TREAT
Treatments for Restoration
Economic Analysis Tool
User Guide

Modeling Jobs and Labor Income Associated with
CFLR/N Funds and Full Projects
For Use In Project Proposals, Work Plans,
And Annual or Five Year Reports

Revised October, 2015
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NOTE:

1) TREAT was developed to provide a standardized approach to computing jobs and income for CFLRP proposals, work plans, annual and five year reports to allow for easier comparison across teams. For help in conducting project-, landscape-, or forest-level impact analysis outside of the CFLRP program, please contact your Regional Economist or Social Science coordinator, if available in your region, or contact one of the WO EMC economists listed in the section of this User Guide entitled “Where to Get Help”.

2) Throughout the User Guide the term “impact” is used. This is actually incorrect; analysis of current projects is descriptive of current conditions and is therefore termed “contribution” analysis. Analysis of proposed projects is predictive and is therefore “impact” analysis. However, only “impact” is used in the User Guide as more people are familiar with that term.

Introduction

The Omnibus Public Land Management Act of 2009 includes Title IV: Forest Landscape Restoration. The purpose of this title is to conduct ecosystem restoration that encourages economic and social sustainability, leverages local resources with national and private resources, reduces wildfire management costs, and addresses the utilization of forest restoration byproducts to offset treatment costs and benefit local economies (http://www.fs.fed.us/restoration/CFLR/index.shtml). Title IV established the Collaborative Forest Landscape Restoration Program (CFLRP), which provides funding to cover up to 50 percent of ecological restoration treatments on National Forest System (NFS) lands. The Act requires that projects “… benefit local economies by providing local employment or training opportunities through contracts, grants, or agreements for restoration planning, design, implementation, or monitoring…” The proposal requirements sent to Regional Foresters on February 24, 2010 identified multiple topics to be addressed. The investments section specifically asks “Will jobs be created? If so, what kind, how many, and for how long?” The teams selected to receive funding are required to complete a work plan and annual reports that also require teams to estimate jobs created/maintained.

Given the varying degrees of economic capacity among teams preparing CFLRP proposals, a tool was developed by NFS economists¹ to standardize the approach to estimating the number of jobs that would be supported by restoration efforts. Having a standardized approach allows for a basis of comparison across teams and for consistent reporting of CFLR program accomplishments. If teams used different methodologies to estimate the number of jobs created, it would be difficult to compare the economic impacts or roll up the results for reporting at the national level. The Treatments for Restoration Economic Analysis Tool (TREAT) was developed to address this problem. TREAT provides teams with a standard interface to estimate employment and labor income impacts from current and/or proposed restoration activities. This User Guide explains the methodology and functionality of TREAT as applied to CFLRP projects.

¹ Principally, economists with Ecosystem Management Coordination, Region 1 and TEAMS Enterprise.
Methodology

TREAT is a modeling tool used to assist in the estimation of the economic effects (jobs and labor income) of restoration activities tied to the CFLRP. TREAT was designed to provide a standardized approach for impact estimation and to streamline data entry and preparation for the generation of economic impact tables to be used in CFLRP proposals, work plans, and reports. It consists of: 1) data entry worksheets to be filled out by the teams, 2) a Microsoft Excel workbook that serves as the interface between user inputs and data from an economic impact model for each project area for use by the economists supporting the teams (see the section “Where to Get Help”), and 3) worksheets reporting the economic impacts of the restoration strategy (provided to the teams by the economists). The section of this User Guide entitled “Using TREAT” contains instructions for filling out the TREAT data entry sheets for 1) CFLR/N funds only (Tab 1) and 2) All funds (“Full Project Details” Tab 3).

The economic impact analysis estimates in TREAT illustrate the effects of restoration activities on local or regional employment and labor income levels. The relative size of the modeled economy plays an important role in the estimate of impacts on jobs and income and should ideally be customized based on data defining a functioning economy such as where the wood products are likely to be processed (log flows), where restoration contracting firms are based and commuting data. All CFLRP projects have individual models specified for them comprised of groups of counties that represent the areas where the estimated impacts are likely to occur. A commercial economic impact analysis program, “IMPLAN”, is used to build a model for each unique CFLR Project county grouping and the results are imported into TREAT as “response coefficients”. Response coefficients estimate the impacts to jobs and income per a specified unit of a restoration treatment activity. When combined with the user data from the data entry sheet, these response coefficients represent how that activity would cause ripples through the local economy, impacting employment and income levels. Once loaded with IMPLAN response coefficients and Project data, TREAT models are designed to estimate the economic contribution of 1) Commercial forest products, and 2) Contracted restoration activities (no commercial forest products).

