

## **Part 613 –Developing Cost Data for Conservation Planning**

### **Subpart A – Introduction**

#### **613.0 Purpose**

A. The purpose of this handbook is to provide policy guidance to NRCS economists and other supporting NRCS personnel in developing cost data for conservation planning. These cost-related data products are to be used in carrying out NRCS conservation planning activities. Also, it provides policy on updating and maintaining cost data.

B. The instructions contained in this section are to be used in conjunction with national policy as contained in other sections of the general manual (GM) and additional handbooks, as applicable.

#### **613.1 Scope**

This handbook addresses the methodology for documenting the costs of conservation practices and activities useful in all conservation planning activities and technical assistance programs. Methodology for documenting the costs of conservation practices and activities for Farm Bill (financial assistance) Programs payment schedules can be found in the Payment Schedule Handbook.

#### **613.2 Cost Data for Conservation Planning Versus Financial Assistance Programs**

Cost data are important for making informed resource management and funding decisions. Cost data are reviewed annually and updated when needed by NRCS economists and field planners, and used by land owners to make conservation practice and activity decisions. Cost data used to support financial assistance programs and payment schedules may not be the same cost data developed for conservation planning. Conservation planning cost data is developed locally for site-specific analysis and decisionmaking, while cost data for financial assistance programs is often developed on a broader or even national scale. However, planning cost data may be used to “ground truth” financial assistance program cost data and improve program administration.

#### **613.3 Cost Data Worksheet Format**

A. Cost data will be documented in spreadsheet-based worksheets as displayed in figure 613-A1. Each worksheet will contain standard data categories and equations. The worksheet format and calculations presented in this handbook are approved agencywide, and worksheets must meet the requirements outlined in this handbook. The worksheet format and style may not be modified, with the exception of adding rows or columns as needed to adequately document cost.

B. The standard naming convention for workbooks is as follows: StateAbbreviationPracticeCode. The practice name may also be added to the file name if States choose to do so. The fiscal year can also be added. For example, practice code 590, nutrient management, from Montana would be named: MT590, MT590NutrientManagement, or MT590NutrientManagementFY14.

C. Only one file will be developed for each practice or activity. However, each file may have multiple worksheets (tabs) for each practice or activity scenario. The top of each worksheet must also contain the State name and the practice or activity code, name, and type for print identification purposes.

**Figure 613-A1: Approved Cost Data Worksheet Format**

**Cost Data**

<b>Typical Implementation Scenario</b>	
<i>Enter Scenario Description, including practice name and code.</i>	
<b>Geographic Area:</b>	
<b>Unit for Cost Estimate:</b>	
<b>Practice Life (Years):</b>	
<b>Discount Rate (%/Year):</b>	<b><u>Cost/Unit</u></b>
<b><u>Materials</u></b>	<i>Sum of Materials Cost</i>
<i>Enter cost description and data</i>	
<i>Data should include an itemized list of all cost items, units and unit costs.</i>	
<i>A. Enter as many rows and columns, within each cost category, as necessary to document costs.</i>	
<i>B. Cost Data developer can be as creative as necessary, working with technical specialists, to create a worksheet that best meets their needs.</i>	
<i>C. The worksheet should be developed as a "stand alone" tool for planners and clients to input actual data and estimate site-specific practice/activity costs.</i>	
<i>D. Cost data may come from receipts, published cost data or predictive models.</i>	
<b>Data Source:</b> <i>Identify where the data came from (vendor, location, date). May be kept in separate tab. Must be removed before sharing with the public.</i>	
<b><u>Equipment/Installation</u></b>	<i>Sum of Equipment/Install Cost</i>
<i>Enter cost description and data</i>	
<b><u>Labor</u></b>	<i>Sum of Labor Cost</i>
<i>Enter cost description and data</i>	
<b><u>Mobilization</u></b>	<i>Sum of Mobilization Cost</i>
<i>Enter cost description and data</i>	
<b><u>Operation &amp; Maintenance (Annual)</u></b>	<i>Sum of O&amp;M Cost</i>
<i>Enter cost description and data</i>	
<b><u>Acquisition of Technical Knowledge</u></b>	<i>Sum of Tech Knowledge Cost</i>
<i>Enter cost description and data</i>	
<b><u>Forgone Income (Annual)</u></b>	<i>Sum of Forgone Income Cost</i>
<i>Enter cost description and data</i>	
<b><u>Risk</u></b>	<i>Sum of Risk Cost</i>
<i>Enter cost description and data</i>	
<b><u>Administration &amp; Permit Costs</u></b>	<i><u>Sum of Admin/Permit Cost</u></i>
<i>Enter cost description and data</i>	
<b>Total Cost Estimate:</b>	<b><i>Sum of all 9-Cost Categories</i></b>
<b>Commonly associated or facilitating practices:</b> (list practices)	

## Part 613 – Developing Cost Data for Conservation Planning

### Subpart B – Cost Data

#### 613.10 Introduction

- A. The cost data worksheet contains information documenting the typical costs of implementing a practice or activity. This information describes a typical practice or activity scenario, which includes sufficient description of the resource concerns and setting so as to identify where the scenario applies the geographic area covered by the scenario, the scenario unit type, the life span of the practice or activity, the discount rate (if used for additional analysis), and the costs associated with implementing the practice or activity. States are encouraged to use a multidisciplinary approach with technical specialists to help develop scenarios and cost data.
- B. The cost data in the worksheet represents the actual costs to a land user to install or implement a practice or activity based on the typical scenario. The cost data are “program neutral,” and are not adjusted for costs that are approved for program payments or to encourage participation in financial assistance programs.
- C. The total cost in the worksheet does not represent the total costs of a practice or activity over its life; it represents the total cost to install the practice or activity and the cost to operate and maintain the practice or activity for the first year. In actuality, some costs occur only one time and other costs can occur over several years of the practice life. Only the first year of operation and maintenance, foregone income, and risk will be included in the total implementation cost.
- D. Total Implementation Cost = (Materials + Equipment/Installation + Mobilization + Acquisition of Technical Knowledge + Administration/Permit) + (First year of: Operation/Maintenance + Foregone Income + Risk).

