Forest Management Plans are developed to help protect and restore California’s resources and forested watersheds. The Feather River watershed is a critical watershed within the Sacramento River Basin and significant investments have and are being made to restore the area. These investments however are not significant enough to reach the scale needed to improve forest health in the Feather River Watershed to safe levels. Consequently, local Butte county stakeholders (BCFSC, CWPP, XX, XX) and the SRWP have joined together to work closely with the Forbestown forest restoration project to create a digital forest health management plan and tool that can be used by stakeholder groups, planners and projects throughout the watershed. Building on the Forebestown planning and evaluation process, the SRWP data program will work with local resource managers and regional stakeholders to aggregate and centralize data collection; organize and analyze data and make data and information available for collaborative planning activity. This process will provide stakeholders with a platform to develop goals, assess current and future conditions, produce sustainable management plans for forest properties, and establish a tool that can be used throughout the watershed to streamline the planning process and increase the pace and scale of watershed restoration.

Developing comprehensive data management practices, making a data plan and sharing them with regional stakeholders is a key aspect of this project. Currently stakeholders work in silos and often times without current data. This project will provide data access in several ways: web based (for viewing and interaction), downloadable GIS files and web services. The data will cover both the planning area details as well as at a watershed scale. This landscape scale (expanded view) will provide planning teams visualization tools to prioritize projects, access impacts of projects in the watershed or find ways to increase project impact.

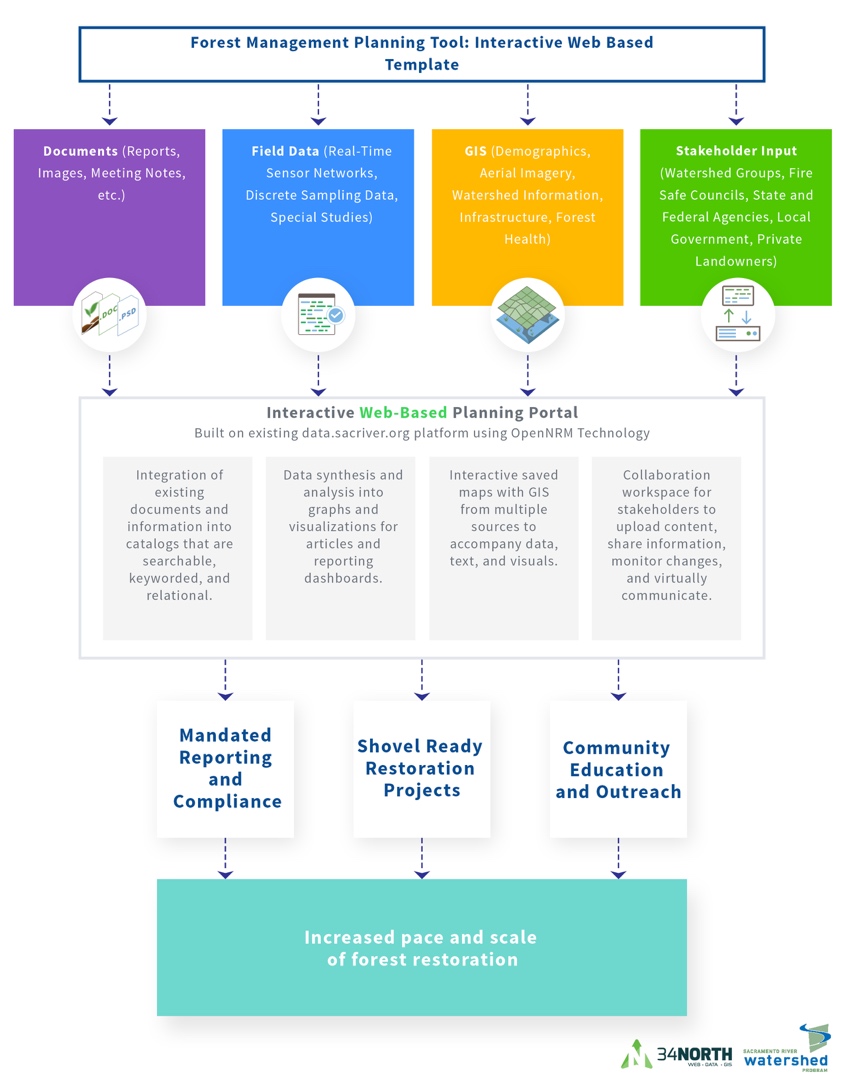
Another key element in the process of prioritizing projects for landscape-level planning is gathering information from stakeholders not available as datasets or GIS and ground-truthing geospatial analysis. Gathering input from residents and scientific experts can be achieved through the Planning Tool by allowing an online comment feed for evaluating planning documents. In addition, the Planning Tool would create the ability to draw on top of maps to make corrections, leave comments on maps and have ongoing discussions connected to documents and other assets. This would create a virtual, web-based opportunity for gathering information and input from locals, experts and stakeholders without having to meet in person.

There is an extensive amount of GIS data, databases and sensor data necessary for this type of interactive plan. Much of the GIS data needed to form management decisions on a landscape scale should be geoprocessed (mathematical calculations performed on data) prior to web publication. Layers will need to be combined into objective function weighted rasters to identify priority areas (is this already done for forbestown because they have identified this already?). Geoprocessing tasks include creating weighted rasters from a combination of environmental data layers such as vegetation, fire history, fuel loads. The Planning tool would include an extensive GIS library, map viewer, and layer functions such as clipping, drawing buffers, selecting features, and the ability to consume and display modeled data. With the Planning Tool, datasets could be spatially displayed and modeled for changes over time. One of the key elements to landscape-level plans is identifying high value resources and assets (HVRA). Stakeholders can add the location of an HVRA to an existing map using the Planning Tool. The GIS catalog and map tools can ingest a diverse range of datasets including shapefiles, aerial imagery rasters, ArcGIS feature and map services, other external web mapping and web feature services. Existing services connected to the SRW Data Portal include: CA Water Board, US Fish and Wildlife Service Fish Monitoring and Wetlands data sets, USGS National Hydrography Dataset and Mineral Resource Data System, CalFire FRAP, US Forest Service Forest Health and Insect and Disease datasets, NOAA National Weather Service and National Water Information System, TIGER Census data, California Data Exchange Center (CDEC) real-time sensor network, California Environmental Data Exchange Network (CEDEN), California Irrigation Management Information System, and the Sacramento River Coordinated Monitoring Program.