1) Commercial Forest Products: Economic models are built annually using direct employment and income information from the University of Montana’s Bureau of Business and Economic Research (BBER), and the IMPLAN software and economic data package. IMPLAN is an input-output model that represents the activity within an economy. Changes in one or more economic components ripple through the economy and can affect employment and income levels in a variety of sectors. For example, an increase in the level of wood product harvesting in an area will likely require logging companies to hire more labor to perform the

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2 County groupings were defined by each CFLR Team with input from R1 and EMC economists.
3 Developed by the Forest Service for the first round of forest planning and later given away to a private firm.
4 It is important to note that IMPLAN is a static model. In other words it represents a snapshot in time. The most data used in the IMPLAN models underlying TREAT are for the year 2013 (2014 due out in January, 2016). The models represent the state of the economy in that year; therefore any changes in the economy since that time are not reflected in the model. It also important to note the employment impacts are reported simply as jobs, not full time equivalents (FTE’s). The impacts include both full time and part time employment; therefore, a person with more than one job could show up more than once in the data. This prohibits comparisons to population data and inferences about the effect on unemployment rates.
additional harvesting and transportation associated with the increased extraction levels. Increases in employment will also increase the total wages paid by the companies, which will raise total income. Thus, in this example, firms within the logging industry are reacting directly to the increased extraction of the timber resource. Similarly, with more wood product volume on the market, local sawmills will likely have to compensate by increasing employment to handle the added volume. Thus, both logging and sawmill businesses must react to the increase in local timber harvesting. Such impacts to industries occurring from a change in local production are referred to as “direct effects.” In other words, these are the impacts (i.e. change in employment) resulting from the changes in expenditures and/or production values caused by an increase in the timber harvested in the area. Data used to estimate the direct effects from commercial timber harvest and processing were provided by the BBER (Morgan et al. 2007, updated in 2014, paper soon to be published in The Journal of Forestry). The data are grouped into multi-state regions and are considered more accurate than that which is available from IMPLAN. The BBER’s data are drawn from mill censuses carried out for each 5 year RPA Assessment that relate volume harvested and processed to employment, and labor income. IMPLAN is then used to model the indirect and induced effects (defined below).

In addition to hiring more labor, industries must meet production requirements by purchasing more equipment, supplies, and other inputs. Some of these purchases will be made from other local industries; for example, additional fuel purchased by the logging companies at local gas stations increases the demand for the products of the oil and gas industry. Thus, the local gas stations may respond to the increased demand for fuel by hiring additional labor, which also affects total income in the study area; such impacts are called the indirect effects. Thus, the “indirect effects” are the changes in inter-industry purchases as they respond to the new demands of the directly affected industries. Another type of effect is referred to as “induced effects.” The induced effects reflect changes in the spending ability of individual households as income increases or decreases due to changes in production. For example, an increase in temporary, part-time or full-time employment in the sawmill sector or the local gas station will be filled by individuals in the area and/or the in-migration of new households; and the increased income to those individuals will stimulate an increase in their demand for goods and services in the local area, which in turn may cause firms to respond by increasing employment and output.

2) Contracted restoration activities (no commercial wood products): An infusion of new money into an area comes when contracts are let by the Forest Service for ecosystem restoration projects and can be a boost to local employment and income. In previous versions of TREAT, fairly generic sectors were used to model the effects of contracting but the results weren’t particularly satisfactory. To solve this, EMC entered into an Agreement with the University of Oregon’s Ecosystem Workforce Program to use their survey data to develop expenditure profiles of restoration firms for use in IMPLAN/TREAT models. The firms surveyed were ones that had had restoration contracts with the Forest Service (as documented in the Federal Procurement Database). The U of OR’s EWP is a recognized leader in the economics of ecosystem restoration. Information on their methods can be found at http://ewp.uoregon.edu/home. Dr. Eric White of the Pacific Northwest Station who also worked on this project is preparing a GTR specifically covering the work done for the Forest Service. Given these new data, the 2015 TREAT will look quite different to veteran TREAT.