#### 613.11 Cost Data

##### A. Typical Implementation Scenario

Each State will develop cost data for a typical scenario. The typical scenario describes the most commonly used inputs and costs associated with a practice or activity installation in a typical setting for a geographic area. The typical scenario is the basis for cost data development. More than one scenario may be described for a practice or activity to reflect different conditions such as size, alternative materials, significant equipment or labor costs that exist within the geographic area. It is recommended that States limit the number of scenarios for a particular practice or activity to reduce workload, including only the most commonly applied scenarios and scenarios the agency is promoting. A scenario must have sufficient information about where the treatment is applicable. This is especially important to distinguish between multiple practice activities. The scenario must include the following:

- (i) Brief description of the location and site setting
- (ii) Typical installation size (number of acres, sq. ft., cu ft., lin. ft., etc.)
- (iii) Broadly identified resource concerns to be addressed
- (iv) Commonly associated or facilitating practices

##### B. Geographic Area

The geographic area is the area covered by the scenario. The geographic area may be statewide if there are no compelling geographic cost differences.

C. Unit for Cost Estimate

The unit for cost estimate is used for a specified conservation practice or activity scenario. Different scenarios within the same practice or activity may have different units. Units are not required to be the same as the national practice standard units and may vary from payment units and from reporting units. Units should be the most logical to achieve the practice purpose and in the simplest unit for cost estimating. Examples include acres, animal units, feet, number, or cubic yards.

D. Practice Life (Years)

A practice's or activity's "useful" life is based on how long the materials or activity is expected to last or when they are expected to be replaced by newer technology.

E. Discount Rate (Percent/Year)

Rate of return is used to evaluate the benefits and costs over time of conservation practices or activities. The discount rate is the rate by which monetary benefits and costs that accrue in the future are adjusted so that they can be compared with current values.

F. Cost Data Categories

- (1) Cost data are grouped into nine categories. For each practice or activity, the typical cost of implementation will be documented. For cost data that cannot be itemized or do not clearly fall into one of the defined categories, the most similar category will be used.
- (2) The cost data may be obtained from various data sources including contract receipts, contractors, vendors, agricultural suppliers, conservation partners, external cost databases, Internet data sources, published catalogs, agricultural statistics, cost estimating models or tools, contract payment records, discipline experts, and other reliable sources.
- (3) Cost data documentation should include the date, the source of information, and how the cost was determined. If there are no costs in a category, include a statement that there are no costs and place a \$0 in the unit cost column. Examples of the cost data categories are found in exhibit A-1.

- (4) The cost data categories are defined as follows:

(i) Materials

Materials are inputs used to make, develop, or implement a practice or activity. Examples of materials may include items such as sand, gravel, grass seed, soil amendments, plants, piping, and concrete.

(ii) Equipment

Equipment is defined as tools, machinery, or similar items needed to implement a practice or activity. Equipment may stay on site, be used annually, or only used during practice installation. The land user is not required to purchase equipment to implement a practice or activity. Equipment can be purchased, leased, custom hired, or bartered with a neighbor to perform work. Purchasing cost or equipment rental rate may be used to estimate the cost of equipment. The costs of the other methods may also be used. If equipment is used for an annual practice or activity, the purchase price of the equipment is amortized to estimate its yearly cost.

(iii) Labor

Labor is the time and wage rate for hiring individuals or self-labor needed to implement the practice or activity. Labor may be described in terms of cost per hour or as a fixed contract price for completion of a particular task. Labor cost is occasionally included in

materials or equipment cost. This does not include labor costs associated with operation or maintenance of a practice.

(iv) Mobilization

Mobilization is the cost of moving equipment, materials, and labor to and from the installed practice or activity site. It may also include site access costs such as a temporary road, bridge, or trail.

(v) Operation and Maintenance (O&M)

- Operation includes the administration, management and performance of nonmaintenance actions needed to keep the completed practice or activity safe and functioning as intended. Maintenance includes work to prevent deterioration of the practice or activity, repairing damage, or replacement of the practice or activity to its original condition if one or more components fail. This cost category includes work performed by the participant to keep the applied conservation practice or activity functioning for the intended purpose and life of the practice.
- O&M costs, as utilized in cost data are annual costs. O&M costs are assumed to be constant throughout the life of the practice or activity. In some cases, O&M is higher the first year (such as brush management and spot treatment of missed plants). In other cases, it is cost every several years (such as cleaning out a sediment basin every 3 years). And in some other cases, O&M may not be a significant cost until the last few years of the practice life (such as pumping plant). For the purposes of cost data, O&M is assumed to be a constant, annual cost.

(vi) Acquisition of Technical Knowledge

The cost category that includes cash expenditures to obtain direct technical assistance over and above what NRCS (or a similar agency) would typically provide. It is the cost to the land manager of acquiring technical knowledge, through personal study or educational course, to operate or manage a practice activity that is "new" to the land user. It may include time and other expenditures related to learning how to plan, oversee, and record new farm activities, or related to training on how to properly operate or maintain a practice or enhancement activity (practice or activity) that is "new" to the land user. It may also include the cost of hiring a private consultant or specialist to assist in implementing the practice.

(vii) Foregone Income

The cost category that includes the annual net income lost from a change in land use, or land taken out of production, or the opportunity cost of accepting less farm income in exchange for improved resource conditions due to the practice. Foregone income may be a one-time cost during the installation year, or it may be an annual cost occurring after the installation year, such as taking land out of production. More detailed guidance on foregone income is located in subpart D of this handbook and Tech Note 200-ECN-3, "Guiding Principles in Calculating Foregone Income for Conservation Planning," May 2015.

(viii) Risk

Risk is the probability of loss of income including the cost of uncertainty or the probability of financial loss associated with implementing a practice or activity. If a land user believes their risk is adequately accounted for when calculating the cost of a new practice or activity, they will be more inclined to adopt a new practice or activity.

