

Pacific Southwest Region
Ecology Program
Annual Report
FY 2022



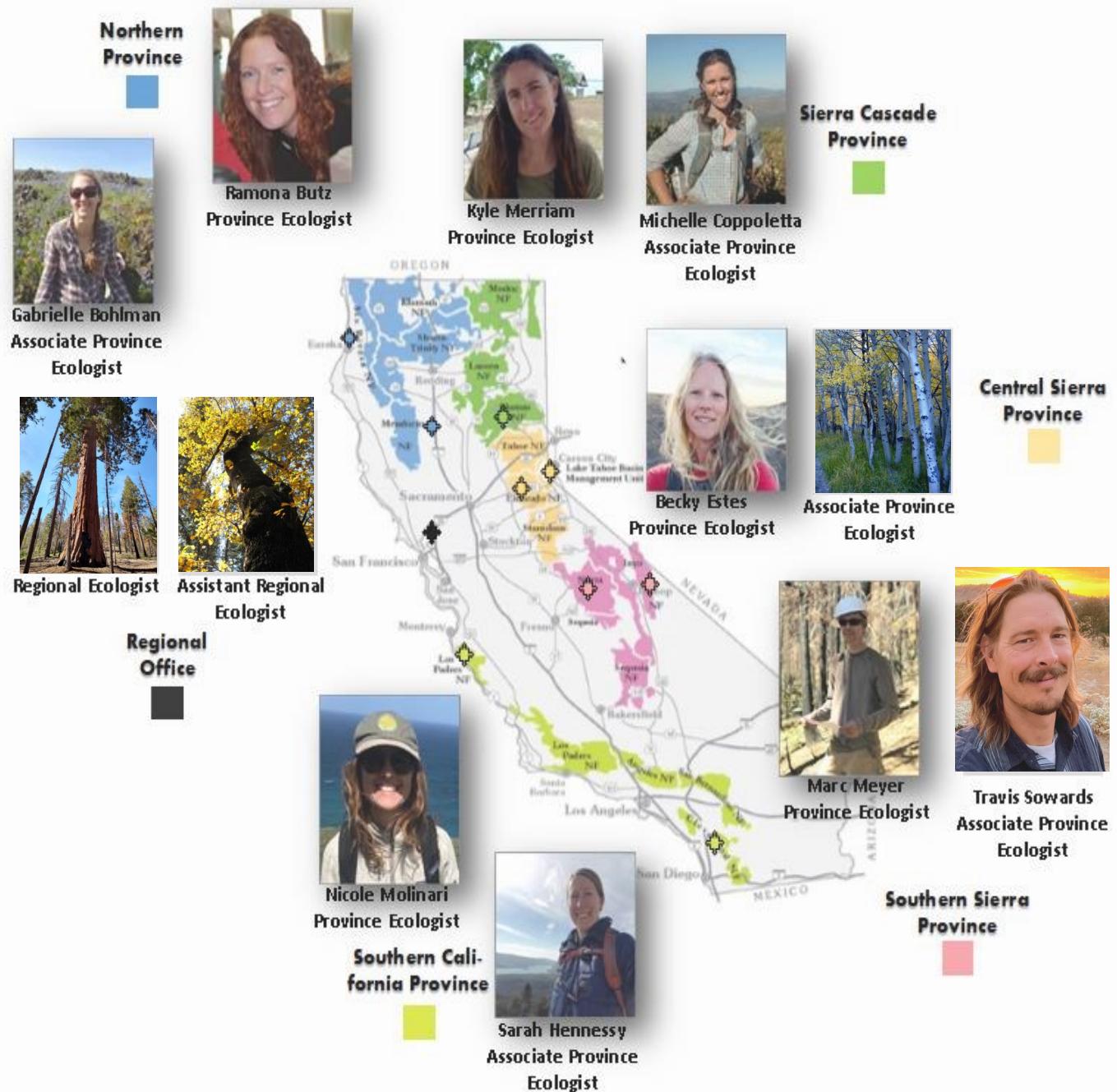
REP Organization

The Region 5 Ecology Program (REP) is a boundary-spanning organization that provides expertise fundamental to sustainable, science-based, multiple-use land management in the Pacific Southwest Region. REP staff work closely with other ecologists, resource specialists, and managers across the region and country. The REP is divided into five Provinces. Each Province has two ecologists, a Province Ecologist and an Associate Province Ecologist. Additionally, the Regional Ecologist and Assistant Regional Ecologist are based out of the Regional Office. Province Ecologists work across Forest Service Zones to help us meet our goals.



