the Move Vertices Tool to the Add Vertices Tool. Arrow keys move the selected vertex in the arrow's direction.
 Add Vertices: Similar to the Move Vertices Tool, except clicking between points of a selected polygon inserts a vertex.
 Add feature: Delineate an area feature as a polygon.
 Split feature: Split a selected area feature polygon into two polygons.
 Loss: This tool is used for two purposes: (1) For real decrease in an existing feature, delineate the area that has decreased; or (2) to cut an exclusion area out of a polygon.

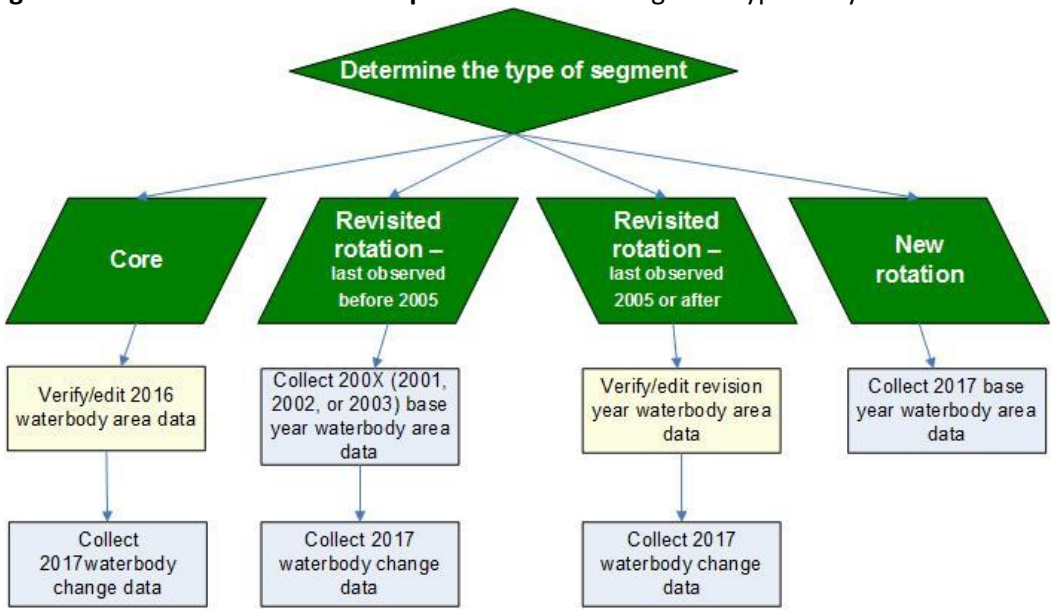
3.3 Area Data

The NRI monitors conversion of rural land to developed land in part by measuring changes (increases or decreases) in areas of waterbodies, streams, eligible areas, transportation, and eligible structures within sample segments. In NRIs prior to 2005, boundaries for area data were delineated on analog PSU Support Maps. The analog segment PSU Support Maps were replaced by digital delineations beginning with the 2005 Annual NRI survey.

Use the PSU Support Maps, photo interpretation of base year imagery, and other ancillary materials to delineate and attribute area data features to establish the base year geometry. Changes in area features will be delineated and corresponding attributes recorded for subsequent years by comparing the current year image with the revision year's image.
Area data are collected as both spatial and tabular data. Spatial data are delineated using the tools in *NRI_Collect.* Additional attributes are selected from choice lists within the instrument. Delineation tools available in NRI_Collect are given for waterbodies, streams, eligible areas, transportation, and eligible structures.

3.3.1 Waterbodies

View the diagram below to see the order of operation for each segment type and year.



Definitions: Waterbodies

- **Waterbody:** A type of permanent water area that includes ponds, lakes, reservoirs, bays or gulfs, estuaries, and open oceans. There are two size categories: less than 40 acres, and at least 40 acres.
- **Permanent Water:** Permanent water includes streams that flow continuously throughout the year and waterbodies where water is normally present for all seasons during the year. Designation as perennial on 7.5-minute quadrangle map or the National Hydrography Dataset (NHD) is evidence of permanence if the PSU Support Map is not definitive. [NRI-05] Historical photography may also be used with local knowledge as evidence of permanence.
- **Normal Pool** - The average elevation of the surface of a permanent waterbody. [NRI-05]
- **Real change** - A real change in a waterbody or stream is caused by a change in the land that forms the boundary or basin of the permanent water. Drought or floods that temporarily change only the normal pool or water level are not considered real change.

Waterbody type

Waterbodies are divided into two categories, large and small, for area data collection.

- **Large:** Waterbody at least 40 acres in size.
- **Small:** Waterbody less than 40 acres in size.

Waterbody kind

Waterbodies are further described by one of the following categories:

- **Manmade:** Constructed waterbody.
- **Natural:** A naturally formed waterbody.
- **Gulf:** A relatively large portion of sea partially enclosed by land. [ASCE-Nomenclature of Hydraulics]
- **Bay:** A recess in the shore or an inlet of a sea between two capes or headlands, not as large as a gulf, but larger than a cove. [USACE, 1984]
- **Estuary:** A perennial tidally influenced body of water existing where a river meets the sea. Ocean water is at least occasionally diluted by freshwater. [NRI-97]
- **Open ocean**

Permanent Island

- **Permanent Island:** An area within a waterbody or stream that appears as an island on the image and on the DRG/NHD, or has woody vegetation, or has a stable boundary at mean water level. [NRI-05]

Procedure for Determining Mean Water Level and Normal Pool

Floods, long-term drought, wet years, dry years, time of year an image was taken, etc., all complicate determining the mean water level of streams and normal pool of waterbodies. These events do not affect mean level unless they permanently change the water feature. Water concealed by vegetation should be included in water if it is part of the normal pool or within the mean level.

The historical PSU support map (pre-2005 Annual NRI), if available, is used to establish mean water level for streams and normal pool for waterbodies for base year data collection during the transition from pre-2005 Annual NRI to 2005 Annual NRI and later protocols. After the transition when base year data have been collected, the PSU support map from pre-2005 Annual NRI is no longer relevant for water areas. The extent of streams and waterbodies will be stored digitally (geometries) and these digital representations form the basis for determining annual change.

Frequently the mean water level will coincide with banks of a stream and normal pool with the shoreline and should be obvious to the data collector. A sequence is presented for using support materials in establishing mean water level and normal pool for base year data.

1. To establish the mean water level or normal pool for base year use NHD, the historical DOQ, the historical DRG, the new topo clips, NWI, photo interpretation of base year imagery, and the documentation that appears on the PSU support map. Use the preponderance of evidence from all sources to determine the appropriate mean water level or normal pool. If the sources do not agree other available imagery may be used to guide in determining water levels (see below).

2. Evidence of single flood events, drought, and other evidence of high or low precipitation on all imagery sources should NOT impact the normal pool or mean water level determinations. Also be aware that ancillary sources, including support maps, may be outdated and may not represent mean water levels or the normal pool.

3. If the data collector is undecided in the previous step then they must contact a resource specialist(s) at the RSL for assistance.

Beaver Ponds

Beaver ponds that meet the criteria for permanent water should be delineated and reported as small water bodies. Ancillary information including topographic sheets, NHD and historical photography or local knowledge may be used to make decisions regarding the permanency of a particular water body that may be the result of beaver activity.

Collection Software: Waterbodies

Delineation Tools for Waterbodies

	Add Waterbody: Delineate a waterbody feature as a polygon.
	Add Area: For real change in an existing waterbody, delineate the area that has increased. Alternatively, the boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
	Draw Waterbody Loss: This tool is used for two purposes: (1) For real decrease in an existing waterbody, delineate the area that has decreased; or (2) Delineate an island feature in a waterbody as a polygon.

Waterbody Protocol Window

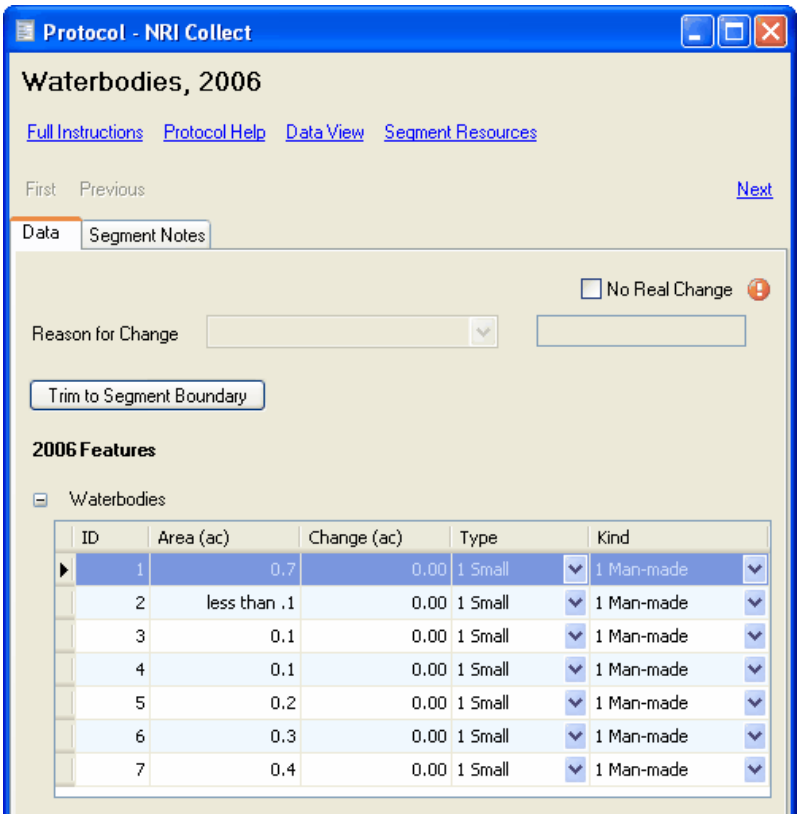


Figure 5: Waterbody Data Collection Window

Right Click on a Selected Waterbody Feature

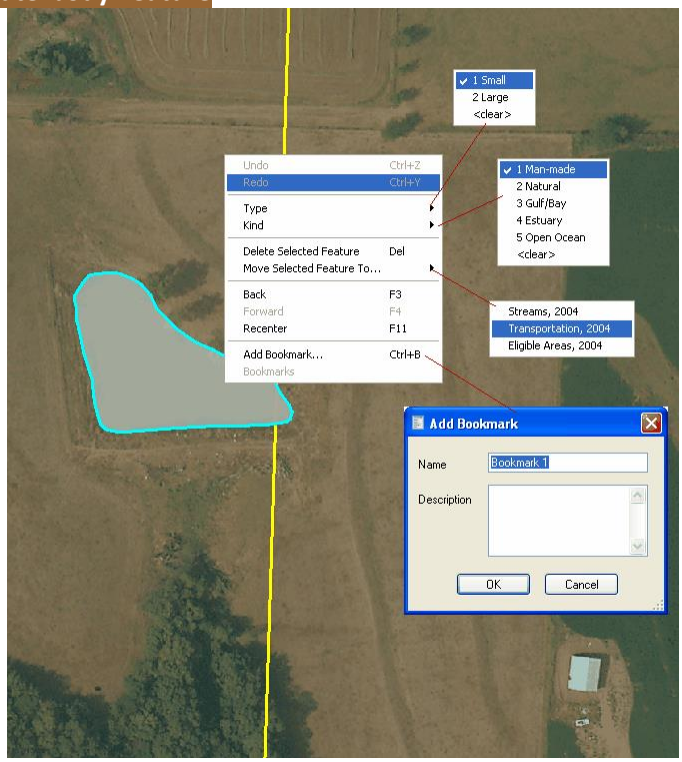


Figure 6: Polygon features available with right click

Data Collection for Waterbodies in the Base Year

1. View the base year high resolution image and review the base year PSU Support Map for revisited rotation segments (1997 PSU Support Map for new rotation segments), DRG/NHD, and DOQ to identify all permanent waterbodies at least 0.1 acres in total size and at least partly in the segment.

   For each waterbody in the segment, complete items 2-5.

2. Delineate the extent of the normal pool for each waterbody that is at least partially in the segment. Follow the step-by-step process for using support material to determine normal pool for waterbodies (See Area 1 in Diagram 3).
   - Delineate each waterbody as a single polygon at a scale of between 1:1000 and 1:2000. If the edge is complex or covered with vegetation, delineate at a scale of 1:500.
   - If a waterbody intersects a stream, delineate the common boundary between the waterbody and stream as part of the waterbody polygon. Delineate the common boundary at a scale of 1:500.
   - If the waterbody:
     - (1) lies completely within the segment boundary or;
     - (2) is at least partly within the segment boundary, extends past the segment boundary, and the full extent of the waterbody is less than 40 acres;

     Delineate the full extent of the waterbody.
   - If the waterbody is:
     - (1) at least partly within the segment boundary;
     - (2) extends past the segment boundary and;
     - (3) the full extent of the waterbody is at least 40 acres;

     Delineate only the extent of the waterbody within the segment, including the portion of the segment boundary intercepted by the waterbody.

3. Select the waterbody size from the choice list:
    - Large (at least 40 acres in size)
    - Small (less than 40 acres in size)

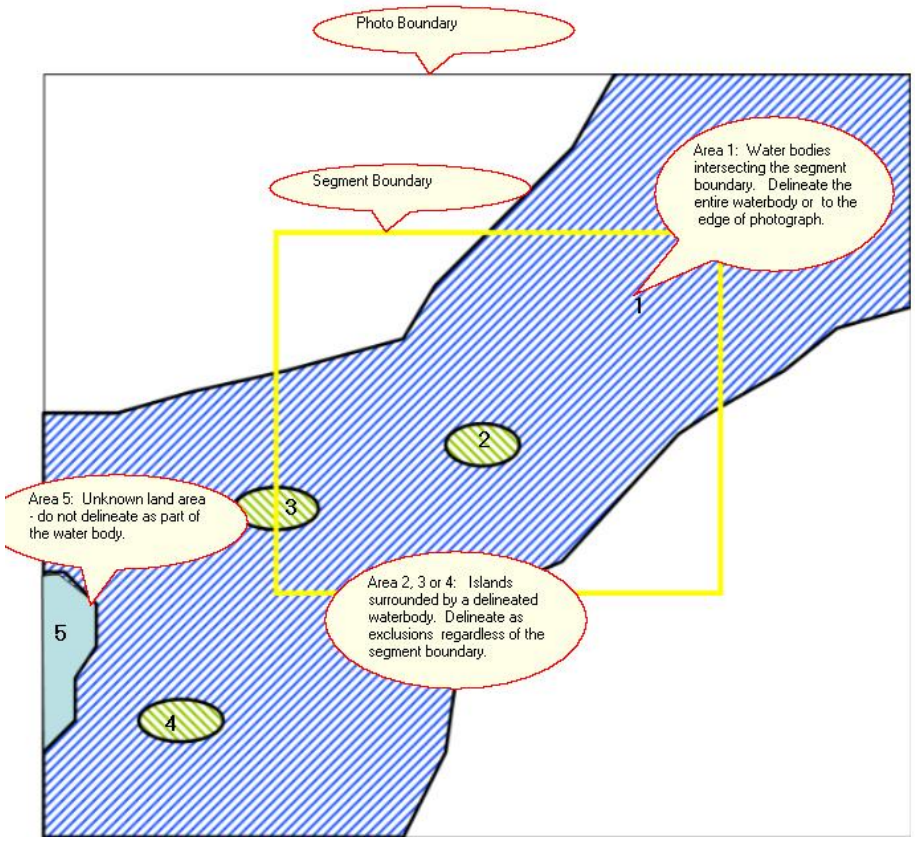
4. Select the waterbody kind from the choice list:
    - Man-made
    - Natural
    - Gulf or bay
    - Estuary
    - Open Ocean

5. View the base year high resolution image and review the base year PSU Support Map for revisited rotation segments (1997 PSU Support Map for new rotation segments), DRG/NHD, and DOQ to identify all permanent islands at least 0.1 acre in size within delineated waterbodies.

6. Delineate the extent within the interpretable portion of the image for all permanent islands within delineated waterbodies (See Areas 2, 3, and 4 in Diagram 3). If a waterbody island intersects the edge of the interpretable portion of the image (See Area 5 in Diagram 3), do not delineate the area as a waterbody island. Waterbody islands must be completely surrounded by the waterbody within the interpretable portion of the image to be delineated as a waterbody island. Exclude the area of a waterbody island intercepting the interpretable portion of the image as part of the waterbody delineation.

Waterbody Island Delineation

Diagram 3-Waterbodies and Exclusion Areas



Verify/Edit Data for Waterbodies in the Revision Year

1. Select Waterbodies within the revision year phase in NRI_Collect.

2. Review the DRG and DOQ in NRI_Collect and examine the waterbodies.
   Review the revision year high resolution image and examine the waterbodies. Review the revision year image in NRI_Collect.

3. For each waterbody at least partially within the segment boundary determine the waterbody size (type):
   - Large (at least 40 acres in size)
   - Small (less than 40 acres in size)

   When determining the size of each waterbody at least partially within the segment, include the area of the waterbody both inside and outside the segment boundary.

4. The normal pool of each waterbody that is at least partially in the segment boundary should have been delineated according to the step-by-step process for use of support materials to determine normal pool for waterbodies (See Area 1 in Diagram 3).

   All waterbodies that lie completely within the segment boundary must be delineated to their full extent. Small waterbodies at least partially within the segment boundary must be delineated to their full extent and include areas that extend outside the segment boundary. Large waterbodies that extend outside

the segment boundary will be truncated to the segment boundary (i.e., for large waterbodies, only the area within the segment boundary is delineated).

Inspect the previously delineated polygons for each waterbody to verify that they accurately represent the extent of each waterbody feature according to the protocol.

If not, this becomes a non-standard case.

- Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
- Seek guidance following RSL standard procedure.

5. Inspect the recorded type (large or small) and kind for each waterbody to determine if the attributes are correct.

   If not, this becomes a non-standard case.

   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

Data Collection for Change in Waterbodies

1. View the revision year high resolution image and inspect previously delineated waterbody polygons to determine if they accurately represent the historical extent of the waterbody.

   If not, this becomes a non-standard case.

   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

2. Use the swipe tool to determine if the locations of features on the two images are aligned.

   If not, this becomes a non-standard case.

   - Stop data collection on this segment.
   - Notify the designated RSL contact.

3. While viewing the current and revision year high resolution images, identify and compare each waterbody on the two images. For each waterbody at least partially within the segment, compare the current year's extent to that of the revision year. Determine if there is evidence that any real change in a waterbody has occurred. A change in the extent of waterbodies due to changes in water levels caused by annual weather variation is NOT real change.

   Select the reason for any real change in the extent of a waterbody from the following list:

   - New excavation, new/enhanced dams, or other permanent human-caused changes to normal pool
   - Filling in ponds or the expansion of built-up areas resulting in loss of water surface area
   - Geologic activity or other natural siltation resulting in a change in the normal pool of a waterbody
   - Pond drained
   - Some other event (this requires a note)

Waterbody Gains

4. Are there any waterbody gains? Waterbody gains may result from construction of new waterbodies or enhancement of an existing waterbody.
   - If no, check "None" and go to item 8.
   - If yes, complete items 5-7.

5. Delineate any waterbody gains (i.e., the area(s) of increase in an existing waterbody or the extent of a new waterbody).
    - Use a scale of 1:500 when delineating waterbody gains.
    - For small waterbodies, delineate the extent of the waterbody gain both inside and outside the segment boundary. Check the area of the waterbody to determine if the waterbody type (size category) has changed from small (less than 40 acres) to large (at least 40 acres). If so, change the waterbody type in the choice list to 'large'.
    - For large waterbodies, delineate the extent of the waterbody gain within the segment boundary.

6. Select the kind of waterbody from the choice list:
    - Man-made
    - Natural
    - Gulf or bay
    - Estuary
    - Open Ocean
7. Select the reason for change from the choice list:
    - New pond or enhanced dam -New excavation, or new/enhanced dams or other permanent human-caused changes to normal pool
    - Natural process - Geologic activity or other natural siltation resulting in a change in the normal pool of a waterbody, or
    - Other –note required - Some other event

    If "Other" is selected as the Reason for Change, record the following information in the note:
        - Data collection phase,
        - Protocol: Waterbodies,
        - Item number: 7 - Gain, and
        - Explain what other event caused the waterbody gain.

    For a waterbody gain, do not select from the choice list:
        - Fill-in pond or development - Filling-in ponds or the expansion of eligible areas resulting in loss of water surface area

Waterbody Losses

8. Are there any waterbody losses?
    - If no, check "None".
    - If yes, complete items 9-10.

9. Delineate any waterbody losses (i.e., the area(s) of decrease in a previously existing waterbody).
    - Use a scale of 1:500 when delineating waterbody losses.
    - For small waterbodies, delineate the extent of the waterbody loss both inside and outside the segment boundary.
    - For large waterbodies, delineate the extent of the waterbody loss within the segment boundary.

    Check the area of the waterbody to determine if the waterbody type (size category) has changed from large (at least 40 acres) to small (less than 40 acres). If so, change the waterbody type in the choice list to 'small'.

10. Select the reason for change from the choice list:
    - Fill-in pond or development - Filling-in ponds or the expansion of built-up areas resulting in loss of water surface area,
    - Natural process - Geologic activity or other natural siltation resulting in a change in the normal pool of a waterbody,
    - Pond drained, or
    - Other –note required - Some other event

    If "Other" is selected as the Reason for Change, record the following information in the note:
    - Data collection phase,
    - Protocol: Waterbodies,
    - Item number: 10- Loss, and
    - Explain what other event caused the waterbody loss.

    For a waterbody loss do not select from the choice list:
    - New pond or enhanced dam -New excavation, or new/enhanced dams or other permanent human-caused changes to normal pool.

Island Changes

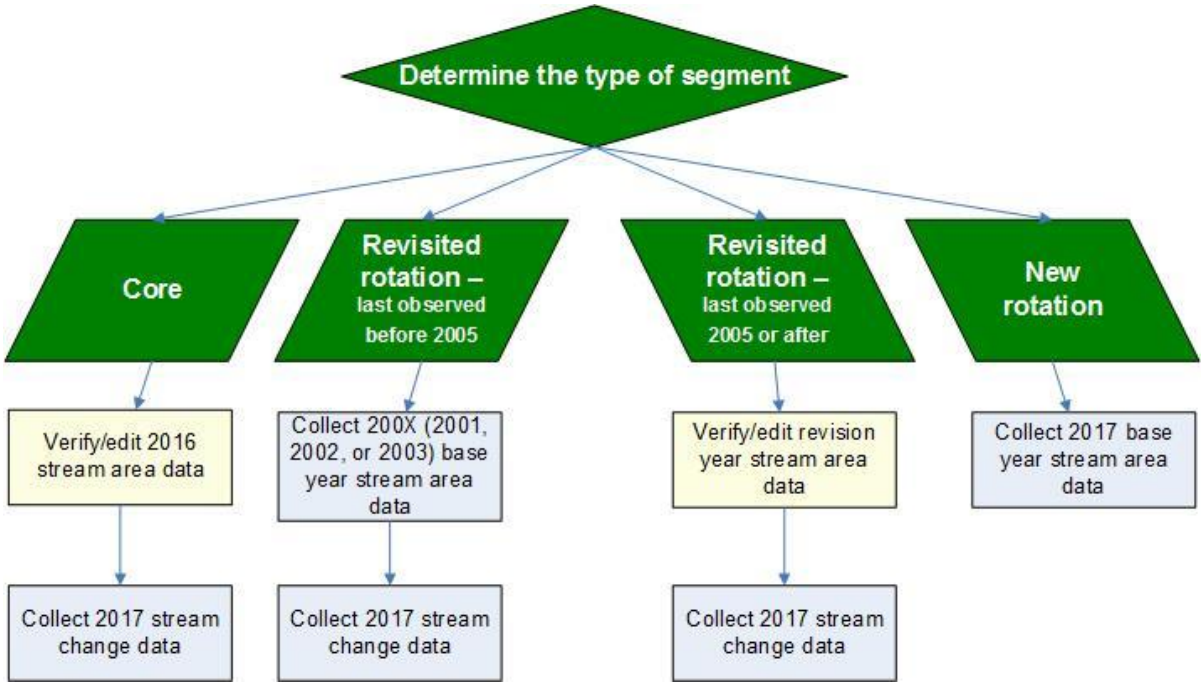
11. For each permanent island within the segment, compare the current year's extent to that of the revision year by viewing the current and revision years' high resolution images. Determine if there is evidence that any real change in a permanent island has occurred. A change in the extent of permanent islands due to changes in water levels caused by annual weather variation is NOT real change.

12. Delineate any real change in a permanent island within the segment boundary.
    - When delineating a permanent island gain or loss, use a scale of 1:500.

13. Record a note that includes:
    - Data collection phase,
    - Protocol: Waterbodies,
    - Item number: 13 - Islands, and
    - Explain the reason for the island change.

3.3.2 Streams

View the diagram below to see the order of operation for each segment type and year.



Definitions: Streams

- **Permanent Water:** Permanent water includes streams that flow continuously throughout the year and waterbodies where water is normally present for all seasons during the year. Designation as perennial on 7.5-minute quadrangle map is evidence of permanence if the PSU Support Map is not definitive. [NRI-05]

- **Mean Water Level** - In permanent streams the average elevation of the water surface. [NRI-05]

- **Real change** - A real change in a waterbody or stream is caused by a change in the land that forms the boundary or basin of the permanent water. Drought or floods that temporarily change only the normal pool or water level are not considered real change.

Stream type

Streams are divided into two categories, large or small, for area data collection. Type must be selected once digitization of a stream is complete.

- **Large:** Stream that is at least 660 feet wide. [NRI-05]
- **Small:** Stream that is less than 660 feet wide. [NRI-05]

Permanent Island

- **Permanent Island:** An area within a waterbody or stream that appears as an island on the image and on the DRG/NHD, or has woody vegetation, or has a stable boundary at mean water level. [NRI-05]

Other Definitions

- **Intermittent stream** - A stream, or reach of a stream, that does not flow year-round (commonly dry for 3 or more months out of 12); it flows only when it receives a) base flow (i.e. solely during wet periods), or b) ground-water discharge or protracted contributions from melting snow or other erratic surface and shallow subsurface sources.[SSM]

- **Ephemeral stream** - Generally a small stream, or upper reach of a stream, that flows only in direct response to precipitation. It receives no protracted water supply from melting snow or other sources and its channel is above the water table at all times.[SSM]

- **Braided channels** - In streams having highly variable discharge and easily eroded banks, sediment gets deposited to form bars and islands that are exposed during periods of low discharge. In such a stream the water flows in a braided pattern around the islands and bars, dividing and reuniting as it flows downstream. Such a channel is termed a braided channel. During periods of high discharge, the entire stream channel may contain water with the islands covered to become submerged bars. During such high discharge, some of the islands could erode, but the sediment would be re-deposited as the discharge decreases, forming new islands or submerged bars. Islands may become resistant to erosion if they become inhabited by vegetation. [From - River Systems and Causes of Flooding, Professor Stephen A. Nelson, Tulane University http://www.tulane.edu/~sanelson/geol204/riversystems.htm]

Delineation Tools for Streams

 Add Steam as Polygon: Delineate a stream feature as a polygon. The boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
 Add Stream as Line: Delineate a stream feature as a buffered line. Use the shift-mouse wheel (or the Up Arrow or Down Arrow) to adjust the buffered width; the diameter of the buffered line is reported at the lower edge of the Main View. The buffered line results in a polygon. The boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
 Add Area: For real change in an existing stream, delineate the area that has increased as a polygon. Alternatively, the boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
Draw Stream Gain as a Line: For real change in an existing stream, delineate the area that has  increased as a line. The shift-mouse wheel to adjust the buffered width; the diameter of the buffered line is reported at the lower edge of the Main View. The buffered line results in a polygon. Alternatively, the boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
 Draw Stream Loss: This tool is used for two purposes: (1) For real change in an existing stream, delineate the area that has decreased; or (2) Delineate an island feature in a stream as a polygon.

Streams Protocol Window

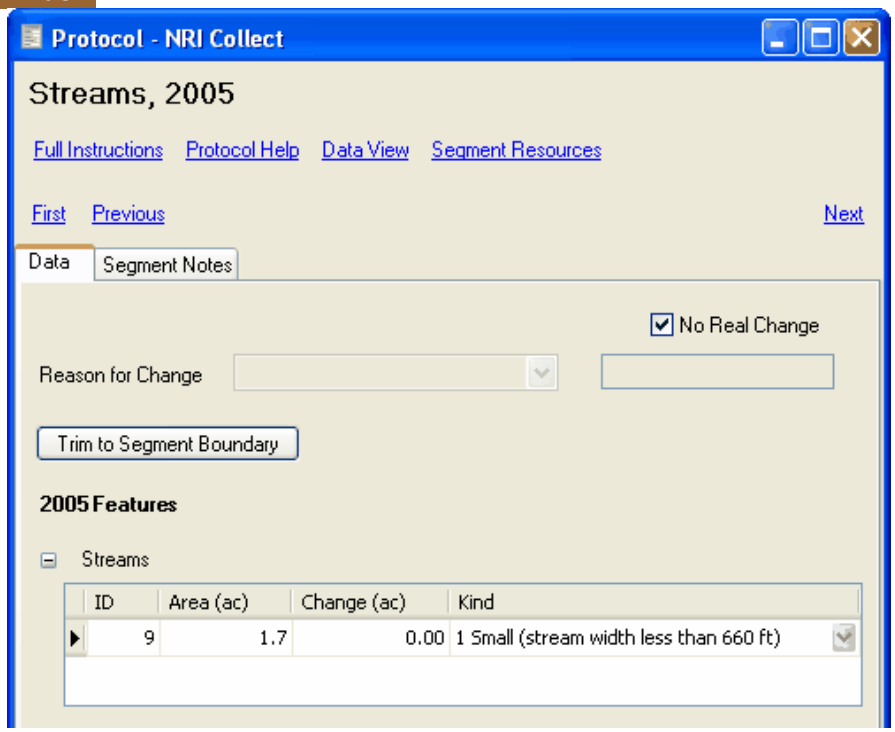


Figure 7: Stream Data Collection Window

Right Click on a Selected Stream Feature

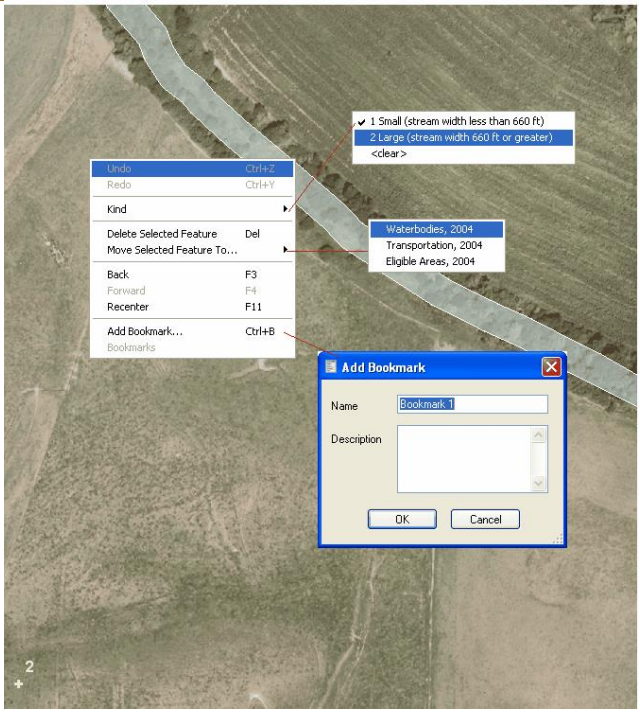


Figure 8: stream polygon features available with right click

Data Collection for Streams in the Base Year

1. View the base year high resolution image and review the base year PSU Support Map for revisited rotation segments (1997 PSU Support Map for new rotation segments), DRG/NHD, and DOQ to identify all permanent streams in the segment.