(ix) Administration and Permit Costs

Administration includes the costs of completing paperwork, attending meetings, and regulatory management costs of implementing a practice or activity. Permit cost is the cost of obtaining all necessary legal documents to implement the practice or activity.

## 613.12 Additional Considerations for Developing Cost Data

### A. Contingency Costs

Contingency costs are often included in “on the ground” cost estimates. Contingency costs are defined as: “An amount added to cost estimate to allow for items, conditions, or events for which the occurrence or effect is uncertain and that experience shows will likely result in additional costs.” Contingency costs include planning and estimation errors and omissions, minor price fluctuations, inflation, minor design changes within the project, and variations in market and environmental conditions. However, because contingency costs are site specific, extremely variable, and a good faith effort was made to obtain and document the best, most-accurate cost data, they will not be included in cost data worksheet. The planner should recognize that contingency costs may exist when presenting the cost data to the client, but contingency costs are not included in the cost data.

### B. Supplementary Notes

As needed, additional blank lines may be added to document or other cost information or supplemental notes to clarify decisions or add explanation.

### C. Economies of Scale

The unit costs may vary depending on the total units purchased for a project or activity. If materials are purchased in bulk, the vendor may likely reduce the cost per unit. For example, 5,000 feet of pipe may cost \$5 per foot. But, if only 100 feet of pipe are purchased, pipe may cost \$8 per foot. The cost data developer must make an educated decision on the most common units purchased for a practice or activity and use the relevant per unit cost in the cost worksheet. Subject matter specialists and program managers may also need to be consulted to arrive at the most reasonable type of unit to associate with a practice for a typical scenario description.

### D. Guidance for Limited Use of Components

- (1) States must develop well-defined scenarios. However, for a very limited number of complex practices or activities, it may be helpful to use components to avoid having to create an excessive number of scenarios for a practice. When components are used, they must be described by a scenario and the component must meet the conservation practice standard. Use components only when it will reduce the number of scenarios.
- (2) Components may be developed considering the following:
  - (i) Relatively high cost items whose inclusion or exclusion will significantly alter the cost of implementing the practice.
  - (ii) Stand-alone items that can be added or taken away from a practice without affecting other costs for the practice.
  - (iii) Will be handled in the same manner as a typical scenario for a practice or activity.

### E. Multistate and Coordination Considerations

Cost data should be reasonably consistent across State lines. States should coordinate the development of cost data for practices and activities offered across State boundaries. Opportunities should be provided for public and stakeholder input for cost data development, including State Technical Committees, local work groups, and other conservation partners.

### F. Use of Amortization

Cost data may not be amortized, with the exception of items procured that last beyond the practice or activity life. For example, a residue management practice has a 1-year life, but requires the acquisition of a no-till drill that has a 10-year life. The no-till drill may be rented, custom-hired, or purchased. If the drill is purchased, the 10-year life of the drill may be amortized to estimate a 1-year cost that is included in the cost data.

### 613.13 Cost Data Source Documentation

A. Cost data sources must be referenced to facilitate updating cost data the next year and defend the cost estimates. At a minimum, the data references must include the data source, the location, and date. A data source is needed for each cost identified in the nine cost categories.

B. Data sources may include contract receipts, vendor estimates, agricultural supplier information, conservation partners estimates, Internet data sources, published catalogs, agricultural statistics, cost estimating models or tools, privately developed cost databases, contract payment records, and other reliable sources. The data location may include the business address, Web site, or phone number where the data provider can be contacted to update cost information in the preceding years. The date the cost data was collected is required documentation. Cost data documentation may include notes, scanned documents, or Web links.

C. There are three options for storing cost data source documentation.

- (1) Include the documentation directly in the cost data worksheet
- (2) Provide the documentation in a separate worksheet “tab” in the worksheet
- (3) Provide the documentation in a separate electronic file or hardcopy file

D. Care should be taken to select the appropriate documentation method to facilitate the removal of data references before posting data to the FOTG or sharing information with the public. Examples of cost data source references are found in subpart E, section 613.40.

### 613.14 Rounding

A. After the cost data has been developed, it may be desirable to round the cost to provide clarity and efficiency in planning. Rounding is optional and is done prior to uploading into the planning software. Rounding to the nearest base-ten even number will help to avoid odd numbers like \$250.03 or \$1.38. Examples of rounding are displayed in figure 613-B1.

B. Before rounding, consider the tradeoff between efficiency gains and the overall impact of accuracy. Practices that cost small dollar amounts per unit but that are typically implemented in very large quantities per year should be rounded with care—if they are rounded at all—to ensure accuracy. For example, \$0.385 for pipe fittings may not rounded to 40 cents, but may be rounded from \$385.50 to \$390 for 100 pipe fittings.

Figure 613-B1 Rounding Examples

Under \$5: Round to the nearest \$0.10
\$5-\$9.99: Round to nearest \$0.50
\$10-\$49.99: Round to nearest \$1.00
\$50-\$99.99: Round to nearest \$5.00
\$100-\$999.99: Round to nearest \$10.00
\$1,000 and up: Round to the nearest \$100

## **Part 613 – Developing Cost Data for Conservation Planning**

### **Subpart C – Maintenance of Cost Data**

#### **613.20 Introduction**

The purpose of this section is to provide States with guidance on the general process for the annual review and maintenance requirements of cost data. As mentioned in an earlier chapter, cost data will be reviewed and updated, as needed, annually and will be maintained at the State level. This chapter provides guidance on collecting, updating, and maintaining cost data, annual reviewing data, and other issues that must be addressed prior to the annual fiscal year upload of cost data.

#### **613.21 Cost Data Annual Plan of Work – Example**

A. This policy proposes certain activities annually to prepare cost data for the upcoming fiscal year. National policy, national conservation practice standards, State policy, and practice and activity costs are likely to influence the specific work that must be done each year to prepare for fiscal year update of cost data. State cost data developers must take into consideration these influences and incorporate appropriate changes into cost data.