REP Mission Statement

- ⇒ To provide leadership and program direction that incorporates the best available ecological science to managing natural resources for sustainability and diverse human needs.
- ⇒ To facilitate understanding, development, and appropriate use of ecological science in Agency activities such as landscape analysis and assessment, land management planning, inventory and monitoring, and project implementation.



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Scan the QR code to visit our website at

<https://www.fs.usda.gov/detail/r5/plants-animals/?cid=stelprdb5427254>

Find resources such as monitoring reports, climate change summaries and contributions from each province across the forests.



Program Priorities

Ecological Restoration

- The REP supports Forests in the interpretation and implementation of the R5 Ecological Restoration initiative.
- We collaborate with staff on post fire recovery strategies, including providing guidance on reforestation and on the implementation of GTR-270, a postfire restoration framework for National Forests in California.
- Other products include the development of peer-reviewed Natural Range of Variation (NRV) assessments that provide baseline information on ecosystem conditions that can be compared to current conditions to determine the level of departure in altered ecosystems. These assessments have been completed for a range of vegetation types across the Region and have been used for forest planning, development of restoration projects, and as a communication tool.

Climate Change Adaptation

- The REP provides climate change science interpretation support to help forest managers plan for, and where possible, mitigate climate related ecosystem vulnerabilities.
- We regularly update Climate Change Trend Summaries for all of the National Forests in Region 5. These summaries highlight the most current climate science for past, current, and projected future climate change trends by resource area and disturbance type.

Inventory and Monitoring

- The REP works closely with managers to identify, implement, and analyze key inventory and monitoring questions to meet a variety of program goals and address key management concerns. Inventory and monitoring support includes topics such as treatment effectiveness monitoring, status and trend monitoring for key issues across the region (e.g., whitebark pine status and trends, collaborative monitoring, forest health monitoring), and post-disturbance monitoring.
- The REP serves as a repository of monitoring protocols developed through partnerships to address a diverse range of monitoring questions.
- The REP also assists with the application of new technology in the form of tools, data sets, and modelling to answer pressing land management questions.

REGIONAL OFFICE

PACIFIC SOUTHWEST REGION

Regional Office Team

- Hugh Safford, Regional Ecologist (*retired in Dec. 2021*)
- Marc Meyer, Acting Regional Ecologist (*Jan-May 2022*)
- Becky Estes, Acting Regional Ecologist (*July-Nov 2022*)
- Michelle Coppoletta, Acting Assistant Regional Ecologist (*Nov 2021-Feb 2022*)
- Jennifer Falkey, Acting Assistant Regional Ecologist (*May-Aug 2022*)

Accomplishments

Ecological Restoration

- Collaboration with Post Fire Recovery Coordinator to develop strategy incorporating GTR 270
- Provided input to Reforestation for Resilience
- Participated in media interviews with Southern California Public Radio and Bay Area Public Radio on forest management and fire effects to forest ecosystems
- Co-organized a symposium for forest managers—Postfire Restoration in California: A Framework for Success

Climate Change Adaptation

- Participated on working group developing the Climate Activity Tracker

Inventory & Monitoring

- Provided assistance to Caldor Post Fire Vegetation Monitoring and Fuel Treatment Effectiveness

Other

- Pursued program budget priorities (e.g., SoCal associate ecologist, CFSC renewal) and facilitated internal discussion of REP vision
- Developed recommendations for addressing OPI 2.0 with REP and acting EM Deputy Director
- Continued coordination of approval and Pre-Hiring planning of the Associate Ecologist positions in the REP (Southern CA, Central Sierra CA as well as the Regional Ecologist and Associate Regional Ecologist)
- Assisted in the outreach and selection of acting Assistant Regional Ecologist and acting Southern Sierra Province Ecologist
- Led hiring panel with Sierra NF Ecosystem Staff Officer for Southern Sierra Associate Province Ecologist
- Developed a program brochure to increase visibility of the Region 5 Ecology Program in response to OPI 2.0 requirements
- Development and coordination of Regional Ecology Program Annual Ecology Meeting at Sagehen (this might get bumped to 2023 accomplishments)

