COLORADO STATE FOREST SERVICE
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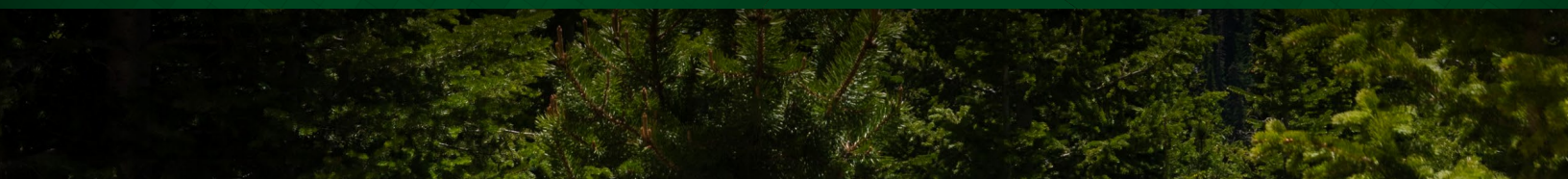
Colorado Forest Management Activity Tracker (Forest Tracker)

Report, February 2025



PURPOSE AND NEED

Communities have been actively managing forests and living with fire in Colorado for thousands of years. Yet, the impacts of wildfires and other forest disturbances are posing major threats to forested landscapes and communities across Colorado. Numerous federal, state, tribal and local organizations, as well as private landowners, are implementing forest restoration, hazardous fuels reduction, prescribed burning and reforestation management activities to sustain forest resilience and reestablish positive relationships with fire.

Despite the importance of forest management for our communities, Colorado does not currently have a robust mechanism to consistently track, document and monitor forest management accomplishments across ownership boundaries. This limits the ability of private landowners and public agencies to collectively reduce wildfire risk, respond to the effects of climate change and plan strategies to maximize benefits of forests for our communities. Accordingly, there is an increasing need to track these activities across all land ownerships, enable reporting on accomplishments and facilitate coordinated, cross-boundary landscape management.

The Colorado Forest Tracker is intended to serve as a transparent, comprehensive and open-access resource for forest and woody vegetation management activities across the state. It is freely accessible for all communities, natural resource and fire professionals, policy makers, researchers and others interested in tracking forest management activities. The intent is to create a central database and reporting system for completed forest management activities. This will allow for improved cross-boundary strategic planning and implementation, to ensure investments are being made in places that need it the most.

The primary aim of the Colorado Forest Tracker is to support learning and adaptive management to improve forest management outcomes throughout Colorado. We strive to improve stewardship of Colorado's forests on public and private lands through the following goals:

- Implement a public data viewer and web application(s) to provide transparent annual report metrics and visualizations of statewide forest management activity data.
- Provide high-level information that helps policymakers understand and communicate ongoing efforts related to forest management and wildfire risk reduction in Colorado.
- Support public communication and adaptive management towards forest health and wildfire risk reduction goals.
- Streamline the availability of fuels management data to support firefighters who are actively managing wildfires.
- Ensure a standardized dataset that enables researchers to monitor and study treatment effectiveness for wildfire mitigation, biomass and carbon assessments, and other forest science research questions.
- Provide a tool to evaluate and prioritize funding in forest and fuels management grant programs.

COLLABORATIVE DATA STEWARDSHIP

The Colorado Forest Restoration Institute (CFRI) and Colorado State Forest Service (CSFS), both housed at Colorado State University (CSU), have partnered to leverage the unique expertise of each organization to build and maintain an accessible database of all-lands forest management activities, the Colorado Forest Tracker. The data will be published as an ESRI Map Service and available as a direct download geodatabase. Data also will be viewable on the Colorado Forest Tracker dashboard, with reporting metrics for forest management outcomes. Forest Tracker data will be housed in the CSFS Colorado Forest Atlas to facilitate the use and application of forest management activity data in conjunction with a wide variety of other forest and wildfire information.

The CFRI is a congressionally authorized program housed at CSU that serves as a boundary-spanning organization focused on research, management and policy that supports collaborative adaptive management for wildfire risk reduction and forest restoration throughout the Interior West. In 2016, CFRI began developing an all-lands spatial database of forest restoration and fuels management projects occurring in Colorado (Caggiano 2017). In 2022, CFRI released an update to the database that synthesized spatial data for forest restoration and fuels management projects across all land ownerships within Colorado over a 20-year period (Mueller and Caggiano 2022). The database has proven useful to inform many management, policy and research endeavors, necessitating modernization efforts to enhance data accessibility for a broader audience. The Colorado Forest Tracker is a continuation and enhancement of the previous CFRI interagency treatment databases.

The CSFS is the leading state agency for providing forest stewardship and management, fuels reduction and wildfire risk reduction assistance to communities and landowners in Colorado. As a statewide organization, the CSFS has access to a network of partners conducting land management activities and strives to implement forestry projects that span ownership boundaries to achieve landscape-scale benefits. The CSFS maintains the Colorado Forest Atlas, which serves as a decision support tool for CSFS partners and the public to access statewide geospatial data and information related to forestry, including forestry planning, assessing wildfire risk and evaluating forest conditions. The goal of the Colorado Forest Atlas is to provide partners and the public with the best available information about forest conditions and activities.

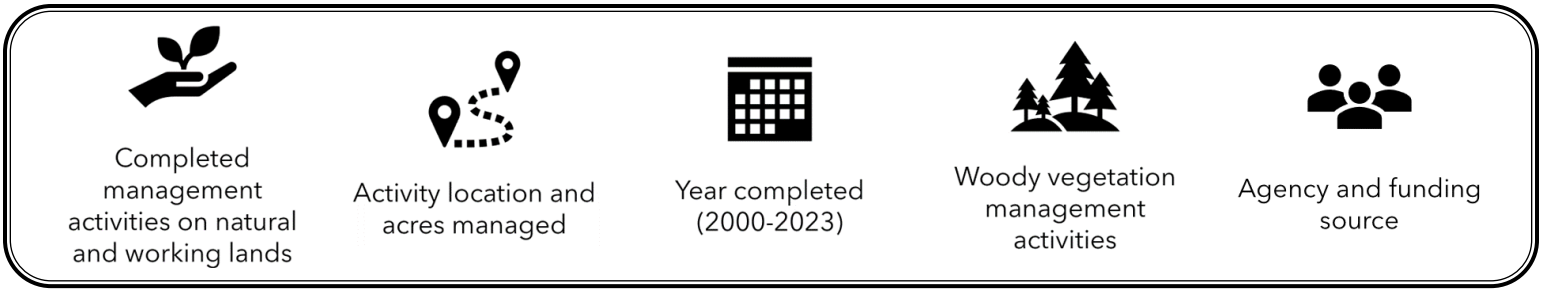


Figure 1. *Information included in the Colorado Forest Tracker database.*

The collaboration between CFRI and CSFS in developing, maintaining and reporting on a statewide all-lands database aims to leverage the expertise of each organization for the benefit of Colorado's forests and communities.

DATA COLLECTION

The Forest Tracker provides information about the agencies conducting forest management activities, funding sources, land ownership, forest management activities including prescribed fire, forest canopy and surface vegetation manipulations, and reforestation activities, project objectives and the calendar year of the work.