B. Updates to cost data worksheets begin at the beginning of each fiscal year. See figure 613-C1 for an example of a cost data annual plan of work.

#### **613.22 Cost Data Quality Assurance**

States must develop a quality assurance plan for developing and compiling cost data. This plan must include a timeline for an annual review process, the items and issues that must be reviewed, and the review methodology. The plan must also identify personnel to participate in the review process and provide enough time for corrective actions to be carried out. Quality assurance plans may be modified or changed from fiscal year to fiscal year, depending on the previous year's findings. The general manual contains guidance on developing quality assurance plans.

- (1) **Cost Data Updates.**—Cost data collection must take place throughout the year. As data become available, planners and developers should document the data for use in developing upcoming fiscal year cost data.
- (2) **Review Methodology.**—All cost data being utilized in the State must be reviewed for appropriate scenario descriptions, data documentation, mathematical errors, and general acceptability. Suggested methodology for this review is to establish a multidiscipline review team to provide assurance that cost data meet handbook guidelines and program policy.
- (3) **Quality Control Checklist.**—Subpart E, section 613.41, contains a sample checklist that States may use to conduct quality assurance reviews. The checklist may also be used by developers as a guide for completing cost data worksheets.

#### **613.23 FOTG Cost Data**

A. Cost data will be included in each State's FOTG for each practice or activity as a cost data workbook. It will be filed in section I, under "Cost Data," and be made available to the public.

B. In the cost data worksheet, all personal identifiable information or references to private businesses, contractors, vendors, or other sensitive data references must be removed from the cost data. NRCS must also avoid any public endorsement or bias toward specific suppliers or trade names, and must refrain from publishing any data source or information that would imply endorsement.

**Figure 613-C1: Cost Data Collection Annual Plan of Work – Example**

<b>State</b>	<b>Fiscal Year</b>	
<b>Date</b>	<b>Activity</b>	<b>Persons Involved</b>
November	Request State Technical Advisory Committee input for next fiscal year.	State Conservationist (STC)
January	Obtain a list of new or updated practices from Conservation Practice Standards (CPS) for the upcoming fiscal year.	State resource conservationist and State engineer
February	Obtain a list of approved practices for the upcoming fiscal year.	State financial assistance (FA) program managers
February	Identify practices or activities needing to be developed (or eliminated)	State resource conservationist and State program managers
Feb-June	Develop or update practice or activity scenarios	State technical specialists
Jan-June	Develop or update practice or activity costs	State economist or State economic contact
	Collect cost receipts from field offices.	
	Contact vendors and contractors for updated information.	
	Obtain updated commercial cost data and software.	
	Query Internet for cost data.	
Feb-June	Organize and work with interdisciplinary teams to develop and update worksheets.	State economist or State economic contact, State resource conservationist, and State engineer
July	Work with adjoining States to ensure that cost data are reasonably consistent across State lines.	State economist, adjoining State economist or economic contact

Title 200 – National Resource Economics Handbook

September	Finalize and review cost data for utilization in the upcoming fiscal year.	State economist or State economic contact, State resource conservationist, and State engineer
November	Prepare and post cost data information to the FOTG	State program managers

## Part 613 – Developing Cost Data for Conservation Planning

### Subpart D – Glossary

Note: Additional terms defined in Part 610, Subpart G, “General Glossary”

#### 613.30 General Terms and Definitions

This glossary provides explanation for terms associated with the development and use of cost worksheets. Additional definitions and explanation of terms may be found in other agency policy manuals, handbooks, and documents found in the eDirectives System.

- (1) **Acquisition of Technical Knowledge (Cost Category).**—Cost category that includes cash expenditures to obtain direct technical assistance, over and above what NRCS (or similar agency) would typically provide. It is the cost to the land manager of acquiring technical knowledge, through personal study or educational course, to operate or manage a practice or enhancement activity that is "new" to the land user. Includes time and other expenditures related to learning how to plan, oversee, and record new farm activities, or related to training on how to operate or manage a practice or enhancement activity that is "new" to the land user. Also may include the cost of hiring a private consultant or specialist to assist in implementing the practice. See subpart B, section 613.11F(vi).
- (2) **Actual Cost Data.**—Data pertaining to the actual market cost of implementing a conservation practice or activity. This data can be obtained through a variety of means or sources, including completed contracts, vendor information, cost databases, and other cost estimating software or tools, conservation partners, discipline experts, and etc.
- (3) **Administration and Permit Costs (Cost Category).**—Cost category that includes the costs of completing paperwork and attending meetings, and the regulatory management costs of implementing a practice or activity. This cost category also includes the cost of obtaining all necessary permits. Permit cost is the cost of obtaining all necessary legal documents to implement the practice or activity. See subpart B, section 613.11F(ix).
- (4) **Amortize.**—To spread the cost of implementing a conservation practice or activity over the practice life for that practice or activity using an appropriate or approved amortization rate or discount rate.
- (5) **Amortization.**—Converting capital to periodic payments by determining the size of payment per time period needed to pay off a debt over a given time at a given interest rate.

$$r(1+r)^n / (1+r)^n - 1, \text{ where: } r = \text{interest rate and } n = \text{number of periods}$$

- (6) **Annual Cost.**—A practice or activity implementation cost that is incurred on an annual, recurring basis, usually over the period of the practice life. Examples include operation and maintenance (O&M) costs and some types of foregone income costs.
- (7) **Applicable Area.**—The geographic area to which the cost data applies.
- (8) **Average Annual Cost.**—The amortized installation costs of the practice, plus the annual costs for O&M and some types of foregone income costs.
- (9) **Component.**—A part, input, or activity necessary to implementing a conservation practice. See subpart B, section 613.12, for guidance on the use of components in cost data development.