NORTHERN PROVINCE

KLAMATH, MENDOCINO, SHASTA-TRINITY, AND SIX RIVERS NATIONAL FORESTS

Province Team

- Ramona Butz, Province Ecologist
- Gabrielle Bohlman, Assoc. Province Ecologist
- *Christal Johnson, Assoc. Province Ecologist*
(Detail: Nov 2021-Jan 2022)

Accomplishments

Ecological Restoration

- Initiated a GTR 270 analysis focused on three key resources (conifer forests, late seral habitat, and oak woodlands) for the Mendocino NF.
- Collaboratively developed desired conditions for using fire to restore ecological health and resilience of eight main vegetation types included in the Six Rivers Hazardous Fuels and Fire Management Project.
- Co-chaired a session at the 39th Annual Salmonid Restoration Conference titled *Mountain Meadows: Restoring Functions in Headwater Catchments under Changing Climate and Wildfire Regimes* (April 2022).
- Helped organize the R5 Postfire Restoration Symposium hosted by the Mendocino NF.

Climate Change Adaptation

- Completed climate change trend summary updates for the Northern Province.
- Contributed to climate adaptation workshops focused on the Six Rivers Hazardous Fuels and Fire Management Project .

Inventory & Monitoring

- Submitted a successful pre-proposal alongside members of the Klamath Meadows Partnership to fund the development of a comprehensive meadow inventory across northwestern CA.
- Provided support to the Fire Behavior and Assessment Team (FBAT) for several fires.
- Provided postfire conifer regeneration prediction tool (POSCRPT) outputs for 2020 & 2021 fires: August Complex, Slater, River Complex, Monument, Red Salmon, McFarland, and Antelope.
- R5 lead for mature and old-growth forest estimation work tied to Executive Order 14072.



Field visit to a site in the North Shore Restoration Project on the Mendocino National Forest.

Forest Planning

- Terrestrial Ecosystems team lead for the first cohort of forests in the Northwest Plan Revision process.
- Continued to provide reviews of Forest Assessments as requested for first cohort of forests in Northwest Forest Plan Revision.
- Developed annotated planning documents to assist in transitioning to new planning framework.
- Developed evaluations of ecological integrity white papers for key terrestrial ecosystems across northwestern California using information gathered and developed during forest plan revision preassessment work.

Collaboration

- Coordinated with PSW/PNW researchers, the Mendocino NF, and FireScape Mendocino to put on a public workshop that highlighted the collaborative development of a forest-wide restoration strategy for the Mendocino NF.
- Coordinator of the Klamath Meadows Partnership, a diverse network of over 20 agencies, non-profits, and scientists committed to the health and resilience of meadows in northern California.

Other

- Ramona detailed as Ecosystems Staff Officer on the Shasta-Trinity NF from Sept 2021-Jan 2022.

Publications

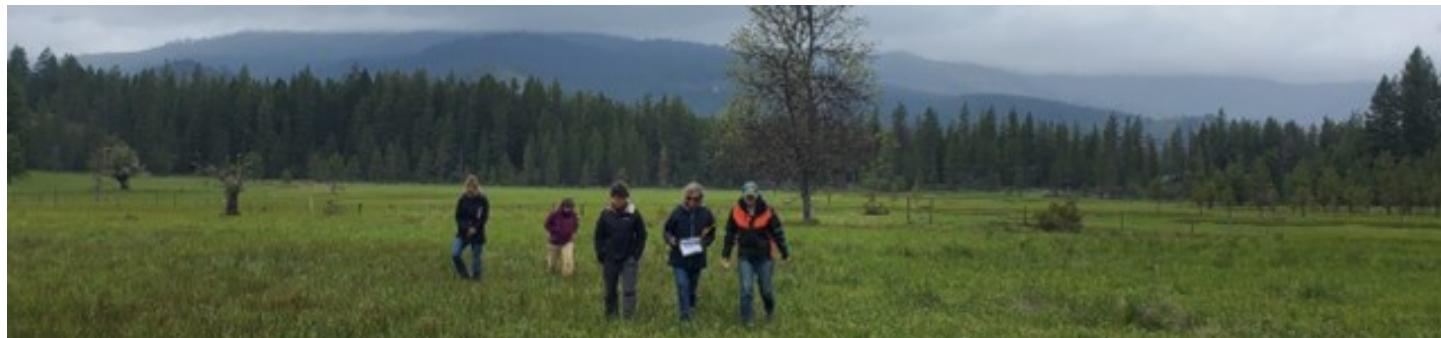
Jules, E. S., M. H. DeSiervo, M. J. Reilly, D. S. Bost, and R. J. Butz. 2022. The effects of a half century of warming and fire exclusion on montane forests of the Klamath Mountains, California, USA. *Ecological Monographs* 92(4):1-24. <https://doi.org/10.1002/ecm.1543>

Merriam, K. E., M. D. Meyer, M. Coppoletta, R. J. Butz, B. L. Estes, C. A. Farris, and M. P. North. 2022. Re-establishing natural fire regimes to restore forest structure in California's red fir forests: The importance of regional context. *Forest Ecology and Management* 503. <https://doi.org/10.1016/j.foreco.2021.119797>

Long, J. W., D. Walsh, M. Coppoletta, R. Tompkins, M. D. Meyer, C. Isbell, G. Bohlman, and M. P. North. *In Press*. Interventions to restore wildfire-altered forests in California. Gen. Tech. Rep. PSW-GTR-278. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.

Addressing 2023 Priorities

- Wildfire Crisis Strategy Landscapes — Klamath River Basin and Trinity Forest Health and Fire Resilient Rural Communities
- Post Fire Restoration—Mendocino National Forest Restoration Strategy



Klamath Meadows Partnership Core Team members visited a handful of meadows in the Upper Trinity Watershed and discussed opportunities for restoration and collaboration.

SIERRA CASCADE PROVINCE

PLUMAS, LASSEN AND MODOC NATIONAL FORESTS

Province Team

- Kyle Merriam, Province Ecologist
- Michelle Coppoletta, Associate Province Ecologist
- Kirsten Bovee, Staff Research Associate, UC Davis (May-December)

Accomplishments

Climate Change Adaptation

- Completed climate trend assessment reports for the Plumas, Lassen and Modoc National Forests.
- Provided current and predicted future climate analysis for project planning, including the Claremont and Tributaries projects and the North Complex Fire area (Plumas NF).

Ecological Restoration

- Completed GTR-270 post-fire restoration strategies for conifer forests and spotted owl habitats impacted by the 2021 Dixie and Sugar fires (Lassen and Plumas NF), as well as five fires that occurred on the Plumas NF between 2017-2020.
- Completed a GTR-270 assessment of restoration opportunities across the entire Plumas NF.
- Awarded Genetics Resource Conservation Grant to conserve rare conifers threatened by altered fire regimes (Plumas, Lassen and Modoc NF).
- Collaborated with the Tehama Resource Conservation District to complete field surveys, tribal-workshops, and the proposed action for a 37,000-acre prescribed fire project located in the Ishi Wilderness (Lassen NF).
- Worked with Plumas NF staff to implement thinning and piling treatments and develop interpretive signs in the old-growth forest of the Valley Creek Special Interest Area.
- Implemented thinning and piling treatments at the Wheeler Peak Unit of the Mud Lake Research Natural Area after the Dixie Fire (Plumas NF).



Fire crew thinning snags at the Wheeler Peak unit of the Mud Lake Research Natural Area after the Dixie Fire.

Accomplishments (cont.)

Inventory & Monitoring

- Completed an assessment of whitebark pine condition, and developed treatment recommendations for the proposed Bear Soup Habitat Restoration Project (Modoc NF).
- In partnership with Plumas Audubon, evaluated aspen regeneration after successive fires (Plumas NF).
- Collaborated with The Nature Conservancy and UC Davis to monitor the effectiveness of thinning and fuel reduction treatments at moderating fire severity in the 2021 Dixie Fire (Plumas and Lassen NF).
- Coordinated ecological monitoring for the Burney Hat Creek Collaborative Landscape Restoration Project. Completed analyses to determine whether DFPZ, Owl HRCA, and juniper removal treatments met project-specific objectives (Lassen NF).
- Led the effort to monitor fire effects on three rare plants: *Castilleja lassenensis* (Mt. Lassen paintbrush), *Penstemon personatus* (close-throated beardtongue), and *Astragalus webberi* (Webber's milkvetch).