5 IMPLAN relates employment and income to total sales value, which can be volatile, whereas the BBER mill flow survey data relate jobs and income to volume which tends to be a more stable relationship.
users. Teams will now be asked to characterize contracted activities in terms of the percentage of total expenditures spent in the following categories; Labor-intensive, equipment-intensive, material-intensive, technical and professional services, and contracted monitoring.

Just as with the commercial timber analysis, impacts are broken down into direct, indirect and induced effects for employment and labor income. For example, for a watershed restoration project, direct employment effects could come from hiring a heavy equipment operator to install culverts and technical services to plan the project. The new work might cause them to purchase inputs from other local firms (indirect effects) such as gasoline, office supplies, etc. Induced effects would be the re-spending of any extra income enjoyed by employees of the firms contracted by the Forest Service for this work plus employees in firms supplying them. Since these firms have different business models (different labor cost, business inputs etc) the economic contributions to the local economy will be different. This new specificity will greatly enhance our modeling capability.

Similar to impacts on employment, the income in the study area will be affected according to the activities associated with each restoration project. “Labor income” is the sum of wages, plus the value of benefits, plus the income of sole proprietors. Labor income changes along with local employment levels. As described in the case of employment impacts, labor income is generated through direct, indirect, and induced effects. Direct, indirect and induced effects may be summed up in order to estimate a total effect. The employment and labor income reported in TREAT are direct and total effects. The interpretation of the results will depend upon whether you are modeling only CFLR/N funds or all funds (both are required in the annual report, requiring the teams to fill in two data entry sheets). More detail regarding filling in the data entry sheets is provided in the “Using TREAT” section below.
Using TREAT

This section explains the operation of TREAT and interpretation of the results. TREAT has been set up so that teams fill out data entry worksheets in an Excel spreadsheet (one tab for CFLR/N funds only and one tab for CFLR/N funds plus all matching funds) and send them to one of the economists supporting the CFLRP teams (see the section “Where to Get Help”). The most important component of using the tool is entering user data into the data entry worksheet. If data is input incorrectly, the results will not be representative of economic impacts that may occur with the restoration activities.

The worksheets provided to the CFLR teams contain four tabs titled, “CFLR-CFLN Project Details”, “Full Project Details”, “CFLR-CFLN Fund Impacts,” and “Full Fund Impacts.” The “Project Details” worksheets are the data entry sheets where the user will input all the CFLR/N fund and full project data associated with restoration activities, respectively. Likewise, the “CFLR-CFLN Fund Impacts” and “Full Fund Impacts” are where the output will be reported after the analysis is completed by the economists. The summary tables on these sheets may be cut and pasted directly into proposal and reporting documents. The remainder of this section goes into greater detail on the mechanics of these worksheets.

Step 1: Download TREAT

TREAT is available on the Restoration Economics SharePoint site at https://ems-team.usda.gov/sites/fs-emc-secf/RestorationEconomics/_layouts/15/start.aspx#. If you try to get in to the site and are unsuccessful, please contact Susan Winter at swinter@fs.fed.us for assistance. There is a Quick Start Guide on the home page. The detailed User Guide is available at the User Guide link on the list on the left hand side of the Home page. The TREAT Excel file (zipped) is available at the Software Download link on the left. There are FAQs that will be built up as questions come in. Also on the Home page is a Newsfeed section for announcements of interest to TREAT users.

Step 2: Enter project details

The first task is to enter information about the project. This data will be entered into either Tab 1 (for modeling CFLR/N funds only) or Tab 3 (for modeling all funds). Data requirements are broken down into four categories: Funding and Employment, Contract Funding Distributions, Commercial Harvest Volumes, and Product Distributions (harvest processed by firms in the model area). Data are entered in the cells shaded in bright green. The remaining cells are for information or calculation purposes only.
Tab 1: (CFLR/N Project Details)

Select Project

TREAT is pre-populated with some of the requisite information for each CFLR project. Select your project by clicking in the green Project Name box and then clicking the down arrow for a picklist. Don’t worry about the “Data Year” to the right. That’s just information for the economists about the latest GDP deflator year that’s loaded. However, please let the economists know what year your data are for when you mail the spreadsheet.