Reporting of forest management activities falls under a wide variety of classifications and terminology. The Forest Tracker aims to synthesize across data sources to provide consistent terminology and accessibility of data from a variety of sources in one place. Data included in the tracker is generally limited to management activities that physically alter or remove woody vegetation in Colorado, primarily through mechanical cutting and/or removal of woody vegetation, prescribed fire and tree planting. Other management activities such as grazing, mowing, seeding, noxious weed control, insect and wildlife management, and many others can have large impacts on forest structure and wildfire behavior. The Forest Tracker focuses on direct management of woody vegetation and other secondary forest management activities were not included in this iteration of the tracker.

Our urban communities are also greatly enhanced by intensive forest management to sustain trees and forests that provide shade, clean air, wildlife habitat and enjoyment critical to the livability of our most developed areas. However, the Forest Tracker currently focuses on natural and working lands across Colorado rather than urban centers. While forest management activities within urban areas were included if they met Forest Tracker data standards and were identified in natural and working lands databases, urban forest management data is not a current priority focus of the Forest Tracker.

Data collection process

Data collected for the Colorado Forest Tracker is divided into three general categories based on the data reporting source: federal, state and local data.

Federal data

Activity data for the U.S. Forest Service and U.S. Department of the Interior agencies was downloaded directly from national corporate datasets.

U.S. Forest Service Forest Activity Tracking System (FACTS)

The USFS FACTS data tracks where specific forest resource activities have occurred nationwide. FACTS manages information about activities related to fire/fuels, silviculture, trust funds, range vegetation improvement and invasive species. It is used by all levels of the Forest Service and allows tracking and monitoring of National Environmental Policy Act (NEPA) decisions. The Forest Tracker includes 10 layers under the FACTS umbrella including: Brush Disposal Funded Activities, Collaborative Forest Landscape Restoration Program, Hazardous Fuels Treatment Reduction, Integrated Resource Restoration, Activity Knutson-Vandenberg, Activity Range Vegetation Improvement, Activity Silviculture Reforestation, Activity Silviculture Timber Stand Improvement, Stewardship Contracting, Timber Harvests and Western Bark Beetle Strategy (U.S. Forest Service 2024).

National Fire Plan Operations and Reporting System (NFPORS)

Unlike USFS FACTS data, data collected from Department of the Interior agencies (Bureau of Land Management (BLM), National Park Service (NPS), Bureau of Indian Affairs (BIA), and Fish and Wildlife Service (FWS)) was obtained through multiple databases based on the National Fire Plan Operations and Reporting System (NFPORS). Currently NFPORS is no longer being used as a reporting system for DOI and will be replaced by the Interior Fuels and Post-fire Reporting System (IFPRS). Neither database was fully available at the time of data collection for the Forest Tracker, so multiple sources were used, but all follow a similar attribute structure.

BLM CO Completed Vegetation Treatment Polygons

This data includes completed vegetation treatment areas and associated attribute information for the BLM Colorado. Vegetation treatments documented in these datasets are categorized by the general type of treatment used in the area being treated. These different types of vegetation treatments are

Chemical, Physical, Biological and Prescribed Fire, and are further categorized by the treatment sub-type. (Bureau of Land Management Colorado 2024).

NPS Complete Treatment Perimeters via the Rocky Mountain National Park Fire Web Application

The web application is designed to bring together relevant data sources to show the fire history, current risks, and planned and completed fuels treatments in parks and monuments owned by the NPS in Colorado. Date range of the data is from 2003 to 2023. (National Park Service 2024).

BIA and FWS data were transferred from the CFRI interagency treatment database, which was originally downloaded from NFPORS in 2019. Updated data from 2020 to 2023 is not currently available.

State data

State-level activity data was compiled from Colorado Department of Natural Resources (DNR), Colorado Parks and Wildlife (CPW) and CSFS sources.

Colorado Department of Natural Resources

DNR activity data was collected through the Colorado Forest Tracker Survey123 submission form and was submitted by both DNR staff and partner agencies whose work was funded through the Colorado Strategic Wildfire Action Program (COSWAP) grant program.

Colorado Parks and Wildlife

CPW data was submitted in two separate datasets, each from a different division within the agency: one from CPW's Resource Stewardship division and one from the Habitat Partnership Program division.

Colorado State Forest Service

CSFS data contributions were collected from three different forest management activity and stewardship reporting databases (WebDET, SMART and GeoTracks), as well as CSFS field office records. From the mid-2000s until the mid-2010s, CSFS primarily used the Web-based Data Entry Tool (WebDET), which was developed in partnership with the USFS, CSFS and Environmental Systems Research Institute, Inc. (ESRI). In the early-2010s, the Stewardship Mapping and Reporting Tool (SMART), developed by Timmons Group and USFS, began to replace WebDET, eventually becoming the primary reporting tool for the CSFS. In 2023, the CSFS introduced GeoTracks, a custom-built internal reporting system tailored specifically to the needs and work of the CSFS, which became the primary activity tracking tool for the agency and includes forest management treatments. In all these CSFS databases, often the Project Name field included personal identification information of the private landowner, such as their last name. To preserve this sensitive information, the Project Name for all CSFS activities implemented on private lands was removed.

Local data

Primarily defined as management activities led by entities other than federal or state agencies, "local data" includes contributions from Colorado municipalities, park and open space districts, and regional collaboratives. Local data is submitted by individuals representing these entities to the Colorado Forest Tracker through various submission methods, including activities entered through an ESRI Survey123 form, batch submission through a Google Form, or direct email correspondence with CSFS staff. To support a more accessible and streamlined process, GIS documentation on schema requirements and data submission best practices, was well as direct technical assistance was provided, especially to those entities who lack dedicated staffing to handle such data requests.

Local data submissions were compiled and standardized to align with Forest Tracker methodology and classifications. Activity attributes were adjusted as necessary to maintain consistency, and records that did not meet minimum data quality criteria were excluded. The integration of local data within the Forest Tracker enhances the comprehensiveness of Colorado's forest management landscape, capturing the critical contributions of regional initiatives and diverse community organizations.

Management activity classification

Each management activity was classified into a broad management type or general prescription type for prescribed fire activities, canopy fuels, surface fuels and reforestation activities to allow for additional sorting and analysis (Table 2). Common management activities using prescribed fire include broadcast burning and pile burning, canopy fuels include thinning (mechanical, manual, mastication) or chemical applications, surface fuels include biomass removal from site, mulching, lop and scatter and piling of fuels. Reforestation activities include planting or seeding of tree species. Although this approach may be overly simplified in some cases, our aim is to provide standardized information about woody vegetation management activities to create a snapshot of forest management that informs a wide variety of interested stakeholders. In some cases, the information provided did not clearly fit into our defined categories, and we classified activities using our best judgement to facilitate consolidation of disparate activities into a single, useable database. The original label or description of the activity was retained when provided by the contributing agency.