2. Delineate the mean water level of each stream that lies at least partially within the segment as a polygon.
   - Delineate streams at a scale no smaller than 1:2000. If the edge is complex or covered with vegetation, delineate at a scale of 1:500.
   - If a stream intersects a waterbody, delineate the common boundary between the stream and the waterbody as part of the stream polygon. Delineate the common boundary at a scale of 1:500.
   - If a stream, large or small, intersects the segment boundary, delineate the extent of the stream that lies within the segment boundary and include the segment boundary intercepted by the stream.
   - Delineate braided streams using the same conventions as those for non-braided streams.
   - For Alaska glacial bar and river complexes, the entire area between banks describes the extent of the area to be delineated.

3. Determine the stream type, large (stream width at least 660 feet) or small (stream width less than 660 feet).
   - Use the measurement tool to determine if the average stream width is at least 660 feet or less than 660 ft.
   - If PSU Support Maps document the stream of interest, compare the type in the most recent PSU Support Map documentation with your determination.
     If they do not agree, this becomes a non-standard case.

- Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
- Seek guidance following RSL standard procedure.

- If no PSU Support Maps are available or the stream is not documented on the PSU Support Maps, this becomes a non-standard case.
  - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
  - Seek guidance following RSL standard procedure.

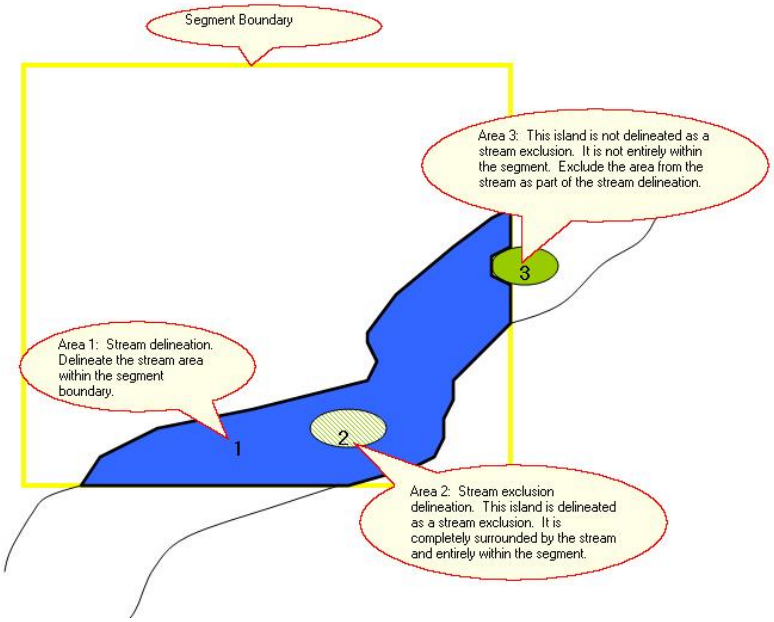
4. Select the stream type,
   - Small (stream width less than 660 feet)
   - Large (stream width 660 feet or greater)

5. View the base year high resolution image and review the base year PSU Support Map for revisited rotation segments (1997 PSU Support Map for new rotation segments), DRG/NHD, and DOQ to identify all permanent islands that are at least partially within the segment.

6. Delineate all permanent islands at least 0.1 acre in size and completely surrounded by the delineated stream within the segment (See Area 2 in Diagram 2). If a stream island intersects the edge of the segment boundary, do not delineate the area as a stream island. Exclude the area of a stream island intercepting the segment boundary as part of the stream delineation (See Area 3 in Diagram 2).

Stream Island Delineation

Diagram 2 - Streams and Exclusion Areas



Verify/Edit Data for Streams in the Revision Year

1. Select Streams within the revision year phase in NRI_Collect.
2. Review the revision year high resolution image and examine the streams. Inspect the previously delineated polygons and determine if they accurately represent the extent of each stream feature.
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

Data Collection for Change in Streams

1. View the revision year high resolution image and inspect previously delineated polygons to determine if they accurately represent the historical extent of the stream.
   If not, this becomes a non-standard case.
   - Correct the polygon and describe the resolution in the segment notes or:
   - Seek guidance following RSL standard procedure.

2. Use the swipe tool to determine if the locations of features on the two images are aligned.
   If not, this becomes a non-standard case.
   - Stop data collection on this segment.
   - Notify the designated RSL contact.

3. For each stream within the segment, compare the current year's extent to that of the revision year by viewing the current and revision year's high resolution image. Determine if there is evidence that any real change has occurred. A change in the extent of streams due to changes in water levels caused by annual weather variation is NOT real change. A change in a stream polygon due to meanders exceeding 33 feet or that result in a change in land cover/use or the wetland status of a point must be delineated. Determine the reason for any real change in the extent of a stream the following list:
   - New canals or drainage channels,
   - Stream filling or channelization,
   - Stream meandering or some other geological event changing stream course, or
   - Some other event (This requires a note).

Stream Gains

4. Are there any stream gains?
   - If no, check "None" and go to item 8.
   - If yes, complete items 5-7.
5. Delineate any stream gains (i.e., the area(s) of increase in an existing stream or the extent of a new stream within the segment).
   - Delineate the full extent of the stream gain within the segment and include the segment boundary intercepted by the stream gain.
   - When delineating the stream gain, use a scale of 1:500.
6. Select the kind of steam from the choice list:
   - Large – stream is at least 660 feet wide
   - Small – stream is less than 660 feet wide
7. Select the reason for change from the choice list:
   - New canals or drainage channels,
   - Stream filling or channelization,
   - Stream meandering or some other geological event changing stream course, or

- Some other event

If "Other" is selected as the reason for change, record the following information in the note:
- Data collection phase,
- Protocol: Streams,
- Item number: 7 - Gain, and
- Explain what other event caused the stream gain.

Stream Losses

8. Are there any stream losses?
   - If no, check "None".
   - If yes, complete items 9-10.
9. Delineate any stream losses (i.e., the area(s) of decrease in a previously existing stream).
   - Use a scale of 1:500 when delineating stream losses.
10. Select the reason for change from the choice list:
    - New canals or drainage channels,
    - Stream filling or channelization,
    - Stream meandering or some other geological event changing stream course, or
    - Some other event

    If some other event is selected as the reason for change, record the following information in the note:
    - Data collection phase,
    - Protocol: Streams,
    - Item number: 10 - Loss, and
    - Explain what other event caused the stream loss.

Island Changes

11. For each permanent island within the segment, compare the current year's extent to that of the revision year by viewing the current and revision year's high resolution image. Determine if there is evidence that any real change in a permanent island has occurred. A change in the extent of permanent islands due to changes in water levels caused by annual weather variation is NOT real change.

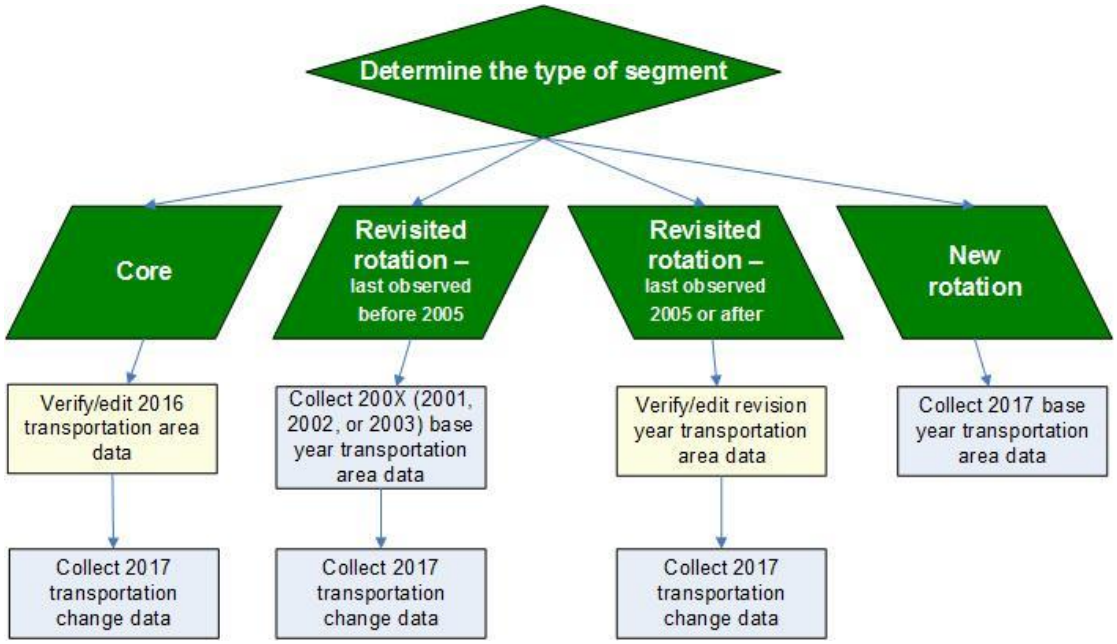
12. Delineate any real change in a permanent island.
    - Delineate the full extent of the permanent island gain or loss within the segment and include the segment boundary intercepted by the island change.
    - When delineating a permanent island gain or loss, use a scale of 1:500.
13. Record a note that includes:
    - Data collection phase,
    - Protocol: Streams,
    - Item number: 13 - Island, and
    - Explain the reason for the island change.

***NOTE:** The order in which area features are collected changed in June 2012. Eligible areas are now collected before Transportation features. Transportation features are not collected where an eligible area has been delineated. Eligible structures are collected after Transportation features.

Go to Data Collection for Change in Transportation

3.3.3 Transportation

View the diagram below to see the order of operation for each segment type and year.



Definitions: Transportation

Transportation area data are not collected for private roads. Area data are collected for all public roads, including those in urban areas and federally-owned tracts. Transportation area data are identified as one of four categories: (1) paved public road with 4 lanes or more; (2) paved public road with < 4 lanes; (3) unpaved public road; or (4) railroads.

Transportation Kind

- **Paved public road with 4 lanes or more:** A hard surface public road with at least four lanes. [NRI-05]
- **Paved public road with < 4 lanes:** A hard surface public road with fewer than four lanes. [NRI-05]
- **Unpaved public road:** An unpaved public road with fewer than four lanes. [NRI-05]
- **Railroads:** A category of transportation areas that includes all operational rail systems and their right-of-way areas. Abandoned railroad beds are not included as railroad areas. [NRI-05]

Other Definitions

- **Paved road:** Road with a hard surface such as asphalt or concrete. [NRI-05]
- **Public road:** Includes Federal highways, state highways, county roads of all types, and the associated roadbed, road shoulder, drainage improvements, rest areas, and remaining rights-of-way. Includes the center median and interchange areas for divided highways. Abandoned public roads that are still in usable condition are included in the public road category. Logging roads and private roads to farmsteads, farm headquarters, or ranch headquarters are not public roads. [NRI-05]
- **Unpaved road:** Road without a hard surface such as asphalt or concrete. [NRI-05]

Procedure for Determining If a Road is Public or Private

The 2005 Annual NRI and later requires all railroads and public roads in both Federal and non-Federal portions of the segment be delineated and labeled. Railroads, public roads and private roads were delineated and labeled on historical PSU support maps (pre-2005 Annual NRI Survey) for the non-Federal portion of the segment. The historical PSU support map is the primary source material for determining if a road is public or

private for base year data collection during the transition from pre-2005 to 2005 Annual NRI Survey and later NRI annual surveys.

A change in protocol in 2005 required public roads and railroads on Federal tracts to be delineated. For NRI purposes roads on government installations that would otherwise be deemed transportation for the NRI, are considered public despite restricted access/gates. The built-up or federal portions of segments will not (reliably) have roads or railroads delineated on historical support maps.

Examples of roads not to be inventoried are skidder trails in forests, desert tracks, trails not maintained on rangeland, field lanes in cropland, trails on military installations that are typically used for training maneuvers, and those roads that would normally require a very high security clearance such as roads on a bombing range or very secure facility such as a prison. If you are uncertain whether to collect a road as public, contact an RSL Technical Specialist. These features are photo-interpretable. Materials described in the Ancillary Resources section may be needed in areas delineated as built-up on support maps from prior NRIs to separate public from private roads. Roads inside gated communities are also considered public and should be collected.

To determine if a road is public or private:

1. Use photo interpretation and one or more of the following resources to make the determination of public or private:
   - DRGs (or 7.5-minute USGS Quads)
   - DOQ images
   - County Road maps from state DOTs.
   - Plat Books (Ownership and right-of-way boundary verification)
   - Base year PSU support map for revisited rotation segments and 1997 for new rotation segments.
   - PSU support maps for a previous inventory (e.g., 2002, 2001, 2000, 1997), if available
   - In the absence of state or county road maps, publicly available imagery (Google, Bing, etc.) is a potential resource including street view where available
   - NOTES: Historical notes in the NRI database
2. View the high resolution image.
3. The documentation on the PSU support map can be a guide for determining if a road is public or private on areas of the segment that are not built-up or Federal tracts of land

Verify/Edit Data for Transportation in the Revision Year

1. Select Transportation within the revision year phase in NRI_Collect.
2. Review the revision year high resolution image and examine the transportation features. Inspect the previously delineated polygons and determine if they accurately represent the extent of each transportation feature.

   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

Delineation Tools for Transportation

 Add Road as Polygon: Delineate a road feature as a polygon. The boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
Add Road as Line: Delineate a road feature as a line. The shift-mouse wheel to adjust the  buffered width; the diameter of the buffered line is reported at the lower edge of the Main View. The buffered line results in a polygon. The boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
 Draw Road Gain as a Polygon: For real change in an existing road or a newly constructed road, delineate the area that has increased as a polygon. Alternatively, the boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
Draw Road Gain as a Line: For real change in an existing road or a newly constructed road,  delineate the area that has increased as a line. The shift-mouse wheel to adjust the buffered width; the diameter of the buffered line is reported at the lower edge of the Main View. The buffered line results in a polygon. Alternatively, the boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
 Draw Road Loss: For real change in an existing road, delineate the area that has decreased. Alternatively, the boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.

Transportation Protocol Window

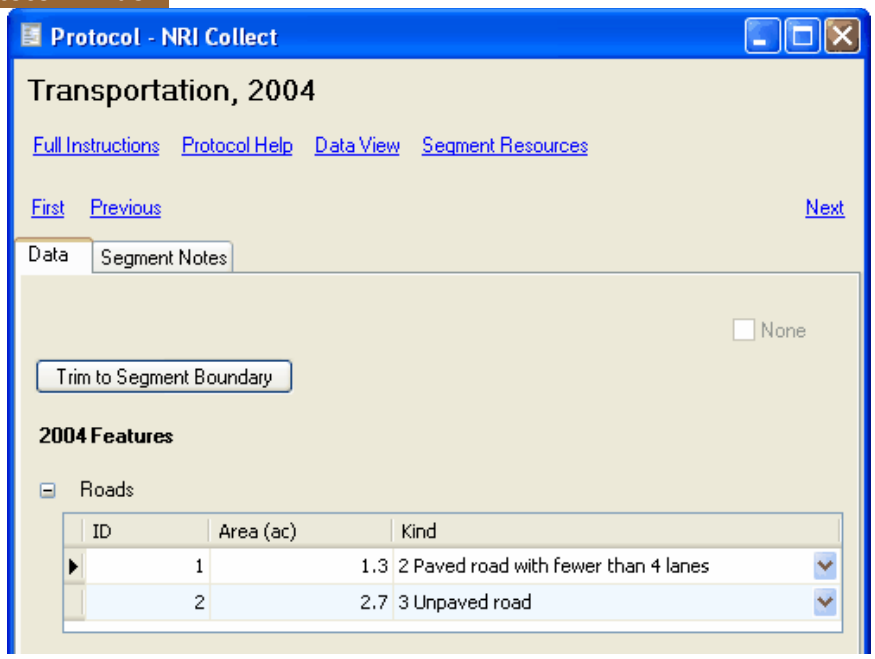


Figure 9: Transportation Data Collection Window

Right Click on a Selected Transportation Feature

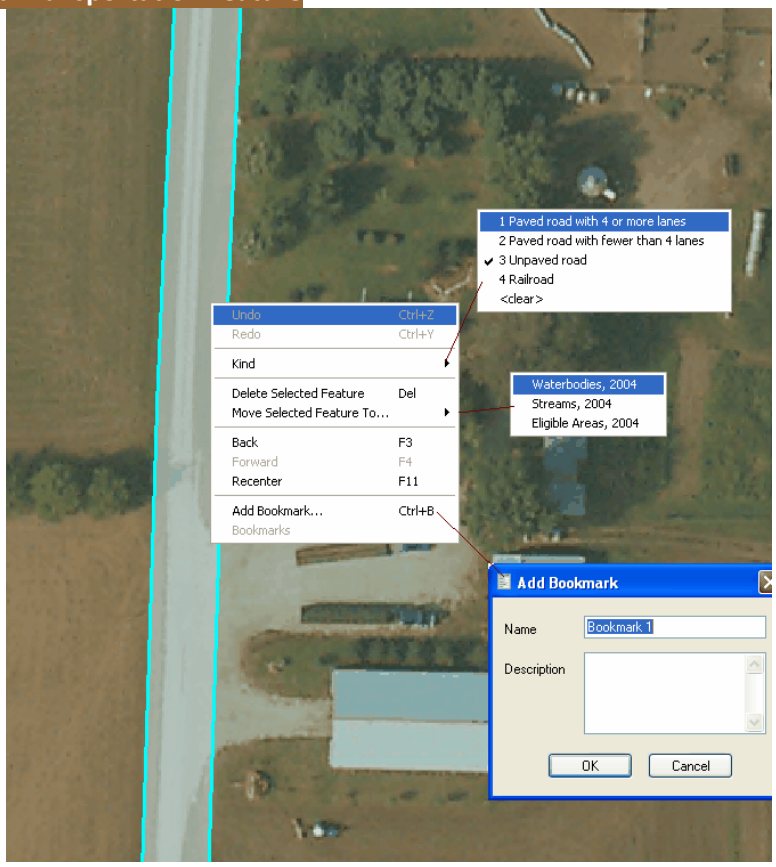


Figure 10: Transportation polygon features available with right click

Data Collection for Transportation in the Base Year

1. View the base year high resolution image and review the base year PSU Support Map for revisited rotation segments (1997 PSU Support Map for new rotation segments), DRG, DOQ, or other Ancillary Resources to identify all public roads and railroads in the segment.

2. Delineate all public roads and railroads in the segment for the base survey year.
   - Include the roadbed, road shoulder, drainage improvements, rest areas, and the remaining rights-of-way for public roads. In the absence of photo-interpretable rights-of-way, use the county lists of average rights-of-way. If the county of interest is not included in the county list, use the state list of average rights-of-way.
   - For residential streets delineate the roadway from curb/edge to curb/edge.
   - Include the center median and interchange areas for divided highways.
   - Delineate railroads as single polygons irrespective of the number of tracks.
   - Delineate the extent within the segment boundary and include the portion of the segment boundary intercepted by the road or railroad.
3. Determine and select each delineated road kind from the choice list:
   - Paved road with 4 or more lanes
   - Paved road with fewer than 4 lanes
   - Unpaved road
   - Railroad

Verify/Edit Data for Transportation in the Revision Year

1. Select Transportation within the revision year phase in NRI_Collect.
2. Review the revision year high resolution image and examine the transportation features.
   Inspect the previously delineated polygons and determine if they accurately represent the extent of each transportation feature.
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

Data Collection for Change in Transportation

1. View the revision year's high resolution image and inspect previously delineated polygon(s) and lines to determine if they accurately represent the historical extent of transportation.
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.
2. Use the swipe tool to determine if the locations of features on the two images are aligned.
   If not, this becomes a non-standard case.
   - Stop data collection on this segment.
   - Notify the designated RSL contact.
3. Compare the extent of roads for the current year with that of the revision year. Determine if there has been any real change in roads since the revision year. Reasons for real change in roads include:
   - New or expanded transportation areas,
   - Abandoned roads or railroads (track removal is evidence of abandonment of a railroad), or
   - Some other event that caused a permanent change in transportation (this requires a note for us to evaluate the case)

Road Gains

4. Are there any road gains?
   - If no, check "None" and go to step 8.
   - If yes, complete steps 5-7.
5. Delineate any road gains (i.e., the area(s) of increase in an existing road or the extent of a new road within the segment).
   - Delineate the full extent of the road gain within the segment and include the segment boundary intercepted by the road gain.
6. Select the kind of road from the choice list:
   - Paved road with 4 lanes or more
   - Paved road with fewer than 4 lanes
   - Unpaved road
   - Railroads
7. Select the reason for change of road from the choice list:
   - New or expanded transportation
   - Abandoned
   - Other (this requires a note)

   If "Other" is selected as the reason for change, record the following information in the note:
   - Data collection phase,
   - Protocol: Transportation,
   - Item number: 7 - Gain, and

- Explain what other event caused the road gain.

Road Losses

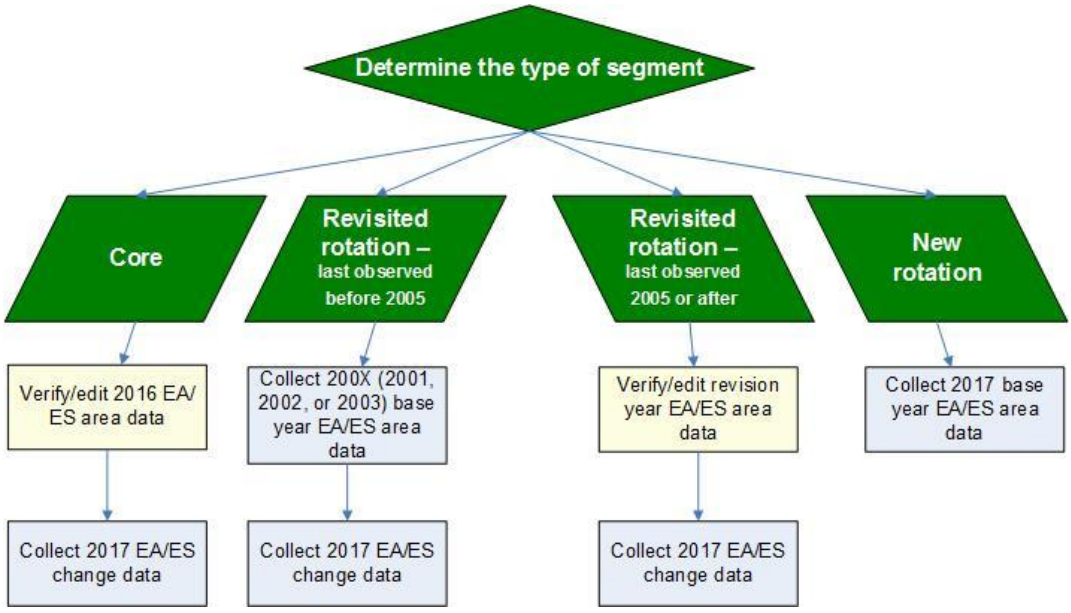
8. Are there any road losses?
   - If no, check "None".
   - If yes, complete items 9-10.
9. Delineate any road losses (i.e., the area(s) of decrease in a previously existing road).
10. Select the reason for change of road from the choice list:
    - New or expanded transportation
    - Abandoned
    - Other (this requires a note)

    If "Other" is selected as the reason for change, record the following information in the note:
    - Data collection phase,
    - Protocol: Transportation,
    - Item number: 10 - Loss, and
    - Explain what other event caused the road loss.

Go to Data Collection for Change in Eligible Areas and Structures

3.3.4 Eligible Area and Structures

View the diagram below to see the order of operation for each segment type and year.



Definitions: Eligible Areas and Structures

Built-up area data are divided into two types, eligible areas and eligible structures.

- **Eligible areas:** Areas that include airports; apartment buildings, row houses, and adjacent parking areas; cemeteries; dams, spillways, and levees (for further direction on earthen levees see “dams, spillways, and levees” below); gas stations; golf courses; institutional sites; industrial/commercial sites; parking facilities; playground areas and parks; public administration sites; sanitary landfills; and sewage treatment plants. [NRI-05]
- **Eligible structures:** Single-family, duplex, triplex, and 4-plex residences, foundations of residences under construction, and pads used to site house trailers. [NRI-05]

- **Exclusion areas**: Areas completely surrounded by eligible areas within the segment boundary, but not meeting the definition for eligible areas. The exclusion areas within eligible areas are typically non-maintained areas of forest land, scrub shrub land, or grasslands. Other types of area data (e.g., waterbodies, streams, public roads, and eligible structures) are delineated using their corresponding protocols.

Procedure for Determining Eligible Areas

Eligible Area types include the following:

Airports: Include the runways, taxiways, hangars, terminals, parking lots, and other buildings associated with the airport as an eligible area. For an airport to be an eligible area, the runway must be composed of ***impermeable material***. Also include areas that are maintained and adjacent to the previously named airport features. For airports under construction, include areas where foundations and/or paved runways can be identified as part of the eligible area. ***Airplane landing strips composed of permeable material are not eligible areas.*** [NRI-05]

Apartment buildings, row houses, and adjacent parking areas: In addition to including the structures and associated parking lots and parking garages, include adjacent maintained areas (typically mowed or landscaped) in the eligible area. Where construction is underway, include areas where one or more foundations can be observed and distinguished from eligible structures. [NRI-05]

Cemeteries: Include the areas with headstones or mausoleums and other maintained areas adjacent to the areas being actively used for or reserved for burial. There is no minimum size.

Commercial Solar Arrays: Any ground mounted solar panel installation, whether a fixed angle system or a single or double axis tracking system, associated with a commercial/industrial enterprise. Excluded are arrays that, via photointerpretation, are clearly associated with agricultural operations.

Dams, spillways and levees: Dams, spillways, and levees that are hard-surfaced (not earthen) are considered eligible areas. However, some earthen structures are considered eligible areas too. Include all earthen dams associated with large waterbodies (40 acres or greater) and large streams (660 feet or greater in width) as eligible areas. Also include other dams greater than 300 feet in length as eligible areas. However, never include earthen dams as eligible areas when the waterbody is less than 40 acres. That part of an earthen levee that borders an eligible area is considered part of the eligible area. Earthen levees, not classified as eligible areas, covered by public roads are classified as transportation. All other levees that are earthen are given land cover/use of the vegetation covering the levee. [NRI-07]

Gas stations: Include the store, if present, repair garage, gas pumps, and associated hardened surfaces as eligible areas. Also include associated maintained areas (typically mowed or landscaped) in the eligible area. [NRI-05]

Golf courses: Include the fairways, greens, bunkers, traps, buildings and associated maintained areas as eligible areas. [NRI-05]

Institutional sites: Include churches, schools (including playgrounds), hospital, museums, civic centers, and other public service areas as eligible areas. Also include associated maintained areas (typically mowed or landscaped). Where construction is underway, include areas where one or more foundations can be observed and distinguished from eligible structures. [NRI-05]

Industrial/commercial sites: Include downtown areas, shopping malls and centers, strip shops/businesses, lodging facilities, resorts, marinas (excluding areas over permanent water), manufacturing buildings and plants, warehouses, docks and port facilities, truck terminals, railway yards and tank farms as eligible areas. Also include adjacent parking facilities and maintained areas (typically mowed or

landscaped). Where construction is underway, include areas where one or more foundations can be observed and distinguished from eligible structures. [NRI-05]

Parking facilities: Include parking garages and both paved and unpaved parking lots as eligible areas when not associated with other eligible areas. [NRI-05]

Playground areas and parks: Playgrounds with permanent structures are eligible areas. Include portions of parks that are developed to allow access and use. Include parking facilities, picnic areas, swimming areas, offices, toilets, and sports areas. Also include associated maintained areas (typically mowed or landscaped). [NRI-05]

Public administration sites: Include buildings devoted to the support of federal, state, city, or other local government business as eligible areas. Areas to include are courthouses, city halls, police and fire stations, public highway administration buildings, highway machinery areas, and state and federal fish hatcheries. Post offices and federal administrative buildings in urban areas are included as eligible areas. Also include associated maintained areas (typically mowed or landscaped). [NRI-05]

Sanitary landfills: Include the area of the landfill that is actively being used in operations as an eligible area. Also include associated maintained areas (typically mowed or landscaped). If the landfill has been partially reclaimed, assign the reclaimed area to the appropriate non-eligible area land cover/use. Include the disturbed areas when digitizing the eligible area. [NRI-05]

Sewage treatment plants: Include the hard-surface areas as eligible areas. Also include associated maintained areas (typically mowed or landscaped). Lagoons that appear to be only storing solids and not actively involved in treatment are also included as part of the eligible area. [NRI-05]

Collection Software: Eligible Areas and Structures

Delineation Tools for Eligible Areas and Structures

 Add Eligible Area: Delineate an eligible area feature as a polygon.
Draw Eligible Area Gain: For real change in an existing eligible area between revision and current years or to add a new eligible area, delineate the area of gain. Alternatively, the boundaries of the polygon may be adjusted by selecting and using the Add Vertices and Move Vertices tools.
Draw Eligible Area Loss: This tool is used for two purposes: (1) For real loss in a previously existing eligible area between revision and current years, delineate the area that has decreased; and (2) Delineate an exclusion area within an eligible area as a polygon.
 Add Eligible Structure: Delineate eligible structures (residences).
 Eligible Structure Loss: For real loss in a previously existing eligible structure between the revision and current years, delineate the eligible structure that has been removed.