Funding and Employment (CFLR/N Funds Only) – Table 1

This section is where the Team enters data regarding the proposed or current level of funding, length of the project, contracted work and monitoring. TREAT averages this data so that impacts are based on annual expenditures.

- “Enter Total Funding (proposed or current depending on the purpose of the analysis). Enter only the CFLR Funds requested in your proposal OR those for the year or years for which you are reporting. For proposals and work plans, include all ten years of funding. For annual reports, include only funding for the year for which you are reporting. It does not include matching funds. Matching funds consist of: Forest Service appropriated funds, Forest Service permanent trust funds, partnership funds, partnership in kind services, and other (if applicable). For example, if the proposal is asking for $4 million of CFLR funds per year for

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6 This is important as the IMPLAN models and dataset are annual.
10 years, with another $2 million dollars per year for 10 years of matching funds, then the amount entered into the green box would be 40,000,000. The other $2 million would be included in the data entry for Tab 3.

- “Enter number of years for project implementation”. This is the number of years that restoration activities will take place. For proposals and work plans enter the full implementation period (usually 10 years). For 5 year reports, enter “5”. For annual reports, enter “1”.

- “Enter the percent of this funding that is going to be used for contracted work within the model area”. This is the percent of CFLR/N funds that will be spent on work completed by partners and contractors. Only firms located within the model area should be included (see the list of counties in cell B6). Firms based outside the model area will contribute to “leakage”. Leakage is money leaving the economy due to the import of goods and services\(^7\). Purchasing a service from a partner or contractor outside of the region is the same as importing those services. Once that money leaves the economy it is no longer available for circulation and will not generate additional jobs and income locally.

- “Enter percent of project funding that is going to be used for Force Account Implementation and Monitoring”. This is the percent of funding that will be spent on implementation and monitoring conducted by Forest Service employees.

- “Enter Annual Force Account FTEs for Implementation & Monitoring”. This is the number of Forest Service employees per year that will be used for implementation and monitoring during the life of the project. Again, this should reflect the CFLR/N Funds only, or the portion of total attributable to the fund (e.g., 50%). Fractional employees may be reported. For example if one-half of an FTEs time will be spent on implementation and monitoring then the 0.5 should be entered. For seasonal employees, estimate the percentage of the year that each employee will be involved in implementation and monitoring and multiply times the number of seasonal employees performing this work. For example, if you have 3 seasonal employees performing monitoring work for 4 months out of the year, this would equate to 1 FTE (1/3 year x 3 employees).

\(^7\) Automatically accounted for in the modeling process is the leakage of commuters who live and spend their income outside of the model area.
Contract Funding Distributions (CFLR/N Funds Only) – Table 2

<table>
<thead>
<tr>
<th>Description</th>
<th>Types of Products</th>
<th>Project Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment intensive work</td>
<td>No commercial products; includes chipper;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>thinning; mechanical treatments such as</td>
<td></td>
</tr>
<tr>
<td></td>
<td>non-commercial logging, mastication,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>莫过于; site work; tree-stripping, etc.</td>
<td></td>
</tr>
<tr>
<td>Labor-intensive work</td>
<td>No commercial products; includes labor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>intensive, simple mechanical treatments such</td>
<td></td>
</tr>
<tr>
<td></td>
<td>as truncating with chainsaw, hand piling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>prescribed burning, tree planting, etc.</td>
<td></td>
</tr>
<tr>
<td>Material-intensive work</td>
<td>No commercial products; projects where</td>
<td></td>
</tr>
<tr>
<td></td>
<td>materials represent a significant portion of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>project costs; includes road work,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stream restoration, force construction,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comcastal work, etc.</td>
<td></td>
</tr>
<tr>
<td>Technical services</td>
<td>No commercial products; includes stand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>surveys; marking; biological censuses;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cultural surveys; invasive weed spraying,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>etc.</td>
<td></td>
</tr>
<tr>
<td>Professional services</td>
<td>No commercial products; includes studies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>completed by scientists, engineering design,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>acquisition or analysis of remotely sensed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>data, vegetation modeling, wildlife, etc.</td>
<td></td>
</tr>
<tr>
<td>Contracted Monitoring</td>
<td>Services Contracted for monitoring</td>
<td></td>
</tr>
<tr>
<td>(Does not include in-kind</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and volunteer contributions)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals – must be less than or equal to 100%</td>
<td></td>
<td>0%</td>
</tr>
</tbody>
</table>