Wildfires are sometimes classified as active forest management and counted as accomplishments in agency reporting. While leveraging wildfires as treatments is important to consider in forest

management, activities described as wildland fire use were not retained in the Forest Tracker at this time. For comparison, since 1990 about 3.4 million acres have burned in wildfires in Colorado; over the same two decades, agencies have treated about 1.5 million acres of forest. When paired together, forest management activities and wildfire data can contribute to monitoring the effects of management on wildfire outcomes or ecosystem services.

Data crosswalk

The Forest Tracker assembled data from diverse federal, state and local data sources. Because of this, there was a need to transform these diverse datasets into a single, consistent schema.

CLASSIFICATION OF U.S. FOREST SERVICE FACTS DATA

Three attribute fields were used to classify USFS FACTS data: ACTIVITY, METHOD and EQUIPMENT (Figure 2). First, polygons were classified using only ACTIVITY. For example, ACTIVITY: 'Broadcast Burning-Covers a majority of the unit' is classified as 'Broadcast Burn' in the Forest Tracker (See Appendix A, Table A1- A3 for FACTS Classification Tables; Figure 3). However, an ACTIVITY such as 'Precommercial Thin' may describe more than one classification type within the Forest Tracker schema. Therefore, to classify these polygons, we required additional information from additional fields in FACTS.

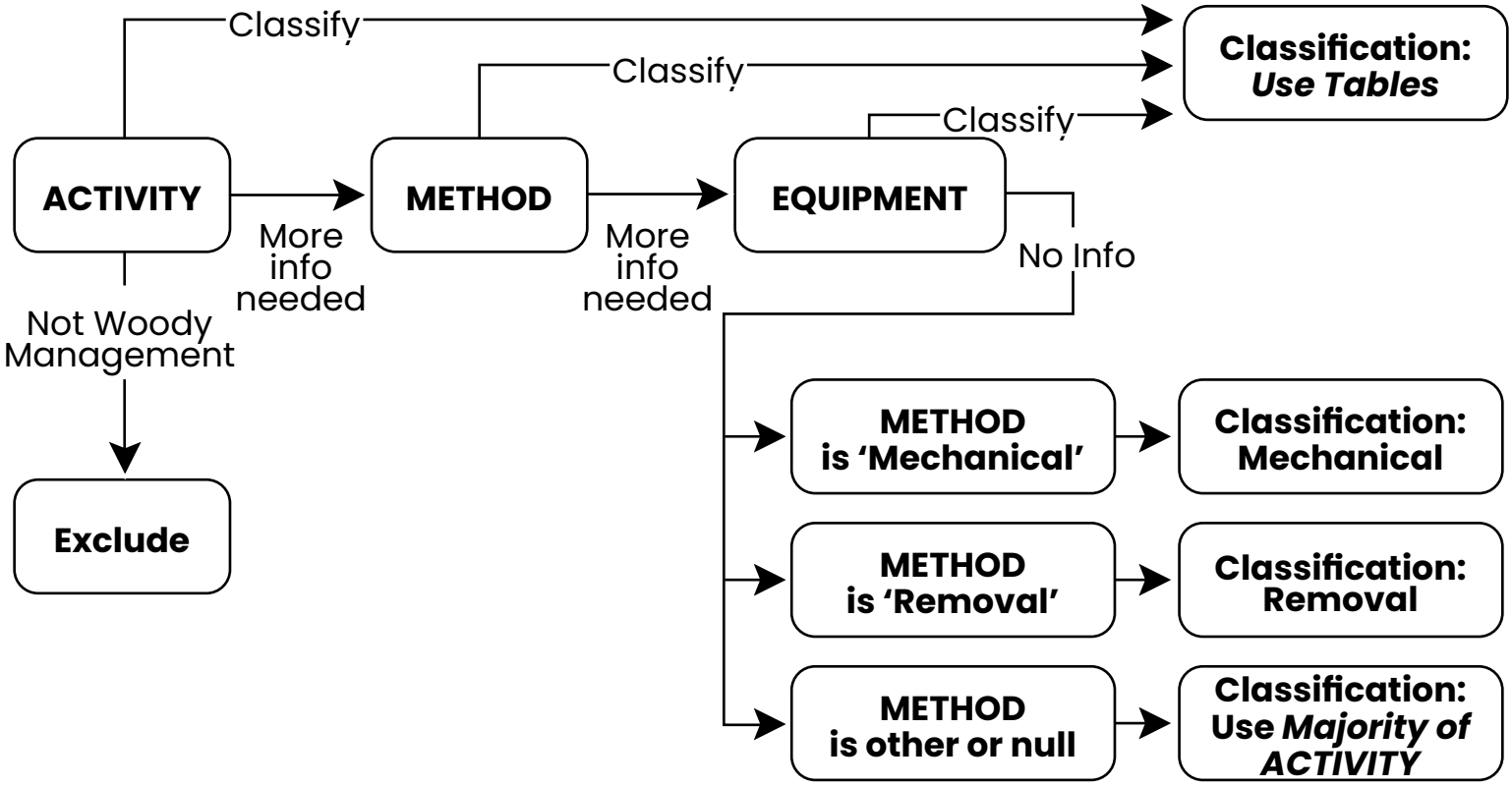


Figure 2. *FACTS classification workflow. ACTIVITY, METHOD and EQUIPMENT refer to attribute fields in FACTS. See Appendix A, Table A1- A3 for full FACTS Classification Tables.*

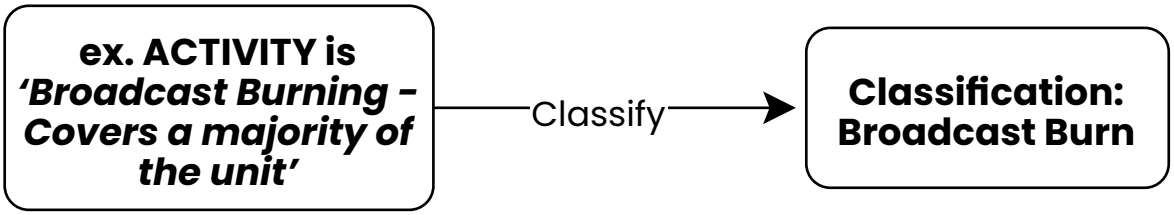


Figure 3. *Example of classification by ACTIVITY field in FACTS.*

The next field, METHOD, was used subsequently to classify polygons that were unable to be classified in the first step. Like the ACTIVITY field, polygons were classified using the additional information in METHOD, for example, METHOD: 'Power hand' is classified as 'Manual' while METHOD: 'Tractor Logging' is classified as 'Mechanical'. Where METHOD still did not provide enough additional information, (i.e. 'Mobile Ground' or 'Maintenance' or 'Not Applicable', etc.), we used a third field, EQUIPMENT.

EQUIPMENT was subsequently used to classify polygons we were unable to categorize using the first two columns only. For example, under METHOD: 'Mechanical', EQUIPMENT: 'hand work' was classified as 'Manual', whereas, under the same METHOD, EQUIPMENT: 'Masticator' was classified as 'Mastication' (Figure 4).