- (10) **Conservation Practice.**—A specified treatment, such as a structural or land management measure, which is planned and applied according to NRCS standards and specifications.
- (11) **Cost.**—The amount of money and time expended and the opportunity costs incurred by a participant to implement a conservation practice or enhancement activity.
- (12) **Cost Categories.**—Designated subdivisions of the costs of implementing conservation practice and activities. The cost categories approved for use in developing cost data are materials, equipment, labor, mobilization, operation and maintenance, acquisition of technical knowledge, foregone income, risk, and administration and permit costs.
- (13) **Cost Data.**—A dataset containing cost estimates and supporting documentation for conservation practices and activities.
- (14) **Cost Data Worksheet.**—An economic database containing cost data for a single practice or activity type.
- (15) **Cost Estimate.**—An estimate of the costs of implementing and maintaining a conservation practice or activity. Cost estimates can apply to either actual costs for a specific producer project, or costs of a practice or activity type within a specific implementation scenario.
- (16) **Cost-Share Rate.**—The percentage of cost paid by the agency for the implementation of a practice or activity. Within the payment schedule process, this is called the payment percentage.
- (17) **Cost Variability.**—The degree to which the cost of implementing a conservation practice or activity varies, either across time, geographic boundaries, or between scenarios.
- (18) **Discount Rate (Percent/Year).**—Rate of return used to evaluate the benefits and costs over time of conservation practices. The discount rate is the rate by which benefits that accrues in some future time period must be adjusted so that they can be compared with values in the present. It is set by national policy found in Title 200, General Manual, Part 400, Subpart C, and in Office of Management and Budget (OMB) Circular A-94, or the farmer (decisionmaker) may provide the discount rate he or she wants to use.
- (19) **Economic Contact.**—An individual designated to fulfill the role of economist for the purposes of developing cost data within a given State. This individuals must have the skills to carryout collateral duties defined their position description.
- (20) **Enhancement Activity.**—Actions other than conservation practices that are included as a part of a conservation stewardship contract, such as a measure, incremental movement on a conservation index or scale, or an on-farm demonstration, pilot, or assessment.
- (21) **Equipment/Installation (Cost Category).**—Cost category that includes the cost of equipment (owned, rented, or hired) used to implement a practice or activity. See subpart B, section 613.11F(ii).
- (22) **Financial Assistance.**—Federal dollars paid to producers to support the implementation of a conservation practice or activity.
- (23) **Financial Assistance Program.**—NRCS programs such as Agricultural Management Assistance (AMA), Conservation Stewardship Program (CSP), Environmental Quality Incentives Program (EQIP), etc., that include financial assistance payments to producers as distinguished from programs that include technical assistance only, such as Conservation Technical Assistance (CTA).
- (24) **Foregone Income (Cost Category).**—Cost category that includes lost net income from a change in land use or land taken out of production, or the opportunity cost of accepting less farm income in exchange for improved resource conditions. Foregone

net income may be a one-time cost, such as deferred grazing (lost forage value) during range or pasture establishment. Foregone net income may also be an ongoing cost, such as an annual net loss from a conservation buffer. See subpart B, section 613.11F(vii).

- (25) **Geographic Area.**—The area covered by a cost data worksheet (statewide, watershed, county, other).
- (26) **Implementation.**—Carrying out a planned or contracted conservation practice or activity.
- (27) **Implementation Cost.**—Total Implementation Cost = (Materials + Equipment/Installation + Mobilization + Acquisition of Technical Knowledge + Administration/Permit) + (First year of: Operation/Maintenance + Foregone Income + Risk). Also known as "Total Cost" within the cost data development process.
- (28) **Installation.**—Commitment of real resources in the implementation of a conservation practice or enhancement activity. Installation commences when the first irreversible use of real resources occurs. For example, the purchase of supplies for installation of a pipeline does not constitute installation. When pipeline excavation commences, installation has begun. Installation is finished when a conservation practice has been completed and certified.
- (29) **Labor (Cost Category).**—Cost category that includes expenditures for the labor (own or hired) required to implement a practice or activity. Labor may, on occasion, be included in other cost categories for calculation purposes or when available cost data already include labor as an embedded cost within another cost (such as equipment/installation cost). See subpart B, section 613.11F(iii).
- (30) **Land Management Practice.**—See “Management Practice.”
- (31) **Lifespan.**—See “Practice Lifespan.”
- (32) **Management Practice.**—Conservation practices that primarily require site-specific management techniques and methods to conserve, protect from degradation, or improve soil, water, or related natural resources in the most cost-effective manner. Management practices include, but are not limited to, nutrient management, manure management, integrated pest management, strip-cropping, contour farming, grazing management, and wildlife habitat management. Management practices have a lifespan of 1 year.
- (33) **Materials (Cost Category).**—Cost category that includes inputs (typical materials) purchased to install or implement, operate, and maintain a practice or activity. See subpart B, section 613.11F(i).
- (34) **Mobilization (Cost Category).**—Cost category that includes direct cash expenditures required to move equipment and materials to and from the installed practice or activity site. May include access costs such as costs associated with a temporary road, bridge, or trail. See subpart B, section 613.11F(iv).
- (35) **One-Time Costs.**—Costs that are incurred only once in carrying out a conservation practice or activity.
- (36) **Operation and Maintenance (O&M)(Cost Category).**—Cost category that includes work performed by the participant to keep the applied conservation practice or activity functioning for the intended purpose for its practice life. Operation includes the administration, management, and performance of nonmaintenance actions needed to keep the completed practice or activity safe and functioning as intended. Maintenance includes work to prevent deterioration of the practice or activity, repairing damage, or replacement of the practice or activity to its original condition if one or more components fail. O&M is normally recorded as an annual cost, after some intermediate calculations. See subpart B, section 613.11F(v).