Addressing 2023 Priorities

- Monitoring post-fire conditions and treatment effectiveness in the 2021 Dixie Fire.
- Assisting with planning, implementation, and monitoring in the Plumas Community Protection Project (Wildfire Crisis Strategy Landscape).
- Planning for the Ishi Fire Restoration Project (Lassen NF)

Publications and Reports

Hardage, K., Wheelock, S.J., Gaffney, R., O'Halloran, T., Serpa, B., Grant, G., Coppoletta, M., Csank, A., Tague, C., Staudacher, M., Tyler, S. 2022. Soil moisture and micrometeorological differences across reference and thinned stands during extremes of precipitation, southern Cascade Range. *Frontiers In Forests and Global Change* 5: 188.

Merriam, K.E., M.D. Meyer, M. Coppoletta, R.J. Butz, B.L. Estes, C.A. Farris, and M.P. North. 2022. Reestablishing natural fire regimes to restore forest structure in California's red fir forests: The importance of regional context. *Forest Ecology and Management* 503:119797.

Paudel, A., Coppoletta, M., Merriam, K., and Markwith, S. H. 2022. Persistent composition legacy and rapid structural change following successive fires in Sierra Nevada mixed conifer forests. *Forest Ecology and Management*, 509: 120079.

Gross, S., J. Greenberg, and K. Merriam. 2022. Comparison of Meadow Assessment Protocols. Technical Paper R5-TP-044. USDA Forest Service, Pacific Southwest Region, Vallejo, California. pp. 88. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1004737.pdf

Bovee, K., Coppoletta, M., and Merriam K. 2022. Identifying restoration opportunities in recently burned and unburned conifer forest across the Plumas National Forest . Sierra Cascade Ecology Program, USDA Forest Service 11 p . https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1093468.pdf

Bovee, K. and K. Merriam. 2022. Restoration Opportunities for California Spotted Owl on the Plumas National Forest. Sierra Cascade Ecology Program, USDA Forest Service. 16 p. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1093458.pdf

Bovee, K. and M. Coppoletta. 2022. Post-fire Restoration Opportunities for Conifer Forest, Plumas NF Fires 2017-2020. Sierra Cascade Ecology Program, USDA Forest Service. 56 pages. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1093654.pdf

Coppoletta, M., Brendecke, W., Bauer, R., Tompkins, R. and F. Heide. 2022. Post-fire Restoration Opportunities for Conifer Forest in the 2021 Dixie and Sugar Fires. Sierra Cascade Ecology Program, USDA Forest Service . 48 pages. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1093652.pdf

Merriam, K.E., and A. White. 2022. Postfire Restoration Opportunities for California Spotted Owl in the 2021 Dixie and Sugar Fires. Sierra Cascade Ecology Program, USDA Forest Service Pacific 23 p https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1093469.pdf

CENTRAL SIERRA PROVINCE

TAHOE, ELDORADO AND STANISLAUS NATIONAL FORESTS & LAKE TAHOE BASIN MANAGEMENT UNIT

Province Team

- Becky Estes, Province Ecologist
- Vacant, Associate Province Ecologist
- *Leif Mortenson, Associate Province Ecologist*
(Detail: July 2021— November 2021)
- *Kirsten Bovee, Associate Province Ecologist*
(Detail: December 2021—April 2022)

Accomplishments

Climate Change Adaptation

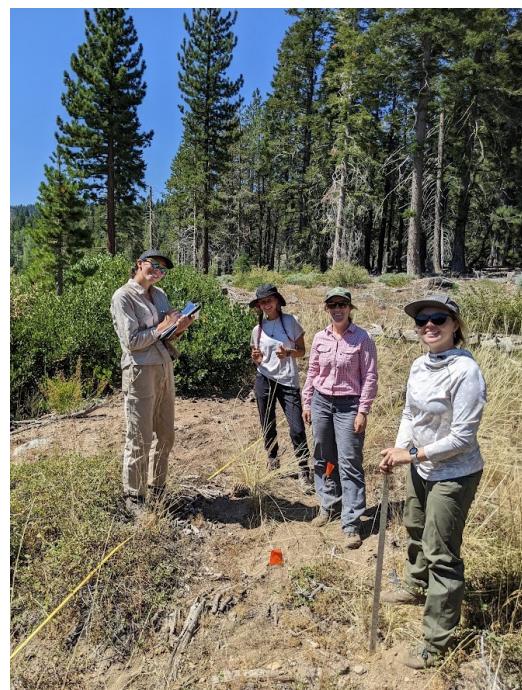
- Provided input on projects addressing vulnerability and adaptation for national reporting contributions to the climate change scorecard;
- A contributor to the California Climate Stewards Program presenting a broad background on climate change in the Sierra Nevada and California.