In some cases, EQUIPMENT and/or METHOD did not provide sufficient information. In these cases, we first returned to the METHOD column and classified polygons with METHOD: 'Mechanical' or 'Removal', with no indication of the type of EQUIPMENT used, as 'Mechanical' and 'Removal', respectively. If no information was provided in the EQUIPMENT field and METHOD lacked sufficient information to classify the polygon, we returned to the ACTIVITY field and classified that polygon as the majority of that ACTIVITY. All analyses for FACTS were completed using Python.

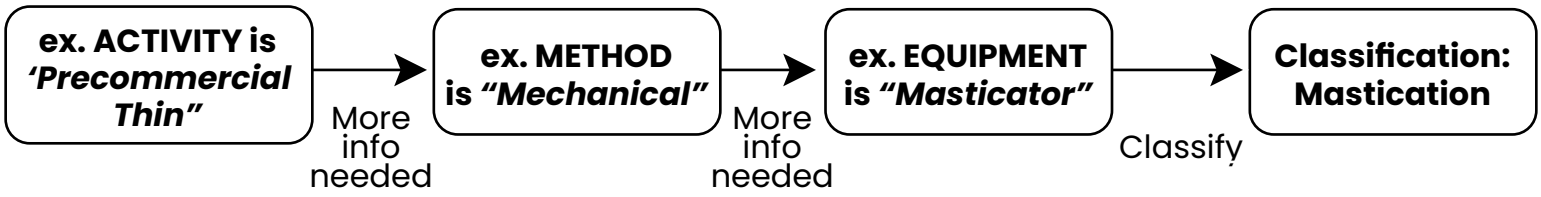


Figure 4. *Example of classification by ACTIVITY, METHOD and EQUIPMENT fields in FACTS.*

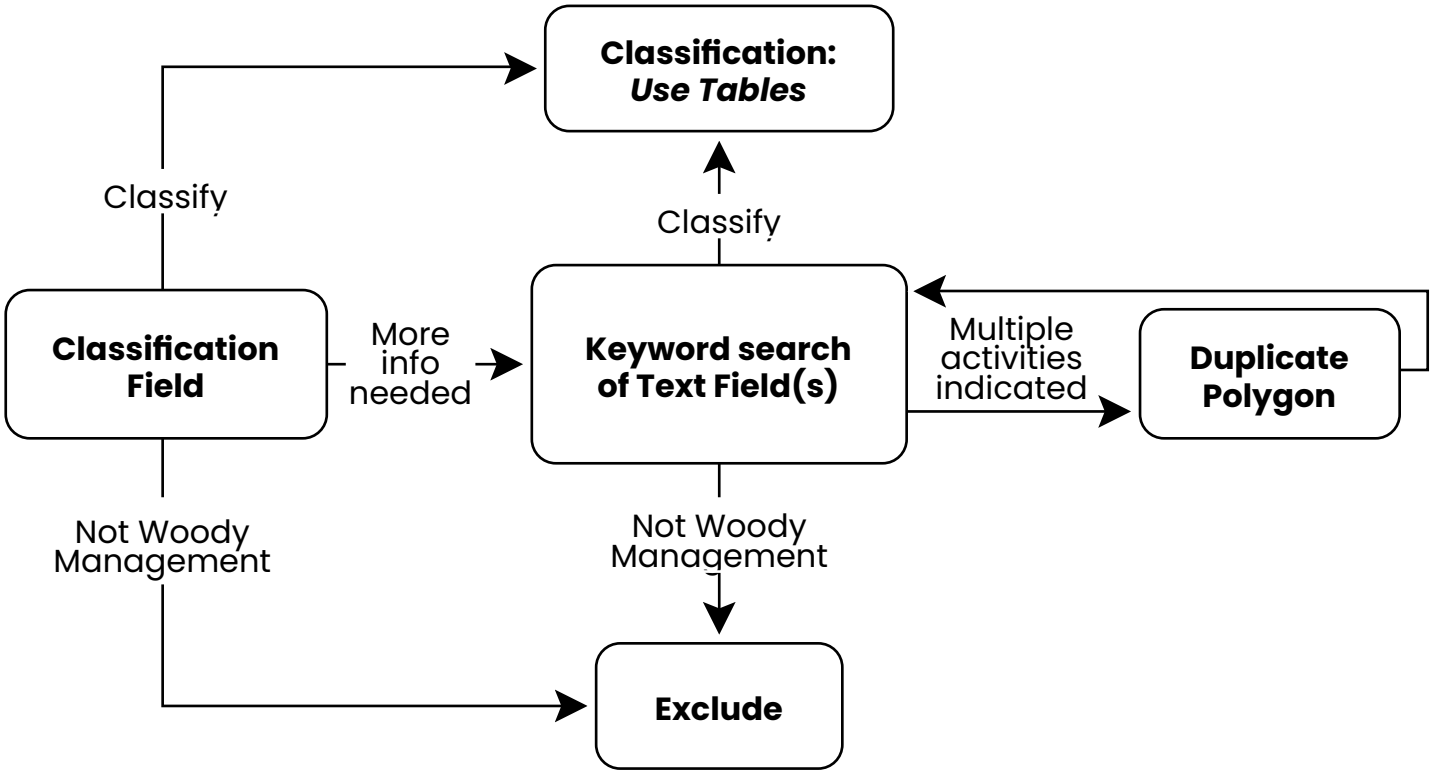


Figure 5. *Non-FACTS, other federal and state data classification workflow. Classification fields and text fields are named differently within each database. The full list of names is in Appendix A, Table A4.*

Figure 6. *Example of classification by Classification Field and Text Field.*

CLASSIFICATION OF OTHER FEDERAL AND STATE

All non-FACTS databases included a field or fields classifying the data for that databases' schema; however, this Classification Field is named differently for each system (See Appendix A, Table A4). First, we attempted to classify polygons using only the Classification Field. For example, in the BLM NFPORS data, if the Classification Field: TypeName is 'Broadcast Burn', it was classified as 'Broadcast Burn' in the Forest Tracker. However, an activity like 'Thinning' may describe more than one classification type with the Forest Tracker schema. Therefore, to classify these polygons, we required additional information from the Text Fields. Text Fields refer to those fields in the database relating to comments, notes, objectives, etc.

Unlike FACTS data, this data did not consistently include discrete information on method or equipment, so we relied on a keyword search of any Text Fields in the data. Like the Classification Field, these columns did not necessarily have the same name (See Appendix A, Table A4). For example, in the BLM NFPORS data, if the Classification Field: Type Name is 'Thinning', this could refer to 'Mechanical', 'Manual', or 'Mastication' in the Forest Tracker. If, in the Text Field: 'TRTNMT_COM', it includes information such as, 'Hand Thinning', 'hand', 'manual', or 'chainsaw', etc., we would classify the polygon as 'Manual' in the Forest Tracker (See Appendix A, Table A5 for non-FACTS Keyword Classification tables).

In some cases, the Text Fields may have indicated that more than one management activity was performed within a polygon. When that occurred, the polygon was duplicated, and each was classified according to the Text Field. Where the management activity within a polygon did not indicate woody vegetation management, it was excluded.

Duplication of activity perimeters

It is important to note that overlapping management activities were not aggregated or removed when they were not the same or occurred in different years. For example, for the USFS FACTS data, duplication most often occurs when multiple activities are implemented on the same piece of ground, usually as part of a series of connected activities normally considered part of the same management plan. For example, mechanical thinning followed by a pile burning activity on the same 100-acre hillside is often represented by two separate, identical polygons. This would consist of two records in the Forest Tracker: first as a canopy management mechanical activity; and second as a prescribed fire management pile burn activity.

However, in places where the same activity was performed in the same calendar year on the landscape, these polygons were dissolved to create one management activity attribute. This duplication most often occurred when management activities were funded by two different sources or where multiple agencies with shared agreements have reported management activities in individual agency databases. The multiple funding sources or other relevant information was retained from the overlapping polygons.

When duplication occurs, management acres are calculated in two ways. The management acres of overlapping polygons are summed. If the sum of these acres is less than the GIS calculated acres, the sum of the management acres is retained. If the sum is greater than the GIS calculated acres, the GIS acres are used instead.

Calculating land ownership

Landownership in the Forest Tracker refers to the majority landowner as defined by the Colorado Ownership, Management, and Protection (COMaP) dataset (Colorado Natural Heritage Program and the Geospatial Centroid 2024), which depicts all protected lands in Colorado. This field is calculated as the landowner with the largest area of physical landownership that intersects the management activity footprint. When management activities cross jurisdictional boundaries, only the largest landowner is preserved. This is done to root out accuracy issues with the data where activity boundaries and land boundaries do not precisely line up and to allow for more effective data filtering. The landowner in this field may be different from the agency that completed the work within the polygon footprint.

DATABASE STRUCTURE AND ATTRIBUTES

Table 1. *List, description and source of Forest Tracker attributes. Highlighted fields are required for an activity to be included in the tracker.*

Name	Alias	Description	Source
PRJ_NAME	Project Name	Name given to the project by the originating agency.	Originating agency defined
AGENCY	Agency	Name of the unique organization, entity or individual that was responsible for overseeing activity implementation. **Required.**	Originating agency defined
AGENCY_C	Agency Code	Acronym or code for the name of the unique organization, entity or individual responsible for overseeing activity implementation.	Originating agency defined
FUNDING	Funding Source	Identifies the primary funding source(s) for the activity implementation, including grants, stewardship contracts or other supplemental funding, as well as activities that are primarily revenue generating, such as timber sales.	Originating agency defined
LANDOWNER	Landowner	The majority landowner as defined by the Colorado Ownership, Management, and Protection (COMaP) dataset, which depicts all protected lands in Colorado.	Compiled and maintained by the Colorado Natural Heritage Program (CNHP and the Geospatial Centroid at Colorado State University (CSU))
MGT_TYPE	Management Type	Categorical selection of management type. The four management types included are: **RXFIRE, CANOPY, SURFACE or REFOREST. Required.**	Originating agency defined, OR classified by CFRI/CSFS
RXFIRE_MGT	Prescribed Fire Management	General description of the management activities for prescribed fire-related projects. Activity types are broadly generalized into one of two categories (see Table 2). **At least one of RXFIRE_MGT, CANOPY_MGT, SURF_MGT or REFOREST field required.**	
CANOPY_MGT	Canopy Management	General description of the management activities for forest canopy and/or overstory. Activity types are broadly generalized into one of six categories (see Table 2). **At least one of RXFIRE_MGT, CANOPY_MGT, SURF_MGT or REFOREST field required.**	Originating agency defined, OR classified by CFRI/CSFS
SURF_MGT	Surface Management	General description of the management type for understory woody vegetation of shrubs and small trees, tree branches and tops or other "slash" from canopy management, and surface fuels management. Surface management types are broadly generalized into one of seven categories (see Table 2). **At least one of RXFIRE_MGT, CANOPY_MGT, SURF_MGT or REFOREST field required.**	Originating agency defined, OR classified by CFRI/CSFS
REFOREST	Reforestation	General description of the reforestation management type for planting tree species. **At least one of RXFIRE_MGT, CANOPY_MGT, SURF_MGT or REFOREST field required.**	Originating agency defined, OR classified by CFRI/CSFS

Name	Alias	Description	Source
TREE_COUNT	Number of Trees	Number of trees planted as part of reforestation planting activity. Only included if associated with a REFORESTATION ACTIVITY.	Originating agency defined
SPECIES	Species Planted	Select majority species type planted as part of reforestation planting activity. Only included if associated with a REFORESTATION ACTIVITY.	Originating agency defined
PRJ_OBJECT	Description	Description of project objectives, goals or additional information on activities provided by originating agency. This could include more detail on how the tools were implemented to achieve goals and objectives, such as patch cut, shaded fuel break, seed tree harvest, post fire reforestation for hillslope stabilization or other specific applications of the Canopy, Surface and Reforestation tools.	Originating agency defined
YEAR_COMP	Year Completed	The calendar year the work was physically completed. **Required.**	Originating agency defined
ACRES_MGT	Managed Acres	Area in acres where active forest management occurred, as submitted by the originating agency. ACRES_MGT can match the ACRES_GIS of the submitted polygon, however in some cases total management acres may be less than the area of the submitted polygon (e.g., GIS polygon represents a property boundary instead of discrete management locations). **Required.**	Originating agency defined
ACRES_GIS	GIS Acres	Total area of polygon in acres as calculated in ArcGIS.	Calculated by CFRI/CSFS
NOTES	Notes	Notes or additional relevant information provided by the originating agency.	Originating agency defined OR augmented by CFRI/ CSFS
ORGFILE	Original File Name	Name of the original feature class containing the RAW data provided directly from the Originating agency for tracking purposes. Internal field.	Originating agency defined
UPDATED	Date Updated	Date data was processed and uploaded to database for tracking purposes. Internal field.	NA
MODIFY_BY	Modified By	Last name of person who most recently updated the attribute row for tracking purposes. Internal field.	NA

Table 2. *List of prescribed fire, canopy, surface and reforestation management activities in the Forest Tracker.*

Management Type	Activity	Description
Prescribed Fire	Broadcast Burn	Prescribed burning activity where fire is intentionally ignited and applied to the majority or all of an area within well-defined boundaries.
	Pile Burn	Burning of piled material including hand and machine piles and forestry piling decks.
Forest Canopy	Manual	Selective felling of trees and shrubs using hand tools. This can include motorized equipment such as chainsaws, as well as other hand-powered tools including saws, loppers or other equipment primarily operated manually by hand. Manual methods involve tools carried by hand and generally do not include self-mobile machines.
	Mechanical	Selective felling of trees and shrubs using heavy equipment. Mechanical methods generally involve the use of self-mobile machines with wheels or tracks that can be driven through the forest, and the tree cutting method is an integrated part of the machine.
	Mastication	Using machines to grind, shred, chip, chop or break apart woody vegetation into smaller pieces that are immediately deposited onto the forest floor and not passed through a secondary machine.
	Chemical	Application of pesticides, herbicides or any chemical treatment on cut or uncut woody vegetation. The spraying of grasses or forbs is not included in this method.
Forest Surface	Removal	Removal of vegetation off-site by any method except burning.
	Lop and Scatter	Cutting woody vegetation and slash into smaller pieces and scattering the pieces throughout the site.
	Pile Fuels	Piling woody vegetation manually or using machines.
	Mulching	Using machines to grind, shred, chip, chop or break apart woody vegetation into smaller pieces. This includes both mastication (mulching of material that includes the felling and mulching in one action) and chipping (felling of woody vegetation followed by feeding material into a chipper, grinder or secondary machine to mulch material, which is then spread on site). Note: Chipping woody vegetation into containers and removing off-site should be classified as Removal.
Reforestation	Plant Trees	The establishment or re-establishment of forest cover artificially by planting seedlings and/or cuttings with or without site preparation. If selected, please include information on the number of trees planted and species in the appropriate fields.
	Seed	Scattering or placement of seed more or less evenly over a designated area for establishment of forest stand or tree cover; includes broadcast, partial, full or aerial seeding with or without site preparation.

DATABASE COMPLETENESS AND DATA LIMITATIONS

The Colorado Forest Tracker is an ongoing effort to aggregate interagency forest management data across multi-jurisdictional boundaries in Colorado. However, achieving a fully comprehensive dataset remains challenging due to the variability in data collection methods and reporting standards among agencies. Incomplete and inconsistent attribute data, particularly regarding management activities and total managed acres, further complicate this task. The Forest Tracker can only present the data as it is reported, without making modifications or assumptions about its accuracy.

Activity polygons are used to delineate areas where management activities have occurred, but they may not always accurately reflect the actual footprint of work completed at a given location. In some cases, only a portion of the designated area may have received work during a specific time. Additionally, discrepancies can arise between Managed Acres – the area where active forest management occurred as submitted by the originating agency – and GIS Acres – the total area of a polygon as calculated using geographic information systems software. To provide a more conservative estimate of forest management acres, Forest Tracker staff prioritizes the use of Managed Acres wherever possible. However, due to reporting inconsistencies, acreage totals may reflect a combination of both measures within the final dataset.

Federal land constitutes approximately 65% of Colorado's forests, and agencies are legislatively mandated to report publicly funded activities. Additionally, state agencies that contributed data to the Forest Tracker provide substantial funding to support forest management activities on nonfederal lands. While the Forest Tracker captures most grant-funded activities in Colorado, it is not exhaustive. Some forest management activities fall outside its scope, either through agencies not currently represented or projects funded by sources other than public grants. This is particularly relevant in landscapes where nonfederal activities are more prevalent.

Certain agencies, including the Natural Resources Conservation Service (NRCS), and some fire protection districts and local municipalities are not currently direct contributors to the Forest Tracker. However, many of these agencies leverage state or federal funding for their management activities and are therefore included when reported in federal or state data sources. In the 2022 Colorado Interagency Fuel Treatment Database (Mueller and Caggiano, 2022), federal and state data accounted for 99% of the total acres collected, even with the inclusion of local agency data. Accordingly, we estimate that the Forest Tracker captures the majority of forest management acreage and activities in Colorado. Nonetheless, some crucial management activities may still be missing, which should be considered when using and interpreting the data.

The Forest Tracker team adheres to legal data privacy regulations and respects individual data-sharing preferences. Consequently, certain data may be withheld at the request of specific entities. This may impact local data, as well as state-reported data, when landowners choose to opt out of data sharing through state-funded programs.

The Twin Sisters habitat restoration project near Estes Park put the Larimer County Youth Conservation Corps to work thinning overgrown forest on a section of land owned by the State Land Board.

The ongoing project will cover 40 acres and accomplish goals set forth in the Colorado Strategic Wildfire Action Plan (COSWAP). ***Photo: Amy Bulger, Colorado State Forest Service***

The Forest Tracker includes data from 2000 to the present. During this timeframe, the adoption of electronic mapping and tracking systems has varied across agencies. Many still lack robust digital reporting tools, leading to potential gaps in earlier data. Users should exercise caution when analyzing historical records.

This data is dynamic and may change over time, and users should be aware of an acknowledge the limitations in the geospatial data prior to use.

DATABASE MAINTENANCE AND AVAILABILITY

The Forest Tracker will be updated on an annual cycle.

Release History
November 2024 - v1 (Beta)
February 2025 - v1

Forest Tracker data has been made available as a public dashboard data viewer and as both an ESRI Map Service and a File Geodatabase. Access these resources at *ColoradoForestTracker.org.*

FUNDING STATEMENT

Funding for this project was provided by the Colorado Forest Restoration Institute through the Southwest Forest Health and Wildfire Prevention Act, and the Colorado State Forest Service through HB-1199 Healthy Forests & Vibrant Communities funds.

REFERENCES

Bureau of Land Management Colorado. (2024). *Completed Vegetation Treatment Polygons.*

Caggiano, M.D. (2017). *Front Range Round Table 2016 Interagency Fuel Treatment Database*. Fort Collins, CO: Colorado Forest Restoration Institute.

Colorado Natural Heritage Program and the Geospatial Centroid. 2024. *The Colorado Ownership and Protection Map (COMaP).* Colorado State University, Fort Collins, CO. Accessed 8/29/2024.

Mueller, S.E., Caggiano, M.D. (2022). *Colorado Interagency Fuel Treatment Database*. Fort Collins, CO: Colorado Forest Restoration Institute.

National Park Service. (2024). NPS Complete Treatment Perimeters, 2024. Unpublished.

U.S. Forest Service. (2024). *Enterprise Data Warehouse*, keyword FACTS.

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Dannels, Rebecca, Nic Kotlinski, Stephanie Mueller, Amanda West Fordham, and Brett Wolk. (2025). Colorado Forest Management Activity Tracker (Forest Tracker) Report. February, 2025. Fort Collins, CO: Colorado State Forest Service.

The ideal way to plant a new tree from a container is to remember: basin, berm and shade.

Give the seedling a basin around its base that can collect and hold water for the roots; create a berm alongside the new planting to protect the seedling from the environment; and use an object to create a little extra shade for the new tree.

Photo: Field Peterson, Colorado State Forest Service

APPENDIX A. FEDERAL AND STATE DATA CROSSWALK TABLES

Table A1. *Table of unique USFS FACTS ACTIVITY codes within Colorado and assigned Forest Tracker classification. Activities not related to woody vegetation management are excluded. An ACTIVITY that may describe more than one classification type within the Forest Tracker schema requires additional information from the METHOD attribute (Table A2).*

ACTIVITY	Classify
Acres Improved - Construction/Reconstruction of Range Grz Structural Improv Area	Excluded
Administrative Changes	Excluded
Anadromous Fish Habitat Access Management (Closures)	Excluded
Animal Damage Control for Reforestation	Excluded
Broadcast Burning - Covers a majority of the unit	Broadcast Burn
Burning of Piled Material	Pile Burn
Campground Maintenance	Excluded
Certification of Natural Regeneration With Site Prep	Excluded
Certification of Natural Regeneration Without Site Prep	Excluded
Certification-Planted	Excluded
Certification-Seeded	Excluded
Chipping of Fuels	Mulching
Commercial Thin	METHOD
Commercial Thin Cut trees and brush	METHOD
Compacting/Crushing of Fuels	Mulching
Cone Collection	Excluded
Control of Understory Vegetation	Excluded
Control of Understory Vegetation- Burning	Broadcast Burn
Coppice Cut (EA/RH/FH)	Mechanical
Coppice Cut (w/leave trees) (EA/RH/FH)	Mechanical
Cover brush pile for burning	Pile Fuels
Cruising	Excluded
Disease Control	Excluded
Disease Prevention	Excluded
Disturbed Facilities Replacement	Excluded
Evaluation Plantation Examination/ Measurement	Excluded
Facility and Site Reconstruction	Excluded
Fill-in or Replant Trees	Plant Trees
Fill-in Seed or Reseed Trees	Excluded
Fuel Break	METHOD
Grazing and Range Mgt. for Hazardous Fuels Reduction	Excluded
Group Selection Cut (UA/RH/FH)	METHOD
Harvest Without Restocking	METHOD
Improvement Cut	METHOD
Initiate Natural Regeneration	Excluded
Insect Control	Excluded
Insect Prevention	Excluded
Invasives - Biocontrol, Classic	Excluded

ACTIVITY	Classify
Invasives - Biocontrol, Livestock	Excluded
Invasives - Mechanical /Physical	Excluded
Invasives - Pesticide Application	Excluded
Invasives - Treatment Activity Monitoring	Excluded
Jackpot Burning - Scattered concentrations	Pile Burn
Layout and Design	Excluded
Leave Trees (Wildlife Reasons) - Area	Excluded
Management & Control of Recreation to Protect Resources	Excluded
Marking/Designation	Excluded
Native Species Established	Excluded
Natural Changes (excludes fire)	Excluded
None	Excluded
Nonrange Fences - Area	Excluded
Other Stand Tending	Excluded
Overstory Removal Cut (from advanced regeneration) (EA/RH/FH)	METHOD
Overstory Removal Cut (from advanced regeneration) (EA/RH/FH) Helicopter	Mechanical
Patch Clearcut (EA/RH/FH)	METHOD
Patch Clearcut (w/ leave trees) (EA/RH/FH)	METHOD
Patch Clearcut (w/ leave trees) (EA/RH/FH) Cut trees and brush	METHOD
Permanent Land Clearing	METHOD
Piling of Fuels, Hand or Machine	Pile Fuels
Planned Treatment Burned in Wildfire	Excluded
Plant or Seed Shrubs, Forbs, Grasses	Excluded
Plant Trees	Plant Trees
Plantation Survival Survey	Excluded
Planting propagules and cuttings	Excluded
Post Treatment Vegetation Monitoring	Excluded
Precommercial Thin	METHOD
Precommercial thinning for visual	METHOD
Pretreatment Exam for Reforestation	Excluded
Pretreatment Exam for Release or Precommercial Thinning	Excluded
Prune	Manual
Pruning to Raise Canopy Height and Discourage Crown Fire	METHOD
Range Control Vegetation	Excluded
Range Cover Manipulation	Excluded
Range Fences - Length	Excluded
Range Fertilization	Excluded
Range Grazing Non-Structural Improvements	Excluded
Range NEPA/AMP Implementation	Broadcast Burn
Range Non-Structural Maintenance	Excluded
Range Seeding and Planting	Excluded
Rearrangement of Fuels	METHOD
Reclamation of Mines	Excluded

ACTIVITY	Classify
Recreation Activity Enhancement	Excluded
Recreation Removal of hazard trees and snags - Area	METHOD
Reforestation Need Created by Fire	Excluded
Reforestation Need Created by Regeneration Failure	Excluded
Removal of Range Non-Structural Improvements	Excluded
Road Maintenance - Vegetation Reduction	METHOD
Salvage Cut (intermediate treatment, not regeneration)	METHOD
Sanitation Cut	METHOD
Scarify and Seed Landings	Excluded
Seed (Trees)	Seed
Seed Production Area Maintenance	Excluded
Seeding grasses, forbs and/or shrubs	Excluded
Seed-tree Removal Cut (w/ leave trees) (EA/NRH/FH)	METHOD
Seed-tree Seed Cut (with and without leave trees) (EA/RH/NFH)	METHOD
Shelterwood Establishment Cut (with or without leave trees) (EA/RH/NFH)	METHOD
Shelterwood Preparatory Cut (EA/NRH/NFH)	METHOD
Shelterwood Removal Cut (EA/NRH/FH)	METHOD
Shelterwood Removal Cut (w/ leave trees) (EA/NRH/FH)	METHOD
Shelterwood Staged Removal Cut (EA/NRH/NFH)	Mechanical
Silvicultural Stand Examination	Excluded
Single-tree Selection Cut (UA/RH/FH)	METHOD
Site Preparation for Natural Regeneration - Burning	Broadcast Burn
Site Preparation for Natural Regeneration - Manual	Manual
Site Preparation for Natural Regeneration - Mechanical	METHOD
Site Preparation for Natural Regeneration - Other	METHOD
Site Preparation for Planting - Mechanical	METHOD
Site Preparation for Planting - Other	Manual
Site Preparation for Seeding - Other	METHOD
Slashing - Pre-Site Preparation	Manual
Soil Productivity Improvement	Excluded
Soil Productivity Monitoring	Excluded
Special Products Removal	METHOD
Stand Clearcut (EA/RH/FH)	METHOD
Stand Clearcut (w/ leave trees) (EA/RH/FH)	METHOD
Stand Clearcut (w/ leave trees) (EA/RH/FH) Cut trees and brush	METHOD
Stand Diagnosis Prepared	Excluded
Stocking Survey	Excluded
T&ES Species Survey	Excluded
Thinning for Hazardous Fuels Reduction	METHOD
Trail Maintenance	Excluded
Tree Release and Weed	METHOD
TSI Certification - Release/weeding	Manual
TSI Certification - Thinning	Manual

ACTIVITY	Classify
Two-aged Patch Clearcut (w/res) (2A/RH/FH)	METHOD
Two-aged Preparatory Cut (w/res) (2A/NRH/NFH)	METHOD
Two-aged Seed-tree Seed and Removal Cut (w/res) (2A/RH/FH)	Mechanical
Two-aged Shelterwood Establishment and Removal Cut (w/ res) (2A/RH/FH)	METHOD
Two-aged Shelterwood Final Removal Cut (w/res) (2A/NRH/FH)	METHOD
Underburn - Low Intensity (Majority of Unit)	Broadcast Burn
Visual Resource Slash Treatment	METHOD
Visual Resources Protection & Improvement	Excluded
Visual Resources Seeding/Replanting	Excluded
Watershed Resource Non-Structural Improvements Erosion Cont	Excluded
Watershed Resource Non-Structural Improvements Riparian	Excluded
Watershed Resource Road Closure - Length	Excluded
Watershed Resource Road Obliteration - Area	Excluded
Wildfire - Fuels Benefit	Excluded
Wildfire - Human Ignition	Excluded
Wildfire - Natural Ignition	Excluded
Wildland Fire Use	Excluded
Wildland seed collecting	Excluded
Wildlife Habitat Activities	Excluded
Wildlife Habitat Improvement	Excluded
Wildlife habitat inventory	Excluded
Wildlife Habitat Mechanical Treatment	METHOD
Wildlife habitat monitoring - area	Excluded
Wildlife Habitat Non-Structural Improvement	Excluded
Wildlife Habitat Prescribed Fire	Broadcast Burn
Wildlife Habitat Seeding and Planting	Excluded
Yarding - Removal of Fuels by Carrying or Dragging	METHOD

Table A2. *Table of unique USFS FACTS METHOD codes associated with the ACTIVITY codes from Table A1 and assigned Forest Tracker classification. A METHOD that may describe more than one classification type within the Forest Tracker schema requires additional information from the EQIPMENT attribute (Table A3).*

METHOD	Classify
Animal Logging	Manual
Chemical	Manual
Chipping	Mastication
Christmas Tree Harvest	Manual
Crushing, pushing	Mastication
Cut trees and brush	EQUIPMENT
Fire	EQUIPMENT
Firewood Removal	EQUIPMENT
Girdle	Manual
Hand cut, cut surface treatment	Manual
Hand piling	Manual
Helicopter	Mechanical
Highlead	Mechanical
Logging Methods	Mechanical
Maintenance	Mechanical
Manual	Manual
Manual Logging	Manual
Mechanical	EQUIPMENT
Mechanical pile	Mechanical
Mobile Ground	EQUIPMENT
Not Applicable	EQUIPMENT
Power Hand	Manual
Prescribed Burn	EQUIPMENT
Quick Plot Exams	EQUIPMENT
Removal	EQUIPMENT
Tractor Logging	Mechanical
Utilizer - Chip	EQUIPMENT
Walk-through	Mechanical

The Colorado State Forest is a prime destination for viewing fall colors. Aspens take their cue to change when days get shorter in the fall. Color changes also depend on tree health, local weather, environmental factors like drought or increased moisture, elevation and latitude. ***Photo: Field Peterson, Colorado State Forest Service***

Table A3. *Table of unique USFS FACTS EQUIPMENT codes associated with the ACTIVITY and METHOD codes from Table A1 and A2 and assigned Forest Tracker classification.*

EQUIPMENT	Classify
Aerial Ignition Device	CLASSIFY VIA METHOD OR MAJORITY
Animal logging	Manual
Auger	Manual
Axe	Manual
Brush cutter	Manual
Chain Saw	Manual
Chipper	Mastication
Cut to length	Mechanical
Dibble	Manual
Disc	Mastication
Dozer	Mastication
Drip torch	CLASSIFY VIA METHOD OR MAJORITY
Drum Shredder	Mastication
Feller Buncher	Mechanical
Fencing	CLASSIFY VIA METHOD OR MAJORITY
Forwarder	Mechanical
Grapple Piler	Mechanical
Ground Base Skidder	Mechanical
Hand saw	Manual
Hand Tool	Manual
Hand Work	Manual
Hazel hoe	Manual
Helicopter (non-harvest)	Mechanical
Helicopter logging	Mechanical
Helicopter logging -large	Mechanical
Helicopter logging -medium	Mechanical
Helicopter logging -small	Mechanical
Helitorch	Mechanical
Highlead	Mechanical
Hoedad	Manual
Ladders	CLASSIFY VIA METHOD OR MAJORITY
Loader logging	Mechanical
Low ground pressure machinery (non-harvest)	Mechanical
Lumagel	CLASSIFY VIA METHOD OR MAJORITY
Machette	Manual
Manual logging	Manual
Masticator	Mastication
Mechanized systems (felling/bucking/delimbing)	Mechanical
Mower	Mastication
Mulcher	Mastication
NA	CLASSIFY VIA METHOD OR MAJORITY

EQUIPMENT	Classify
Other logging	Mechanical
Ping Pong Balls	CLASSIFY VIA METHOD OR MAJORITY
Planting bar	Manual
Power hand	Manual
Propane torch	CLASSIFY VIA METHOD OR MAJORITY
Pruning saw	Manual
Pulaski	Manual
Ripper	Mechanical
Roller Chopper	Mastication
Rubber tired skidder logging	Mechanical
Scarification rake	Manual
Shovel	Manual
Shredder	Mastication
Single span skyline	Mechanical
Skid-Steer-Type Vehicle	Mechanical
Small Yarder	Mechanical
Terra torch	CLASSIFY VIA METHOD OR MAJORITY
Track loader/jammer	Mechanical
Tractor logging	Mechanical
Tractor (non-harvest)	Mechanical
Tree Shear	Mechanical
Utility Vehicle	Mechanical
Utilizer-chip	Mastication

Table A4. *List of attribute field names for the Classification Fields and Text Fields in non-FACTS data used to classify the data for the Forest Tracker.*

Database	Classification Fields	Text Fields
BIA	Type_Name	ACT_TRT_NM
BLM NFPORS	TypeName	TRTMNT_COM
BLM other systems	TRTMNT_SUB	TRTMNT_COM
CPW HPD	Trt_Type, Trt_Method, TrtSubMthd	Trt_Cmnt, Trt_Descri
CSFS GeoTracks	PRIMARY_TR, SLASH_TREA	COMMENTS
CSFS SMART	Activity_Type, Activity_Practice	Activity_Description, Comments
CSFS WebDET	COWRAP_Act	Comments
FWS	Type_Name	ACT_TRT_NM
NPS	TreatmentType	OBJECTIVE

Table A5. *List of common keywords used to classify text-based fields for non-FACTS data when the source classification schema did not provide enough information to classify within the Forest Tracker schema. This list is not exhaustive. Additionally, expert knowledge and/or other context clues were used to make final classification decisions.*

Management Type	Activity	Keywords
Prescribed Fire Management Method	Broadcast Burn	'rx fire', 'rx burn', 'prescribed burn'
	Pile Burn	'jackpot burn'
Canopy Management Method	Manual	'hand thin', 'hand thinning', 'hand', 'manual', 'chainsaw', 'volunteer', 'crews', 'defensible space maintenance of infrastructure', 'single tree'
	Mechanical	'machinery', 'logging equipment'
	Mastication	'crushing', 'mowing [of woody vegetation]', 'FECON', 'hydroaxe', 'rollerchop', 'brush', 'dixie harrow'
	Chemical	'oak', 'Russian olive', 'tamarisk', 'brush', 'salt cedar', 'tree'
Surface Management Method	Removal	'biomass removal'
	Lop and Scatter	
	Pile Fuels	'hand pile'
	Mulching	'chipping', 'wood chipper', 'masticated'
Reforestation Method	Plant Trees	
	Seed	'cottonwood'
Exclude	Exclude	'grass', 'cheatgrass', 'herbicide', 'pesticide', 'thistle', 'knapweed', 'forb', 'fire use', 'monitoring', 'rosettes', 'musk', 'trail stabilization', 'sagebrush'

The West Bench of the Grand Mesa offers up fabulous stands of fall color. Aspens take their cue to change when days get shorter in the fall. Color changes also depend on tree health, local weather, environmental factors like drought or increased moisture, elevation and latitude. Photo: Kamie Long, Colorado State Forest Service

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