Eligible Areas and Structures Protocol Window

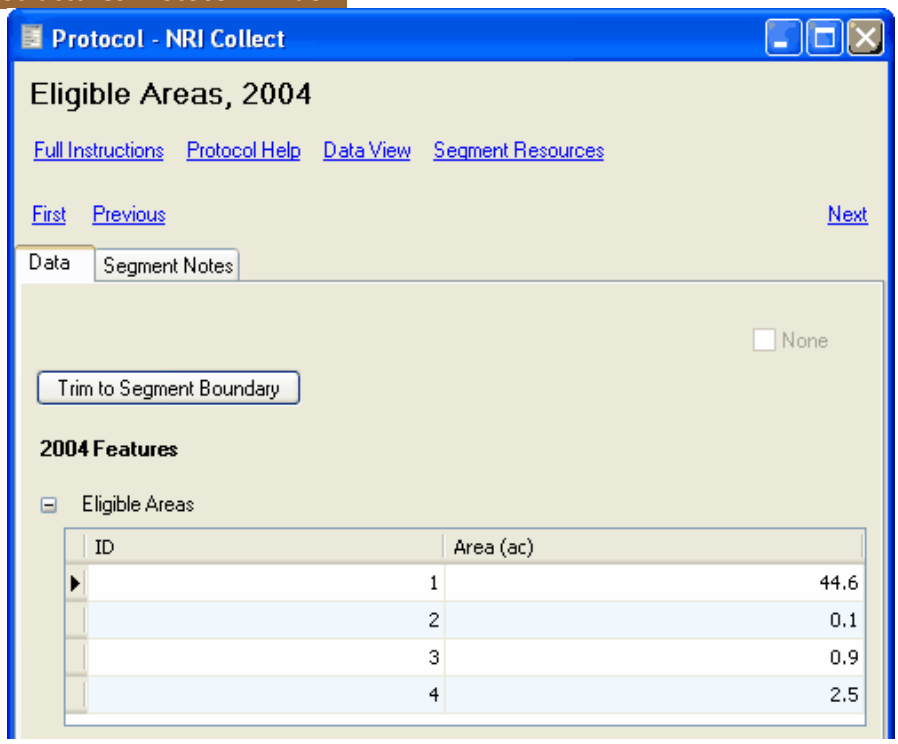


Figure 11: Eligible Area Data Collection Window

Eligible Areas and Structures Protocol Window

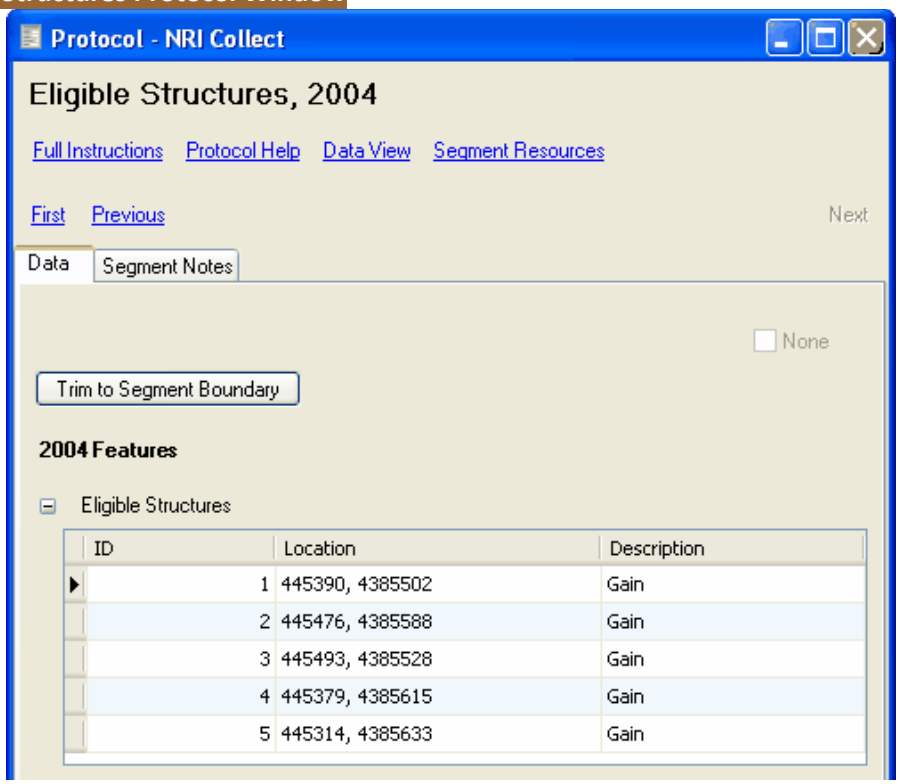


Figure 12: Eligible Structure Data Collection Window

Right Click on a Selected Eligible Area

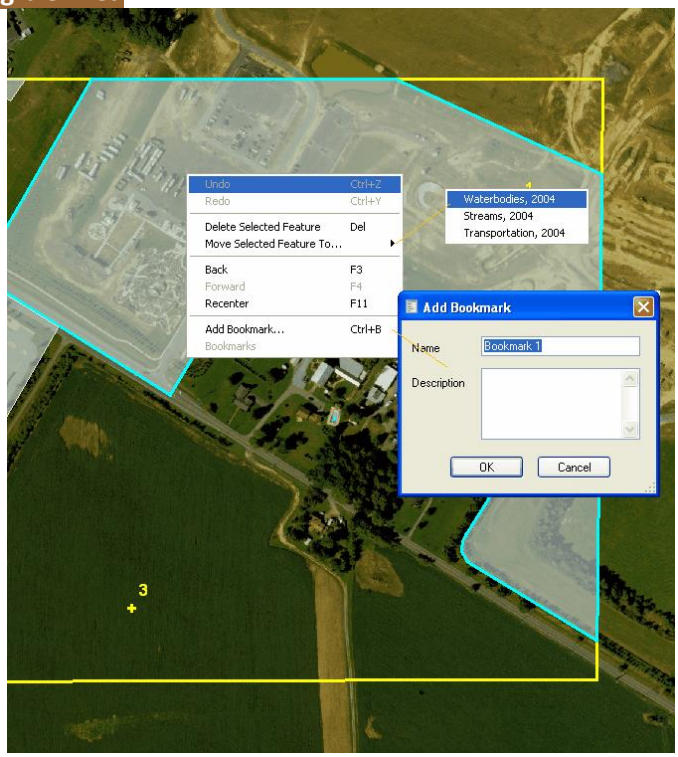


Figure 13: Eligible Area Polygon Features Available with Right Click

Right Click on a Selected Eligible Structure

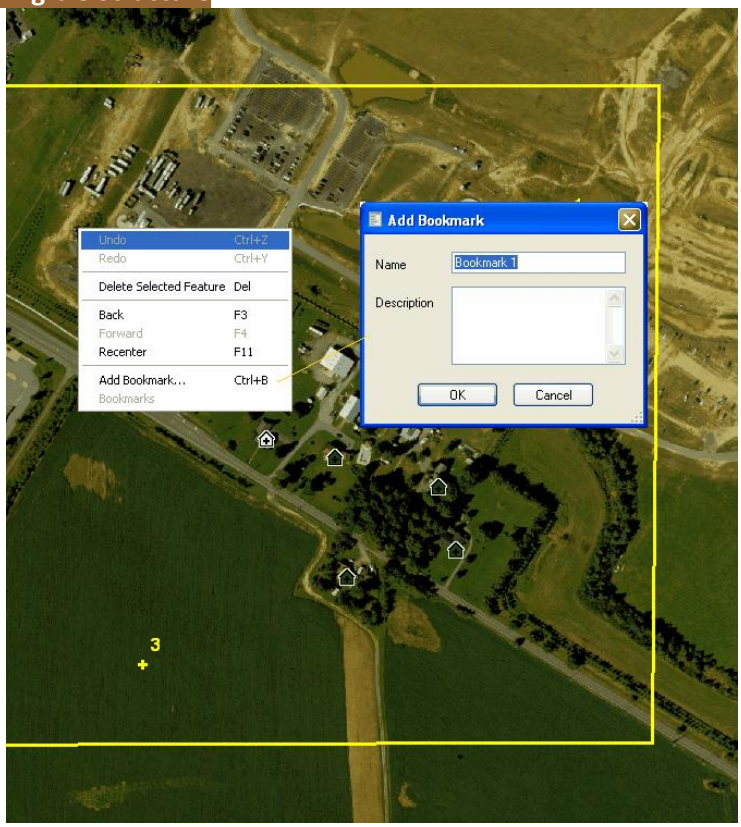


Figure 14: Eligible Structure Polygon Features Available with Right Click

Data Collection for Eligible Areas and Structures in the Base Year

1. View the base year high resolution image and review the base year PSU Support Map for revisited rotation segments (1997 PSU Support Map for new rotation segments) to identify all eligible areas in the segment.
   - Eligible area types include airports; apartment buildings and adjacent parking areas; cemeteries; dams, spillways, and levees; gas stations; golf courses; institutional sites; industrial/commercial sites; parking facilities; playground areas and parks; public administration sites; sanitary landfills; and sewage treatment plants.

2. Delineate all cemeteries regardless of size, and all other eligible areas at least 0.1 acre in size, within the segment as polygons (See Diagram 1). The section for determining eligible areas describes areas to include or exclude when digitizing eligible area polygons.
   - Include the hard-surface portions when delineating eligible areas.
   - Include maintained areas (mowed or landscaped) adjacent to or associated with hard surfaced portions of eligible areas.
   - Delineate the extent within the segment and include the segment boundary intercepted by the eligible area.
   - If a public road forms a boundary of an eligible area, delineate the eligible area boundary to the center of the transportation area.
   - Delineate contiguous eligible areas as a single polygon.
   - If multiple eligible areas are separated only by public roads, delineate the eligible areas as a single polygon that includes the interior public roads.
   - Mark each house trailer, either isolated or in a residential trailer park, as an eligible structure.

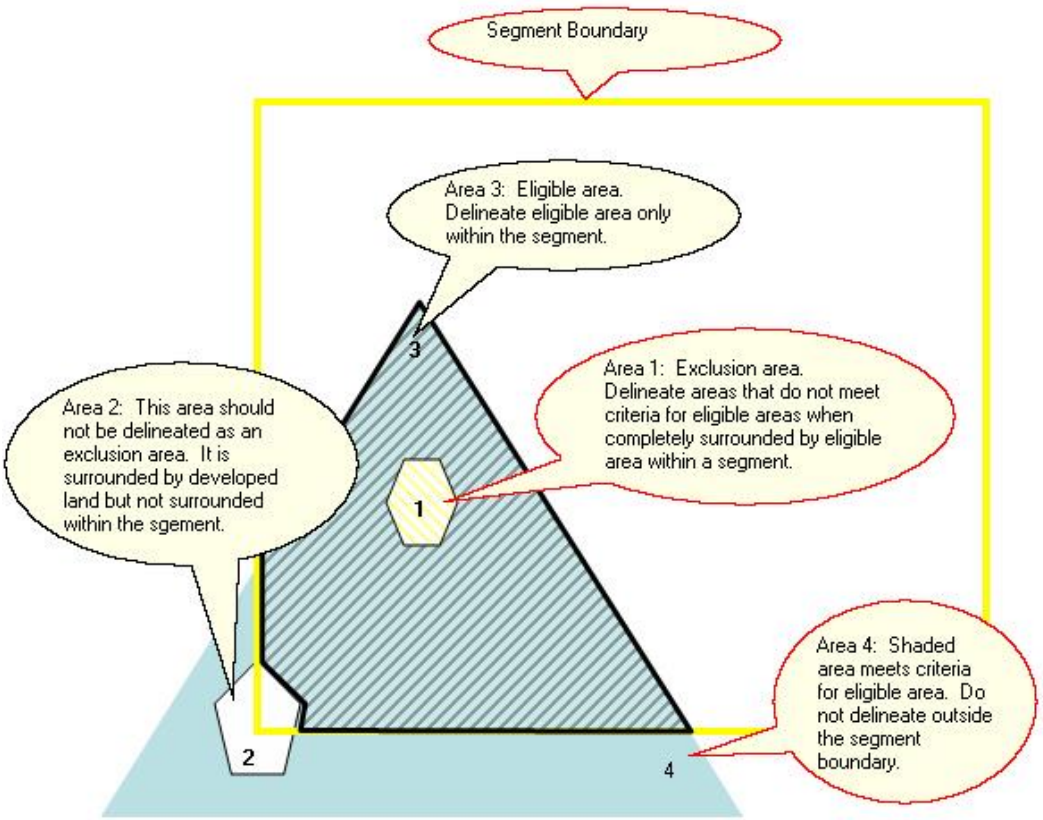
3. Exclusions: Exclusion areas within eligible areas are typically non-maintained areas of forest land, scrub shrub land, or grasslands. Exclude from eligible area delineations areas at least 1.0 acre in size and completely surrounded by eligible areas within the segment boundary, but not meeting the definition for eligible areas (See Diagram 1). Other types of area data (e.g., waterbodies, streams, public roads, and eligible structures) are delineated using their corresponding protocols.

4. View the base year high resolution image to identify eligible structures within the segment boundaries and outside of eligible areas.

5. Delineate eligible structures within the segment. Remember that eligible structures and eligible areas are mutually exclusive.
   - Include single-family, duplex, triplex, and 4-plex residences, foundations of residences under construction, and pads used to site house trailers.
   - Include eligible structures where at least half the structure is within the segment boundary.

Eligible Area Exclusion Delineation

Diagram 1 - Eligible Areas and Exclusion Areas



Verify/Edit Data for Eligible Areas and Structures in the Revision Year

1. Select Eligible Areas and Structures within the revision year phase in NRI_Collect.
2. Review the revision year's high resolution image and examine the eligible areas. Inspect the previously delineated polygons and determine if they accurately represent the extent of each eligible area feature.

   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.
3. Review the revision year's high resolution image and examine the eligible structures. Inspect the previously delineated eligible structure marks and determine if they accurately represent each eligible structure.

   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

Data Collection for Change in Eligible Areas and Structures

1. View the revision year's high resolution image and inspect previously delineated polygon(s) and eligible structure marks to determine if they accurately represent the historical extent of eligible areas and structures.
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.
2. Use the swipe tool to determine if the locations of features on the two images are aligned.
   If not, this becomes a non-standard case.
   - Stop data collection on this segment.
   - Notify the designated RSL contact.

3. Compare the extent of eligible areas and structures for the current year with that of the revision year. Determine if there has been any real change in eligible areas and structures since the revision year. Reasons for real change in eligible areas and structures include:
   - New construction
   - Weather-related events or fire resulting in the loss of eligible areas or structures,
   - Some other event (this requires a note for us to evaluate the case).

Eligible Area and Structure Gains

4. Are there any eligible area or structure gains?
   Eligible area or structure gains may result from construction of new eligible areas or structures or expansion of an existing eligible area.
   - If no, check "None" and go to item 8.
   - If yes, complete items 5-7.
5. Delineate any eligible area or structure gains.
   - Delineate the extent of the eligible area gain within the segment and within the segment boundary intercepted by the eligible area gain.
6. Select the reason for change from the choice list:
   - New construction
   - Weather-related events or fire resulting in the loss of eligible areas or structures,
   - Some other event (Record a note.)

   If some other event is selected as the Reason for Change, record the following information in the note:
   - Data collection phase,
   - Protocol: Eligible Areas and Structures,
   - Item number: 6, and
   - Explain what other event caused the eligible area or structure gain.

Eligible Area and Structure Losses

7. Are there any eligible area or structure losses?
   - If no, check "none"
8. Delineate any eligible area or structure losses.
9. Select the reason for change from the choice list:
   - New construction
   - Weather-related events or fire resulting in the loss of eligible areas or structures,
   - Structure removed,
   - Some other event (record a note)

If some other event is selected as the Reason for Change, record the following information in the note:

- Data collection phase,
- Protocol: Eligible Areas and Structures,
- Item number: 9, and
- Explain what other event caused the eligible area or structure loss.

Exclusion Area Changes

10. For each exclusion area at least 1.0 acre in size completely surrounded by an eligible area within the segment boundary, compare the current year's extent to that of the revision year by viewing the current and revision year's high resolution images. Determine if there is evidence that any change in an exclusion area has occurred.
11. Delineate any real change in an exclusion area.
    - If the exclusion area gain lies at least partly within the segment and extends past the segment boundary, it is not considered an exclusion area. Exclusion areas must be completely surrounded by an eligible area within the segment. The boundary of an exclusion area must not touch or intersect the boundary of either the eligible area or segment.
    - When delineating an exclusion area gain or loss, use a scale of 1:500.
12. Record a note that includes:
    - Data collection phase,
    - Protocol: Eligible Areas and Structures,
    - Item number: 12, and
    - Explain the reason for the exclusion area change.

Other Issues

1. Undeveloped parts of parks and earthen farm pond dams are not eligible areas.
2. Non-contiguous eligible areas must be delineated as separate polygons. Contiguous eligible areas do not have to be delineated separately.

3. A house that has been converted to a business will be called a residence unless there is evidence to support the business interpretation.

4. Row houses (5 or more units) are classified as eligible areas, not individual eligible structures. Row houses have shared walls separating the individual houses.

5. Isolated trailers are eligible structures. Mark each trailer in a residential trailer park as an eligible structure.

6. Include small constructed features as part of the eligible area if adjacent to or included in the eligible area feature. Recall that the minimum size for an eligible area is 0.1 acre.

   Small constructed features include:

   - High voltage transmission towers;
   - Radio, TV, and cell phone towers;
   - Water tanks and towers, and oil wells.

   The land cover/use for a point within a small constructed feature is the land cover/use of the adjacent area if the feature is not part of an eligible area.

7. Delineate to the center of a private road area when it forms an eligible area boundary.

8. Parts of marinas and piers over water are considered water, not eligible areas.

***NOTE:** The order in which area features are collected changed in June 2012. Eligible areas are now collected before Transportation features. Transportation features are not collected where an eligible area has been delineated. Eligible structures are collected after Transportation features.

Go to Data Collection for Change in Transportation

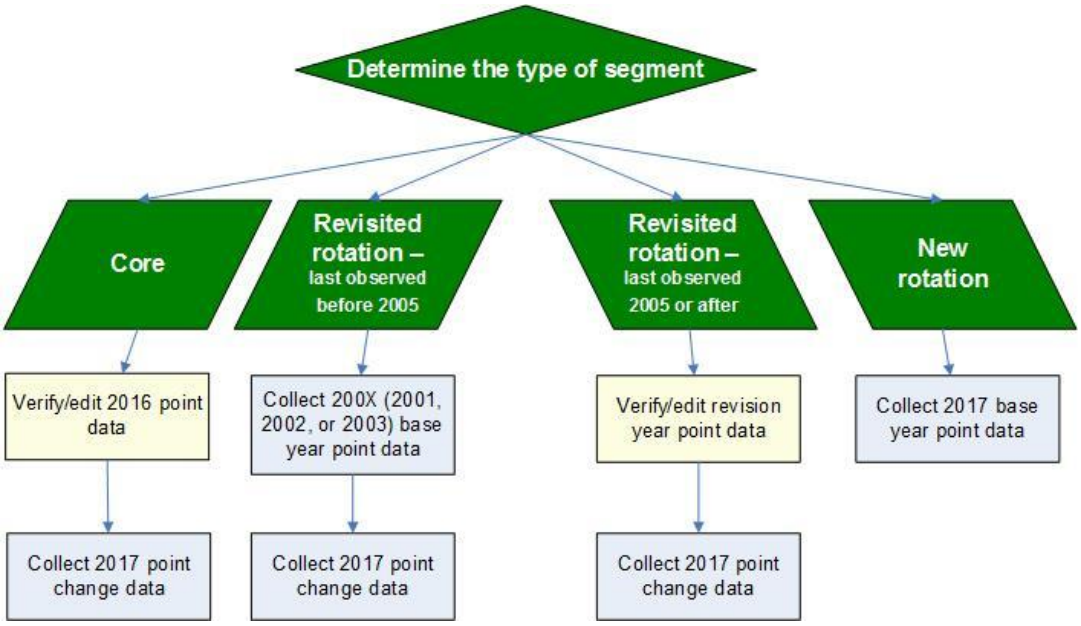
Go to Data Collection for Change in Land Cover/Use

3.4 Point Data

Point data are collected for Land Cover/Use, Wetlands and Deepwater Habitats, Erosion, Use of Land, Conservation Practices, and Resource Concerns. Of these types of point data, Land Cover/Use must always be collected first. Collect all point data for a single year before collecting point data for the next year.

3.4.1 Land Cover/Use

View the diagram below to see the order of operation for each segment type and year.



Definitions: Land Cover/Use

Land Cover/Use is a term that includes categories of land use and land cover. Land cover is the vegetation or other kind of material that covers the land surface. Land use is the purpose of human activity on the land; it is usually but not always related to the land cover. The NRI uses the term Land Cover/Use to identify the categories that account for all the surface area of the United States. Cropland, for example, is basically a land use category that includes a variety of land covers (grass, trees, shrubs, bare soil, small grains, etc.); it is classified primarily by its use and secondarily by its cover. In contrast, forest land is basically a land cover category that includes a variety of uses or multiple concurrent uses; it is classified primarily by its cover and secondarily by its use. The term Land Cover/Use permits land with both crops and trees to be properly assigned to a single, non-overlapping category.

Cropland, Hayland, or CRP Land: 000 Cropland, Hayland, or CRP land

Cropland: A land cover/use category that includes areas used for the production of adapted crops for harvest. Two subcategories of cropland are recognized: cultivated and noncultivated. Cultivated land comprises land in row crops or close-grown crops and also other cultivated cropland; for example, hayland or pastureland that is in a rotation with row or close-grown crops. Noncultivated cropland includes permanent hayland and horticultural cropland. [NRI-97]

Hayland: A subcategory of cropland managed for the production of forage crops that are machine harvested. These crops may be grasses, legumes, or a combination. Hayland also includes land in set-aside or other short-term agricultural programs. [NRI-92]

Conservation Reserve Program Land (CRP) A land cover/use category that includes land under a general CRP contract. [NRI-97]

Nurseries

007 Nursery production areas

Grassland: 200 Grassland

Grassland: An area that has at least 50% aerial coverage of grasses, grass-like plants and or forbs. When viewed from a vertical direction there must be less than 30% canopy cover of woody plants that grow to a height of less than 4 meters at maturity and less than 25 % canopy cover of leaves and branches of trees that grow to a height of 4 meters or taller at maturity. The total area coverage of shrubs and trees must be less than 50 %. **The minimum area for classification of grassland is 1 acre, and the area must be at least 100 feet wide**. [NRI-2005]

Grassland is further classified into as either “rangeland” or “not rangeland.”

Grassland Defined as Rangeland: A land cover/use category on which the vegetation is predominately grasses, grass-like plants, and or forbs and defined as rangeland. Includes lands re-vegetated naturally or artificially when routine management of that vegetation is accomplished mainly through manipulation of grazing. [NRI-2005]

Rangeland: A land cover/use category that includes land on which the climax or potential plant cover is composed principally of native grasses, grass-like plants, forbs or shrubs suitable for grazing and browsing, and introduced forage species that are managed like rangeland. This would include areas where introduced hardy and persistent grasses, such as crested wheatgrass, are planted and practices, such as deferred grazing, burning, chaining, and rotational grazing, are used with little or no chemicals or fertilizer being applied. Grassland, savannas, many wetlands, some deserts, and tundra are considered to be rangeland. Certain low forb and shrub communities, such as mesquite, chaparral, mountain shrub, and pinyon-juniper, are also included as rangeland. [NRI-97]

Grassland not Defined as Rangeland: A land cover/use category on which the vegetation is dominated by grasses, grass-like plants, and or forbs not defined as rangeland used primarily for the production of introduced or domesticated native forage plants for livestock grazing, erosion control, wildlife habitat or recreation areas. Cultural practices may include periodic tillage, fertilization, mowing weed control and irrigation. This category does not include intensely managed turfgrass areas around home and businesses. [NRI-2005]

Scrub shrub: 220 Scrub shrub

Scrub shrub Classification criteria

Scrub shrub: Scrub shrub areas must have at least 30% canopy cover of woody plants that grow to a height of less than 4 meters at maturity and less than 25 % canopy cover of trees that grow to a height of more than 4 meters at maturity. **The minimum area for classification of scrub shrub land rangeland is 1 acre, and the area must be at least 100 feet wide. [NRI-2005]**

Scrub shrub is further classified as either "rangeland" or "not rangeland."

Scrub shrub, defined as Rangeland: A land cover/use category with significant numbers of woody plants that grow to a height of less than 4 meters at maturity defined as rangeland. [NRI-2005]

Rangeland: A land cover/use category that includes land on which the climax or potential plant cover is composed principally of native grasses, grass-like plants, forbs or shrubs suitable for grazing and browsing, and introduced forage species that are managed like rangeland. This would include areas where introduced hardy and persistent grasses, such as crested wheatgrass, are planted and practices, such as deferred grazing, burning, chaining, and rotational grazing, are used with little or no chemicals or fertilizer being applied. Grassland, savannas, many wetlands, some deserts, and tundra are considered to be rangeland. Certain low forb and shrub communities, such as mesquite, chaparral, mountain shrub, and pinyon-juniper, are also included as rangeland. [NRI-97]

Scrub shrub not Defined as Rangeland: A land cover/use category with significant numbers of woody plants that grow to a height of less than 4 meters at maturity not defined as rangeland and used for livestock grazing, erosion control, wildlife habitat or recreation areas. This category may include abandoned cropland. [NRI-2005]

Scrub shrub Sub categories (Alaska only),

Scrub shrub grazed by domestic livestock:

261 Tall Scrub shrub
262 Low Mid Shrub
263 Alpine Tundra Dwarf Shrub
264 Moist Tundra Dwarf Shrub
265 Bog Fen Dwarf Shrub

Scrub shrub not grazed by domestic livestock:

271 Tall Scrub shrub
272 Low Mid Shrub
273 Alpine Tundra Dwarf Shrub
274 Moist Tundra Dwarf Shrub
275 Bog Fen Dwarf Shrub

Forest land: 340 Forest land

Forest land: A land cover/use category that is at least 10% stocked by single-stemmed woody species of any size that will be at least 4 meters (13 feet) tall at maturity. Also included is land bearing evidence of natural regeneration of tree cover (cutover forest or abandoned farmland) and not currently developed for non-forest use, and land that is between harvest and replanting. Ten percent stocked, when viewed from a vertical direction is a canopy cover of leaves and branches of 25 % or greater. The graphic below (figure 15) illustrates crown density and can be used as a tool for visualizing canopy cover of 25% or greater. The minimum area for classification of forest land is 1 acre, and the area must be at least 100 feet wide.

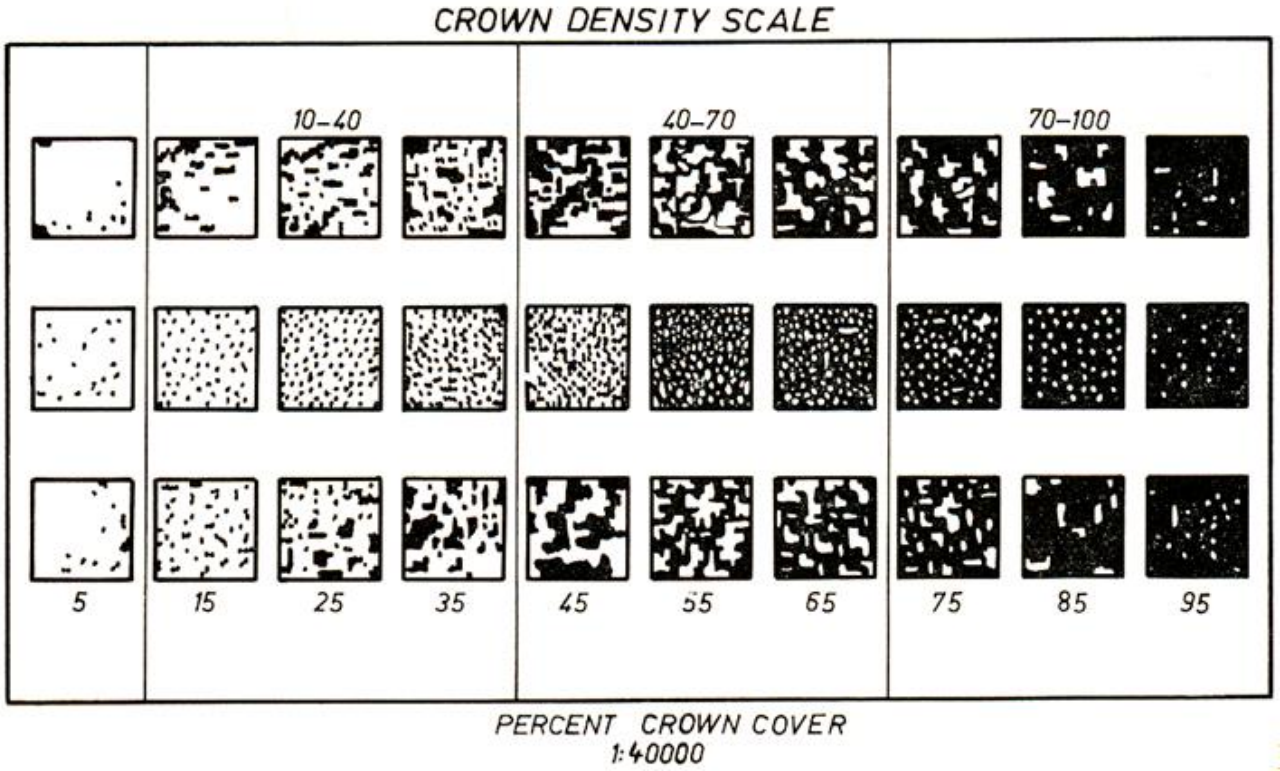


Figure 15: Subdivision of a region into equal size cells for forest cover estimation. Kleinn C. 2000. Estimating metrics of forest spatial pattern from large area forest inventory cluster samples. Forest Science 46(4):548-557.

Forest type: A classification of forest land based on the species presently forming a plurality of the live tree stocking. [FRUS-97] For NRI forest types are grouped into 2 major forest type groups (Eastern and Western). [NRI-97]

Forest plantation: Land used for the production of trees for commercial purposes where the vegetative community has been planted by human activity or is even-aged because of clear cutting. Forest plantations will typically be characterized by uniform stands of trees usually site prepared and planted in rows or blocks and with uniform crown heights. The plantations usually will consist of an even-aged stand of single species, or the plants will all be about the same size and general shape. Forest plantations are considered a separate category from fruit and nut orchards, bush fruits, vineyards, or other tree or shrub stands used to grow edible produce. These types would be classified under Cropland, Hayland, or CRP (LCU code 0). Agro-forestry and tree plantations planted to specialty uses and provided a high level of management, such as Christmas trees, oils, fiber, flower, specialty woods, and bio-fuel are classified as "404 Other land in farms". **"04 is now "Xmas trees, agro-forestry" [NRI-2005]

New Forest Tree Plantings

Applies to points that have been historically classified as a non-forest LCU, but current imagery indicates the point now lies in a planting of tree seedlings or saplings. The Survey Methods and Protocol Team (SMPT) determined that such plantings will not be classified as forest until these plantings have become established and the canopy has developed to meet the canopy cover requirement established by the NRI definition of forest. This decision ensures that cropland, hayland, and pasture points will be evaluated by local data collectors for possible enrollment in the General CRP program.

Other farmland

402 Commercial feedlots
404 Xmas trees, agroforestry
405 Miscellaneous agricultural lands: Including greenhouses, mushroom farms, non-impervious airplane landing strips, and wildlife food plots.

Barren land

611 Barren land, salt flats
612 Barren land, bare exposed rock
613 Barren land, strip mines, quarries, gravel pits, borrow pits
614 Barren land, beaches
615 Barren land, sand dunes
616 Barren land, mixed barren land
617 Barren land, mud flats, salt evaporator ponds
618 Barren land, river wash
619 Barren land, oil wasteland
620 Barren land, other barren land

Other rural non-agricultural Land

630 Other rural land, permanent snow and ice fields: areas where year-long surface cover of snow and/or ice comprise >25% of the total cover in a 1-acre circle surrounding the NRI point. To be considered as a permanent ice and/or snow field, (1) a 1-acre circle surrounding the NRI point must contain >25% snow and/or ice cover, and (2) the NRI point must meet one of the following permanence requirements: (a) the point must intersect a glacial polygon on a 7.5-minute quadrangle map or in the National Hydrography Dataset (NHD), or (b) the point is in an area where historical photography and local knowledge strongly indicate evidence of permanence [NRI-15].

640 Other rural land, marshland
650 Other rural land, all other rural land
652 Other rural land, not vegetated construction site

Built-up land

710 Built-up, Eligible area
745 Built-up, Residence related structures and features: Including eligible structures, gardens, landscaped areas, windbreaks, driveways, recreation areas, lawns.

Agriculture Related Features

746 Agricultural related structures and features: Including machine sheds, barns, bins, corrals, and lots

Transportation

815 Transportation, public road, 4 lanes or greater
825 Transportation, public road, paved and less than 4 lanes
845 Transportation, public road, unpaved and less than 4 lanes
860 Transportation, railroad
870 Transportation, other private roads

Water

901 Permanent water area, waterbody, at least 2 acres, but less than 40 acres
902 Permanent water area, waterbody, less than 2 acres
913 Permanent water area, stream at least 1/8 mile (660 feet) wide
915 Permanent water area, Stream less than 1/8 mile (660 feet) wide
921 Waterbody of at least 40 acres, lake
922 Waterbody of at least 40 acres, reservoir
923 Waterbody of at least 40 acres, gulf or bay
924 Waterbody of at least 40 acres, estuary
937 Open ocean - An area of the sea not considered a gulf, bay, or estuary

Procedure for Determining Land Cover/Use

Land cover/use is determined using three criteria: boundaries, type of cover/use and size. Certain well defined features such as residences (residences not in eligible areas), permanent water features or roads are also cover/uses. The cover/use is the cover/use of the feature if and only if the point falls on the feature.
For land managed for agricultural purposes, the cover/use is the cover/use for the field. If the point falls on an inclusion, such as a pile of rocks, group of trees or other perennial cover associated with a conservation practice, less than one acre in size, the cover/use of the field is the cover use for the point.
For points classified as forest, scrub shrub or grassland cover/use, more than one step may be required to determine cover/use.