Ecological Restoration

- Completed Caldor Fire GTR 270 Analysis focused on two key resources (mixed conifer forests and late seral wildlife species particularly California Spotted Owl);
- Developed a fuel treatment effectiveness annotated bibliography with the Regional Office to summarize relevant research;
- Participated on the Tahoe Central Sierra Initiative science coordination team to move forward the HRV Analysis and decision support tools.

Inventory & Monitoring

- Coordinated with UC Davis to monitor vegetation changes and fuel treatment effectiveness following the 2021 Caldor Fire ;
- Completed vegetation monitoring in the Caples/Caldor interface to document the differences in the 2019 Caples Fire and the 2021 Caldor Fire;
- Served on working groups to develop monitoring plans for Lake Tahoe West, North Yuba Partnership and SERAL Project;
- Lead for Amador Calaveras Consensus Group (ACCG) monitoring workgroup and continued effort to complete monitoring in red fir and mixed conifer projects initiated while a CFLRP.



Field crew uses a belt transect to sample conifer encroachment in aspen restoration sites.

Accomplishments (cont.)

Collaboration

- Worked with the Humboldt-Toiyabe National Forest and the Western Aspen Alliance to host a Central Sierra Aspen Workshop on the LTBMU and the Humboldt-Toiyabe National Forest including the Tamarack Fire to explore aspen management issues;
- Coordinated a joint monitoring symposium with the Amador Calaveras Consensus Group (ACCG) and the South Fork of the American Cohesive Strategy (SOFAR) focused on the application of post fire research and monitoring in the 2021 Caldor Fire.



Central Sierra aspen workshop located on the LTBMU where the group viewed a number of different treatments types used in aspen restoration.

Addressing 2023 Priorities

- Assisting with planning and monitoring for the North Yuba Partnership (CFLR and Wildfire Crisis Strategy Landscapes)
- Assisting with planning and monitoring for SERAL (Priority Landscape)
- Post Fire Restoration Monitoring on the Caldor and Mosquito Fires

Publications and Reports

Bovee, K., Allen, T. and Estes, B. and 2023. Post-fire Restoration Opportunities for California Spotted Owl Habitat in the 2021 Caldor Fire, Eldorado National Forest and Lake Tahoe Basin Management Unit. Pacific Southwest Region Ecology Program, USDA Forest Service. 36 pages. <https://www.fs.usda.gov/detail/r5/plants-animals/?cid=FSEPRD1087476>

Estes, B. and Bovee, K. 2023. Post-Fire Restoration Framework in Mixed Conifer Forests in the 2021 Caldor Fire, Eldorado National Forest and the Lake Tahoe Basin Management Unit. Pacific Southwest Region Ecology Program, USDA Forest Service. 52 pages. <https://www.fs.usda.gov/detail/r5/plants-animals/?cid=FSEPRD1087476>

Gross, S., J. Greenberg, and K. Merriam. 2022. Comparison of Meadow Assessment Protocols. Technical Paper R5-TP-044. USDA Forest Service, Pacific Southwest Region, Vallejo, California. pp. 88. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1004737.pdf

McGarigal, K., B. Estes, S. Conway, M. Tierney, T. Walsh, L. Perrot, and E. Smith. 2022. Upper Yuba River Watershed and Historical Range of Variability and Current Landscape Departure. (In press with Vibrant Planet).

Merriam, K.E., M.D. Meyer, M. Coppoletta, R.J. Butz, B.L. Estes, C.A. Farris, and M.P. North. 2022. Reestablishing natural fire regimes to restore forest structure in California's red fir forests: The importance of regional context. *Forest Ecology and Management* 503:119797.

Young, D., B. Estes, S. Gross, A. Wuenschel, M. Meyer, and C. Restaino (in press). The effectiveness of forest thinning for increasing tree growth resistance to drought depends on environmental context. *Ecological Applications*.