- (37) **Opportunity Cost.**—The value of the best alternative forgone in order to implement and maintain a conservation practice or activity. Includes both explicit and implicit costs. A cost incurred to purchase material inputs is an explicit opportunity cost. Foregone income, such as the net revenue from crops removed for the purpose of installing a conservation buffer, is an implicit opportunity cost.
- (38) **Payment Percentage.**—The percentage of the sum of all eligible cost categories to implement a conservation practice, activity, or enhancement within a typical implementation scenario that will be paid to a program participant.
- (39) **Payment Rate.**—The payment method used for all financial assistance payments (except payments for TSPs) for eligible practices or activities in contracts written beginning October 1, 2007. It is the sum of all eligible cost categories, multiplied by the approved program payment percentage, for a typical implementation scenario to implement a conservation practice or activity.
- (40) **Payment Schedule.**—A list of the payment rates for all approved practices or activities for a specific financial assistance program for a defined geographic area (used in agency planning and contracting software).
- (41) **Permitting.**—The process of obtaining approval or permission from any applicable official entities for carrying out a conservation practice. Usually associated with structural practices but may apply to nonstructural practices as well.
- (42) **Practice.**—A specified treatment, such as a structural or land management measure, which is planned and applied according to NRCS standards and specifications.
- (43) **Practice Code.**—The identifying number designated within the NRCS national practice standard database as being associated with a specific conservation practice and its practice name.
- (44) **Practice Life (Years).**—Practice life based on how long the materials or activity will last or when they are expected to be replaced by newer technology.
- (45) **Practice Name.**—The identifying name designated within the NRCS national practice standard database as being associated with a specific conservation practice and its practice code.
- (46) **Practice Standard.**—NRCS standards and specifications under which a conservation practice must be implemented in order to be certified. Certification of contracted conservation practices is required before the payment terms of a financial assistance contract are considered to have been fulfilled.
- (47) **Practice or Activity Type.**—A specified version of the application of a conservation practice or activity within a defined, typical implementation scenario. There may be several practice types associated with a single practice code or enhancement activity. For example, under Fence (382), practice types may include barbed wire, electric wire, woven wire, etc.
- (48) **Program Payment Percentage.**—The percent of eligible costs that the agency is willing to pay for implementing a conservation practice or activity. Equivalent to cost-share rate but applied during payment rate development. In contrast, cost-share rates were used in cost lists and applied during the contracting process.
- (49) **Reporting Unit.**—Unit of measure used for reporting conservation progress within NRCS's Progress Reporting System (PRS). These can vary from payment units.
- (50) **Risk (Cost Category).**—Cost category that includes uncertain costs. This can be expressed in terms of the probability of financial loss associated with implementing a conservation practice or activity and the value of the loss should it occur. For example, the probability that there will be a financial loss due to a decline in crop or livestock yields or that there will be an unforeseen increase in production or management expenses. See subpart B, section 613.11F(viii).

- (51) **Section I Cost List.**—A cost list maintained in section I of the eFOTG to NRCS personnel and to the public for purposes of conservation planning activities. This cost consists of program-neutral cost data. Section I cost lists are not equivalent to a payment schedule. The cost data is not to be used in lieu of formal cost estimation when planning complex structural conservation practices.
- (52) **Structural Practice.**—A conservation practice that primarily involves the establishment, construction, or installation of a site-specific measure to conserve, protect from degradation, or improve soil, water, or related natural resources in the most cost-effective manner. Examples include, but are not limited to, facilities installed to handle animal waste, terraces, grassed waterways, livestock and wildlife water developments, capping of abandoned wells, etc.
- (53) **Total Cost.**—The sum of the nine cost categories for a single practice or activity type. The total practice cost constitutes the NRCS estimate of how much it will cost a producer to implement a conservation practice or activity. Also known as "Implementation Cost."  $\text{Total Implementation Cost} = (\text{Materials} + \text{Equipment/Installation} + \text{Mobilization} + \text{Acquisition of Technical Knowledge} + \text{Administration/Permit}) + (\text{First year of: Operation/Maintenance} + \text{Foregone Income} + \text{Risk})$ .
- (54) **Typical Implementation Scenario.**—A scenario that describes the resource setting within which a practice or activity type is typically implemented. A typical implementation scenario describes the most common application of the practice, including how the practice is implemented and typical quantities and units, materials and other inputs used, and methods of implementation, on the most common landscape setting. One or more typical implementation scenarios may be developed for each practice or activity, based on the practice complexity, to account for variability in implementation and variations in economies of scale (i.e., large, medium, small animal waste storage structure, or high, moderate, low levels of pest management). Each separate implementation scenario for a practice or activity will correspond to a "practice or activity type."
- (55) **Unit Cost.**—The cost of implementing a single unit of a specified practice or activity type.
- (56) **Unit for Cost Estimate.**—The unit type used for preparing a cost estimate for a practice or activity for a typical scenario (not required to be the same unit as the national "conservation practice standard" units). Different scenarios within the same practice or activity may have different units. The unit may vary from payment units and from reporting units.
- (57) **Unit Type.**—The unit of cost or payment used for a specified conservation practice or activity. Examples include acres (AC), animal units (AU), feet (FT), number (NO), etc.
- (58) **Vegetative Practice.**—A conservation practice that primarily involves the establishment or planting of a site-specific vegetative measure to conserve, protect from degradation, or improve soil, water, or related natural resources in the most cost-effective manner. Examples include, but are not limited to, vegetative buffer strips, plantings for the protection of vulnerable or heavily impacted areas, revegetation of riparian zones, etc. Vegetative practices have a lifespan of more than 1 year.

## Part 613 – Developing Cost Data for Conservation Planning

### Subpart E – Exhibits

#### 613.40 Cost Data and Scenario Examples

##### A. Cost Data

###### Materials

###### Critical Area Planting:

###### Perennial Grass/Clover Seed Mix:

Pounds per Acre: 18

Cost per Pound: \$6.00

(White Clover, Annual Rye, Oats)

Fertilizer (placed with seed): \$30.00 16-16-16-0, 100lbs/Ac, \$.30/Lb. Total Cost:  
\$138.00/Acre

###### Nutrient Management:

Soil Test \$10.00/Acre

Tissue Testing \$5.00/Acre

Nutrient Budget \$2.00/Acre

Record Keeping \$3.00/Acre

Precision Agricultural \$10.00/Acre

Tillage of Green Manure \$0.50/Acre

Manure Nutrient Testing \$0.25/Acre

Use of Overlap Reduction Technologies \$5.00/Acre

###### Dike

Dike Length (Ft): 500

Unit: CuYd

Units/Ln Ft Dike: 2.75

Total Units: 1,375

Total Cost of Materials/CuYd: \$10.00

###### Equipment

Sediment Basin (\$/Cubic Yard): Excavation/Fill (bulk earth moving with dozer)