If the point does not fall in a well-defined category, i.e. the area is not homogeneous; the first step is to determine if there is a distinct boundary. For example, there may be a line of clear demarcation between a dense wooded area and a large area of grassland. In some cases the boundary may be a fence or road. If both areas exceed one acre in size, and meet a cover/use definition, the cover/use for the point is the cover/use of the area in which the point falls.

If there is no clear boundary, or if there is a boundary but one of the areas does not meet the definition, then a sequential procedure is used for cover/use determination. A circular area of size one acre centered on the point is examined.

- If the area meets the definition for forest, the cover/use if forest.
- If the area fails to meet the definition for forest, the area is checked to see if the area meets the definition for scrub shrub. If so, the cover/use is the appropriate category of scrub shrub.
- If the area does not meet either the forest or scrub shrub definitions, the point cover/use is the appropriate grassland category.

While making land cover/use interpretations, apply the definitions and concepts uniformly for all years. Consistent data collection is essential to allow for trending analysis of the data.
The understanding of land cover/use definitions is the key to correctly determining land cover/use classifications for NRI points. The consistent use of definitions for land cover/use categories is essential to collecting quality information. The land cover use categories are:

Cropland, Hayland, or CRP Land: 000 Cropland, hayland, or CRP land

Nurseries: 007 Nursery production areas

Grassland: 200 Grassland

Scrub shrub: 220 Scrub shrub
Forest land: 340 Forest land

Other farmland
402 Commercial feedlots
404 Christmas trees, agroforestry
405 Miscellaneous agricultural lands: Including greenhouses, mushroom farms, wildlife food plots, and non-impervious airplane landing strips

Barren land
611 Barren land, Salt flats
612 Barren land, Bare exposed rock
613 Barren land, Strip mines, quarries, gravel pits, borrow pits
614 Barren land, Beaches
615 Barren land, Sand dunes
616 Barren land, Mixed barren land
617 Barren land, Mud flats
618 Barren land, River wash
619 Barren land, Oil wasteland
620 Barren land, Other barren land

Other rural non-agricultural Land
630 Other rural land, Permanent snow and ice fields
640 Other rural land, Marshland
650 Other rural land, All other rural land
652 Other rural land, Non-vegetated construction site
Urban and built-up land
710 Urban and built-up, Eligible area (based on delineation)
745 Urban and built-up, Residence related structures and features: Including eligible structures, gardens, landscaped areas, windbreaks, driveways, recreation areas, lawns

Agriculture Related Features
746 Agricultural related structures and features: Including machine sheds, barns, bins, corrals, and lots

Transportation
815 Transportation, Public road, 4 lanes or greater
825 Transportation, Public road, paved and less than 4 lanes
845 Transportation, Public road, unpaved and less than 4 lanes
860 Transportation, Railroad
870 Transportation, Other private roads

Water
901 Permanent water area, Waterbody, greater than 2 acres and less than 40 acres
902 Permanent water area, Waterbody, less than 2 acres

913 Permanent water area, Stream at least 1/8 mile (660 feet) wide
915 Permanent water area, Stream less than 1/8 mile (660 feet) wide
921 Waterbody of at least 40 acres, Lake
922 Waterbody of at least 40 acres, Reservoir
923 Waterbody of at least 40 acres, Gulf or bay
924 Waterbody of at least 40 acres, Estuary
937 Open ocean

Compare LCU determination with Local Data

After making a determination of the LCU for a point, compare that decision (right-hand column) with the LCU from local data (left-hand column). The table displays consistent LCU categories. If the RSL data collector's determination of LCU for a point is inconsistent with that of the local data, the point becomes a non-standard case.

Table 5. Consistent Land Cover/Use (LCU) Determinations from Local Data and the RSL Data Collector

Local Data Land Cover/Use	Consistent LCU Codes in NRI_Collect
Cropland—Horticultural Crops	
Fruit—Orchards	000 Cropland, Hayland, or CRP
Nuts—Tree	000 Cropland, Hayland, or CRP
Vineyard	000 Cropland, Hayland, or CRP
Bush fruit—(woody perennial shrub or bush types)	000 Cropland, Hayland, or CRP
Berries	000 Cropland, Hayland, or CRP
Other	000 Cropland, Hayland, or CRP
Cropland—Row	
Corn	000 Cropland, Hayland, or CRP
Sorghum	000 Cropland, Hayland, or CRP
Soybeans	000 Cropland, Hayland, or CRP
Cotton	000 Cropland, Hayland, or CRP
Peanuts	000 Cropland, Hayland, or CRP
Tobacco	000 Cropland, Hayland, or CRP
Sugar beets	000 Cropland, Hayland, or CRP
Potatoes	000 Cropland, Hayland, or CRP
Other vegetable and truck crops including melons	000 Cropland, Hayland, or CRP
All other row crops	000 Cropland, Hayland, or CRP
Sunflowers	000 Cropland, Hayland, or CRP
Cropland—Close Grown	
Wheat	000 Cropland, Hayland, or CRP
Oats	000 Cropland, Hayland, or CRP
Rice	000 Cropland, Hayland, or CRP
Barley	000 Cropland, Hayland, or CRP
All other close grown crops	000 Cropland, Hayland, or CRP
Cropland—Hayland	
Hayland	000 Cropland, Hayland, or CRP
Cropland—Other Cropland	
Summer fallow	000 Cropland, Hayland, or CRP
Aquaculture in a crop rotation	000 Cropland, Hayland, or CRP
Other cropland not planted	000 Cropland, Hayland, or CRP
CRP (not on choice list – auto filled based on item)	000 Cropland, Hayland, or CRP

Pastureland	
Pastureland - Grass	200 Grassland or 220 Scrub-shrub
Pastureland - Legume	200 Grassland or 220 Scrub-shrub
Pastureland - Grass Legume	200 Grassland or 220 Scrub-shrub
Not Cropland, Hayland, or CRP (not on choice list – auto filled by based on local data)	Category other than 000 Cropland, Hayland, or CRP

Table 6. Land Cover/Use Crosswalk of Pre-2005 Annual NRI Codes and Current Annual NRI Codes

PRE-2005 ANNUAL NRI GENERAL LCU	PRE-2005 ANNUAL NRI SPECIFIC LCU	PRE-2005 NRI CODE	Current ANNUAL NRI CODE
Cropland – Horticultural Crops			
	Fruit - Orchards (…)	1	000 Cropland, Hayland, or CRP
	Nuts (…)	2	000 Cropland, Hayland, or CRP
	Vineyard (…)	3	000 Cropland, Hayland, or CRP
	Bush fruit (…)	4	000 Cropland, Hayland, or CRP
	Berries (…)	5	000 Cropland, Hayland, or CRP
	Other (…)	6	000 Cropland, Hayland, or CRP
	Corn (…)	11	000 Cropland, Hayland, or CRP
	Sorghum	12	000 Cropland, Hayland, or CRP
	Soybeans	13	000 Cropland, Hayland, or CRP
	Cotton	14	000 Cropland, Hayland, or CRP
	Peanuts	15	000 Cropland, Hayland, or CRP
	Tobacco	16	000 Cropland, Hayland, or CRP
	Sugar beets	17	000 Cropland, Hayland, or CRP
	Potatoes	18	000 Cropland, Hayland, or CRP
	Other vegetable and truck crops (…)	19	000 Cropland, Hayland, or CRP
	All other row crops (…)	20	000 Cropland, Hayland, or CRP
	Sunflowers	21	000 Cropland, Hayland, or CRP
Cropland - Close Grown			
	Wheat	111	000 Cropland, Hayland, or CRP
	Oats	112	000 Cropland, Hayland, or CRP
	Rice	113	000 Cropland, Hayland, or CRP
	Barley	114	000 Cropland, Hayland, or CRP
	All other close grown (…)	116	000 Cropland, Hayland, or CRP
Cropland - Hayland			
	Grass	141	000 Cropland, Hayland, or CRP
	Legume	142	000 Cropland, Hayland, or CRP
	Legume-grass	143	000 Cropland, Hayland, or CRP

Cropland - Other Cropland			
	Summer fallow	170	000 Cropland, Hayland, or CRP
	Aquaculture in a crop rotation	171	000 Cropland, Hayland, or CRP
	Other cropland not planted	180	000 Cropland, Hayland, or CRP
Pasture and Native Pasture			
	Grass	211	200 Grassland
			220 Scrub-shrub
	Legume	212	200 Grassland
			220 Scrub-shrub
	Grass-forbes-legumes mixed	213	200 Grassland
			220 Scrub-shrub
Rangeland			
	Rangeland	250	200 Grassland
			220 Scrub-shrub
Forest land			
	Forest land, grazed	341	340 Forest land
	Forest land, not grazed	342	340 Forest land
Other Farmland			
	Farmsteads	400	745 Residence related structures and features (including eligible structures, gardens, landscaped areas, windbreaks, driveways, recreation areas, lawns)
			746 Agricultural related structures and features (including machine sheds, barns, bins, corrals, and lots)
	Other land in farms (…)	401	007 Nurseries (other than container nursery stock)
			402 Commercial feedlots and feeding facilities
			404 Christmas trees, agroforestry
			405 Miscellaneous other farmland (including container nursery stock, greenhouses, mushroom farms, wildlife food plots, and non-impervious airplane landing strips)
			746 Agricultural related structures and features (including machine sheds, barns, bins, corrals, lots)

	Conservation Reserve Program (CRP) land	410	000 Cropland, Hayland, or CRP
Barren Land			
	Salt flats	611	611 Barren/Salt flats
	Bare exposed rock	612	612 Barren/Bare exposed
	Strip mines, quarries, gravel pits, borrow pits	613	613 Barren/Strip mines
	Beaches	614	614 Barren/Beaches
	Sand dunes	615	615 Barren/Sand dunes
	Mixed barren lands	616	616 Barren/Mixed barren lands
	Mud flats	617	617 Barren/Mud flats/Salt evaporator ponds
	River wash	618	618 Barren/River wash
	Oil wasteland	619	619 Barren/Oil wasteland
	Other barren land	620	620 Barren/Other barren land
Other Rural Land			
	Permanent snow and ice fields	630	630 Other rural/Permanent snow and ice fields
	Marshland	640	640 Other rural/Marshland
	All other land (…)	650	650 All other land
Urban and Built-Up			
			652 Not vegetated construction site
	Urban and built-up, in a unit 10 acres or larger	700	710 Eligible area (based on delineation)
			745 Residence related structures and features (including eligible structures, gardens, landscaped areas, windbreaks, driveways, recreation areas, lawns)
			746 Agricultural related structures and features (including machine sheds, barns, bins, corrals, lots)
			815 Public roads, 4 lanes or greater
			825 All other public paved roads
			845 All other public, non-paved roads
			860 Transportation/railroad
			870 Transportation/other roads (private)
			901 Waterbody, 2 to 40 acres
			902 Waterbody, less than 2 acres

	Small built-up, in a unit .25 to 10 acres	730	710 Eligible area (based on delineation)
			745 Residence related structures and features (including eligible structures, gardens, landscaped areas, windbreaks, driveways, recreation areas, lawns)
			746 Agricultural related structures and features (including machine sheds, barns, bins, corrals, lots)
			815 Public roads, 4 lanes or greater
			825 All other public paved roads
			845 All other public, non-paved roads
			860 Transportation/railroad
			870 Transportation/other roads (private)
			901 Waterbody, 2 to 40 acres
			902 Waterbody, less than 2 acres
Transportation Land			
	Interstate highway	810	815 Public roads, 4 lanes or greater
	Paved primary Federal and state highways	820	815 Public roads, 4 lanes or greater
			825 All other public paved roads
	Other paved roads (public)	830	815 Public roads, 4 lanes or greater
			825 All other public paved roads
	Gravel road (public)	840	845 All other public, non-paved roads
	Dirt road (public)	850	845 All other public, non-paved roads
	Railroad	860	860 Transportation/railroad
	Other roads (private)	870	870 Transportation/other roads (private)
Permanent Open Water Areas			
	Waterbody, 2 to 40 acres	901	901 Waterbody, 2 to 40 acres
	Waterbody, less than 2 acres	902	902 Waterbody, less than 2 acres
	Perennial stream less than 66 feet wide	911	915 Perennial stream less than 1/8 mile (660 feet) wide
	Perennial stream 66 to 660 feet wide	912	915 Perennial stream less than 1/8 mile (660 feet) wide
	Perennial stream at least 1/8 mile wide	913	913 Perennial stream at least 1/8 mile wide
Waterbody of at least 40 Acres			
	Lake	921	921 Water > 40 acres/Lake

	Reservoir	922	922 Water > 40 acres/Reservoir
	Gulf or bay	923	923 Water > 40 acres/Gulf or bay
	Estuary	924	924 Water > 40 acres/Estuary
			937 Open ocean

Table 7. Local Data Survey Instrument Crop List

If crop grown is...	Please select...
Alfalfa for seed	All other close grown
Almonds	Nuts
Amaranth	All other veg and truck crops
Apple	Fruit (orchards)
Apricots	Fruit (orchards)
Aquaculture in a crop rotation	Aquaculture in a crop rotation
Arugula	All other veg and truck crops
Artichokes	All other veg and truck crops
Asparagus	All other veg and truck crops
Avocados	Fruit (orchards)
Bananas (all types)	Fruit (orchards)
Barley	Barley
Bean, field	All other veg and truck crops
Bean, green snap	All other veg and truck crops
Bean, pinto	All other veg and truck crops
Beans (all types except soybeans)	All other veg and truck crops
Beans, fresh	All other veg and truck crops
Beans, garbanzo	All other veg and truck crops
Beans, trellis	All other veg and truck crops
Beets (excluding sugar beets)	All other veg and truck crops
Berries	Berries
Betelnut	Nuts
Bittermelon, trellis	All other veg and truck crops
Blackberry	Bush fruit
Blueberry	Bush fruit
Boysenberry	Bush fruit
Bramble shrub	Bush fruit
Breadfruit cacao	Fruit (orchards)
Broccoli	All other veg and truck crops
Brussel sprouts	All other veg and truck crops
Buckwheat	All other close grown
Bulbs, lily	All other horticultural crops
Bush fruit - (Woody perennial shrub or bush types)	Bush fruit
Cabbage	All other veg and truck crops

Canola	All other close grown
Cantaloupe	All other veg and truck crops
Cardoon	All other veg and truck crops
Carrots	All other veg and truck crops
Casabamelon	All other veg and truck crops
Cashews	Nuts
Cassava	All other veg and truck crops
Casterbean	All other row/field crops
Cauliflower	All other veg and truck crops
Celeriac	All other veg and truck crops
Celery	All other veg and truck crops
Chard, Swiss	All other veg and truck crops
Cherimoya	Fruit (orchards)
Cherries	Fruit (orchards)
Chestnuts	Nuts
Chicory	All other veg and truck crops
Chinese vegetables (truck type)	All other veg and truck crops
Christmas trees	Not crop/grassland/hayland
Citron	Fruit (orchards)
Close grown crops, all other not listed	All other close grown
Coconut	Fruit (orchards)
Coffee	Fruit (orchards)
Commercial feedlots	Not crop/grassland/hayland
Conservation Reserve Program (CRP) land	CRP general contract
Corn - silage, decorative, field, grain, seed, sweet, popcorn	Corn (all types)
Corn - sweet, decorative, popcorn (if only a few rows are grown as part of a larger mixed truck crop or farm market operation)	All other veg and truck crops
Cotton	Cotton
Cover crop	Other cropland not planted
Cow pea	All other veg and truck crops
Cranberries (grown in bogs)	Berries
Cropland not planted	Other cropland not planted
CRP	CRP general contract
Cucumbers	All other veg and truck crops
Cumquat	Fruit (orchards)
Currant	Bush fruit
Daikon	All other veg and truck crops
Dasheen	All other veg and truck crops
Dates	Fruit (orchards)
Decorative corn	Corn (all types)
Dewberry	Bush fruit
Dill (oil and herb)	All other close grown

Dry field peas	All other close grown
Duck farms	Not crop/grassland/hayland
Eggplant	All other veg and truck crops
Elderberry	Fruit (orchards)
Emmer	All other close grown
Endive	All other veg and truck crops
Escarole	All other veg and truck crops
Evergreen-berry	Bush fruit
Fallow, summer	Summer fallow
Farmsteads and ranch headquarters	Not crop/grassland/hayland
Field corn	Corn (all types)
Figs	Fruit (orchards)
Filberts	Nuts
Flax	All other close grown
Flowers - Large commercial operations for bulbs, cutting, or seed production and sales	All other horticultural crops
Forest land	Not crop/grassland/hayland
Fruit - Orchards	Fruit (orchards)
Garlic	All other veg and truck crops
Ginger root	All other row/field crops
Ginseng	All other row/field crops
Gladiola	All other horticultural crops
Gooseberry	Bush fruit
Gourd	All other veg and truck crops
Grain corn	Corn (all types)
Grape	Vineyards
Grapefruit	Fruit (orchards)
Grasses grown for seed	All other close grown
Greenhouses	Not crop/grassland/hayland
Guar	All other row/field crops
Guava	Bush fruit
Guayule	All other row/field crops
Hayland, grass	Hayland
Hayland, legume	Hayland
Hayland, legume-grass	Hayland
Hazelnuts	Nuts
Herbs-seasoning	All other close grown
Hog facilities	Not crop/grassland/hayland
Honeydew melon	All other veg and truck crops
Hops	Vineyards
Horseradish	All other veg and truck crops
Horticultural crops - Other	All other horticultural crops

Jojoba	All other row/field crops
Jujube	Fruit (orchards)
Kale	All other veg and truck crops
K-Early Citrus	Fruit (orchards)
Kenaf	All other row/field crops
Kiwi-fruit	Vineyards
Kohlrabi	All other veg and truck crops
Kumquat	Fruit (orchards)
Leeks	All other veg and truck crops
Lemon	Fruit (orchards)
Lentils	All other close grown
Lettuce (all types)	All other veg and truck crops
Lily, Calla	All other horticultural crops
Lime	Fruit (orchards)
Limon	Fruit (orchards)
Linseed	All other close grown
Loganberry	Bush fruit
Loquat	Fruit (orchards)
Macadamias	Nuts
Mango	Fruit (orchards)
Manioa, Manihot	All other veg and truck crops
Marionberry	Bush fruit
Melon	All other veg and truck crops
Millet	All other close grown
Mink farms	Not crop/grassland/hayland
Mint (all types)	All other close grown
Muscadine	Vineyards
Mushroom farms	Not crop/grassland/hayland
Muskmelon	All other veg and truck crops
Mustard greens	All other veg and truck crops
Mustard-seed	All other close grown
Nectarine	Fruit (orchards)
Nursery production areas	Nurseries
Nuts - (Tree)	Nuts
Oats	Oats
Okra	All other veg and truck crops
Olallieberry	Bush fruit
Olives	Fruit (orchards)
Onions	All other veg and truck crops
Orange	Fruit (orchards)
Papaw	Fruit (orchards)
Papayas	Fruit (orchards)

Parsnip	All other veg and truck crops
Passion Fruit	Vineyards
Pastureland, grass	Grassland
Pastureland, grass-forbes-legumes mixed	Grassland
Pastureland, legume	Grassland
PawPaw	Fruit (orchards)
Peach	Fruit (orchards)
Peanuts	Peanuts
Pear	Fruit (orchards)
Peas (all types)	All other veg and truck crops
Peas, Austrian winter	All other veg and truck crops
Peas, field 7in rows	All other veg and truck crops
Peas, green	All other veg and truck crops
Peas, southern	All other veg and truck crops
Peas, spring	All other veg and truck crops
Pecans	Nuts
Pepino	Bush fruit
Peppers (all types)	All other veg and truck crops
Peppers, bell	All other veg and truck crops
Peppers, chili	All other veg and truck crops
Peppers, hot	All other veg and truck crops
Persimmons	Fruit (orchards)
Pigeon peas	All other veg and truck crops
Pineapple	All other row/field crops
Plantains	Fruit (orchards)
Plums	Fruit (orchards)
Pomegranates	Fruit (orchards)
Pomelo	Fruit (orchards)
Popcorn	Corn (all types)
Potato, sweet	All other veg and truck crops
Potatoes	Potatoes (all types)
Poultry facilities	Not crop/grassland/hayland
Proso	All other close grown
Pummelo	Fruit (orchards)
Pumpkins	All other veg and truck crops
Quenepa	Fruit (orchards)
Quince	Fruit (orchards)
Radish	All other veg and truck crops
Rangeland	Not crop/grassland/hayland
Rape	All other close grown
Raspberry-black	Bush fruit
Raspberry-red	Bush fruit

Rhubarb	All other veg and truck crops
Rice	Rice
Romaine	All other veg and truck crops
Row crops, all other not listed	All other row/field crops
Rutabaga	All other veg and truck crops
Rye	All other close grown
Rye grass	All other close grown
Safflower	All other row/field crops
Salsify	All other veg and truck crops
Salt hay	All other close grown
Sapote	Fruit (orchards)
Scallions	All other veg and truck crops
Seed corn	Corn (all types)
Sod	All other close grown
Sorghum - forage, grain, silage, sudan grass	Sorghum
Soursop	Fruit (orchards)
Soybeans	Soybeans
Spelt	All other close grown
Spinach	All other veg and truck crops
Squash (all types)	All other veg and truck crops
Starfruit	Vineyards
Strawberries	Berries
Sugar beets	Sugar beets
Sugarcane	All other row/field crops
Sunflowers	Sunflowers
Sweet corn	Corn (all types)
Sweet potato	All other veg and truck crops
Sweetsop	Fruit (orchards)
Swiss chard	All other veg and truck crops
Tangelos	Fruit (orchards)
Taniers (tania, tanya)	All other veg and truck crops
Tapioca plant	All other veg and truck crops
Taro (upland dry types)	All other veg and truck crops
Taro (wetland)	All other row/field crops
Temples	Fruit (orchards)
Tobacco	Tobacco
Tomatoes	All other veg and truck crops
Tree nursery	Nurseries
Triticale	All other close grown
Tuberose	All other horticultural crops
Turfgrass	All other close grown
Turnips	All other veg and truck crops

Vegetable and truck crops including melons	All other veg and truck crops
Vineyard	Vineyards
Walnuts	Nuts
Watercress	All other close grown
Watermelon	All other veg and truck crops
Weeds	Other cropland not planted
Wheat	Wheat
Yam	All other veg and truck crops
Zucchini	All other veg and truck crops

Table 8. Forest Type Groups

Forest Type Code	Forest Type Group	Geographic Area	Forest Type Group Definition	Primary Group Components	Common Aggregations
1	White-red-jack pine	Eastern	Forests in which eastern white pine, red pine, or jack pine, singly or in combination, comprise a plurality of the stocking. Common associates include hemlock, aspen, birch, and maple. [FRUS-92]	-Jack Pine -Red Pine -Eastern White Pine -Eastern Hemlock	-White Pine-Eastern Hemlock -White Pine-Northern Red Oak-Red Maple -White Pine-Chestnut Oak -Eastern Hemlock-Yellow Birch [FIA 2008]
2	Spruce-fir	Eastern	Forests in which spruce or true firs, singly or in combination, comprise a plurality of the stocking. Common associates include white cedar, tamarack, birch, maple and hemlock. [FRUS-92]	-Balsam Fir -White Spruce/Red Spruce/Black Spruce -Tamarack -Northern White-Cedar	-Spruce-Balsam Fir -Spruce-Fraser Fir -Spruce-Yellow Birch -Red Spruce-Sugar Maple-American Beech -Paper Birch-Spruce-Balsam Fir [FIA 2008]
3	Longleaf-slash pine	Eastern	Forests in which longleaf or slash pines, singly or in combination, comprise a plurality of the stocking. Common associates include other southern pines, oaks, and gums. [FRUS-92]	-Longleaf Pine -Slash Pine	-Longleaf Pine-other Pine spp.
4	Loblolly-shortleaf pine	Eastern	Forest in which pines (except longleaf and slash pines) and eastern red cedar, singly or in combination, comprise a plurality of the stocking. Common associates include oaks, hickories, and gums. [FRUS-92]	-Loblolly Pine -Shortleaf Pine -Virginia Pine -Sand Pine -Table-mountain Pine -Pond Pine -Pitch Pine -Spruce Pine	-Shortleaf Pine-Virginia Pine -Shortleaf Pine-Oak spp. -Loblolly Pine-Shortleaf Pine -Loblolly Pine-Sweetgum [SAF 80]
5	Oak-pine	Eastern	Forests in which **hardwoods** (usually upland oaks) comprise a plurality of the stocking, but in which **softwoods**, except cypress, comprise **25 to 49 percent of the stocking**. Common associates include gums, hickories, and yellow-poplar. [FRUS-92]	-Oak spp. (ex: Bur Oak, Post Oak, Chestnut Oak, White Oak, Black Oak, Northern Red Oak, Northern Pin Oak) -Pine spp. (ex: Eastern White Pine, Longleaf Pine, Shortleaf Pine, Virginia Pine, Loblolly Pine, Slash Pine)	-Eastern White Pine-Northern Red Oak-White Ash -Longleaf Pine-Oak spp. -Shortleaf Pine-Oak spp. -Virginia Pine-Southern Red Oak -Loblolly Pine-Hardwood spp. -Eastern Red Cedar-Hardwood spp. -Slash Pine-Hardwood spp. [FIA 2008]

6	Oak-hickory	Eastern	Forests in which upland oaks or hickories, singly or in combination, comprise a plurality of the stocking, except where pines comprise 25 to 49 percent, in which case the stand would be classified oak-pine. Common associates include yellow-poplar elms, maples, and black walnut. [FRUS-92]	-Post Oak/Blackjack Oak -Northern Pin Oak -Chestnut Oak -White Oak/Bur Oak -Northern Red Oak/Black Oak -Bear Oak/Scarlet Oak -Southern Scrub Oak -Yellow poplar -Black Walnut -Black Locust	-Chestnut Oak-Black Oak-Scarlet Oak -Maple spp.-Oak spp. -White Oak-Red Oak-Hickory spp. -Oak-Yellow poplar -Sweetgum-Yellow poplar -Sassafras-Persimmon -Other mixed upland hardwoods [FIA 2008]
7	Oak-gum-cypress	Eastern	Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, comprises a plurality of the stocking except where pines comprise 25-49 percent, in which case the stand would be oak-pine. Common associates include cottonwood, willows, ashes, elms, hackberry, and maples. [FRUS-92]	-Black/Water/Swamp Tupelo -Sweetgum -Oaks (e.g., Live Oak, Swamp Chestnut Oak, Nuttall Oak, Willow Oak, Overcup Oak) -Baldcypress/Pond Cypress -Atlantic White-Cedar	-Sweetbay-Red Maple -Pin Oak-Sweetgum -Bald Cypress-Tupelo -Water Tupelo-Swamp Tupelo -Sweetbay-Swamp Tupelo-Redbay -Willow Oak-Water Oak-Diamondleaf Oak -Sweetgum-Willow Oak [FIA 2008]
8	Elm-ash-cottonwood	Eastern	Forests in which elms, ashes, or cottonwood, singly or in combination, comprise a plurality of the stocking. Common associates include willow, sycamore, American beech, and maples. [FRUS-92]	-Cottonwood -Sycamore -American Elm -Ash spp. (e.g., White, Green, Blue, Oregon Ash) -Willow spp.	-Black Ash-American Elm-Red Maple -River Birch-Sycamore -Sycamore-Pecan-American Elm -Sugarberry-Hackberry-Elm-Green Ash -Silver Maple-American Elm -Cottonwood-Willow spp. [FIA 2008]
9	Maple-beech-birch	Eastern	Forests in which maple, beech, or yellow birch, singly or in combination, comprise a plurality of the stocking. Common associates include hemlock, elm, basswood, and white pine. Hawthorn may be associated with this type group on old pastures. [FRUS-92]	-Sugar Maple -American Beech -Yellow Birch -Black Cherry -Basswood -Red Maple -Hawthorn	-Maple spp.-American Beech-Yellow Birch -Black Cherry-Ash spp.-Yellow poplar -Sugar (or other “hard”) Maple-Basswood -Black Cherry-Maple spp. -American Beech-Sugar Maple [FIA 2008]
10	Aspen-birch	Eastern	Forests in which aspen, balsam poplar, paper birch, singly or in combination, comprise a plurality of the stocking. Common associates include maple and balsam fir. [FRUS-92]	-Aspen spp. -Paper Birch -Gray Birch -Pin Cherry -Balsam Poplar	Aspen-Paper Birch Aspen-Sugar Maple Aspen-Balsam Fir [SAF 80]

11	Douglas-fir	Western	Forests in which Douglas-fir comprises a plurality of the stocking. Common associates include western hemlock, western red cedar, the true firs, redwood, ponderosa pine, and larch. [FRUS-92]	-Douglas-fir -Port Orford Cedar	-Douglas-fir-Western Hemlock -Douglas-fir-True Fir sp. (ex: Grand Fir, Pacific Silver Fir, White Fir, Noble Fir, White Fir) -Douglas-fir-Western Hemlock-Western Redcedar [SAF 80]
12	Hemlock-sitka spruce	Western and Alaska	Forests in which western hemlock and/or Sitka spruce comprise a plurality of the stocking. Common associates include Douglas-fir, silver fir, and western red cedar. [FRUS-92]	-Western Hemlock -Western Redcedar -Sitka Spruce	
13	Ponderosa pine	Western	Forest in which ponderosa pine comprises a plurality of the stocking. Common associates include Jeffery pine, sugar pine, limber pine, Arizona pine, Apache pine, Chihuahua pine, Douglas-fir, incense-cedar, and white fir. [FRUS-92]	-Ponderosa Pine -Incense Cedar -Jeffery Pine -Bigcone Douglas Fir -Sugar Pine	-Ponderosa Pine-Douglas-fir -Ponderosa Pine-Sugar Pine [SAF 80]
14	Western white pine	Western	Forests in which western white pine comprises a plurality of the stocking. Common associates include other western redcedar, larch, white fir, Douglas-fir, lodgepole pine, and Engelmann spruce. [FRUS-92]	-Western White Pine	-Western White Pine-Western Larch -Western White Pine-Grand Fir -Western White Pine-Western Redcedar -Western White Pine-Western Hemlock -Western White Pine-Douglas-fir [SAF 80]
15	Lodgepole pine	Western	Forests in which lodgepole pine comprises a plurality of the stocking. Common associates include alpine fir, western white pine, Engelmann spruce, aspen, and larch. [FRUS-92]	-Lodgepole Pine	Often forms pure stands, but may form the following aggregations: -Lodgepole Pine-Subalpine Fir -Lodgepole Pine-Engelmann Spruce -Lodgepole Pine-White Spruce -Lodgepole Pine-Western Larch [SAF 80]
16	Larch	Western	Forests in which western larch comprise a plurality of the stocking. Common associates include Douglas-fir, grand fir, western red cedar, and western white pine. [FRUS-92]	-Western Larch	Western Larch-Douglas-fir Western Larch-Grand Fir Western Larch-Ponderosa Pine Western Larch-Engelmann Spruce Western Larch-Lodgepole Pine [SAF 80]

17	Fir-spruce	Western and Alaska	Forests in which true firs, Engelmann spruce, or blue spruce, singly or in combination, comprise a plurality of the stocking. Common associates include mountain hemlock and lodgepole pine. [FRUS-92]	-White Fir -Red Fir -Noble Fir -Pacific Fir -Engelmann Spruce -Grand Fir -Subalpine Fir	White Spruce-Aspen spp. White Spruce-Paper Birch Engelmann Spruce-Subalpine Fir [SAF 80]
18	Redwood	Western	Forests in which redwood comprises a plurality of the stocking. Common associates include Douglas-fir, grand fir, and tanoak. [FRUS-92]	-Redwood -Giant Sequoia -Tanoak -California Laurel -Giant Chinkapin	Redwood-Douglas-fir Redwood-Grand Fir Redwood-Pacific Madrone Redwood-Tanoak [SAF 80]
19	Non-commercial (other softwoods)	Western	This type group includes forest types that have little or no commercial wood value. Species such as bristlecone, coulter, digger, knobcone, limber, and whitebark pines; black spruce (in Alaska); and blue oak, singly, or in combination, comprise a plurality of the cover. [SAF] [NRI97] The noncommercial forest type group does not apply to the Eastern United States. [FRUS-92]	-Bristlecone Pine/Foxtail Pine -Knobcone Pine -Southwest White Pine -Bishop Pine -Monterey Pine -Limber Pine -Whitebark Pine -Coulter Pine -Digger Pine -Black Spruce (ALASKA ONLY) -Blue Oak	
20	Western hardwoods	Western and Alaska	Forests in which aspen, red alder, or other western hardwood, singly or in combination, comprise a plurality of the stocking. [FRUS-92]	-Aspen spp -Red Alder -California Black Oak -Oregon White Oak -Evergreen Oak -Coast Live Oak -Canyon Live Oak/Interior Live Oak -Bigleaf (“Oregon”) Maple -Pacific Madrone	

21	Pinyon-juniper	Western or Eastern	Forest of pinyon or juniper or both comprise a plurality of the stocking. [FRUS-92] In Eastern forests this forest type group includes eastern red cedar. Associates - gray birch, red maple, sweetbirch, Virginia pine, shortleaf pine, oak. Sites - usually dry uplands and abandoned fields on limestone outcrops and other shallow soils, but can grow well on good sites. [FIA National Core Field Guide, Version 3.0, October 2005]	-Eastern Red Cedar -Rocky Mountain Juniper -Western Juniper -Pinyon Woodland	
30	Tropical hardwoods	Tropical	Forest in which species such as gumbo-limbo, royal palm, mangrove, mahogany, teak, serianthes, monkey pods, acacia, Norfolk Island pine, plumeria and other tropical trees, singly, or in combination comprise a plurality of stocking. [FRUS-92]	-Gumbo-limbo -Royal Palm -Mangrove -Mahogany -Teak -Serianthes -Monkey Pod -Acacia -Norfolk Island Pine -Plumeria -Sable Palm -Paulownia -Melaluca -Eucalyptus	"Although one or more species may dominate an individual stand, the great number of tree species present within the types range…prevents simple definitions of stand composition" [SAF 80]
90	Non-stocked	Eastern or Western	Forest land bearing evidence of natural regeneration or unidentifiable planted trees, with less than 25 percent tree cover, and not currently developed for non-forest use. [FRUS-92]		

Table 9. Land Cover/Use Hierarchy

Land cover/use inheritance rules for points intersecting two area features. Cell is land cover/use, e.g., unpaved road intersecting a railroad has land cover/use - railroad. It is assumed that this process is associative and if more than two area features intersect the point, a solution can be found by intersecting sequential pairs of features without regard to order.