SOUTHERN SIERRA PROVINCE

INYO, SEQUOIA AND SIERRA NATIONAL FORESTS

Province Team

- Marc Meyer, Province Ecologist
- Travis Sowards, Associate Province Ecologist
- *Heather Stone, Acting Province Ecologist (Detail: April to August 2022)*
- *Amarina Wuenschel, Former Associate Province Ecologist (through Sept. 2021)*

Accomplishments

Ecological Restoration

- Completed a GTR-270 post-fire restoration strategy for the Windy Fire, KNP Complex, and French Fire for the Sequoia National Forest, Sequoia and Kings Canyon National Parks, and Giant Sequoia Lands Coalition.
- Provided support to the Eastern Sierra Climate and Communities Resilience Project, Inyo National Forest.
- Gave presentations on GTR-270 at the Region 5 Post-fire restoration symposium.

Climate Change Adaptation

- Completed climate trend assessment reports for the Inyo, Sequoia, and Sierra National Forests.
- Co-chaired session on *Conifers in the face of climate change* at the California Native Plant Society Conference (Oct. 2022).

Inventory & Monitoring

- Coordinated post-fire monitoring of six sequoia groves burned in the 2021 Windy Fire.
- Completed monitoring report of sequoia groves burned in the 2020 Castle Fire.
- Coordinated post-fire monitoring of regeneration in sequoia groves and mixed conifer stands of Sequoia and Kings Canyon National Parks burned in the 2021 KNP Complex.
- Conducted treatment effectiveness monitoring of whitebark pine stands on June Mountain, fire effects monitoring of aspen stands in the 2019 Springs Fire, and conifer mortality near Inyo Craters, Inyo National Forest.



Pre-treatment monitoring of fuel reduction treatments in bark-beetle impacted forest stands at Inyo Craters, Inyo National Forest.

Accomplishments (cont.)

Forest Planning

- Served on Forest Plan Revision core team as the planning ecologist for the Sequoia and Sierra National Forests and assisted with Objections review.
- Served as lead author for the terrestrial ecosystems and agents of change sections for Sierra and Sequoia Forest Plans, Final Environmental Impact Statement, and Record Of Decision.
- Assisted with forest plan biennial monitoring report for the Inyo National Forest (first in R5).

Collaboration

- Coordinated ecological monitoring for the Dinkey Collaborative Forest Landscape Restoration Project, Sierra National Forest.
- Worked with PSW, National Park Service, and Oregon State University to complete GTR-270 post-fire assessment of a 1.5 million acre landscape in the southern Sierra Nevada.

Addressing 2023 Priorities

- Monitoring of emergency response fuel reduction treatments in giant sequoia groves.
- Post-fire ecological monitoring reports for the Windy Fire and KNP Complex.
- Technical assistance to Collaborative Landscape Restoration Projects.

Publications and Reports

Iniguez, J.M., A.M. Evans, S.D. Khanghah, J.D. Young, M.D. Meyer, A. Thode, S.J. Hedwall, S. McCaffrey, S. Fillmore, and R. Bean. 2022. Changes in geographic characteristics and severity of managed wildfires following the 2009 wildfire management guidance. *Forests* 13(5):793.

Guiterman, C.H., R.M. Gregg, L.A.E. Marshall, J.J. Beckmann, P. van Mantgem, D.A. Falk, J.E. Keeley, A.C. Caprio, J.D. Coop, P.J. Fornwalt, C. Haffey, S.T. Jackson, A.M. Lynch, E.Q. Margolis, C. Marks, M.D. Meyer, H. Safford, A.D. Syphard, A. Taylor, C. Wilcox, D. Carril, C.A.F. Enquist, D Huffman, J. Iniguez, N.A. Molinari, C. Restaino, and J.T. Stevens. 2022. Vegetation type conversion in the US Southwest: Drivers, management responses, and outstanding questions. *Fire Ecology* 18(6):1-16.

Shive, K.L., A. Wuenschel, L.J. Hardlund, S. Morris, M.D. Meyer, and S. Hood. 2022. Ancient trees and modern wildfires: declining resilience to wildfire in the highly fire-adapted giant sequoia. *Forest Ecology and Management* 511:120110.

Merriam, K.E., M.D. Meyer, M. Coppoletta, R.J. Butz, B.L. Estes, C.A. Farris, and M.P. North. 2022. Reestablishing natural fire regimes to restore forest structure in California's red fir forests: The importance of regional context. *Forest Ecology and Management* 503:119797.

Meyer, M.D. 2022. Sherwin Creek aspen ecological assessment. USFS unpublished report.



Post-fire regeneration monitoring at Redwood Mountain giant sequoia grove with field crew and NPS and USGS partners.