Units Moved per hour: 50

Units: CuYd

Equipment Cost w/o Operator (\$/hr.): \$90.00

Total Excavation Cost/Unit: \$1.80

Pasture Planting: Seedbed Preparation and Seeding = \$65.00/Acre

(Data Source: Extension Service Crop Budgets, 2014)

### Labor

Fence: 65 percent of Materials & Equipment Costs

Grassed Waterway: Unskilled Labor = \$10.00/hr \* 2 hrs/acre = \$20.00/acre  
Skilled Labor = \$15.00/hr \* 1 hrs/acre = \$15.00/acre

Conservation Cover: Seedbed Preparation and Seeding: .50 Hours/Acre \*  
\$16.00/Hour = \$8.00/Acre (Data Source: Extension Service Crop Budgets, 2014)

### Mobilization

Pond: 3 percent of Materials, Equipment & Labor Costs

Spring Development: 75 percent of Materials, Equipment & Labor Costs

### Operation and Maintenance

Sediment Basin: Five percent of materials, equipment/installation and labor costs.  
Maintenance Plan

Needed: Inspect embankments and pipe inlets, repair damages, remove debris, mow, fertilize, control noxious weeds and burrowing animals, re-seed, and clean out basin.

Fence: Two percent of materials, equipment/Installation and labor costs. Inspect, repair, check tension, clear brush and fallen limbs.

### Acquisition of Technical Knowledge

Prescribed Grazing: Grazing management software and training  
 $\$500.00/(150\text{AU} * 12\text{months}) = \$.28/\text{AUM}$

Feed Management: Hire a dairy feed nutritionist/consultant = \$.05/AU/Day

Pest Management: Hire Professional with Certified Pesticide Application License =  
\$2.00/Acre

Conservation Tillage: Thirty hours land user time (conduct personal research, plan with NRCS) \* \$20.00/hour = \$600.00.

### Foregone Income

Field Border: One acre taken out of row crop production. Row crop net income minus hay net income (from occasional hay harvest from field border). Net Income = \$200.00/Acre/Year

Use Exclusion: One acre grazing land taken out of production, two AUMs/Acre/Year at \$15.00/AUM = \$30.00/Acre/Year

Grass Waterway: Installed using 0.5 acres of corn field. Corn Revenue = \$5.00/bu\*100 bu/ac\*0.5 acre = \$250.00 on 0.5 acres. Corn Production Costs=\$2.00/bu\*100 bu/ac\*0.5 acre = \$100.00 on 0.5 acres. Foregone Net Income for 0.5 acres of Corn = \$150.00 (\$250.00 - \$100.00). If Payment Unit is "acre," then Foregone Income = \$300.00/acre.

### Risk

Residue Management: Increased risk with change in tillage system, 10 percent chance of 20-percent reduction in grain production 60 Bushels/Acre \* \$2.50/Bu \* 10 percent \* 20 percent = \$4.80/Acre/Year (first 3-4 years in grain)

## Title 200 – National Resource Economics Handbook

Expected Value Equation: Expected value can be used to estimate the Risk cost category. Expected Value = [Probability of an event happening] \* [Value of the event when it happens]. For example, the expected value of a cover crop failing = [Probability of a cover crop failure] \* [Cost of replanting after the cover crop fails]. If probability = 3 percent, and replanting cost = \$30.00/acre, then the expected value = [0.03] \* [\$30.00/acre] = \$0.90/acre.

### Administration and Permit Costs

Animal Waste Storage Structure: Paperwork required to design and meetings with engineers = \$500/165,000CuFt Storage = \$.003/CuFt.

Building permit required \$1,000/165,000CuFt Storage = \$.006/CuFt

### Cost Data Source References

Coastline Construction Company, Incorporated, Tillamook, Any State 503-555-1234, July 2014

Mid-West Grain Growers, Any State, April 2013

American Society of Agricultural Engineers Standards 2013, Standards Engineering Practices Data

Engineering News Record, [www.enr.com](http://www.enr.com), April 2014

EQIP Contract #12345, Animal Waste Storage Structure, Middleton County, Any State, September 2013

Any State Department of Forestry, Personnel Communication with Regional Forester, 2013.

B. Practice Scenario Examples

**Terrace (600) Cost Data**

**Typical Implementation Scenario**

320 acre field, wheat/fallow rotation, relatively steep slopes with sheet & rill and concentrated flow erosion.

Level terrace.

An earth embankment, a channel, or a combination ridge and channel constructed across the slope.

**Geographic Area:** Statewide

**Unit for Cost Estimate:** Foot

**Practice Life (Years):** 10

**Discount Rate (%/Year):** 5%

**Cost/Unit**

**Materials**

\$0.00

No Cost

**Equipment/Installation**

\$2.69

Excavation/Fill (bulk earth moving with D8-Dozer)

Units Moved per hour: 130

Units CuYd

Equipment Cost w/Operator (\$/Hr) \$140

Total Excavation Cost/Unit: \$1.08

Units Moved per LnFt Terrace: 2.50

Total Excavation/Fill Cost: \$2.69

**Data Source:** NRCS Engineering Technician & Local Contractor Data, Anywhere, State 3/2010. KC Construction, Anywhere, State. 4/2010. COE - Region VIII Construction Equipment Ownership and Operating Expense Schedule, 2009

**Labor**

\$0.00

Excavation/Fill (bulk earth moving with road grader)

(Included in Equipment/Installation Costs)

**Mobilization**

\$0.13

5% of Materials, equipment and labor costs.

**Operation & Maintenance (Annual)**

\$0.05

2% of Installation Costs

**Acquisition of Technical Knowledge**

\$0.00

No Cost

**Forgone Income (Annual)**

\$0.00

Minimal to no land taken out of production.