Kienzler - 2 December 2013

		Area Feature 1										
Area Feature 2		Paved≥4	Paved <4	Unpaved	Railroad	EA	ES	SS	LS	LWB	SWB < 10 ac	SWB 10-40 ac
	Paved ≥4[1]	Paved≥4	Paved ≥4	Paved ≥4	Paved≥4	EA	NA[2]	SS	LS	LWB	SWB	SWB
	Paved <4[1]		Paved <4	Paved <4	Paved <4	EA	NA	SS	LS	LWB	SWB	SWB
	Unpaved[1]			Unpaved	Railroad	EA	NA	SS	LS	LWB	SWB	SWB
	Railroad				Railroad	EA	NA	SS	LS	LWB	SWB	SWB
	EA[3]					EA	NA	SS	LS	LWB	SWB/EA[7]	SWB
	ES[3]						NA	NA	NA	NA	NA	NA
	SS[4]							SS	NP[5]	NP	NP	NP
	LS[4]								LS	NP	NP	NP
	LWB[6]									LWB	NP	NP
	SWB < 10 ac[6]										SWB	NP
	SWB 10-40 ac[6]											SWB

[1] Public roads with x lanes, unpaved roads are assumed to have < 4 lanes

[2] Not Applicable

[3] EA – eligible area, ES - eligible structures

[4] SS=Small streams, LS=Large streams

[5] Not Possible

[6] LWB=Large waterbody, SWB=Small waterbody

[7] If a SWB less than 10 acres is completely surrounded by the EA, then the point is coded as EA. If the SWB is **not** completely surrounded by the EA, then the point is coded SWB. The segment boundary is ignored in this determination. SWB 10-40 acres are always coded SWB.

If the result from this table conflicts with the historical data, this becomes a non-standard case.

Collection Software: Land Cover/Use

Land Cover/Use Protocol Window

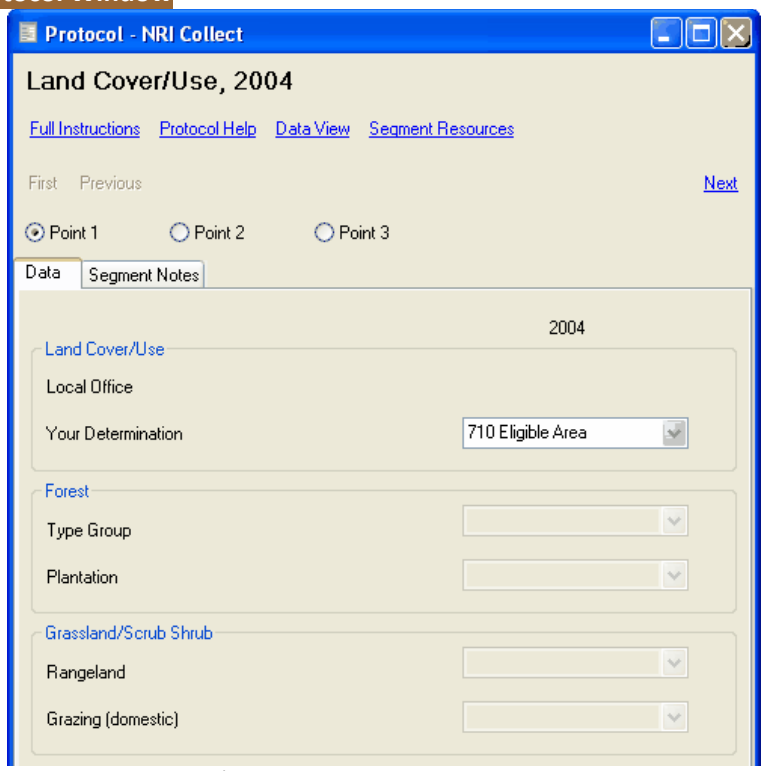


Figure 16: Land Cover/Use Data Collection Window

Data Collection for Land Cover/Use in the Base Year

For each point:

1. View the base year high resolution image to verify the original base year determination of the LCU at the point.
2. Is your determination of LCU consistent with the previous determination based on the LCU cross-walk?
   - If yes and if the original base year LCU code is no longer valid, then select the LCU from the choice list.
     If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

If the new determination is grassland or scrub-shrub, then answer items 3-4.

3. Is the area rangeland? (yes or no)
4. Is the area grazed by domestic livestock? (yes or no)

If the new determination is forest land, then answer items 5-7.

5. What is the forest type group?
6. Is this a forest plantation? (yes or no)
7. Is the area grazed by domestic livestock? (yes or no)

Go to Data Collection for Cowardin Wetlands and Deepwater Habitats in the Base Year

Verify/Edit Data for Land Cover/Use in a Revision Year

Verify/Edit Land Cover/Use data before that of Wetlands, Erosion, Use of Land, and Resource Concerns.

For each point in the revision year under current review:

1. View the high resolution image for the revision year to verify the original determination of the LCU at the point.
2. Is your determination of LCU consistent with the previous determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

If the correct LCU determination is grassland or scrub-shrub, answer items 3-4.

3. Is your determination of rangeland consistent with the previous determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.
4. Is your determination of grazed by domestic livestock consistent with the previous determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

If the correct LCU determination is forest land, answer items 5-7.

5. Is your determination of forest type group consistent with the previous determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.
6. Is your determination of forest plantation consistent with the previous determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.
7. Is your determination of grazed by domestic livestock consistent with the previous determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

Data Collection for Change in Land Cover/Use

For each point:

1. Examine the current and revision year's high resolution images.
2. Review the categories selected in the revision year for LCU and associated items regarding forest land, scrub shrub land or grassland.
3. Do you agree with the categories selected in the revision year for LCU and associated items regarding forest land, scrub shrub land or grassland?

   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.
4. Use the swipe tool to determine if the locations of features on the two images are aligned.

   If not, this becomes a non-standard case.
   - Stop data collection on this segment.
   - Notify the designated RSL contact.
5. Identify the LCU for the current year.
6. Select the LCU for the current year from the choice list.

If the LCU for the current year is grassland or scrub-shrub, then answer items 7-8.

7. Is the area rangeland? (yes or no)
8. Is the area grazed by domestic livestock? (yes or no)

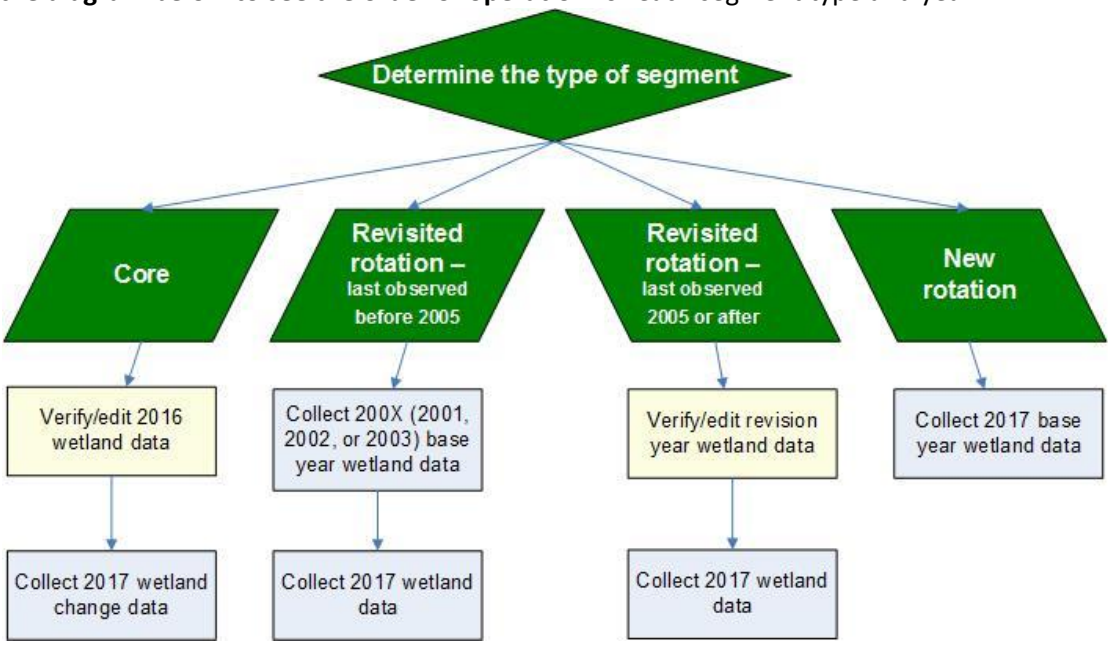
If the new determination is forest land, then answer items 9-11.

9. What is the forest type group?
10. Is this a forest plantation? (yes or no)
11. Is the area grazed by domestic livestock? (yes or no)

Go to Data Collection for Change in Cowardin Wetlands and Deepwater Habitats

3.4.2 Cowardin Wetlands and Deepwater Habitats

View the diagram below to see the order of operation for each segment type and year.



Definitions: Wetlands and Deepwater Habitats

Kind of System

- 0: Not wetland or deepwater
- 10: Marine – None/Other
- 20: Estuarine – None/Other
- 21: Estuarine – Emergent
- 22: Estuarine – Scrub/shrub
- 23: Estuarine – Forested
- 30: Riverine – None/Other
- 31: Riverine – Emergent/Nonpersistent
- 40: Lacustrine – None/Other
- 41: Lacustrine – Emergent/Nonpersistent
- 50: Palustrine – None/Other
- 51: Palustrine – Emergent
- 52: Palustrine – Scrub/shrub
- 53: Palustrine – Forested

Tidal

Tidal categories for 10 Marine or 20 Estuarine None wetlands are:

- 1: Intertidal (interm/exposed) - Intermittently submerged/exposed daily, includes the high-energy splash zone along the coast
- 2: Subtidal (perm submerged) - permanently submerged

Low Water Depth

Low water depth categories for Riverine (codes 30-31) or Lacustrine (codes 40-41) are:

- Less than or equal to 2 meters (6.6 feet) deep
- Greater than 2 meters (6.6 feet) deep

Canopy Cover

Percent canopy cover of nonpersistent emergent plants categories for Riverine (codes 30-31) or Lacustrine (codes 40-41) wetlands are:

- Less than 30 percent nonpersistent emergent
- Greater than or equal to 30 percent nonpersistent emergent

Wetland Size

Wetland size categories for Palustrine (codes 50-53) wetlands are:

- Less than or equal to 1 acre
- Greater than 1 and less than or equal to 5 acres
- Greater than 5 and less than or equal to 20 acres
- Greater than 20 acres

Wetlands. Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following attributes. [Cowardin et al. 1979] (Also see FSA Wetlands.)

- Periodically, the land supports predominantly hydrophytes.
- The substrate is predominantly undrained hydric soil.
- The substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Deepwater habitats. Permanently flooded lands lying below the deepwater boundary of wetlands. These habitats include environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the predominant organisms live, whether or not they are attached to the substrate. [Cowardin et al. 1979]

Hydric soil. A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. [NFSAM-96] See also: http://soils.usda.gov/use/hydric/
Hydrophyte. Any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content [Cowardin et al. 1979]. See also "National List of Plant Species That Occur in Wetlands":
http://www.fws.gov/pacific/ecoservices/habcon/pdf/National%20List%20of%20Plant%20Species%201988.pdf.

Vegetation Life Form descriptions:

- **None.** Areas including shallow water with rock or unconsolidated bottom, unconsolidated shores, reefs, rocky shore, or streambeds. This may include farmed wetlands.
- **Other, aquatic bed.** Wetland and deepwater habitats dominated by plants (e.g., kelp *Laminaria* spp., eelgrass *Zosteria marina*, stoneworts *Chara* and *Nitella* spp., and water hyacinth *Eichhornia crassipes*) that grow principally on or below the surface of the water for most of the growing season in most years. Water regimes include subtidal, irregularly

exposed, regularly flooded, permanently flooded, intermittently exposed, semi-permanently flooded, and seasonally flooded. [Cowardin et al. 1979]

- **Moss/lichen.** A wetland class where mosses or lichens (e.g., sphagnum moss *Sphagnum* spp., reindeer moss *Cladina* spp.) cover substrates other than rock, and where emergents, shrubs, or trees make up less than 30 percent of the areal cover. The only water regime is saturated. [Cowardin et al. 1979]
    - Note: Moss/lichen vegetation life form modifier cannot be identified from photo interpretation and will not be used for NRI purposes unless verified on-site.
- **Emergent (includes persistent and nonpersistent).** The emergent wetland class is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. All water regimes are included except subtidal and irregularly exposed. [Cowardin et al. 1979]
- **Persistent.** Dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine Systems. Examples include: cattails (*Typha* spp.), cordgrass (*Spartina* spp.), bulrushes (*Scirpus* spp.), sedges (*Carex* spp.), common pickleweed (*Salicornia virginica*), and common reed (*Phragmites australis*). [Cowardin et al. 1979]
- **Nonpersistent.** Areas dominated by plants that fall to the surface of the substrate or below the surface of the water at the end of the growing season so that, at certain seasons of the year, there is no obvious sign of emergent vegetation. Examples include: wild rice (*Zizania aquatica*), arrow arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*), and arrowheads (*Sagittaria* spp.). Movement of ice in Estuarine, Riverine, or Lacustrine Systems often removes all traces of emergent vegetation during the winter. Where this occurs, the area should be classified as Nonpersistent Emergent Wetland. [Cowardin et al. 1979]
- **Scrub-shrub.** A wetland class dominated by woody vegetation less than 6 meters (20 feet) tall including young or stunted trees and shrubs. Examples include: alder (*Alnus* spp.), willows (*Salix* spp.), coastal sweetbells (*Leucothoe axillaris*), and Atlantic white cedar (*Chamaecyparis thyoides*). [Cowardin et al. 1979]
- **Forested.** A wetland class characterized by woody vegetation at least 6 meters (20 feet) tall. Examples include: red maple (*Acer rubrum*), baldcypress (*Taxodium distichum*), black spruce (*Picea mariana*), sweetbay (*Magnolia virginiana*), mangroves (*Avicennia* spp. and *Languncularia racemosa*), northern white cedar (*Thuja occidentalis*), and black spruce (*Picea mariana*). [Cowardin et al. 1979]
- **Pioneer plants.** Herbaceous annual and seedling perennial plants that colonize bare areas as a first stage in secondary succession. [Cowardin et al. 1979]
    - Note on classifying vegetation life forms: If vegetation (except pioneer plants) covers at least 30 percent of the substrate, classes are distinguished on the basis of the life form of the plants constituting the uppermost layer of vegetation and possessing an aerial coverage of at least 30 percent. See examples in Section 17.12, Supporting Materials.

Key to NRI Wetland Codes

Refer to Section 4.2 Cowardin Wetland Descriptions and Photos for more detailed information on wetland classifications.

Key to the NRI codes for the Cowardin wetland and deepwater habitats

1. If periodically, the land supports predominantly hydrophytes, or the substrate is predominantly undrained hydric soil, or the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year .....**See 2**
2. If the water regime is influenced by oceanic tides, and salinity due to ocean-derived salts is 0.5 parts per thousand or greater .....**See 3**
3. If :
   - Semi-enclosed by land, but with open, partly obstructed or sporadic access to the ocean and salinity wide-ranging because of evaporation or mixing of seawater with runoff from land, then classification is *Estuarine*. Choose from Estuarine categories below.
     3a. Vegetation is absent or less than 30% canopy cover.....*Estuarine/None/Other (20)*
   - Little or no obstruction to open ocean present. Salinity usually euhaline; little mixing of water with runoff from land .....**See 4**
4. If:
   - Emergents, trees, or shrubs are absent.....*Marine/None/Other (10)*
   - Emergents, trees, or shrubs are present:
     4a. Emergent vegetation at least 30% canopy cover.....*Estuarine/Emergent (21)*
     4b. Scrub-shrub vegetation at least 30%.....*Estuarine/Scrub-shrub (22)*
     4c. Forest canopy at least 30%.....*Estuarine/Forested (23)*
   - Water regime not influenced by ocean tides, or if influenced by oceanic tides, salinity less than 0.5 parts/thousand .....**See 5**
5. If:
   - Persistent emergents, trees, shrubs, or emergent mosses cover 30% or more of the area: *Palustrine*
     5a. Emergent vegetation at least 30% canopy cover.....*Palustrine/Emergent (51)*
     5b. Scrub-shrub vegetation at least 30%.....*Palustrine/Scrub-shrub (52)*
     5c. Forest canopy at least 30%.....*Palustrine/Forested (53)*
     5d. Scrub-shrub and forest canopy are each less than 30%, but when combined the woody canopy at least 30% .....*Palustrine/Scrub-shrub (52)*
     5e. If neither 5a, 5b, 5c, nor 5d conditions apply.....*Palustrine/Emergent (51)*
   - Persistent emergents, trees, shrubs, or emergent mosses cover < 30% of substrate but nonpersistent emergents may be widespread during some seasons of year.....**See 6**
6. If:
   - Situated in a channel; water, when present, usually flowing: *Riverine*
     6a. Vegetation is absent or less than 30% canopy cover .....*Riverine/None/Other (30)*
     6b. Emergent, nonpersistent vegetation at least 30% canopy cover .....*Riverine/Emergent/Nonpersistent (31)*
   - Situated in a basin, catchment, or on level or sloping ground; water usually not flowing.....**See 7**
7. If:
   - Area 8 ha (20 acres) or greater: *Lacustrine*
     7a. Vegetation is absent or is less than 30% canopy cover .....*Lacustrine/None/Other (40)*

7b. Emergent, nonpersistent vegetation at least 30% canopy cover
……*Lacustrine/Emergent/Nonpersistent (41)*

- Area less than 8 ha (20 acres) .....**See 8**

8. If
   - Wave-formed or bedrock shoreline feature present or water depth 2 m (6.6 feet) or more: *Lacustrine*
     8a. Vegetation is absent or less than 30% canopy cover……..*Lacustrine/None/Other (40)*
     8b. Emergent, nonpersistent vegetation at least 30% canopy cover
     ……*Lacustrine/Emergent/Nonpersistent (41)*
   - No wave-formed or bedrock shoreline feature present and water less than 2 m deep: *Palustrine*
     8c. Nonpersistent emergent vegetation covers less than 30% of substrate
     .....*Palustrine/None/Other (50)*
     8d. Nonpersistent emergent vegetation covers at least 30% of substrate
     .....*Palustrine/Emergent (51)*
9. The land does not periodically support predominantly hydrophytes, or the substrate is not predominantly undrained hydric soil, or the substrate is soil that is not saturated with water nor covered by shallow water at some time during the growing season of each year
   ……..*Not wetland or deepwater habitat (0)*

Riverine wetlands guidance

Please note the following guidance in assigning the correct wetland code to Riverine systems.

- A Cowardin 31 (Riverine-emergent/nonpersistent) is somewhat uncommon and should only be used if >30% *non-persistent* emergents are in the river. This is vegetation that falls below the surface of the water at the end of the growing season; NOT grass/shrubs/trees.
- In situations where ice in the channel removes all traces of non-persistent emergents, the wetland type should be classified as Cowardin 31 (Riverine-emergent/nonpersistent). Such cases would likely occur in perennial stream channels that freeze over in northern zones, as opposed to dry intermittent channels; however, if the image is during the growing season, the presence of non-persistent emergents should be easily ascertained.
- A Cowardin 30 wetland code is usually correct for a point falling on an intermittent stream channel that is NOT vegetated (e.g., 618 Riverwash). The Cowardin definition of a Riverine system indicates that stream channels dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens are NOT considered Riverine wetlands, and should instead be coded as Palustrine. When the dominant cover within the intermittent channel is grass/shrubs/trees the Cowardin wetland is NOT 31 because 1) these plants are considered persistent emergents, and 2) Cowardin excludes habitats dominated by persistent emergent cover from the Riverine definition.

Collection Software: Cowardin Wetlands and Deepwater Habitat

Wetlands and Deepwater Habitats Protocol Window

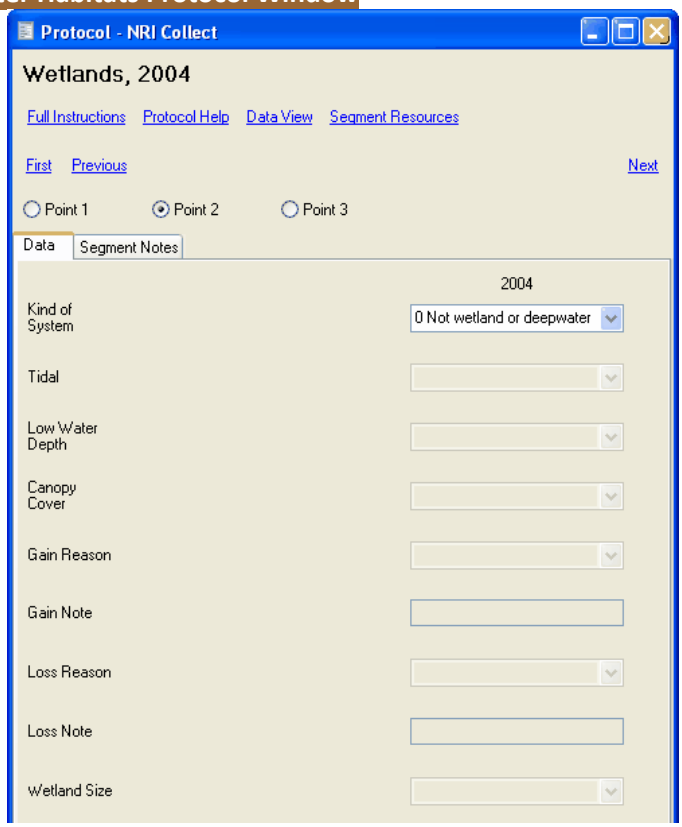


Figure 17: Wetlands Data Collection Window

Data Collection for Cowardin Wetlands and Deepwater Habitats in the Base Year

For each point:

Type of Cowardin System

1. View the base year high resolution image to verify the original base year determination for kind of Cowardin Wetland and Deepwater Habitat system displayed in NRI_Collect.
2. Do you agree with the original base year determination for kind of Cowardin system, if present?

   If not, this becomes a non-standard case.
   - Stop data collection on this point.
   - Notify the designated RSL contact.
   - Describe the resolution in the segment notes
3. If no base year value is present, determine the Cowardin Wetland System and record the information.

Tidal

4. If the kind of Cowardin system is (10) Marine or (20) Estuarine/None/Other, entry for Tidal is required. View the base year high resolution image to verify the original base year tidal determination displayed in NRI_Collect.
5. Do you agree with the original base year tidal determination, if present?

   If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

6. If no base year value is present, make the tidal determination and record the information.

Low Water Depth

7. If the kind of Cowardin system is Riverine (codes 30-31) or Lacustrine (codes 40-41), entry for low water depth is required.

   View the base year high resolution image to verify the original base year low water depth determination displayed in NRI_Collect.

8. Do you agree with the original base year low water depth determination, if present?

   If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

9. If no base year value is present, determine the low water depth and record the information.

Canopy Cover

10. If the kind of Cowardin system is Riverine (codes 30-31) or Lacustrine (codes 40-41), entry for canopy cover of nonpersistent emergent plants is required.

    View the base year high resolution image to verify the original base year canopy cover of nonpersistent emergent plants determination displayed in NRI_Collect.

11. Do you agree with the original base year canopy cover of nonpersistent emergent plants determination, if present?

    If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

12. If no base year value is present, determine the canopy cover of nonpersistent emergent plants and record the information.

Wetland Size

13. Entry for wetland size class is required for all wetland kinds.

    View the base year high resolution image to verify the original base year wetland size determination displayed in NRI_Collect.

    Wetland size is the contiguous area of wetland within the wetted perimeter.

- Wetland area may include more than one vegetation life form.
- Wetland area that extends outside the segment boundary is included in wetland size class determination.
- Wetland area determination does not include any deepwater habitat.

14. Do you agree with the original base year wetland size determination, if present?

    If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

15. If no base year value is present, determine the wetland size and record the information.

Go to Data Collection for Erosion in the Base Year

Verify/Edit Data for Cowardin Wetlands and Deepwater Habitats in the Revision Year

For each point:

Type of Cowardin System

1. View the revision year high resolution image to verify the revision year determination for kind of Cowardin Wetland and Deepwater Habitat system displayed in NRI_Collect.
2. Do you agree with the revision year determination for kind of Cowardin system?

   If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

Tidal

3. If the kind of Cowardin system is (10) Marine or (20) Estuarine None/Other, entry for Tidal is required. View the revision year high resolution image to verify the revision year tidal determination displayed in NRI_Collect.
4. Do you agree with the revision year tidal determination?

   If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

Low Water Depth

5. If the kind of Cowardin system is Riverine (codes 30-31) or Lacustrine (codes 40-41), entry for low water depth is required.

   View the revision year high resolution image to verify the revision year low water depth determination displayed in NRI_Collect.
6. Do you agree with the revision year low water depth determination?

   If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

Canopy Cover

7. If the kind of Cowardin system is Riverine (codes 30-31) or Lacustrine (codes 40-41), entry for canopy cover of nonpersistent emergent plants is required.

   View the revision year high resolution image to verify the revision year canopy cover of nonpersistent emergent plants determination displayed in NRI_Collect.
8. Do you agree with the revision year canopy cover of nonpersistent emergent plants determination?

   If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

Wetland Size

9. Entry for wetland size class is required for all wetland kinds.

   View the revision year high resolution image to verify the revision year wetland size determination displayed in NRI_Collect.

   - Wetland size is the contiguous area of wetland within the wetted perimeter.
   - Wetland area may include more than one vegetation life form.
   - Wetland area that extends outside the segment boundary is included in wetland size class determination.
   - Wetland area determination does not include any deepwater habitat.

10. Do you agree with the revision year wetland size determination?

    If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

Go to Verify/Edit Data for Erosion in a Revision Year

Data Collection for Change in Cowardin Wetlands and Deepwater Habitats

For each point:

1. View the revision year high resolution image to verify the revision year wetland data are correct.
2. Do you agree with the revision year wetland data?

   If not, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

Type of Cowardin System

3. View the high resolution images for current and revision years and review the corresponding documentation for the revision year in NRI_Collect to determine the kind of Cowardin Wetland and Deepwater Habitat system.

4. Has the kind of Cowardin system changed since the revision year?

   If yes, this becomes a non-standard case.

- Stop data collection on this point.
- Notify the designated RSL contact.
- Describe the resolution in the segment notes

5. Select the kind of Cowardin system from the choice list:

- 0: Not wetland or deepwater
- 10: Marine/None/Other
- 20: Estuarine/None/Other
- 21: Estuarine/ Emergent
- 22: Estuarine/Scrub-shrub
- 23: Estuarine/ Forested
- 30: Riverine/ None/Other
- 31: Riverine/Emergent/Nonpersistent
- 40: Lacustrine/None/Other

- 41: Lacustrine/Emergent/Nonpersistent
- 50: Palustrine/None/Other
- 51: Palustrine/Emergent
- 52: Palustrine/Scrub-shrub
- 53: Palustrine/Forested

Tidal

6. If the kind of Cowardin system is (10) Marine or (20) Estuarine/None/Other, entry for Tidal is required.

   View the high resolution images for current and revision years and review the corresponding revision year documentation in NRI_Collect to determine the tidal type.

7. Has the tidal type changed since the revision year?

   If yes, this becomes a non-standard case.

   - Stop data collection on this point.
   - Notify the designated RSL contact.
   - Describe the resolution in the segment notes

8. Select the tidal type from the choice list:
   - 1 Intertidal (interm/exposed)
   - 2 Subtidal (perm submerged)

Low Water Depth

9. If the kind of Cowardin system is Riverine (codes 30-31) or Lacustrine (codes 40-41), entry for low water depth is required.

   View the high resolution images for revision years and review the corresponding revision year documentation in NRI_Collect to determine the current year low water depth class.

10. Has the low water depth changed since the revision year?

    If yes, this becomes a non-standard case.

    - Stop data collection on this point.
    - Notify the designated RSL contact.
    - Describe the resolution in the segment notes

11. Select the low water depth from the choice list:
    - Less than or equal to 2 meters (6.6 feet) deep
    - Greater than 2 meters (6.6 feet) deep

Canopy Cover

12. If the kind of Cowardin system is Riverine (codes 30-31) or Lacustrine (codes 40-41), entry for canopy cover of nonpersistent emergent plants is required.

    View the high resolution images for current and revision years and review the corresponding revision year documentation in NRI_Collect to determine the current year canopy cover of nonpersistent emergent plants.

13. Has the canopy cover of nonpersistent emergent plants changed since the revision year?

    If yes, this becomes a non-standard case.

    - Stop data collection on this point.
    - Notify the designated RSL contact.
    - Describe the resolution in the segment notes

14. Select the percent canopy cover of nonpersistent emergent plants from the choice list:
    - Less than 30 percent nonpersistent emergent
    - Greater than or equal to 30 percent nonpersistent emergent

Wetland Size

15. Entry for wetland size class is required for all wetland types.

    View the high resolution images for current and revision years and review the corresponding revision year documentation in NRI_Collect to determine the current year wetland size class.
    - Wetland size is the contiguous area of wetland within the wetted perimeter.
    - Wetland area may include more than one vegetation life form.
    - Wetland area that extends outside the PSU boundary is included in wetland size class determination.
    - Wetland area determination does not include any deepwater habitat.

16. Has the wetland size changed since the revision year?

    If yes, this becomes a non-standard case.
    - Stop data collection on this point.
    - Notify the designated RSL contact.
    - Describe the resolution in the segment notes

17. Select the wetland size class category from the choice list:
    - Less than or equal to 1 acre
    - Greater than 1 and less than or equal to 5 acres
    - Greater than 5 and less than or equal to 20 acres
    - Greater than 20 acres

18. Has there has been a gain or loss in a wetland as indicated by activated items in NRI_Collect?

    If yes, this becomes a non-standard case.
    - Stop data collection on this point.
    - Notify the designated RSL contact.
    - Describe the resolution in the segment notes

Go to Data Collection for Change in Erosion

Gain and Loss Reasons

Wetland gain - a change from not a wetland to one of the Cowardin wetland classifications or a change from Lacustrine greater than 2 meter depth to Lacustrine less than 2 meter depth.

Reasons for gains in wetlands are:
- **Intentional creation -** restoration, mitigation or construction of a wetland.
- **Unintentional -** byproduct of other construction, agricultural (e.g., aquaculture, rice, cranberry production, etc.), or irrigation activities.
- **Natural change**- permanent change due to natural causes, (e.g. earth quakes, floods, volcanoes, hurricanes).
- **Other-** all other reasons for gain.

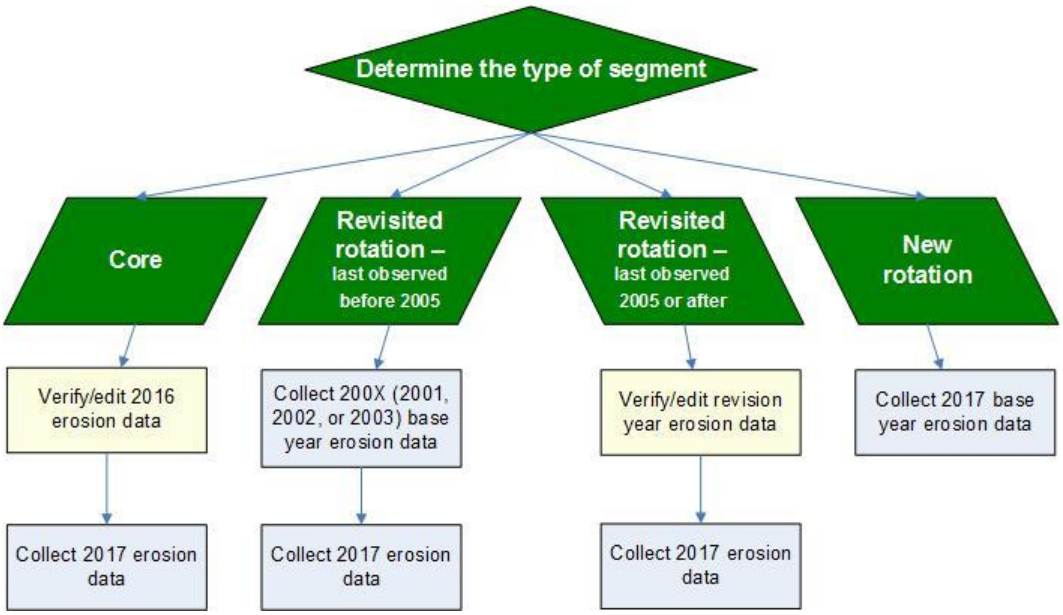
Wetland loss - a change from a Cowardin wetland class to not a wetland or a change from lacustrine less than 2 meter depth to Lacustrine greater than 2 meter depth.

Reasons for losses in wetlands are:

- **Agriculture -** drained, land-leveled, or filled to allow agricultural or horticultural production.
- **Development -** drained, land-leveled, or filled to allow construction of buildings, roads, parking lots, facilities, or other such structures for non-farm purposes.
- **Deepwater construction -** conversion to deepwater habitat because of pond or reservoir construction.
- **Natural change -** permanent change due to natural causes, (e.g. earth quakes, floods, volcanoes, hurricanes).
- **Silviculture -** drained, land-leveled, or altered to allow for forestry purposes, such as production of timber, fiber, pulp, or other wood products.
- **Other -** all other reasons for loss.

3.4.3 Erosion

View the diagram below to see the order of operation for each segment type and year.



Definitions: Erosion

Wind Erosion Equation (WEQ)

Barrier (WEQ). A continuous strip or row that will stop saltation. It has sufficient height to reduce downwind velocity at the soil surface for a distance of 10 times the barrier height (10H). A barrier may be vegetative or non-vegetative, such as a field windbreak (trees), a row of tall grass, or a snow fence. A continuous stand of tall grass or trees in a pasture is also a barrier. [NRI-2001]

Buffer. A row or area of plants that is capable of trapping soil particles moving, by the force of the wind, along the land surface. [NRI-97]

Note: A buffer has sufficient width to trap and store the soil that is anticipated to move off an upwind eroding area and provides a stable point from which to measure L.

Conservation Treatment Unit (CTU). A field, group of fields, or other land parcels of the same land use and having similar treatment needs and planned management. A CTU has definite boundaries, such as fence, drainage, vegetation, topography, or soil lines. [NRI_05]

Critical wind erosion period. Period of the year when most of the erosion from unprotected fields can be expected to occur. [NAM]

Knoll Erodibility. The increased potential for erosion by wind on windward-facing slopes that are less than 500 feet long and the increase in slope gradient from the adjacent landscape is 3 percent or greater. [NAM]

Management period method. A procedure for estimating wind erosion that involves assigning factor values to represent field conditions expected to occur during specified time periods. [NAM]

Saltation. Soil movement in wind where particles skip or bounce along the soil surface in response to wind forces. Particles ranging in size from 0.1 to 0.5 mm (0.0004 to 0.02 in) usually move in this manner. [NAM-88]

Unsheltered distance (L factor - WEQ). The unsheltered distance along the prevailing wind erosion direction across the field or area to be evaluated. [NAM] For NRI, the unsheltered distance is expressed in feet, measured through the sample point, parallel to the prevailing wind direction during the critical wind erosion period. [NRI-97]

Wind erosion. The process of detachment, transport, and deposition of soil by wind. [NAM-88]

Wind erosion equation (WEQ). An erosion model designed to predict long-term average annual soil losses from a field having specific characteristics. [NAM-88]

WEQ is E = f(IKCLV), where:

E = Estimated average annual soil loss expressed in tons per acre per year
I = Soil erodibility factor
K = Soil ridge roughness factor
C = Climatic factor
L = Equivalent unsheltered distance across the field along the prevailing wind erosion direction
V = Equivalent vegetative cover

Universal Soil Loss Equation (USLE)

Cover and management factor (C factor - USLE). The ratio of soil loss from an area with specific cover and management to that from an identical area in tilled continuous fallow. [AH-537]

Ground cover. Vegetation, both living and dead, in contact with and covering the soil surface. It is usually expressed as percent of soil surface covered, but sometimes expressed as pounds of biomass. [NRI-97]

Slope. The inclination of the soil surface from the horizontal. [AH-537]

Slope length. The distance from the point of origin of overland flow to the point where either the slope gradient decreases enough that deposition begins, or the runoff water enters a well-defined channel that may be part of a drainage network or a constructed channel. For the NRI, length of slope is taken through the sample point. [AH–537]

Slope percent. The vertical distance divided by the horizontal distance, than multiplied by 100. [AH-537]

Universal soil loss equation (USLE). An erosion model designed to predict the longtime average soil losses in runoff from specific field areas in specified cropping and management systems. [AH- 537] Location-specific data for the field in which the NRI point falls or that portion of the field surrounding the point that would be considered in conservation planning are used in the NRI calculations. The equation is: A=RKLSCP, where:

A = Computed soil loss per unit area
R = Rainfall factor
K = Soil erodibility factor
L = Slope length factor
S = Slope percent factor
C = Cover and management factor
P = Support practice factor

Tools for WEQ L and USLE Determinations

Determine WEQ L Factor Bearing

Wind erosion factors are determined relative to the prevailing wind erosion direction. NRI wind erosion factors are determined for the critical wind erosion period of the year. Do not use the management period method to determine WEQ for NRI.

1. Determine the critical wind erosion period for the geographic area as listed in the FOTG (e.g., Spring in Salina, KS).
2. Determine the prevailing wind erosion direction as listed in the FOTG (e.g., 339 degrees in Omaha, NE).

Measure WEQ L Factor

- Measure the unsheltered distance (L factor) through the sample point.
- Measure the distance along WEQ L factor bearing (the prevailing wind erosion direction during the critical wind erosion period).
- Begin measurement at the downwind (leeward) edge of the field, CTU, wind barrier, or buffer even though the next field or area downwind may not be stable.
- End measurement upwind at a protected area. This may not end at the upwind edge of the field, CTU, or PSU boundary. A protected area is a stable point where saltation is controlled. A stable point is created by a barrier or buffer. For NRI purposes, a buffer must be at least 15 feet wide measured along the prevailing wind direction.
- If the sample point falls on a barrier, measure L for the field or CTU downwind of the sample point. L is zero only if the entire field or CTU has barriers spaced close enough together (within 10H) to provide protection to all areas between the barriers.
- If the sample point falls on a buffer, the buffer vegetation is to be disregarded. Buffers do not have sufficient height to reduce downwind velocity (e.g., A grassed waterway with sufficient width and vegetation to stop saltation could be a buffer).

- If an area is controlling saltation, but does not have tall grass or trees in a continuous strip, then it is a buffer.
- If a pasture or rangeland is overgrazed to the point that saltation is not controlled, then it is neither a barrier nor a buffer.
- Adjust L if a barrier exists.
- Determine barrier height and multiply by 10 to determine adjustment (e.g., 3-foot barrier × 10 equals 30 feet).
- Subtract adjustment from unsheltered distance (e.g., L equals 500 feet and barrier adjustment equals 30 feet. Adjusted L equals 500 minus 30 = 470 feet).

Changes to Wind L and Bearing

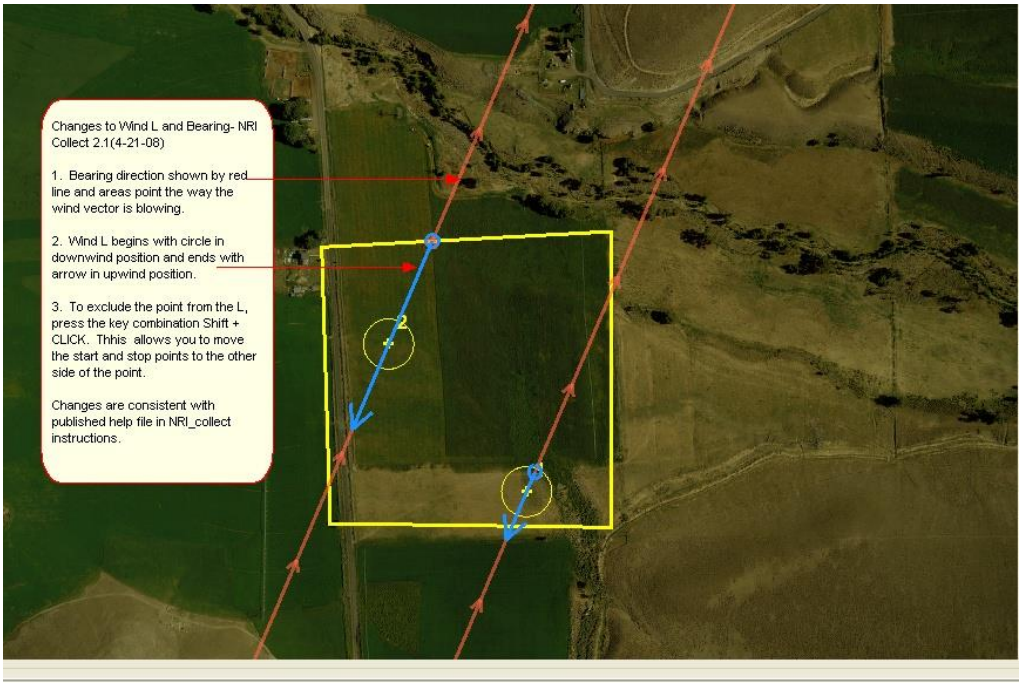


Figure 18: Using the L Factor Delineation Tools

Figure 19: Moving upward to stable area at leeward edge of adjacent field

- Measure L by beginning at the downwind edge of field 2. Do not be concerned about field 3, even though it may be eroding. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point and stop at the stable area at the leeward edge of field 1.

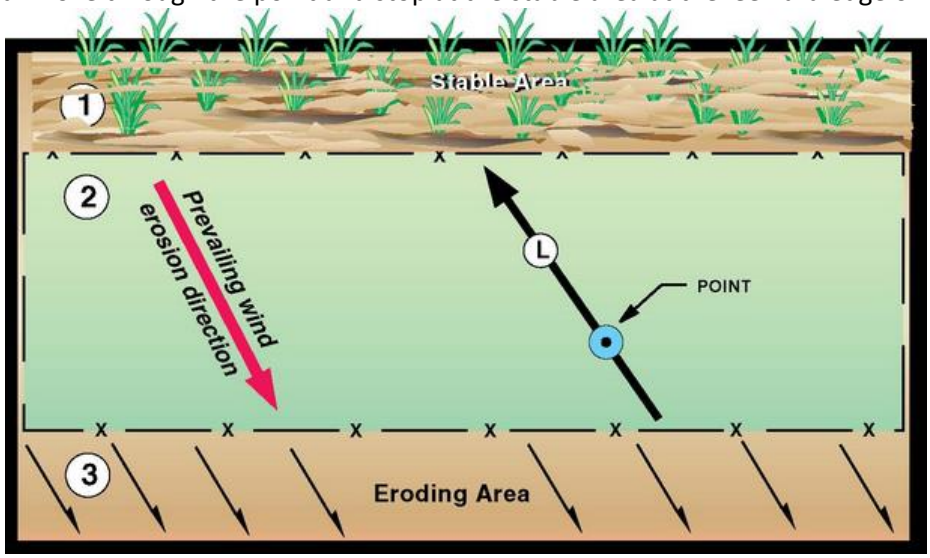


Figure 20

- This situation differs from fig.19 in two ways. First, the field is covered by heavy crop residues. Second, the leeward edge of field 1 is an eroding area. In this case, the crop residue cover is to be ignored because L is measured as if the field were bare except for barriers or buffer areas. In this example, neither barriers nor buffers exist. Measure L beginning at the downwind edge of field 2. Do not be concerned about field 3, even though it may be eroding. It is not contributing to field 2. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point and stop at the stable area in field 1. Do not stop at the leeward field boundary for field 1.

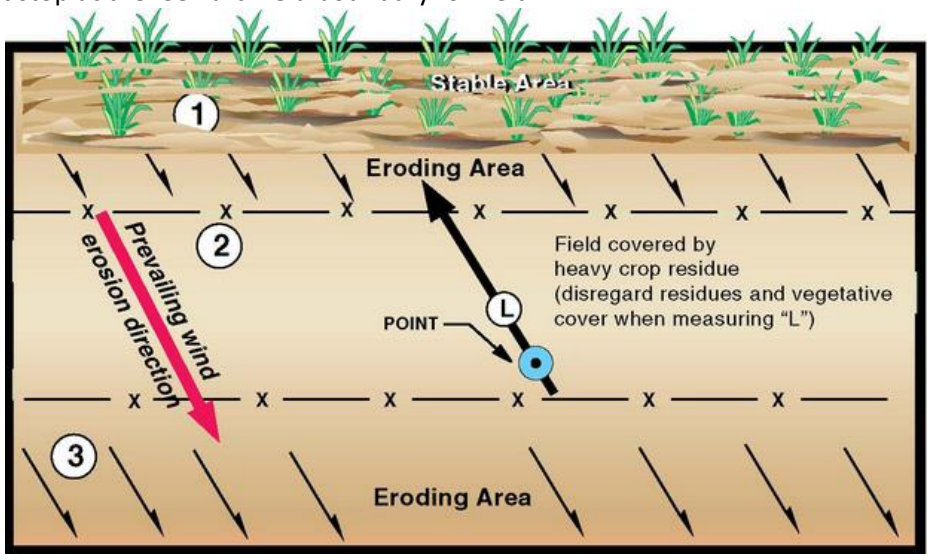


Figure 21: Wind erosion L factor, measuring unsheltered distance (L factor)

- In the fig. 21 example, the point falls in a stable area. In this case the cover is to be ignored because L is measured as if the field is bare. Measure L beginning at the downwind edge of field 3. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point and stop at the stable area on the leeward edge of field 1. L is measured across field 2, because it is an eroding area which affects field 3 in the wind erosion process.

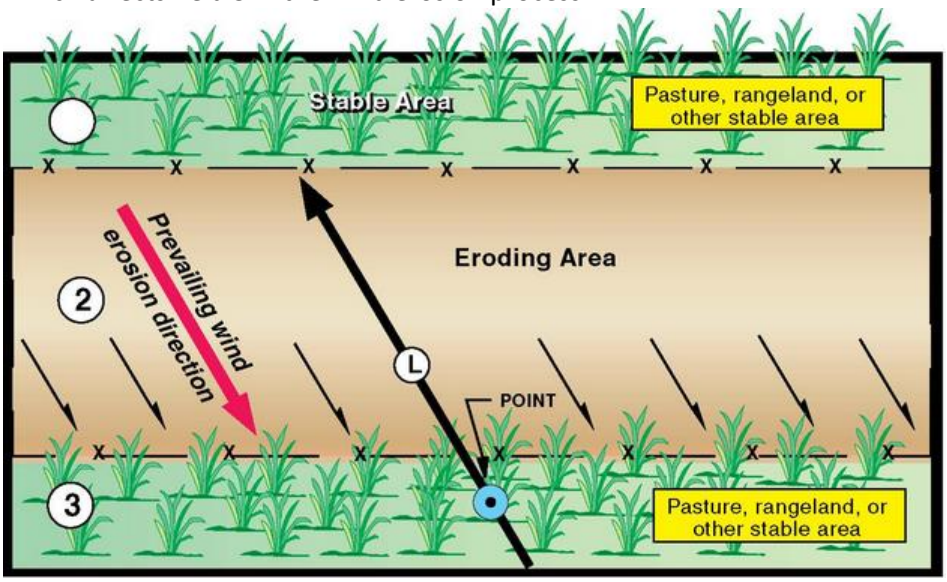


Figure 22

- In the fig. 22 example, field 2 has tall grass barriers. Barriers and buffer areas are considered when measuring L. Measure the distance between the tall grass strips (barriers) where the point falls. Then multiply the height of the grass barrier by 10 and subtract from your first measurement. If the distance between the strips is 50 feet and the grass is 5 feet tall, then L=0, 50-(5x10)=0. If the grass were only 3 feet tall then L would be 20, 50-(3x10)=20.

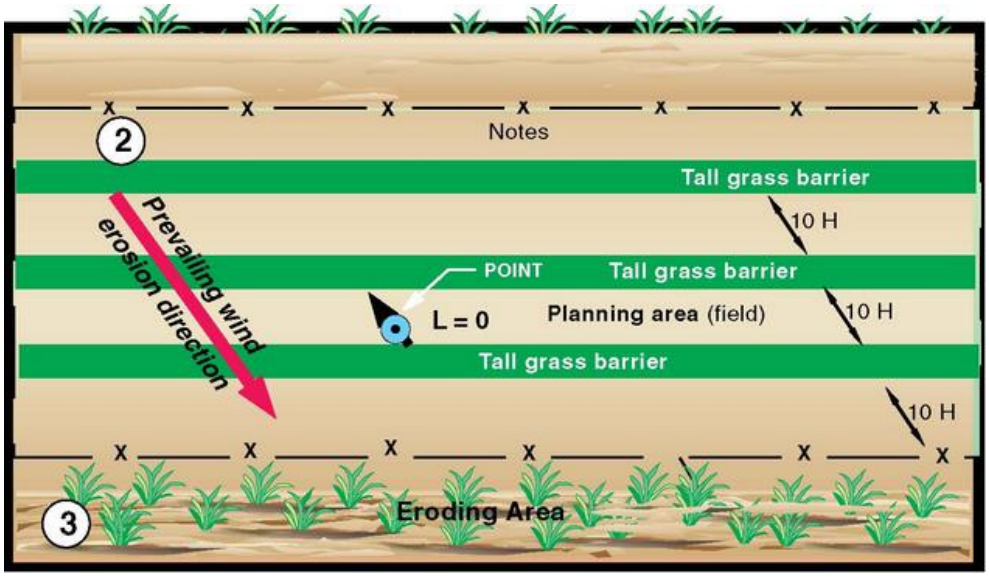


Figure 23

- In the fig. 23 example, field 2 has buffer areas. Buffer areas are considered when measuring L. Measure L beginning at the downwind edge of the tilled area where the point falls. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point and stop at the downwind edge of the first buffer area encountered. If the point were to fall on a designed buffer strip (not just a random area that is acting as a buffer), then measure L for the tilled area downwind of the buffer strip where the point fell. If another field or CTU is downwind of the point, measure L for the area upwind of the buffer strip where the point fell. If the buffer area is random rather than a designed strip, consider the area bare and measure L as if the buffer area does not exist.

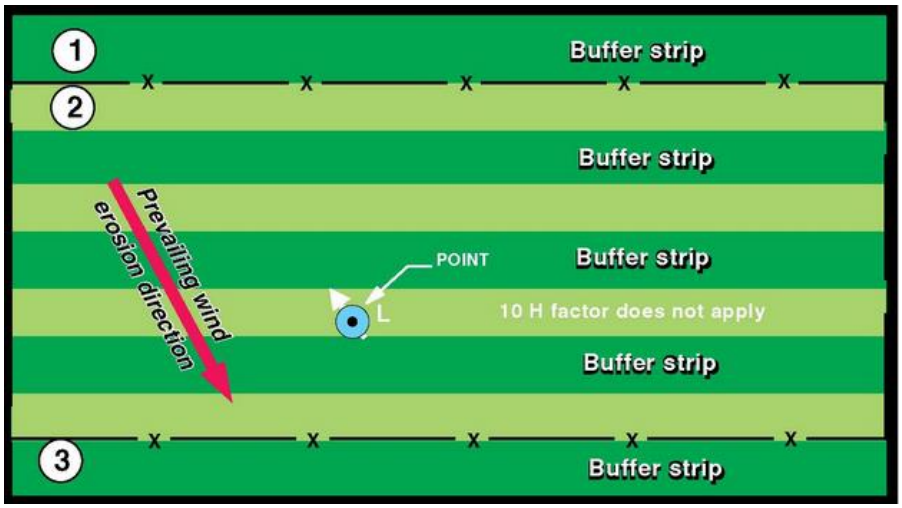


Figure 24

- In the fig. 24 example, there is a windbreak on the upwind side of field 1. Measure L beginning at the downwind edge of field 1. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point and stop at the windbreak on the northern edge of field 1. Multiply the height of the windbreak by 10 and subtract from your first measurement. If the distance across the field is 300 feet and the windbreak is 10 feet tall, then L=200, 300-(10x10)=200. If the windbreak were 30 feet tall, L=O, 300-(30x10)=0.

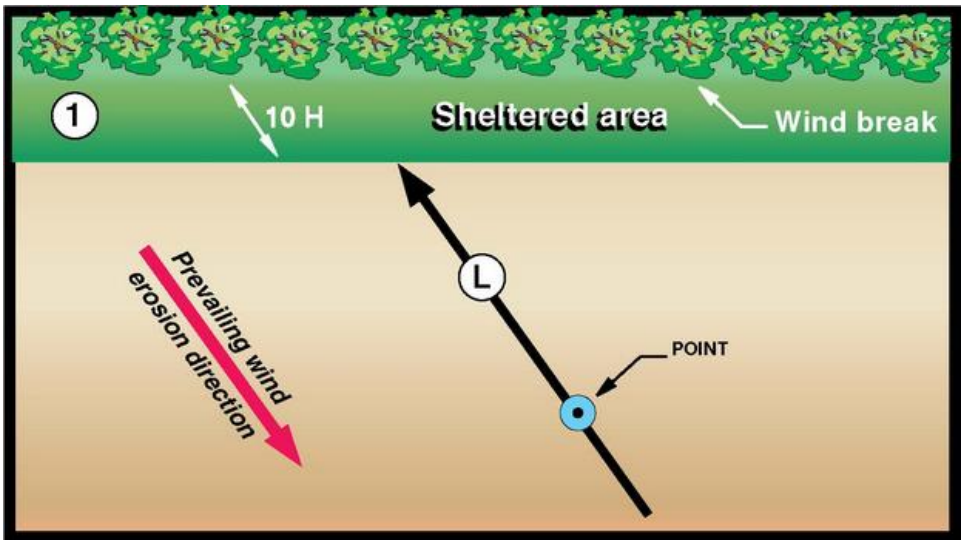


Figure 25

- In the fig. 25 example, field 2 has a windbreak, but the windbreak is downwind from where the point falls. Since barriers are considered when measuring L, begin measuring from the upwind side of the windbreak Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point and stop at the upwind edge of field 2. Do not subtract 10 times the height, because the point is upwind from the area protected by the windbreak, L is not measured across field 1, because it is a stable area.

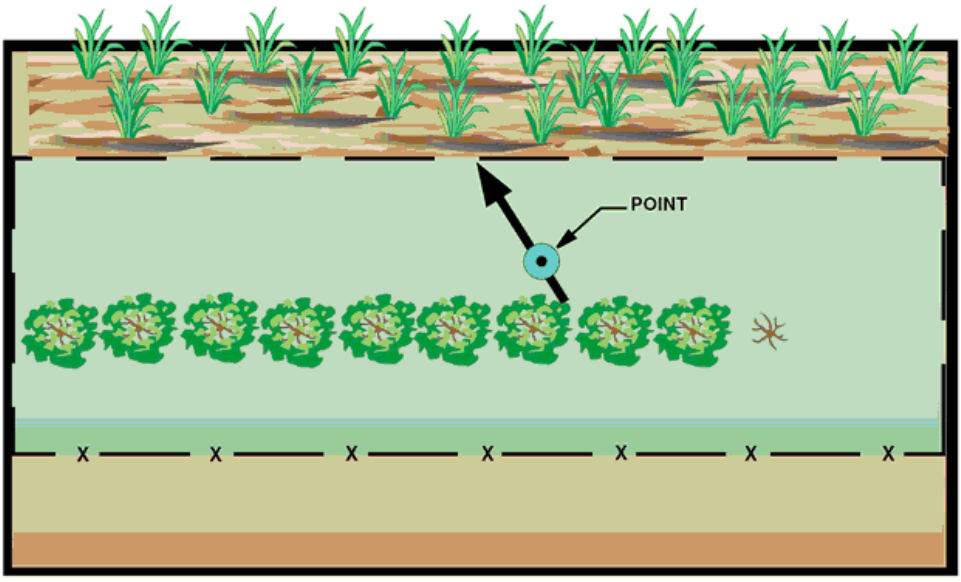


Figure 26

- The fig. 26 example is the simplest of all situations to measure. Field 3 has no buffer areas, no barriers, no crop residues, or cover of any kind. Measure L beginning at the downwind edge of field 3. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point and stop at the stable area at the leeward edge of field 1. L is not measured across field 1, because it is a stable area and not contributing to field 3 in the wind erosion process.

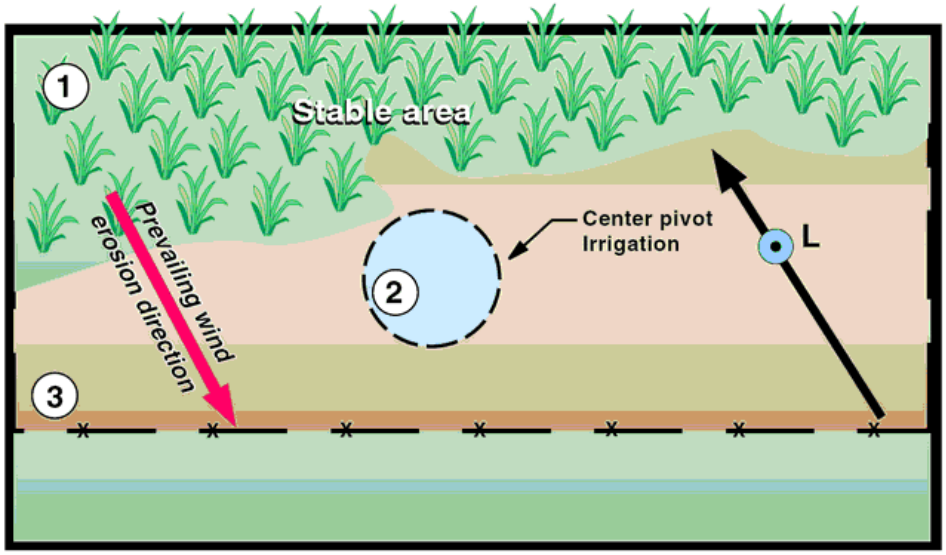


Figure 27

- The fig. 27 example illustrates that some forms of management or practices applied can cause an area to be considered as a separate CTU. In this case, field 2 is under center pivot irrigation, which requires a different set of management and/ or structural practices than do fields 1 or 3. Measure L beginning at the downwind edge of field 2. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point and stop at the stable area at the leeward edge of field 1. L is not measured across field 1, because it is a stable area.

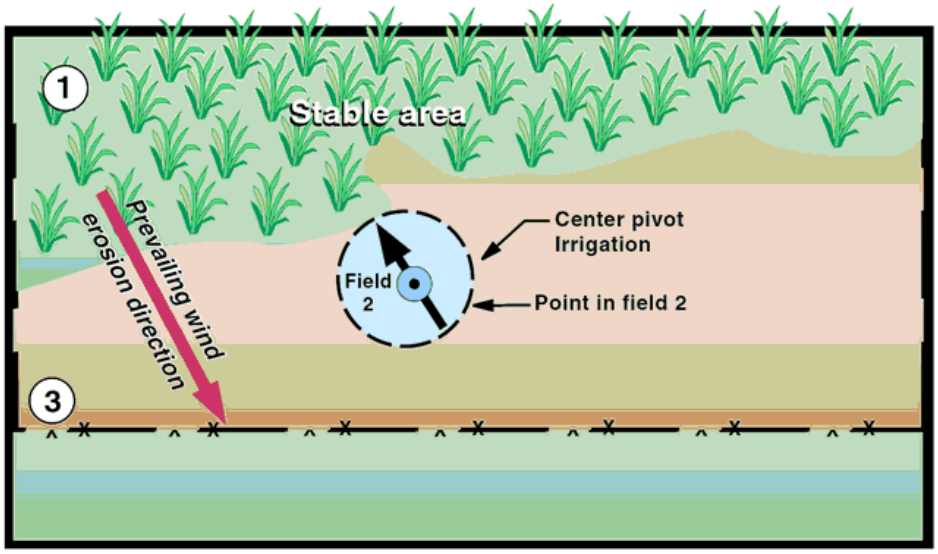


Figure 28

- The fig. 28 example is identical to fig. 9, except that field 4 is not adjacent to a buffer area. Measure L beginning at the downwind edge of field 4. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point, continue across field 3, and stop at the stable area at the leeward edge of field 1.

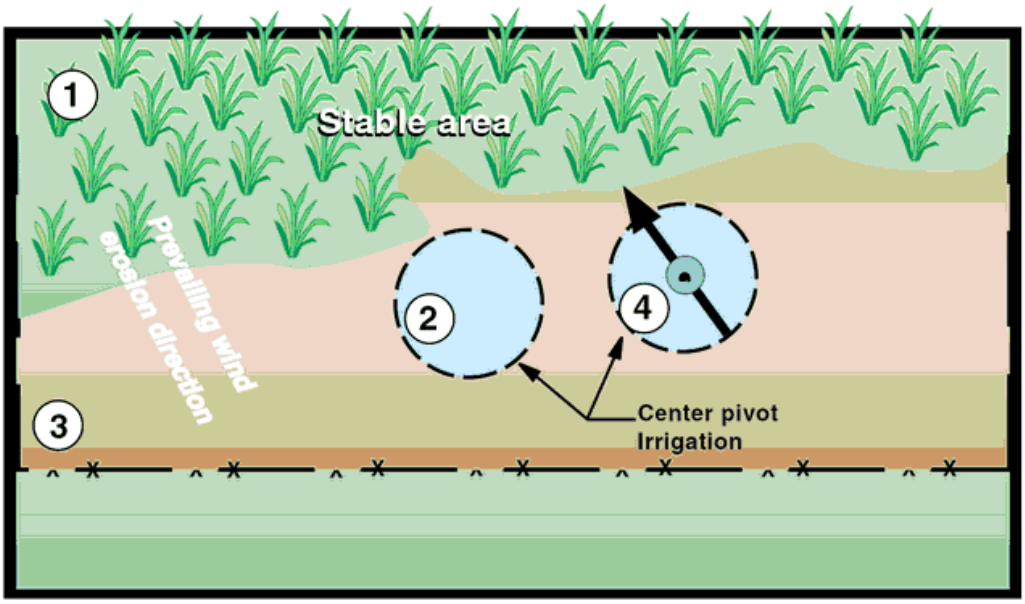


Figure 29

- The fig. 29 example is similar to fig. 10, except that field 5 is downwind from another center pivot irrigated field. Measure L beginning at the downwind edge of field 5. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move through the point, continue across field 2, and stop at the stable area at the leeward edge of field 1. L is measured across field 2, because there are no buffer areas or barriers within field 2.

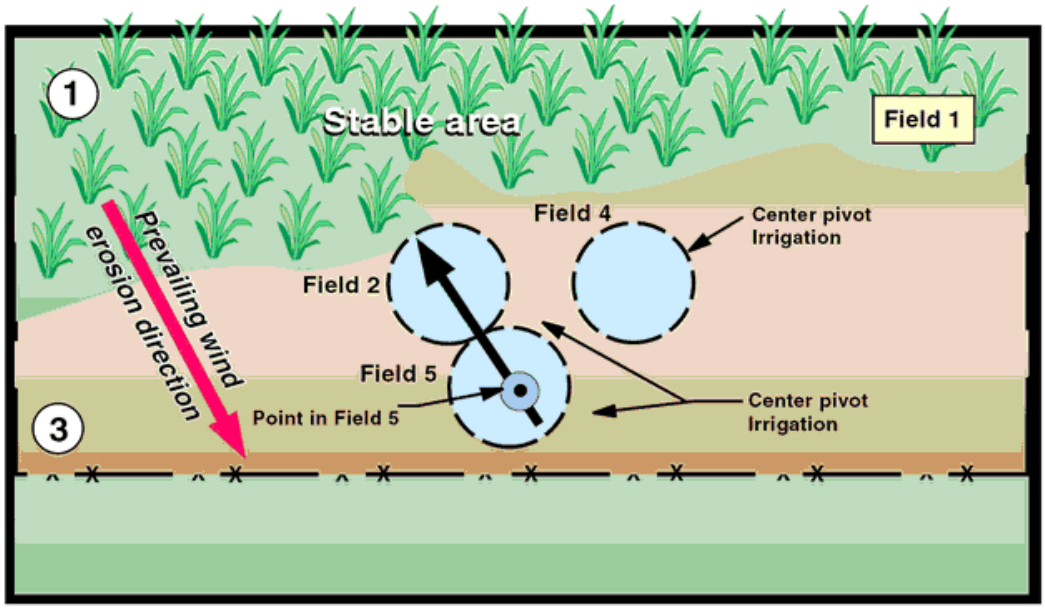
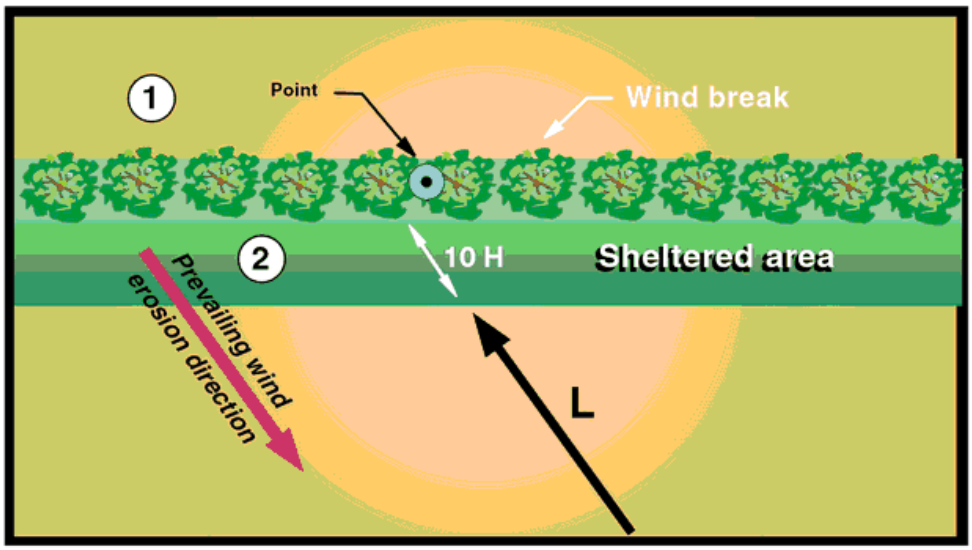


Figure 30

- If the point falls on a barrier (fig. 30) L is to be measured for the area downwind from the barrier. Measure L beginning at the downwind edge of field 2. Move upwind in the direction of the prevailing wind erosion direction during the critical wind erosion period. Move toward the point and stop at the windbreak. Multiply the height of the windbreak by 10 and subtract from your first measurement. If the distance from the field boundary to the windbreak is 300 feet and the windbreak is 10 feet tall, then L=200, 300-(10x10)=200. If the windbreak is 30 feet tall then L=0, 300-(30x10)=0.



Determine USLE Slope Percent

Determine the USLE slope percent through the sample point considering the direction that water flows overland.

- Slope is recorded to the nearest whole number for slopes of 1 percent or greater.
- Slopes less than 1 percent are recorded to the nearest tenth of a percent.
- A zero is not recorded unless the slope is laser-leveled to less than 0.05 percent.
  Slopes that are less than 1 percent will be based on the designed grade found in the engineering
- plan or otherwise documented in the case file.

Determine USLE Slope Length

1. Determine the USLE slope length.
   - Slope length is measured through the sample point in feet.
   - The starting and ending points for measuring slope length may be on or off the segment.
   - On terraced land, slope length is generally the distance between terraces.
2. Verify historical data and correct where necessary.

Collection Software: Erosion

Delineation Tools for Erosion

	Draw L Factor length: Delineate the L Factor length.
	Draw L Factor bearing: Use this tool to change the displayed L Factor bearing.

Erosion Protocol Window

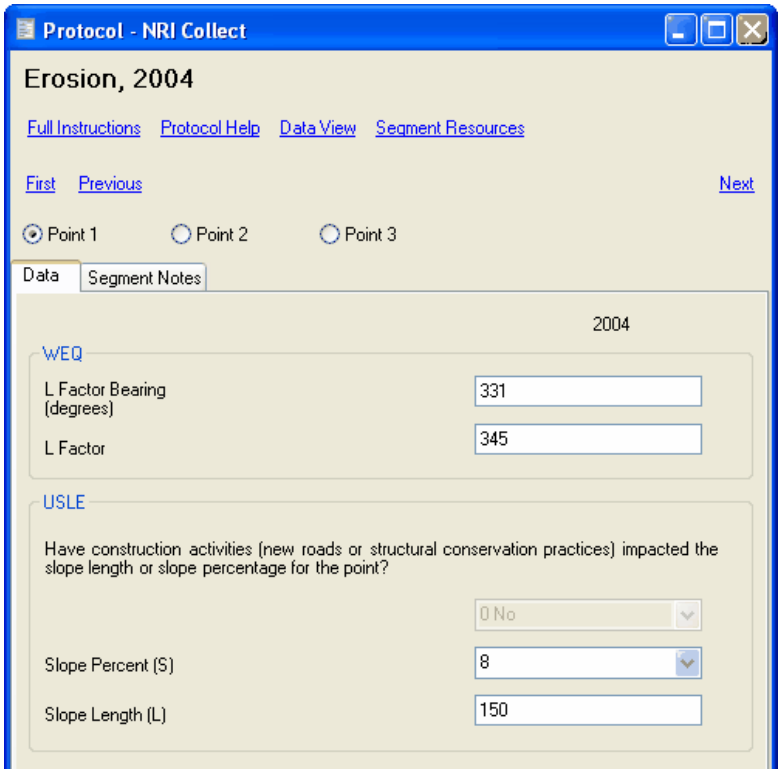


Figure 31: Erosion Data Collection Window

Data Collection for Erosion in the Base Year

For each point:

1. Erosion data are collected for a point if one of the following selections, or combinations of selections was made for the base year point data collection in the LCU module:
   - 000 Cropland, hayland, or CRP land
   - 007 Nursery production areas
   - 200 Grassland and not Defined as Rangeland

   If the base year LCU for the point is not one of the types listed, then no erosion data are entered for the point.

Wind Erosion Equation (WEQ)

2. Review the corresponding documentation on the base year PSU Support Map for revisited rotation segments (1997 PSU Support Map for new rotation segments); the Field Office Technical Guide (FOTG), Section I (General References), Erosion Prediction, Wind, WEQ; and state erosion handbooks or references, where applicable, to determine the L factor bearing.
3. Enter the base year L factor bearing.
4. View the base year high resolution image, review the corresponding documentation on the base year PSU Support Map for revisited rotation segments (1997 PSU Support Map for new rotation segments), and Field Office Technical Guide (FOTG), Section I (General References), Erosion Prediction, Wind, WEQ; and state erosion handbooks or references, where applicable to determine the WEQ L factor unsheltered distance in feet.

5. Use the software tool to record the end points for the L factor unsheltered distance

Universal Soil Loss Equation (USLE)

6. View the base year high resolution image and review the corresponding documentation on the base year PSU Support Map for revisited rotation segments (1997 PSU Support Map for new rotation segments); the Field Office Technical Guide (FOTG), Section I (General References), Erosion Prediction, Wind, WEQ; and state erosion handbooks or references, where applicable to determine if there were construction activities (new roads or structural conservation practices) that impacted the slope length or slope percentage for the point. Was there any new construction activity that impacted the slope length or slope percentage for the point?
    - If no, then no further USLE information is entered for the point.
    - If yes, this becomes a non-standard case.
        - Stop data collection on this point.
        - Notify the designated RSL contact.
        - Describe the resolution in the segment notes

Go to Data Collection for Use of Land in the Base Year

Verify/Edit Data for Erosion in a Revision Year

For each point in the revision year currently being reviewed:

1. Determine if erosion data are required.

    Erosion data are collected for a point if one of the following selections or combinations of selections is recorded for the point in the revision year LCU module:

    - 000 Cropland, hayland, or CRP land
    - 007 Nursery production areas
    - 200 Grassland and not Defined as Rangeland

    If the base year LCU for the point is not one of the types listed, then no erosion data are entered for the point.

Wind Erosion Equation (WEQ)

2. Review the Field Office Technical Guide (FOTG), Section I (General References), Erosion Prediction, Wind, WEQ; and state erosion handbooks or references, where applicable, to determine the L factor bearing.
3. Review the L factor bearing recorded for the revision year. Do you agree with the determination?

    If not, this becomes a non-standard case.
    - Stop data collection on this point.
    - Notify the designated RSL contact.
    - Describe the resolution in the segment notes
4. View the revision year high resolution image, review the Field Office Technical Guide (FOTG), Section I (General References), Erosion Prediction, Wind, WEQ; and state erosion handbooks or references, where applicable to determine the WEQ L factor unsheltered distance in feet to determine the revision year data for WEQ L factor unsheltered distance.
5. Use the software tool to record the end points for the L factor unsheltered distance.

Universal Soil Loss Equation (USLE)

6. View the revision year high resolution image and review the Field Office Technical Guide (FOTG), Section I (General References), Erosion Prediction, Wind, WEQ; and state erosion handbooks or references, where applicable to determine if there were construction activities (new roads or structural conservation practices) that impacted the slope length or slope percentage for the point. Was there any new construction activity that impacted the slope length or slope percentage for the point?
   - If no, then no further USLE information is entered for the point.
   - If yes and the change was **not** accounted for this becomes a non-standard case.
     - Stop data collection on this point.
     - Notify the designated RSL contact
     - Describe the resolution in the segment notes
   - If yes and the change was accounted for:
     - Determine the USLE slope percent to verify the revision year value. Do you agree with the revision year slope percent determination?
       If not, this becomes a non-standard case.
       - Stop data collection on this point.
       - Notify the designated RSL contact.
       - Describe the resolution in the segment notes
     - Use the measure tool to determine the USLE slope length (in feet) through the point to verify the revision year value. Do you agree with the revision year USLE slope length determination?
       If not, this becomes a non-standard case.
       - Stop data collection on this point.
       - Notify the designated RSL contact.
       - Describe the resolution in the segment notes

Go to Verify/Edit Data for Use of Land in a Revision Year

Data Collection for Change in Erosion

For each point:

Erosion data are collected for a point if one of the following selections, or combinations of selections was made for the new point data collection in the LCU module:

- 000 Cropland, hayland, or CRP land
- 007 Nursery production areas
- 200 Grassland and not Defined as Rangeland

If the current year LCU for the point is not one of the types listed, then no erosion data are entered for the point.

Wind Erosion Equation (WEQ)

1. Review the L factor bearing for the revision year; the Field Office Technical Guide (FOTG), Section I (General References), Erosion Prediction, Wind, WEQ; and state erosion handbooks or references, where applicable to verify the determination of the L factor bearing for the revision year and determine that for the current year.
2. Do you agree with the revision L factor bearing?
   If not, this becomes a non-standard case.
   - Stop data collection on this point.

- Notify the designated RSL contact.
- Describe the resolution in the segment notes

3. Do you agree with the placement of the WEQ L factor end points for the revision year?
   If not, this becomes a non-standard case.
   - Stop data collection on this point.
   - Notify the designated RSL contact.
   - Describe the resolution in the segment notes
4. View the current year high resolution image and determine the WEQ L Factor unsheltered distance in feet for the current year.
5. Enter the WEQ L factor bearing for the current year.
6. Use the software tool to record the L factor unsheltered distance end points for the current year.

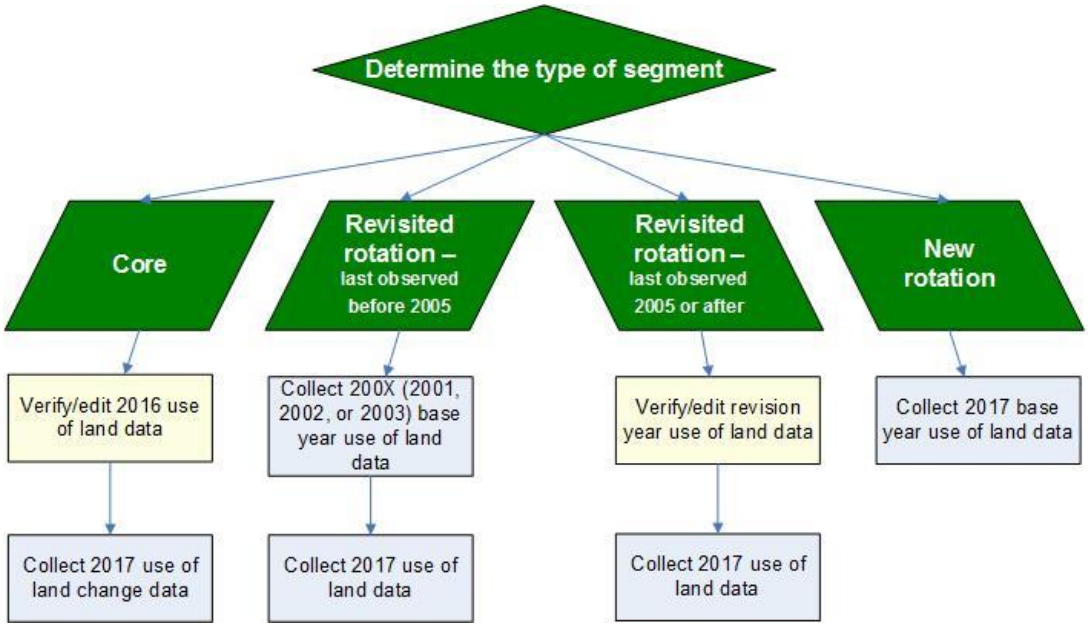
Universal Soil Loss Equation (USLE)

7. View the current and revision year's high resolution images and review the USLE data for the revision year to verify the revision year's determination of construction activities (new roads or structural conservation practices) impacted the slope length or slope percentage for the point. Do you agree with the determination for the revision year?
   If not, this becomes a non-standard case.
   - Stop data collection on this point.
   - Notify the designated RSL contact.
   - Describe the resolution in the segment notes
8. View the current and revision year's high resolution images and review the USLE data for the revision year. Have there been construction activities (new roads or structural conservation practices) since the revision year that impact the USLE slope length or slope percentage for the point?
   If no, then no further USLE information is entered for the point.
   If yes, this becomes a non-standard case.
   - Stop data collection on this point.
   - Notify the designated RSL contact.
   - Describe the resolution in the segment notes

Go to Data Collection for Change in Use of Land

3.4.4 Use of Land

View the diagram below to see the order of operation for each segment type and year.



Definitions: Use of Land

Use of the land: The specific kind of activity that takes place on the land. Most areas have more than one associated use. [NRI-97]

Conservation Treatment Unit (CTU): A field, group of fields, or other land parcels of the same land use and having similar treatment needs and planned management. A CTU has definite boundaries, such as fence, drainage, vegetation, topography, or soil lines. [NRI_05]

Food, feed, fiber, and seed: Includes production and harvest of crops for human consumption, animal feed, seed, and fiber other than wood (cotton). Cover crops grown to increase organic matter, or improve soils tilth, fallow conditions on land used for crop production, and hay in rotation are also included.

Livestock grazing: Includes post-harvest gleaning of cropland fields, and grazing pastures, rangeland, woodland, and marshlands.

Wood, harvested: Includes land showing evidence of partial-cut, clear-cut, or other timber management practices within the last 5 years.

Hay: Includes permanent hay fields with either annual or perennial forage species, as well as hay mechanically harvested from pastureland and rangeland.

Agricultural facilities: Includes farmstead and ranch headquarters, livestock facilities, feedlots, confinement operations (poultry, hogs), pens, corrals, grain bins, and other buildings and structures associated with agricultural production.

Biomass: Includes land reserved for production of energy-producing herbaceous or woody crops.

Commercial: Includes downtown areas, industrial shopping malls/centers, strip shopping/businesses, lodging facilities, resorts, marinas, manufacturing buildings or plants, warehouses, docks or port facilities, truck terminals, and tank farms.

Aquaculture: The production of fish, shellfish, and aquatic plants in a controlled environment and includes fish farming, fish hatcheries, and aquaculture in rotation with farming and crawfish farming.

Institutions: Includes churches, cemeteries, schools, hospitals, museums, civic centers, and other public service facilities.

Mineral Extraction: Includes surface strip mines, gravel pits, borrow areas, quarries, placer mines, extraction wells, injection wells, tailings, piles, salt mines, and oil wasteland.

Agricultural business: Includes granaries, farmer cooperatives, farm machinery dealers, sale barns, and other agribusinesses. Landscape and other ornamental operations, such as sod farms, nurseries, and Christmas tree farms are included.

Land based recreation: Includes such facilities as golf courses, stadiums, athletic fields, parks, zoos, forts, entertainment parks, campgrounds, and racetracks. Also includes land used for fish and game lands, upland and big game hunting, backpacking, climbing, hiking, biking, and nature study.

Concentrated development: Includes closely spaced urban and suburban houses, apartments, condominiums, and strip and cluster residential development in rural areas.

Rural estates: Includes rural residences that are 1.5 to 10 acres, are not part of an operating farm, and have no intensive agricultural enterprises. They may include small pastures for grazing and may have structures, such as garages or barns, with no special use buildings, such as poultry or hog houses or mink ranches.

Undeveloped rural sites: Includes housing or other planned developments where the streets have been laid out. Some utilities may have been installed, but few if any structures have been constructed. The land appears idle with no management for livestock grazing, or harvesting of wood products or cultivated crops.

Agricultural waste: Includes animal waste lagoons, settling ponds, poultry disposal pits, and other waste storage or treatment facilities associated with agricultural operations.

Nonagricultural waste: Includes waste collection and treatment sites and facilities, such as wastewater treatment ponds, recycling facilities, filtration facilities, nuclear and other hazardous waste sites, settling ponds, sewage treatment lagoons, and other waste handling systems not associated with agricultural operations.

Reserved agriculture: Includes land in the Conservation Reserve Program (CRP), and land in other USDA set-aside programs, and long-term agricultural easement protection programs.

Reserved wildlife: Includes areas designated and managed for wildlife habitat. May include game reserves, wildlife parks, or wildlife food, and cover.

Reserved forestry: Includes areas in state and local forest reserve programs and similar applications.

Reserved environmental: Includes permanent vegetative or structural soil and water conservation measures for the protection or enhancement of the environment for erosion and sediment control, water quality improvement, flood prevention, constructed wetlands, drainage, water filtration, watershed protection, ground water recharge, or other land and water uses reserved for environmental purposes.

Reserved research and military: Includes research and experiment stations, military installations, and associated facilities.

Table 10. Use of Land

Use of Land	Definition	Primary LCU associated with listed use
Food, feed, fiber, and seed	Includes production and harvest of crops for human consumption, animal feed, seed, and fiber other than wood (cotton). Cover crops grown to increase organic matter, or improve soils tilth, fallow conditions on land used for crop production, and hay in rotation are also included.	(000)Cropland and hayland
Livestock grazing	Includes post-harvest gleaning of cropland fields, and grazing pastures, rangeland, woodland, and marshlands.	(000) Cropland, hayland (200) Grassland - grazed (220) Scrub/shrub – grazed (340) Forest - grazed
Wood, harvested	Includes land showing evidence of partial-cut, clear-cut, or other timber management practices within the last 5 years.	(340) Forest
Hay	Includes permanent hay fields with either annual or perennial forage species, as well as hay mechanically harvested from pastureland and rangeland.	(000) Hayland (200)Grassland
Agricultural facilities	Includes farmstead and ranch headquarters, livestock facilities, feedlots, confinement operations (poultry, hogs), pens, corrals, grain bins, and other buildings and structures associated with agricultural production.	(402) Commercial feedlots (405) Miscellaneous agricultural lands (746) Agricultural related structures
Biomass	Includes land reserved for production of energy-producing herbaceous or woody crops.	(000) Cropland, hayland, CRP (200) Grassland (340) Forest

Commercial	Includes downtown areas, industrial shopping malls/centers, strip shopping/businesses, lodging facilities, resorts, marinas, manufacturing buildings or plants, warehouses, docks or port facilities, truck terminals, and tank farms.	(710) Eligible area
Aquaculture	The production of fish, shell fish, and aquatic plants in a controlled environment and includes fish farming, fish hatcheries, and aquaculture in rotation with farming and crawfish farming.	(000) Cropland (650) All other rural land
Institutions	Includes churches, cemeteries, schools, hospitals, museums, civic centers, and other public service facilities.	(710) Eligible area
Mineral Extraction	Includes surface strip mines, gravel pits, borrow areas, quarries, placer mines, extraction wells, injection wells, tailings, piles, salt mines, and oil wasteland.	All land
Agricultural business	Includes granaries, farmer cooperatives, farm machinery dealers, sale barns, and other agribusinesses. Landscape and other ornamental operations, such as sod farms, nurseries, and Christmas tree farms are included.	(000) Cropland (404) Christmas trees, agro forestry (710) Eligible area
Land based recreation	Includes such facilities as golf courses, stadiums, athletic fields, parks, zoos, forts, entertainment parks, campgrounds, and racetracks. Also includes land used for fish and game lands, upland and big game hunting, backpacking, climbing, hiking, biking, and nature study.	All land
Concentrated development	Includes closely spaced urban and suburban houses, apartments, condominiums, and strip and cluster residential development in rural areas.	(710) Eligible area (745) Residence related structures and features
Rural estates	Includes rural residences that are 1.5 to 10 acres, are not part of an operating farm, and have no intensive agricultural enterprises. They may include small pastures for grazing and may have structures, such as garages or barns, with no special use buildings, such as poultry or hog houses or mink ranches.	(200) Grassland (745) Residence related structures and features

Undeveloped rural sites	Includes housing or other planned developments where the streets have been laid out. Some utilities may have been installed, but few if any structures have been constructed. The land appears idle with no management for livestock grazing, or harvesting of wood products or cultivated crops.	(200) Grassland (220) Scrub/shrub (340) Forest (652) Not vegetated construction site (745) Residence related structures and features
Agricultural waste	Includes animal waste lagoons, settling ponds, poultry disposal pits, and other waste storage or treatment facilities associated with agricultural operations.	(402) Commercial feedlots (746) Agricultural related structures and features
Nonagricultural waste	Includes waste collection and treatment sites and facilities, such as wastewater treatment ponds, recycling facilities, filtration facilities, nuclear and other hazardous waste sites, settling ponds, sewage treatment lagoons, and other waste handling systems not associated with agricultural operations.	(710) Eligible area
Reserved agriculture	Includes land in the Conservation Reserve Program (CRP), and land in other USDA set-aside programs, and long-term agricultural easement protection programs.	(000) Cropland, hayland and CRP (200) Grassland (220) Scrub Shrub
Reserved wildlife	Includes areas designated and managed for wildlife habitat. May include game reserves, wildlife parks, or wildlife food, and cover.	All lands
Reserved forestry	Includes areas in state and local forest reserve programs and similar applications.	(340) Forest
Reserved environmental	Includes permanent vegetative or structural soil and water conservation measures for the protection or enhancement of the environment for erosion and sediment control, water quality improvement, flood prevention, constructed wetlands, drainage, water filtration, watershed protection, ground water recharge, or other land and water uses reserved for environmental purposes.	(200) Grassland (220) Scrub Shrub (340) Forest (710) Eligible area (611- 652) Miscellaneous categories
Reserved research and military	Includes research and experiment stations, military installations, and associated facilities.	All land

Use of Land Protocol Window

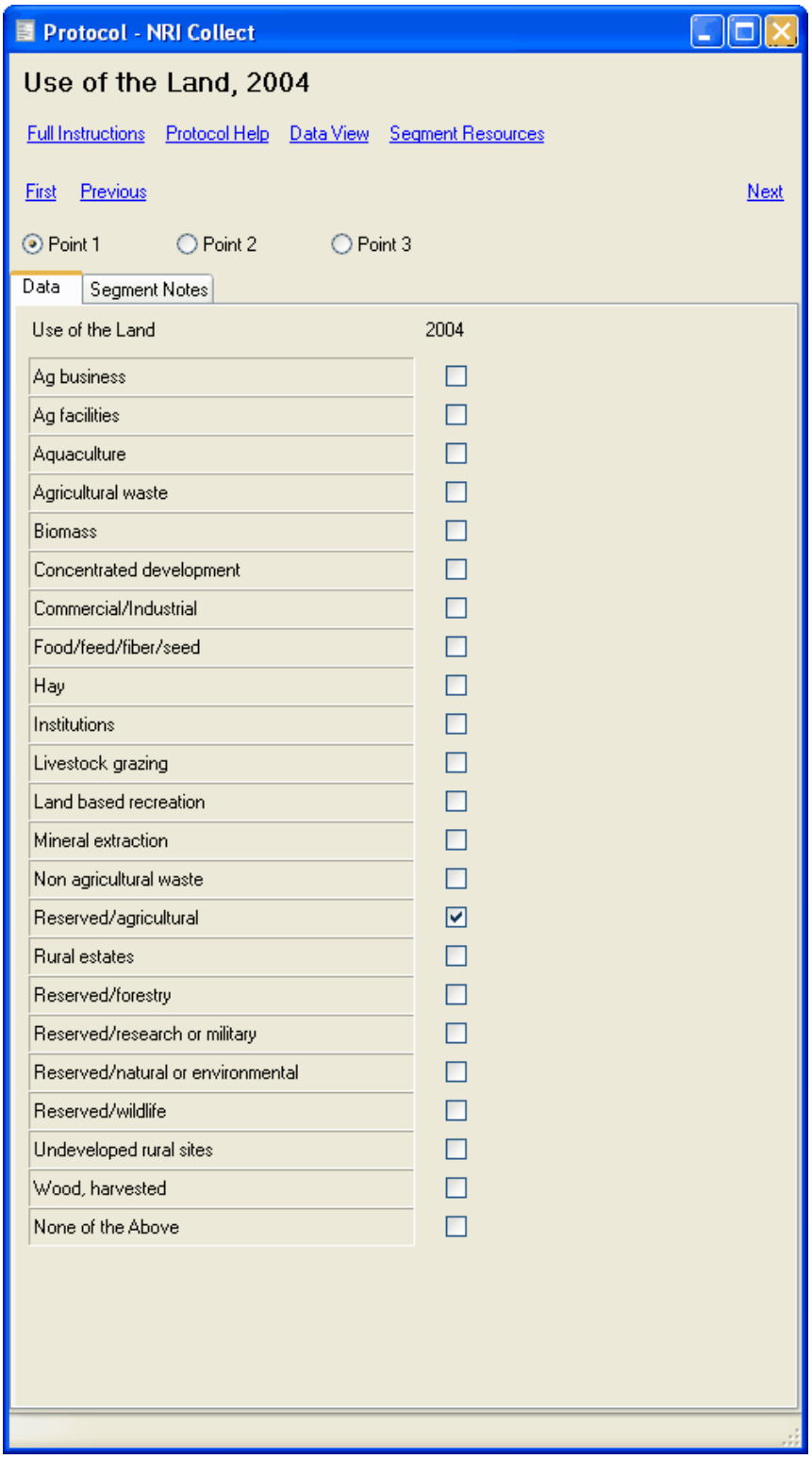


Figure 32: Use of Land Data Collection Window

Data Collection for Use of Land in the Base Year

1. View the base year high resolution image, identify the Conservation Treatment Unit (CTU) or field associated with the sample point for the base year, and verify the original base year determination of Use of Land.
   - Multiple uses of land may be identified for a single sample point.
2. Is your determination of Use of Land consistent with the original base year determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

For each new rotation point:

1. View the base year high resolution image and identify the Use of the Land for the Conservation Treatment Unit (CTU) or field associated with the sample point for the current year.
   - Multiple uses of land may be identified for a single sample point.
2. Enter Use of Land information for the base year.
   - Check the box for all uses identified for the current year.
   - If none of the choices listed for Use of the Land is appropriate, check the box next to "None of the above".

Go to Data Collection for Conservation Practices in the Base Year

Verify/Edit Data for Use of Land in a Revision Year

For each point:

1. View the revision year high resolution image, identify the Conservation Treatment Unit (CTU) or field where the sample point falls for the base year, and verify the original revision year determination of Use of Land for the CTU or field associated with the sample point.
   - Multiple uses of land may be identified for a single sample point.
2. Is your determination of Use of Land consistent with the original revision year determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

Go to Verify/Edit Data for Conservation Practices in a Revision Year

Data Collection for Change in Use of Land

For each point:

1. View the revision year high resolution image, identify the Conservation Treatment Unit (CTU) or field where the sample point falls for the base year, and verify the revision year determination of Use of Land for the CTU or field associated with the sample point.
   - Multiple uses of land may be identified for a single sample point.
2. Is your determination of Use of Land consistent with the revision year determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:

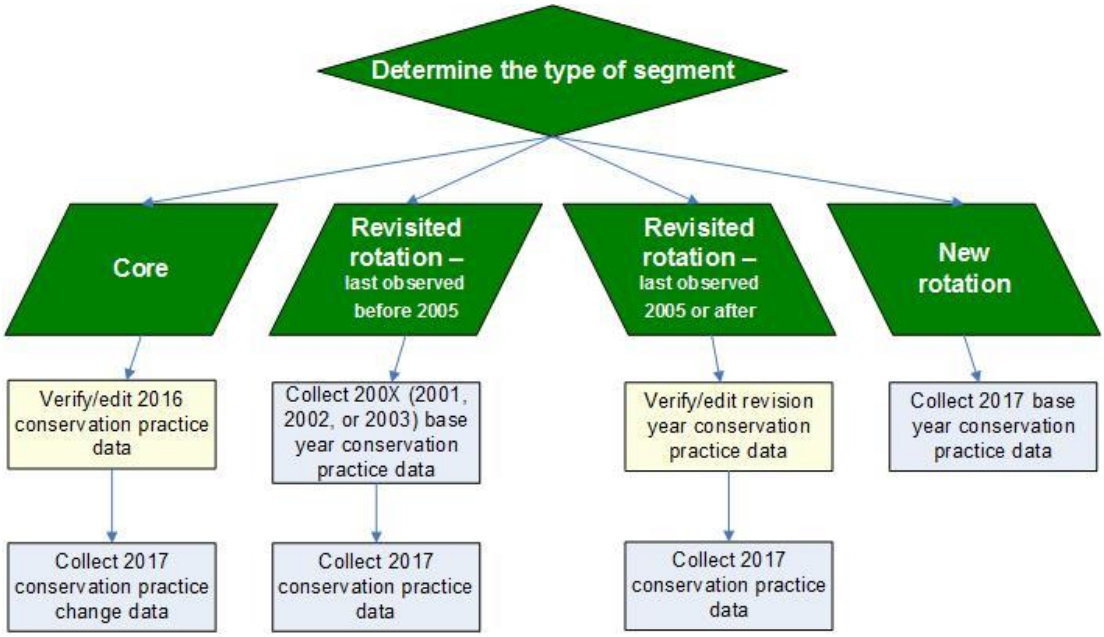
- Seek guidance following RSL standard procedure.

3. View the current year high resolution image and identify the Use of the Land for the CTU associated with the sample point for the current year.
   - Multiple uses of land may be identified for a single sample point.
4. Enter Use of Land information for the current year.
   - Check the box for all uses identified for the current year.
   - If none of the choices listed for Use of the Land is appropriate, check the box next to "None of the above".

Go to Data Collection for Change in Conservation Practices

3.4.5 Conservation Practices

View the diagram below to see the order of operation for each segment type and year.



Definitions: Conservation Practices

Conservation practice. A specific treatment, such as a structural or vegetative measure, or management technique commonly used to meet specific needs in planning and implementing conservation for which standards and specifications have been developed. Conservation practices are in the Natural Resources Conservation Service's Field Office Technical Guide, Section IV, which is based on the National Handbook of Conservation Practices [NPPH-98]. The practices recorded for NRI have been applied to the area of land in which the NRI point falls or the portion of the field that would be used in conservation planning (conservation treatment unit). The point need not fall on a specific practice. [NRI-97]
Each state determines which national practice standards will be adapted for use in their state and issues them as state conservation practice standards in Section IV of the Field Office Technical Guide. The state adds technical details and minimum standards for practice application. This guide should be referenced for state-specific practice information. Practices reported as applied for the point must meet the minimum standards established in the published state practice standards.

Conservation Treatment Unit (CTU). A field, group of fields, or other land parcels of the same land use and having similar treatment needs and planned management. A CTU has definite boundaries, such as fence, drainage, vegetation, topography, or soil lines. [NRI_05]

Conservation Practice Descriptions

The National Handbook of Conservation Practices provides both definitions and pictures of national conservation practices: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/cp/ncps/.

Table 11. Conservation Practice[1] Data Collected in NRI_Collect through Photo Interpretation

Code #	Conservation Practice	Practice Description
311	Alley Cropping	Trees or shrubs planted in a set or series of single or multiple rows with agronomic, horticultural crops, or forages cultivated in the alleys between the rows of woody plants.
310	Bedding	Plowing, blading, or otherwise elevating the surface of flat land into a series of broad, low ridges separated by shallow, parallel channels.
589C	Cross Wind Trap Strips	Herbaceous cover resistant to wind erosion established in one or more strips across prevailing wind erosion direction.
362*	**Diversion**	**A channel constructed across the slope with a supporting ridge on the lower side.**
386	Field Border	Strip of permanent vegetation established at the edge or around the perimeter of a field.
393*	**Filter Strip**	**Strip or area of herbaceous vegetation situated between cropland, grazing land or disturbed land (including forest land) and environmentally sensitive areas.**
412	Grassed Waterway	Natural or constructed channel shaped or graded to required dimensions and established with suitable vegetation.
422	Hedgerow Planting	Establishing a living fence of shrubs or trees in, across, or around a field.
603	Herbaceous Wind Barriers	Herbaceous vegetation established in rows or narrow strips across the prevailing wind direction.
447	Irrigation System, Tailwater Recovery	A facility to collect, store, and transport irrigation tailwater for reuse in a farm irrigation distribution system.
468	Lined Waterway or Outlet	A waterway or outlet having an erosion-resistant lining of concrete, stone, or other permanent material. The lined section extends up the side slopes to a designed depth. The earth above the permanent lining may be vegetated or otherwise protected.
391	Riparian Forest Buffer	Area of trees and/or shrubs adjacent to and up gradient from water bodies.

[1] *Source: National Handbook of Conservation Practices* (https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/cp/ncps/)

585*	**Stripcropping, contour**	**Growing row crops, forages, small grains, or fallow in a systematic arrangement of equal width strips on or near the contour of the field slope.**
607	Surface Drainage, Field Ditch	A graded ditch for collecting excess water in a field.
612	Tree/Shrub Establishment	To establish woody plants by planting or seeding.
638	Water and Sediment Control Basin	An earth embankment or a combination ridge and channel generally constructed across the slope and minor watercourses.
380	Windbreak/Shelterbelt Establishment	Linear plantings of single or multiple rows of trees or shrubs established for environmental purposes.

***Conservation Practices that are collected in both NRI Collect and the Local Data Survey Instrument (LDSI).**

Table 12. Conservation Practice[2] Data Collected in the Local Data Survey Instrument (LDSI) and Displayed in NRI_Collect

Code #	Conservation practice	Practice description
332	Contour Buffer Strips	Narrow strips of permanent, herbaceous vegetative cover established across the slope and alternated down the slope with parallel, wider cropped strips.
330	Contour Farming	Tillage, planting, and other farming operations performed on or near the contour of the field slope.
331	Contour Orchard/ Other Fruit Area	Planting orchards, vineyards, or small fruits so that all cultural operations are done on the contour.
362*	**Diversion**	**A channel constructed across the slope with a supporting ridge on the lower side.**
393*	**Filter Strip**	**Strip or area of herbaceous vegetation situated between cropland, grazing land or disturbed land (including forest land) and environmentally sensitive areas.**
423	Hillside Ditch	A channel that has a supporting ridge on the lower side constructed across the slope at definite vertical intervals and gradient, with or without a vegetative barrier.
585*	**Stripcropping, contour**	**Growing row crops, forages, small grains, or fallow in a systematic arrangement of equal width strips on or near the contour of the field slope.**
600	Terrace	An earth embankment, a channel, or a combination ridge and channel constructed across the slope.
601	Vegetative Barrier	Permanent strips of stiff, dense vegetation along the general contour of slopes or across concentrated flow areas.

***Conservation Practices that are collected in both NRI Collect and the Local Data Survey Instrument (LDSI).**

[2] *Source: National Handbook of Conservation Practices* (https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/cp/ncps/)

Data Collection for Conservation Practices in the Base Year

1. View the base year high resolution image and identify the Conservation Treatment Unit (CTU) or field where the sample point falls for the base year to verify the original base year determination of Conservation Practices listed in Table 11 for the CTU or field associated with the sample point.
   - To be considered "applied", a conservation practice must meet the national standard definition and be maintained and functioning according to the intended purpose.

2. Is your determination of Conservation Practices listed in Table 11 consistent with the original base determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

For each new rotation point:

1. View the base year high resolution image and identify the Conservation Treatment Unit (CTU) or field where the sample point falls for the base year to identify any Conservation Practices listed in Table 11 for the CTU or field associated with the sample point.
   - To be considered “applied”, a conservation practice must meet the national standard definition and be maintained and functioning according to the intended purpose.

2. Record the correct conservation practices.

Go to Data Collection for Resource Concerns in the Base Year

Verify/Edit Data for Conservation Practices in a Revision Year

1. For each point: View the revision year high resolution image and identify the Conservation Treatment Unit (CTU) or field where the sample point falls for the base year to verify the original revision year determination of Conservation Practices listed in Table 11 for the CTU or field associated with the sample point.
   - To be considered "applied", a conservation practice must meet the national standard definition and be maintained and functioning according to the intended purpose.

2. Is your determination of Conservation Practices listed in Table 11 consistent with the original revision year determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

3. View the revision year high resolution image and identify the Conservation Treatment Unit (CTU) or field where the sample point falls for the revision year to verify the local field office determination of Conservation Practices listed in Table 12 for the CTU or field associated with the sample point.

- To be considered “applied”, a conservation practice must meet the national standard definition and be maintained and functioning according to the intended purpose.

4. Is your determination of Conservation Practices listed in Table 12 consistent with the local field office determination?
   - If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.

Go to Verify/Edit Data for Resource Concerns in a Revision Year

Conservation Practices Protocol Window

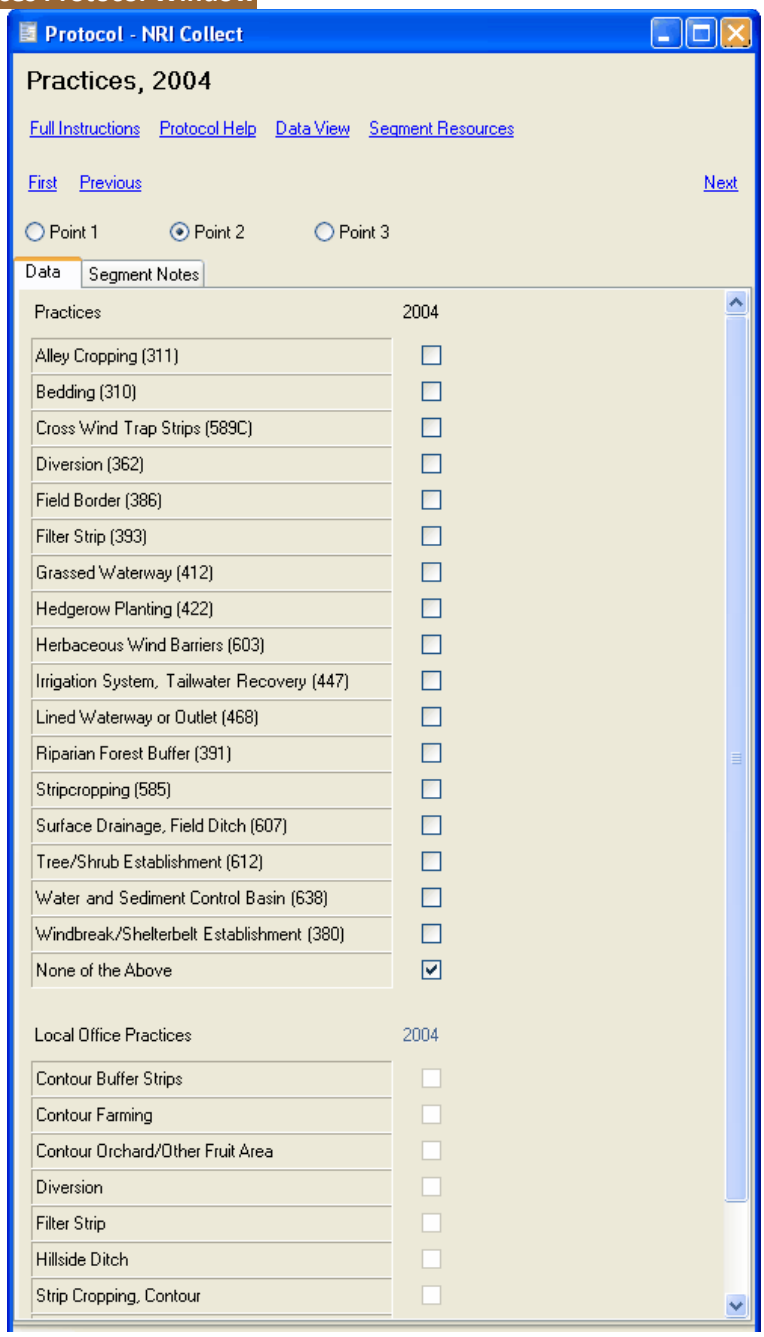


Figure 33: Conservation Practices Data Collection Window

Data Collection for Change in Conservation Practices

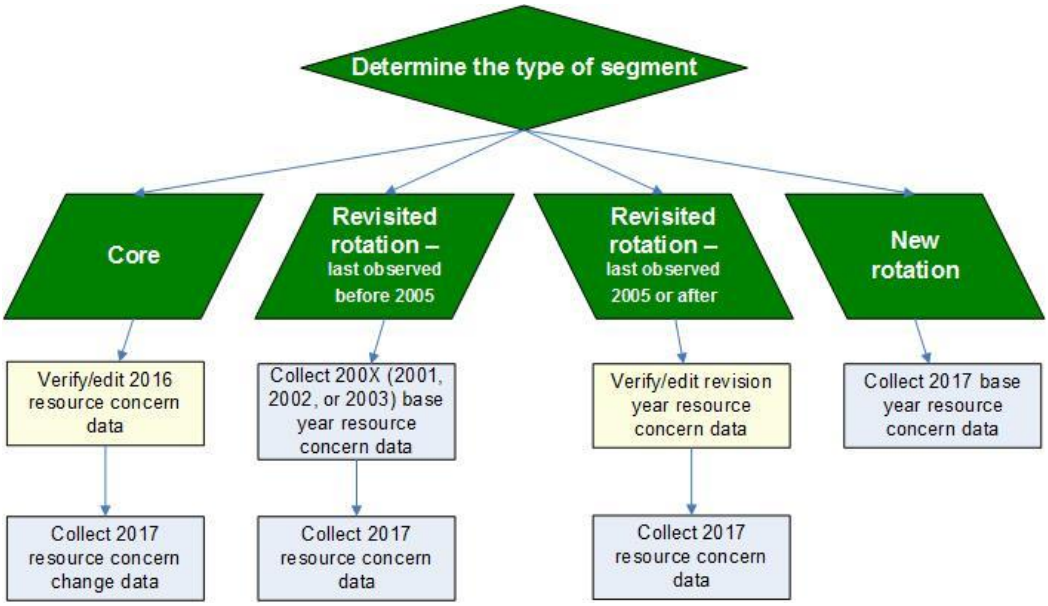
For each point:

1. View the revision year high resolution image and identify the CTU or the area considered for conservation planning where the sample point falls for the revision year to verify the selections for the Conservation Practices listed in Table 11.
2. Do you agree with the selected conservation practices for the revision year?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.
3. View the current year high resolution image and identify the Conservation Practices listed in Table 11 for the CTU associated with the sample point for the current year.
   - The area of consideration (CTU) for monitoring practice application over NRI surveys should generally not change unless there has been obvious change in ownership, land cover/use, or field arrangement.
4. Enter the Conservation Practices listed in Table 11 for the current year.
   - Check the box for all conservation practices identified for the current year.
   - If none of the choices listed for conservation practices is appropriate, check the box next to "None of the above".

Go to Data Collection for Change in Resource Concerns

3.4.6 Resource Concerns

View the diagram below to see the order of operation for each segment type and year.



Definitions: Resource Concerns

Resource concern. An identified conservation problem used to set quality criteria and treatment needs for a resource management system. NRCS has historically divided major resource concerns into the general resource categories of Soil, Water, Air, Plant and Animal (SWAPA). [NRI-2000]

Physical feature. A landscape or vegetation characteristic that can be detected through remote sensing/photo interpretation and characterized by consistent photo features that indicates a potential for a particular resource concern. [RS&II]

Photo feature characteristic. Several important fundamental characteristics are used for identification of features within a photograph. [RS&II] They include the following:

***Size*—**Object size should be considered in the context of the photo scale.
***Shape*—**Refers to the general form, configuration, or outline of individual objects.
***Texture*—**Frequency of tonal change on the photographic image.
Tone (or hue)—Refers to the relative brightness or color of objects on photographs.
Pattern—Relates to the spatial arrangement of objects.
Site association—Refers to the occurrence of certain feature
Shadows—Important to interpreters in two opposing respects:

- The shape or outline of a shadow affords an impression of the profile view of objects, which aids interpretation.
- Objects within shadows reflect little light and are difficult to discern on photographs, which hinders interpretations in relation to others.

Conservation Treatment Unit (CTU). A field, group of fields, or other land parcels of the same land use and having similar treatment needs and planned management. A CTU has definite boundaries, such as fence, drainage, vegetation, topography, or soil lines. [NRI_05]

Table 13. Resource Concerns Table - Potential resource concerns classified by Soil, Water, Air, Plants, and Animals (SWAPA) categories

	Photo features characteristics							
	Size	Shape	Texture	Tone Color	Pattern	Site Assoc.	Identifiable physical feature[2]	NRI Land Cover/Use
Soil								
Sheet and rill erosion		X	X	X		X	Deposition @ toe slopes parallel rills [3, 4]	Cropland, Hayland, CRP, Grassland, Scrub-shrub
Wind		X		X	X		Blowouts classic dunes leeward deposition buried crops	Cropland, Hayland, CRP, Grassland, Scrub-shrub

Concentrated flow (ephemeral gullies)				X	X		Deposition in exposed drains lack of crop growth in drains	Cropland, Hayland, CRP, Grassland, Scrub-shrub
Classic gullies	X	X		X	X		Dendritic patterns shadow with depth little vegetation	Grassland, Scrub-shrub, CRP, Forest land
Streambank		X		X		X	Bare soil soil material in waterways disturbed vegetation [5]	Grassland, Scrub-shrub, Forest land
Irrigation induced				X	X	X	Deposition @ end of irrigated field sediment high reflectance	Cropland, Hayland, CRP, Grassland, Scrub-shrub
Contaminants, chemical				X		X	Drilling sites farm washing facilities bare spots	Cropland, Hayland, CRP, Grassland, Scrub-shrub, Forest land
Onsite damage			X	X	X		Buried crops sediment in structures/ditches [3]	Cropland, Hayland, CRP, Grassland, Scrub-shrub, Forest land
Water								
Seeps		X		X	X	X	White surface deposits chloritic crops weeds, kochia, other tillage exclusions	Cropland, Hayland, CRP, Grassland, Scrub-shrub
Ponding/flooding			X	X	X	X	Drowned crops standing water debris piles sediment vegetation change tillage exclusions	Cropland, Hayland, CRP, Grassland, Scrub-shrub
Excess subsurface water				X	X	X	Tillage exclusions green patches yellowing crops	Cropland, Hayland, CRP, Grassland, Scrub-shrub
Inadequate outlets						X	Standing water drowned crop eroded banks headcuts	Cropland, Hayland, CRP, Grassland, Scrub-shrub

Water management, irrigated				X	X	X	Stressed crops drowned crops field pattern changes	Cropland, Hayland, CRP, Grassland, Scrub-shrub
Restricted capacity, lakes/streams					X	X	Turbidity silt deltas washouts	Water
Surface contaminants, nutrients & organics			X	X			Algal blooms (color) yellow/green surface water	Water
Contaminants, turbidity				X	X	X	Turbidity brown surface water upland erosion on cropland	Water
Surface contaminants, salinity				X	X	X	White crusts along waterways salinized drains	Cropland, Hayland, CRP, Grassland, Scrub-shrub
Plants								
Adapted to the site			X		X	X	Failed planting gaps - orchards-gaps - tree plantations [4]	Cropland, Hayland, CRP, Grassland, Scrub-shrub, Forest land
Health and vigor			X	X	X		Dead (brown color) yellowing vegetation weed monocultures	Cropland, Hayland, CRP, Grassland, Scrub-shrub, Forest land
Plant damage by wind			X	X	X		Blowouts (via wind vector), linear patterns, deposition	Cropland, Hayland, CRP, Grassland, Scrub-shrub, Forest land

1/ Dominant Feature characteristics
2/ Assumes use of natural color, high resolution aerial photography taken during active crop growth
3/ Ancillary data may be required to describe/support physical feature identification
4/ Timing of photography critical
5/ Observed shadows may help describe feature height, stereoscopy recommended

Resource Concerns Protocol Window

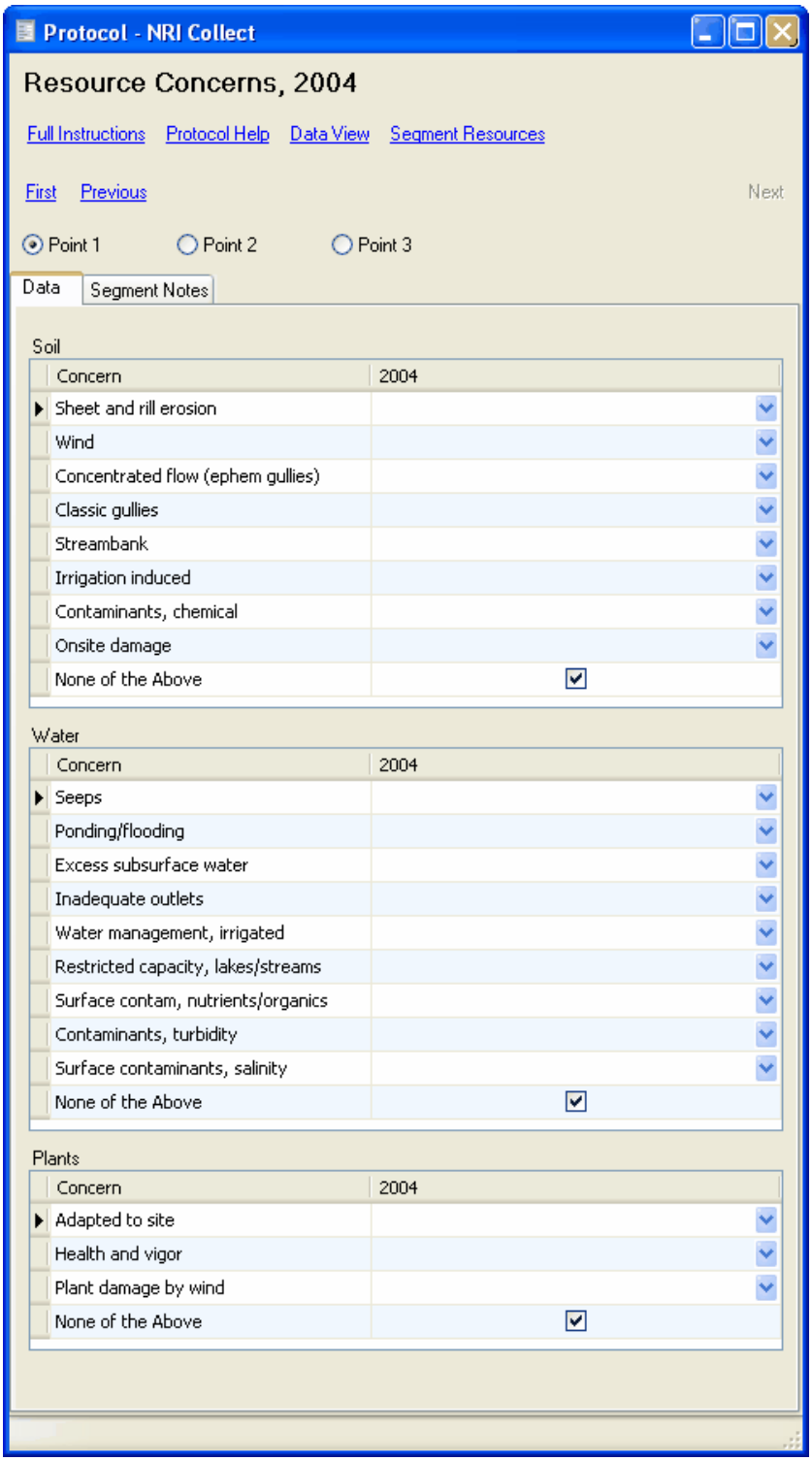


Figure 34: Resource Concerns Data Collection Window

Data Collection for Resource Concerns in the Base Year

For each revisited rotation point:

1. View the base year high resolution image, identify the Conservation Treatment Unit (CTU) or the field where the sample point falls for the base year, and verify the original base year determination of Resource Concerns for the CTU or field associated with the sample point.
    - Use photo feature characteristics (size, shape, texture, tone, pattern, shadows, and site association) to identify physical features.
    - Review the list of Resource Concerns organized by NRI broad cover types and Soil, Water, Air, Plants, and Animals (SWAPA) categories. Physical features (i.e., parallel rills, blowouts, deposition in exposed drains) indicating the resource concern are also listed in this table.
    - If multiple sample points occur within the same field or treatment unit, resource concern information must be entered for each sample point
2. Is your determination of Resource Concerns consistent with the original base year determination?

    If not, this becomes a non-standard case.
    - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
    - Seek guidance following RSL standard procedure.

For each new rotation point:

1. View the base year high resolution image, identify the Conservation Treatment Unit (CTU) or the field where the sample point falls for the base year, and determine the Resource Concerns for the CTU or field associated with the sample point.
    - Use photo feature characteristics (size, shape, texture, tone, pattern, shadows, and site association) to identify physical features.
    - Review the list of Resource Concerns organized by NRI broad cover types and Soil, Water, Air, Plants, and Animals (SWAPA) categories. Physical features (i.e., parallel rills, blowouts, deposition in exposed drains) indicating the resource concern are also listed in this table.
    - If multiple sample points occur within the same field or treatment unit, resource concern information must be entered for each sample point
2. Select the Resource Concerns for the CTU or field.
3.

Go to Data Collection for Change in Land Cover/Use

Verify/Edit Data for Resource Concerns in a Revision Year

For each point:

1. View the revision year high resolution image, identify the Conservation Treatment Unit (CTU) or the field where the sample point falls for the revision year, and verify the original revision year determination of Resource Concerns for the CTU or field associated with the sample point.
    - Use photo feature characteristics (size, shape, texture, tone, pattern, shadows, and site association) to identify physical features.
    - Review the list of Resource Concerns organized by NRI broad cover types and Soil, Water, Air, Plants, and Animals (SWAPA) categories. Physical features (i.e., parallel rills,

blowouts, deposition in exposed drains) indicating the resource concern are also listed in this table.
- If multiple sample points occur within the same field or treatment unit, resource concern information must be entered for each sample point

2. Is your determination of Resource Concerns consistent with the original revision year determination?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
     Seek guidance following RSL standard procedure.

Data Collection for Change in Resource Concerns

For each point:

1. View the revision year high resolution image, identify the CTU or the area considered for conservation planning where the sample point falls for the revision year, and verify the selections for resource concerns.
2. Do you agree with the selected resource concerns for the revision year?
   If not, this becomes a non-standard case.
   - Correct the problem and describe the resolution in the segment notes or, if unsure about the correct solution:
   - Seek guidance following RSL standard procedure.
3. View the current year high resolution image and identify the resource concerns for the CTU associated with the sample point for the current year.
   - Use photo feature characteristics (size, shape, texture, tone, pattern, shadows, and site association) to identify physical features.
   - Review the list of resource concerns organized by NRI broad cover types and Soil, Water, Air, Plants, and Animals (SWAPA) categories. Physical features (i.e., parallel rills, blowouts, deposition in exposed drains) indicating the resource concern are also listed in this table.
   - If multiple sample points occur within the same field or treatment unit, resource concerns information must be entered for each sample point
4. Enter resource concerns information for the current year.
   - Check the box for all resource concerns identified for the current year.
   - If none of the choices listed for resource concerns is appropriate, check the box next to "None of the above".

3.4.7 Integration

Verify LCU from Local Data -Integration

Local data are reviewed for Land Cover/Use, Use of Land, and Conservation Practices.

Note: During the review process, view high resolution images whenever you have difficulty verifying point data through photo interpretation.

For each core segment point:

1. Verify the LCU determination at the point for the corresponding revision year.
2. For cropland, also review crop type looking for obvious errors (i.e., potatoes are recorded but image appears to be wheat stubble).
   a. Observe the date on the collection year image when reviewing crop type (e.g., wheat stubble on a February image would be indicative of a previous year's crop and not the current collection cycle)
3. Is each revision year determination of LCU and crop type consistent with that of local data?
   If not, this becomes a non-standard case.
   - Stop review for this point.
   - Notify the designated RSL contact.
4. Verify that the Use of Land agrees with the LCU (for example a field that came out of CRP should no longer claim reserved agriculture use of land).
5. Verify the LCU determination at the point for the corresponding change year.
6. For cropland, also review crop type looking for obvious errors (i.e., potatoes are recorded but image appears to be wheat stubble).
   a. Observe the date on the collection year image when reviewing crop type (e.g., wheat stubble on a February image would be indicative of a previous year's crop and not the current collection cycle)
7. Is each change year determination of LCU and crop type consistent with that of local data?
   If not, this becomes a non-standard case.
   - Stop review for this point.
   - Notify the designated RSL contact.
8. Verify that the Use of Land agrees with the LCU (for example a field that came out of CRP should no longer claim reserved agriculture use of land).

For each rotation segment point:

1. Verify the LCU determination at the point for the corresponding revision year.
2. For cropland, review crop type. Note where crop type is in obvious error.
   a. Note the date on the collection year image in verifying crop type (e.g., wheat stubble on a February image would be indicative of a previous year's crop and not the current collection cycle)
3. Is the base year determination of LCU consistent with that of local data?
   If not, this becomes a non-standard case.
   - Stop review for this point
   - Notify the designated RSL contact.
4. Verify that the Use of Land agrees with the LCU (for example a field that came out of CRP should no longer claim reserved agriculture use of land).
5. Verify the LCU determination at the point for the corresponding change year.

6. For cropland, review crop type (including second crop in double cropping situations). Note where crop type is in obvious error.
    a. Note the date on the collection year image in verifying crop type (including second crop in double cropping situations). For example, wheat stubble on a February image would be indicative of a previous year's crop and not the current collection cycle.
7. Is each change year determination of LCU consistent with that of local data?
    If not, this becomes a non-standard case.
    - Stop review for this point.
    - Notify the designated RSL contact.
8. Verify that the Use of Land agrees with the LCU (for example a field that came out of CRP should no longer claim reserved agriculture use of land).

Go to Verify Conservation Practices from Local Data

Verify Conservation Practices from Local Data - Integration

Local data are reviewed for Land Cover/Use and Conservation Practices.

Note: During the review process, view high resolution images whenever you have difficulty verifying point data through photo interpretation.

1. Verify the corresponding local field office determination of Conservation Practices listed in Table 12 for the CTU or field associated with the sample point. Only review the three practices (filter strips, diversions, and strip cropping) that are collected in both NRI Collect and the Local Data Survey Instrument.
    - To be considered "applied", a conservation practice must meet the national standard definition and be maintained and functioning according to the intended purpose.
2. Is your base year determination of Conservation Practices listed in Table 12 consistent with that of local data?
    If not, this becomes a non-standard case.
    - Stop review for this point.
    - Notify the designated RSL contact.
    - Describe the resolution in the segment notes
3. Verify the corresponding local field office determination of Conservation Practices listed in Table 12 for the CTU or field associated with the sample point.
    - To be considered "applied", a conservation practice must meet the national standard definition and be maintained and functioning according to the intended purpose.
4. Is your change year determination of Conservation Practices listed in Table 12 consistent with that of local data?
    If not, this becomes a non-standard case.
    - Stop review for this point.
    - Notify the designated RSL contact.
    - Describe the resolution in the segment notes