Proposed Data for Planning

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| --- | --- |
| **GIS Layer** | **Source** |
| Planning Unit Boundaries, Battalion Boundaries, | CalFire |
| Watershed Boundaries, Hydrologic Features | USGS NHD |
| Land Ownership, Parcel Boundaries | Local Assessor, County, Private Landowners, Agencies |
| Land Use, Land Cover | County, Agencies, Local Community |
| Vegetation Types | USGS Landsat NDVI, USFS CalVeg, Ground-truthing surveys |
| Digital Elevation Models, Geology | USGS |
| Fire History, Fire Burn Severity, Fuel Loads | CalFire, Fire Safe Councils, USFS, Forester |
| Critical Habitats | USFWS, CDFW |
| Resource Locations, Asset Locations, No Treatment Zones, Infrastructure (roads, water sources, power generating facilities), Existing Monitoring Station Locations, Approved CEQA Projects, Project Boundaries | All Stakeholders |
| Access and Yarding Capability | Timber Landowners, Agencies |
| Board-feet Equivalents of Forest Stands, Canopy Density | Forester, Agencies |
| Meadow Locations | UC Davis Sierra Nevada Meadows Program, USFS, CalFire |
| Riparian Zones | USGS NHD, Agencies |
| Tree Mortality, Historic Vegetation Response to Wildfires | USFS, CalFire, Local Community, Fire Safe Council |
| LANDFIRE layers | USFS and US DOI |
| High Sedimentation Locations | Water Board, Local Agencies and Environmental Monitoring Groups |
| Soil Types | USDA NRCS |
| Real-time Hydrologic and Meteorologic Monitoring Stations | CDEC, NWIS, NOAA |
| Salmon Runs and Fish Bearing Streams, Species Distribution, Hatchery Locations | USFWS, CDFW, Water Board |
| Water Quality Conditions, Point-source Pollution Locations, Non-point source Pollution Locations, 303d Listed Waterbodies and Streams | Water Board, EPA, Watershed Groups |

Ultimately, the Planning Tool will enhance collaborative engagement, streamline data integration and accessibility, allow for landscape-scale planning, project management and tracking and serves as a repository for public education and outreach.



Caption: This image is currently being edited

The Forest Management Planning Tool Implementation Detail

* Database aggregation, organization and analysis. Collect and prepare regional data for Butte County Region and neighboring areas for watershed. Prepare for web viewing and integration with planning tool.
* GIS data aggregation, styling, pre-processing (analysis) and preparation for web-based viewing (planning unit boundaries, Battalion boundaries, watershed boundaries, land ownership, parcel boundaries, vegetation types, fire history, critical habitats, fuel loads, resource locations, asset locations, access and yarding capability, no treatment zones, board-feet equivalents of forest stands, canopy cover, meadows, riparian zones, tree mortality, infrastructure (roads, water sources, power), LANDFIRE layers, fuel loads, historic fire return intervals, critical habitat, distance to roads, HVRA proximity, wildland-urban interface, land accessibility, geology, soils, proximity to riparian areas historic response to wildfire in an area).
* Development Data Management Plan for publication to all Butte county (SCFSC, CWPP) stakeholders. Plan will facilitate and support the addition of new project areas and data associated with new planning areas areas
* Preparation of project area and local watershed geo-located documents for adding to clearing house (catalog) for stakeholders use: projects (completed, current, planned), CEQA/NEPA project areas and details, forest management plans, CWPPs, Local environmental groups' Strategic Plans and Monitoring Work Plans, Watershed Assessments, Federal Land Policy and Management Act, National Forests - Ecological Restoration Implementation Plan, Land and Resource Management Plans, Travel Management Plans, Watershed Condition Framework, Regional Coordinated Resource Management Group Strategic Planning Documents (Ex: Feather River Coordinated Resource Management Group), BLM Resource Management Plans, General Plans (County and City), CEQA – EIR, NEPA – EIS, CDFW Wildlife Management Plans, Integrated Regional Water Management Plans, Fire Safe Council Firewise Assessments and Management Plans, Resource Conservation District Management Plans, CA Natural Resources Agency Stewardship Council Land Conservation and Conveyance Plans, CalFire Forests and Rangelands Assessments
* Prepare regional collaboration workspace and data views: Space to include collaborative editing: map tools workspace (Points, lines, polygons, comments)\*
* Collaborative workspace: Planning document review and comment feed
* Analysis/graphing/visualization tool(s) for project planning/prioritization/ranking.
* Publication and syndication of private planning (password protected) document to stakeholders for regular review
* Data geo-processing tasks to support post monitoring for effectiveness of treatments.
* Develop web-based forest management plan template to present and share with Butte region stakeholders for consolidation and efficient planning of future projects.
* Develop web services and data packages for use by California State open data programs and informing state wide assessments.
* Reporting, compliance and monitoring dashboards. Data widgets can be used in public outreach campaigns or embedded in State websites.
* Education outreach design and web template. Web based newsletters.

End Goal: Moving away from fragmented planning to a more comprehensive and effective planning process.