SOUTHERN CALIFORNIA PROVINCE

ANGELES, CLEVELAND, LOS PADRES, AND SAN BERNARDINO NATIONAL FORESTS

Province Team

- Nicole Molinari, Province Ecologist
- Sarah Hennessy, Associate Province Ecologist

Accomplishments

Ecological Restoration

- Collaboratively developed- through the Conservation Finance program- a Zone-wide effort to reduce roadside and fuelbreak ignitions through restoration of native species with low flammability.
- Presented at the Region 5 Post-fire Restoration Symposium on the importance for considering chaparral in postfire restoration and associated methodologies.
- Collaboratively developed and outreached a new tool (Postfire Restoration Prioritization Tool, PReP) for identifying chaparral areas in need of restoration following wildfire.
- Initiated a GTR-270 post-fire restoration strategy for montane forest and chaparral areas affected by the Bobcat Fire.
- Collaboratively developed multiple chaparral restoration projects and developed experiments to inform best practices.

- Initiated a nurse plant study to understand the benefits of chaparral shrubs in restoration success of two oak species.

Inventory & Monitoring

- Conducted monitoring and developed a briefing paper for the effects of water extraction on riparian vegetation in Strawberry Creek.
- Conducted monitoring of a prescribed fire project on Bluff Mesa/South Big Bear and developed a briefing paper to evaluate treatment effectiveness.
- Produced a trend analysis of cattle effects to grassland vegetation in the Happy Canyon grazing allotment.



Chaparral restoration experiment focused on understanding the relationship between restoration and the rejuvenation of ecosystem services. This is a collaborative project between UC Davis, Santa Barbara Botanic Garden and USFS on the Los Padres National Forest.

Accomplishments (cont.)

- Worked with Cleveland NF staff to initiate and monitor an experiment evaluating the effects of seasonal burning on black oak and Jeffrey pine.
- Developed carbon estimates in shrublands by Forest to support and inform R5 Carbon White Papers for the 4 Forests.

Forest Planning

- Assisted with forest plan biennial monitoring report for the Cleveland, Angeles and San Bernardino NF.
- Served on Project IDTs for a major forest health EA (North Big Bear) and prescribed fire CE.

Collaboration

- Presented at the first Fire Science Consortium Retreat to be held in Southern California.

Addressing 2023 Priorities

- Spearheading a regional climate-adaptation collaboration, the Southern Montane Forest Project, with USGS and San Diego State. Conducting case studies to support each element of the conservation strategy in montane forest.
- Preparing for landscape-scale strategic implementation of forest health treatments by coordinating with the CA RFFC Program on the development of Regional Prioritization Plans. Coordinating with the RFFC block-grantees through a Southern Convening.

- Served on the advisory panel for the Southern CA region of the California Fire Science Consortium, UC Santa Barbara Wildfire Resilience Initiative, California Fire and Forest Resilience Task Force Science Panel, Region 5 RNA Committee, Santa Barbara Botanic Garden Conservation Committee, National Fish and Wildlife Post-fire Restoration Granting Committee.
- Successfully developed CalFire grant proposals with graduate students and faculty at UC Santa Barbara
- Served on graduate student dissertation and thesis committees for students at Sonoma State, Cal Poly, SLO and UC Santa Barbara

Publications and Reports

Guiterman, C.H., R.M. Gregg, L.A.E. Marshall, J.J. Beckmann, P. van Mantgem, D.A. Falk, J.E. Keeley, A.C. Caprio, J.D. Coop, P.J. Fornwalt, C. Haffey, S.T. Jackson, A.M. Lynch, E.Q. Margolis, C. Marks, M.D. Meyer, H. Safford, A.D. Syphard, A. Taylor, C. Wilcox, D. Carril, C.A.F. Enquist, D Huffman, J. Iniguez, N.A. Molinari, C. Restaino, and J.T. Stevens. 2022. Vegetation type conversion in the US Southwest: Drivers, management responses, and outstanding questions. *Fire Ecology*. <https://doi.org/10.1186/s42408-022-00131-w>

Grupenhoff, A. and N.A. Molinari (2021) Plant Community response to fuel break construction and goat grazing in a southern California shrubland. *Fire Ecology*. <https://doi.org/10.1186/s42408-021-00114-3>



Prescribed fire monitoring plots in the Bluff Mesa project area on the San Bernardino National Forest.