In this section, Teams enter data regarding the distribution of partnership and contracted work to the various activities listed in Table 2. The distribution needs to be reported as a percentage and should sum to 100 percent or less (less than 100% indicates leakage). This allocation may differ between the two data entry worksheets - the one for modeling for CFLR/N Funds only, and the full project, so consider making adjustments if funds will be/ have been spent in a manner that differs from the total proposal allocation.

Hopefully, the “Description” and “Types of Products” fields make it clear what type of work is handled in each category. Each of the types of Restoration firms has a different expenditure profile in the economic model. If there are any questions, please contact Susan Winter at swinter@fs.fed.us.
In this section, only report the volume of wood products that would be removed during the life of the project as a result of CFLR/N funding. TREAT will automatically reduce this volume to annual averages, depending on how many years you selected in Table 1. If you are preparing data for an annual report, provide the volume that was harvested that fiscal year (checking that “years for project implementation” in table 1 is set to 1). If modeling a time period longer than a single year, for example the life of the project (such as for new project proposals), enter the volume for the applicable period (e.g. volume for FY 2012-2019 and enter the number of years (be careful to count the years and not subtract the two dates, in this case FY2012 to FY 2019 is 8 years).

The first column of green cells is where total volumes can be reported in CCF, MBF, Dry Tons and/or Cords. TREAT will do any necessary unit conversions.

In the second column of green cells, specify what percent of the volume is harvested by firms based in the model area (less than or equal to 100)
Product Distributions – Table 4

Timber removed during restoration activities as commercial products are processed into various types of consumer products. Different consumer products have different supply chain events that take place as the timber moves from the forest to the market place. These supply chain events take place in different sectors, and therefore have different effects as modeled in TREAT. It is therefore important to report the distribution of products that are processed from the volume removed during the restoration strategy. Only primary processors in the model area should be counted as it is very difficult to track FS volume all the way to the end user (i.e. for home construction). Table 4 shows a variety of manufacturers and the types of products they produce. Report the percent of volume harvested that would be processed in each of these categories (zero is a valid entry). The percentages will sum to less than 100% if some of the volume harvested is shipped out of the model area for processing.

Tab 3: Full Project Details (All Funds)
Fill out these tables in the same way as done for Tab 1, but for activities supported by both CFLRP/N funds AND matching funds such as Forest Service appropriated funds, Forest Service permanent trust funds, partnership funds, partnership in kind services, and other (if applicable). Questions? Contact Susan Winter swinter@fs.fed.us
Step 3: Send the completed data entry spreadsheet to the economists supporting the CFLR teams

Once data entry is completed, save the spreadsheet with the Project name in the title and submit TREAT to one of the economists supporting the CFLR teams. After processing by the economists, the economic impacts of the restoration strategy will be reported in the worksheet (Tab 2 and Tab 4). The summary table from these worksheets may be cut and pasted directly into the proposal, work plan or annual report. As reported above, the jobs and labor income reported are a result of the direct, indirect and induced effects, and are assumed to last the life of the project or for the time period specified in the data entry sheet. Economic impacts are broken down by commercial forest products, other project activities, and Forest Service implementation and monitoring. Monitoring conducted by partnership agreements and contractors is accounted for in the other project activities. These are the jobs and income that would result from activities in each of those categories.

Where to Get Help

TREAT is supported by the Service-Wide economics community. You may contact your Regional Economist, Social Science coordinator, or anyone on the development team. However, please send your completed data entry sheets for the annual reports to Susan and Doug with a cc to Lindsay Buchanan as they will be conducting the analysis for all teams.

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Doug Smith, Economist and Analyst, WO EMC: (dhsmith@fs.fed.us)