**Risk (Annual)**

\$0.00

No Cost

**Administration & Permit Costs**

\$0.00

No Cost

**Total Cost Estimate:**

\$2.88

**Associated Practices:**

516-Pipeline, 342-Critical Area Planting, 620-Underground Outlet

**Brush Management (314) Cost Data**

**Typical Implementation Scenario**

This management practice is for Brush Management, mechanical treatment on rangeland, native or natural pasture and hayland that the primary vegetation is sagebrush and/or rabbit brush. The practice entails the eradication of sagebrush and/or rabbit brush by use of mower, brush hog, disc or other mechanical means in order to promote forage productivity and improve ecological condition. Slopes are moderately level to genally rolling, moderately deep to deep fine to coarse testured soils types on 80 acres.

Removal, reduction, or manipulation of non-herbaceous plants.

**Geographic Area:** Statewide  
**Unit for Cost Estimate:** Acre  
**Practice Life (Years):** 10  
**Discount Rate (%/Year):** 5%

**Cost/Unit**

**Materials**

\$90.00

<u>Equipment &amp; Operator/Labor</u>	<u>Units/Acre</u>	<u>\$/Unit</u>	<u>Total</u>
5-Foot Mower (Hrs)	0.75	\$40.00	\$30.00
Brush Hog (Hrs)	1.25	\$40.00	\$50.00
Monitoring (Hrs)		\$10.00	\$0.00
4-Wheeler/Pickup Truck (Hrs)	1.00	\$10.00	\$10.00
Total:			\$90.00

**Data Source:** Producer receipts, Anycounty, State, 2010.

**Equipment/Installation**

\$0.00

Included in Material Costs

**Labor**

\$0.00

Included in Material Costs

**Mobilization**

\$4.50

Five percent of materials, equipment/Installation and labor costs

**Operation & Maintenance**

\$0.90

Spot treatment missed or re-growth areas.

One percent of materials, equipment/Installation and labor costs

**Acquisition of Technical Knowledge**

\$0.00

No Cost

**Forgone Income**

\$0.00

Possible short term production loss in treated fields

**Risk**

\$0.00

No Cost

**Administration & Permit Costs**

\$0.00

No Cost

**Total Cost Estimate:**

**\$95.40**

**Associated Practices:**

338-Prescribed Burning, 342-Critical Area Planting, 327-Conservation Cover, 550- Range Planting, 472-Use Exclusion

## Title 200 – National Resource Economics Handbook

### Nutrient Management (590) Cost Data

#### Typical Implementation Scenario

The nutrient management practice scenario is for irrigated cropland, and nurseries or orchards that are irrigated or non-irrigated. The landowner must maintain records for 3 or more years depending on the intensity of the management. A soil test is required with in 3 to 5 years and Irrigation water management is used to facilitate in the management of applied nutrients. If animal manure is applied to a field, a CNMP is required.

Soil test or tissue test, nutrient budget, and record keeping; which consists of crop grown, anticipated and actual yields, types and quantities of nutrients applied (including animal waste) and dates of application..

Managing the amount, source, placement, form and timing of the application of nutrients and soil amendments.

**Geographic Area:** Statewide

**Unit for Cost Estimate:** Acre

**Practice Life (Years):** 1

**Discount Rate (%/Year):** 5%

**Cost/Unit**

#### Materials

Soil test \$10/Acre

Tissue testing \$5/Acre

Nutrient budget \$2/Acre

Record Keeping \$3/Acre

Precision agricultural (consultant) \$10/Acre

Chemi-gation plan \$.50/Acre

Manure Nutrient Testing \$.25/Acre

Convert to "Organic" Fertilizers \$5/Acre

(Non-Petroleum Based Fertilizers)

Use of Overlap Reduction Technologies \$5/Acre

Organic Certification process \$5/Acre

\$30.00

Source: Crop advisory board, Ag-Coop, Anytown, State, 2010

#### Equipment/Installation

Equipment incorporated into materials cost

\$0.00

#### Labor

Labor incorporated into materials cost

\$0.00

#### Mobilization

No Cost

\$0.00

#### Operation & Maintenance (Annual)

No Cost

\$0.00

#### Acquisition of Technical Knowledge

Education incorporated into materials cost

\$0.00

#### Forgone Income (Annual)

No land taken out of production, no lost opportunity costs

\$0.00

#### Risk

Possible reduced risk, crop yield increase, reduced water quality damages

\$0.00

#### Administration & Permit Costs

No Cost

\$0.00

#### **Total Cost Estimate:**

**\$30.00**

#### Associated Practices:

449-Irrigation Water Management, 595-Pest Management, 633 Waste Utilization

### 613.41 Cost Data Quality Review Worksheet

Practice/Activity name:

State/Location:

Code Number:

Contact Person:

File Name:

Phone:

#### Cost Data

- Worksheet links, calculations are correct.
- Each practice is supported by a comprehensive scenario.
  - Scenario description and cost items meet the practice standards.
  - Scenario can be realistically implemented and meets practice standards.
  - Scenario identifies common facilitating practices.
- Geographic area is clearly defined and identified.
- Cost estimate "Unit" is simplest unit for cost estimating.
- Practice "Life Span" identified.
- Discount rate meets criteria in Economic Handbook.
- Cost data identified in nine cost categories (some may have a \$0 cost).
- Only one "subtotal" cost estimate for each of the nine cost categories.
- Cost data source, location and date adequately documented.
- Cost data and methodology are adequate.
  - Materials
  - Equipment/Installation
  - Labor
  - Mobilization
  - Operation and Maintenance\*
  - Acquisition of Technical Knowledge
  - Foregone Income\*
  - Risk\*
  - Administration and Permit Costs

\* Identified and estimated as "annual" costs.

Comments:

Actions Required:

Title 200 – National Resource Economics Handbook

Overall Review Results:

<b>Meets</b>	<b>Does Not Meet</b>	<b>Quality Standard</b>
		Adherence to cost data methodology
		Use of practices consistent with practice standards

Reviewers:

Date: