

Inyo, Sequoia and Sierra National Forests Planning Assessments

Monitoring Supplement: Partial List of Ongoing Regional or National Monitoring Programs and Data Sources

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Not all monitoring that the Forest Service conducts is contained in a forest plan monitoring program. National, regional, eco-regional, state-wide and project-level monitoring are just a few of the other types of information collected that help to inform management on National Forest System lands. In addition to monitoring that occurs as part of land management planning, our Research & Development units conduct ongoing research about a variety of natural and social resource issues and our State & Private Forestry units are also collecting information across landscapes and land ownerships. The Forest Service also is part of several collaboratives and partnerships with both science-based NGOs, universities and other federal and state governmental agencies.

The following is a partial list of ongoing national and regional monitoring programs that provide information which informs forest management but that are not part of the forest plan monitoring programs. Some of these contribute directly to the monitoring questions and indicators in the forest plan monitoring programs and others provide supplemental information for the biennial monitoring report, broader-scale monitoring strategy, project level monitoring or other monitoring.

Watersheds and Aquatics

- The [Watershed Condition Framework](#) (WCF) is a six step framework that establishes a consistent, comparable, and credible process for improving the health of watersheds on national forests and grasslands. Steps 1-3 were completed in 2011 – classify watershed condition, prioritize watersheds for restoration, and develop watershed restoration action plans. Implementation of these restoration projects is under way. Monitoring of these restoration activities is based on [12 watershed condition indicators](#) that will be monitored on these projects.
- The [National Best Management Practices \(BMP\) Program](#) protects water quality through implementation of BMPs to control nonpoint source pollution. The National Core BMPs have been adopted across the FS and National BMP Monitoring (implementation monitoring of project areas or watersheds and some monitoring of BMP implementation effectiveness) has been implemented on nearly all national forests and grasslands over the last three years (FY13-15).
- [Aquatic and Riparian Effectiveness Monitoring Program \(AREMP\)](#) for Northwest Forest Plan (NWFP) forests. Three key questions are currently addressed by AREMP:
 - ◆ What is the status of inchannel conditions?
 - ◆ What is the status of upslope and riparian conditions?
 - ◆ What is the trend in watershed conditions?
- [Stream Condition Inventory \(SCI\)](#), including in-stream monitoring for North Coast Water Board. The CSCI can be used to assess the status and trends of stream condition at multiple scales (sites, watersheds, regions, and statewide) and is also well-suited for compliance monitoring, evaluating the success of mitigation and restoration projects, and evaluating the success of stream protection policies and programs.
- [California Surface Water Ambient Monitoring Program \(SWAMP\)](#) (State Water Resources Control Board) for macroinvertebrate monitoring
- [NorWEST stream temperature monitoring](#) database and modelling by Rocky Mountain Research Station, Boise, will be available for much of Region 5 in 2016 or 2017.
- [EPA Office of Wetlands, Oceans, and Watersheds](#) (OWOW) water quality and aquatic habitat.
- [Sierra Nevada Meadow and Range](#) long term condition and trend monitoring.

Vegetation and Habitat

- [Forest Inventory and Analysis](#) (FIA) FIA reports on status and trends in forest area and location; in the species, size, and health of trees; in total tree growth, mortality, and removals by harvest; in wood production and utilization rates by various products; and in forest land ownership. See [the latest report for California](#).
- [Land cover monitoring and mapping](#) addresses statewide vegetation mapping and long-term monitoring using remotely sensed data.
- [Sierra Nevada Forest Plan Amendment](#) (SNPFA) monitoring includes air quality, fire, meadows, amphibians, spotted owl, fisher, marten and willow flycatcher monitoring.
- [Region 5 vegetation monitoring](#) vegetation classification, inventory, and mapping including deforested conditions in California, change detection and cause and geospatial mapping.
- [Landsat](#) data (30 years of free data) with other remote sensing (e.g., Worldview, Lidar) is a good source for canopy cover and other measures of ecological condition over large areas. Work is underway to combine Landsat with FIA data.
- Regional range and meadow monitoring program monitors ecological condition of grazed meadow and range systems. This monitoring is systematic in time and space focused on grazing allotments to assess standards and guidelines. All Region 5 forests, except Angeles NF, are monitored every 5 years, starting in 1999 and measure plant species composition, invasive species, plant functional groups, diversity, richness, range condition, soil texture, soil saturation, depth to soil mottles on vegetation plots, slope, aspect, and hydrogeomorphic type.
- [Soil Quality Monitoring](#) conducted according to existing protocols

Recreation

- [National Visitor Use Monitoring](#) (NVUM) produces estimates of the volume of recreation visitation to National Forests and Grasslands and descriptive information about that visitation, including activity participation, demographics, visit duration, measures of satisfaction, and trip spending connected to the visit.

Forest Health

- [Monitoring Trends in Burn Severity](#) (MTBS) is a multi-year project designed to consistently map the burn severity and perimeters of fires across all lands of the United States from 1984 and beyond.
- [Forest Health Monitoring](#) including aerial detection for tree mortality, evaluation monitoring to determine extent, severity, and causes of undesirable changes in forest health, vegetation land cover monitoring, and insect and disease activity and risk modelling.

Airsheds and Air Quality

- [IMPROVE](#) monitoring of air quality in Class I wilderness areas:
 - ◆ Angeles NF -- San Gabriel wilderness
 - ◆ Cleveland NF -- Agua Tibia wilderness

- ◆ Eldorado NF – Desolation wilderness
- ◆ Inyo -- Ansel Adams wilderness (mostly Sierra NF), Hoover wilderness (mostly Humboldt-Toiyabe NF), John Muir wilderness (mostly Sierra NF),
- ◆ Klamath NF -- Marble Mountain wilderness and Trinity Alps (mostly Shasta-Trinity NF; also Six Rivers NF)
- ◆ Los Padres NF -- San Rafael wilderness
- ◆ San Bernardino NF -- San Geronio wilderness
- ◆ Sequoia NF – Domeland wilderness
- ◆ Shasta-Trinity NF – Trinity Alps wilderness (also Klamath and Six Rivers NFs)
- ◆ Sierra NF – Ansel Adams wilderness (also Inyo NF), John Muir NF (also Inyo), Kaiser wilderness
- ◆ Six Rivers NF – Trinity Alps wilderness (mostly Shasta-Trinity NF; also Klamath NF)

Species

- Regional Fisher and Marten monitoring on the Lassen, Tahoe, Eldorado, Stanislaus, Sierra, and Sequoia NFs. This monitoring is tied to the FIA plot design, but with a lower intensity and measures presence/absence.
- [Sierra Nevada Bird Monitoring with Point Blue Conservation Science](#) including the fox sparrow, yellow warbler, mountain quail, hairy woodpecker and others.
- [The Institute for Bird Populations](#) (IBP) monitors the black-backed woodpecker in burned forest habitat (the primary habitat used by the woodpecker) throughout the Sierra Nevada. IBP integrates the monitoring data into various tools for informing black-backed woodpecker management, as well as a Conservation Strategy for Black-backed Woodpeckers.
- [Southern Sierra Fisher Assessment](#) and [Strategy](#) with Conservation Biology Institute.
- [CalFish](#) data and maps on anadromous fish.
- [California Department of Fish and Wildlife BIOS](#) database system for all species of state interest including rare plants and animals, game/harvest species, aquatic macroinvertebrates, and vegetation and habitat.
- Point Blue Conservation Science (formerly known as Point Reyes Bird Observatory) is associated with [California Partners In Flight](#) (CalPIF). PBCS monitors Fox Sparrow, Hairy Woodpecker, Yellow
- Warbler, Mountain Quail as part of avian monitoring in the Sierra Nevada. These efforts also gather data on other birds species (primarily landbirds) encountered on the avian surveys. Results are available at <http://data.prbo.org/apps/snamin/>
- [Sierra Nevada Adaptive Management Project](#) joint effort by the University of California, state and federal agencies, and the public to study management of forest lands in the Sierra Nevada. Includes monitoring of various species including spotted owls and Pacific fisher.
- PSW and partners have monitored the demography of the California Spotted Owl in the Sierra Nevada at 3 locations.

Monitoring Under Development

- Wilderness Character Monitoring
- Fire Remote Sensing Lab website (FIA plot and disturbance monitoring – fire and veg)
- A Sierra Nevada amphibian monitoring program is being designed in collaboration with the USFWS. It will include monitoring for Sierra Nevada yellow-legged frog (*Rana sierrae*), Northern Distinct Population Segment of the mountain yellow-legged frog (*Rana muscoa*) and Yosemite toad (*Anaxyrus canorus*) is intended to determine effectiveness of best management practices, standards, and guidelines in the USFWS Programmatic Biological Opinion.
- [Climate Change Roadmap](#) and new Scorecard monitoring and development of carbon assessment tools.

Research

- [Pacific Southwest Research Station Experimental Forests, Ranges and Watersheds](#) Scientific resource in the experimental forests, ranges, and watersheds that exist across the United States and its territories. These experimental areas are sites for most of the long-term studies conducted by Forest Service Research and Development and our partners.
- Effects of beetle colonization on black-backed woodpecker conservation. West Coast Forest Health Monitoring is funding a three-year project to determine implications for forest restoration and black-backed woodpecker conservation following beetle colonization of trees killed by fire and bark beetles. This is a collaborative evaluation monitoring project with cooperators from The Institute for Bird Populations– Point Reyes Station, Forest Health Protection, Ecosystem Management and Pacific Southwest Research Station. Information obtained from this project will be relevant to land managers throughout the Sierra Nevada and Southern Cascades.
- Pine distribution and stand conditions. West Coast Forest Health Monitoring is funding a new project with the Yakama Nation near Toppenish, Washington, to assess whitebark pine distribution and stand conditions on the Yakama Reservation. This is a collaborative evaluation monitoring project with participants from the two groups. Monitoring plots will provide additional baseline data on whitebark pine, the effect of climate change, white pine blister rust and large-scale disturbances (bark beetles and fire). These new plots will supplement the larger collection of whitebark pine plots on lands managed by the Forest Service and Washington State.
- Boreal forest study. West Coast Forest Health Monitoring is funding a three-year project using Cooperative Alaska Forest Inventory permanent plots for boreal forest disease detection and quantification. This is a collaborative evaluation monitoring project between the University of Alaska, Fairbanks, and Forest Health Protection. The boreal forest comprises 91 percent of the 126 million acres of Alaska's forested land. Extraction, mapping and analysis of tree disease and damage information can provide baseline reports for managers, identify potential for hardwood biomass products and yield quantitative data for risk modeling in south-central and interior Alaska.