



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
**Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT**

SUMMARY

Thursday February 25, 2021 | 9:30AM-3:30PM

Welcome, Logistics, and Introductions

Orit Kalman, facilitator, Sacramento State Consensus and Collaboration Program

Ms. Kalman welcomed participants to the Terrestrial Habitat meeting, the fourth in a series of workshops supporting development of the Resources Agency Project Tracking and Reporting (RAPTR) system. She reviewed the workshop purpose, agenda, and guidelines for remote participation during the meeting.

Workshop participants included staff from offices under the California Natural Resources Agency (CNRA). The workshop was the second of two on habitat-focused projects and centered on terrestrial habitat; the first was held two days earlier and focused on aquatic habitat. Participants' expertise included wildlife, forestry, wildfire, agriculture & rangeland management, and watershed, tributaries, streams, riparian, wetlands, and ocean and coastal habitats.

Recap of Day 1

Gina Ford, Senior Environmental Scientist (Supervisor), CNRA-MSU

Ms. Ford gave a recap of the first day of the workshop, highlighting benefits and concerns related to RAPTR, the vision for the RAPTR system, how RAPTR will handle data flow, and design of the RAPTR system. While there are many anticipated benefits, such as increasing transparency, informing decision-making, improving effectiveness, enhancing collaboration, improving science, and enhancing efficiency, the concerns are fewer, relating to logistics and operations, authority and mandates, and the scope of the system. Ms. Ford shared the vision for RAPTR:

- In the near-term, RAPTR will include
 - A grant application portal
 - Grant application review
 - Project management and invoicing features
 - Document storage
 - Performance monitoring resources
 - Analytical opportunities
- In the imagined future, RAPTR might
 - Allow for interface and connection with advanced GIS tools; see projects with other relevant information.



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

- Increase awareness between offices of shared project areas or adjacent projects that can coordinate activities
- Provide ways to look at how projects are helping to accomplish state plans and goals.
- Potentially interface directly with FI\$Cal or other statewide systems, further reducing duplicative data entry.
- A mobile app

RAPTR will make data machine readable and will interrelate pieces of information. It will have a modular design including several project management applications, quality assurance and control tools, geospatial information, and functionality allowing for inclusion of narrative information.

Ms. Ford also shared an update on MSU's work related to acquisitions and easements. The California Conservation Easements Database (CCED) was integrated with the [California Protected Areas GIS Dataset \(CPAD\)](#) and a [Map Collaborator tool](#) was added. RAPTR will also connect with these databases eventually; in the interim, the team is working to ensure that existing information in the databases is accurate. In 2020, approximately 67,000 total acres were added to CPAD, with 32,500 of those being conservation easements.

Ms. Ford noted that featured speakers during the Aquatic Habitat workshop included CNRA Secretary Wade Crowfoot, Andy Rehn of the California Department of Fish and Wildlife, Daniel Schultz of the California State Water Resources Control Board, Evyan Sloane of the California State Coastal Conservancy, and Lori Clamurro-Chew of the Department of Water Resources.

Keynote Speaker

Jennifer Norris, Deputy Secretary for Biodiversity and Habitat, CNRA

Dr. Norris gave a keynote address on how the RAPTR system will help the Agency advance its priorities, including the *Cutting Green Tape* initiative and the *30 by 30* goal. The State needs to enhance restoration at scale, which requires streamlining, improving coordination, and improving regulatory processes to be able to implement work more quickly, cheaply, and effectively.

The *30 by 30* goal aims to conserve 30% of the State's land and coastal waters by 2030 to protect biodiversity and support climate resilience, as well as improve recreation and equitable access. The first critical step to achieving this goal is to identify what percentage of the State is already conserved, identifying where conservation actions have already been taken and where there are opportunities for more. The RAPTR system will contribute to the State's *30 by 30* goal



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
**Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT**

by bringing together data across systems and providing the information needed to ensure the State is not managing by anecdote and can demonstrate its accomplishments.

Dr. Norris recognized the significant challenges of building the RAPTR system but emphasized its value and encouraged participants to focus on helping build a starting place from which to refine as the system is implemented and utilized.

Questions and Answers

- How will the RAPTR system accelerate the *30 by 30* and *Cutting Green Tape* efforts?
 - Dr. Norris: The additional data gathered in RAPTR will contribute to *Cutting Green Tape* by improving understanding of how regulatory contexts shape project scoping and implementation. For the *30 by 30* goal, RAPTR will serve the near-term need of helping identify which areas are already conserved, and will also help the *30 by 30* goal be meaningful in the long-term by compiling information on how investments are functioning on the ground, for example whether conserved areas are being maintained.
- How do streamlined monitoring tools, like RAPTR, help identify gaps to ensure the State has the right information to understand future directions?
 - Dr. Norris: Beginning to gather data is the crucial starting point; gaps will quickly become apparent and those can inform subsequent questions and data collection. The goal is to be able to tell a complete, synthesized story of the State's funding impacts, with both narratives and data, to support policies and legislation.
- What can a re-envisioned collaborative, rather than confrontational, regulatory structure look like?
 - Dr. Norris: Regulation and collaboration do not need to be in contrast. Rules are an important backdrop for work but can be approached from a perspective of the needs, goals, and interests of the regulated parties to build trust and gain support.
- How can the silos of our work be made more permeable?
 - Dr. Norris: Conservation is essentially about life – we are all working towards the same goals, so we can look at conservation through a lens of abundance rather than a zero-sum equation. While in practice there may be some level at which different efforts compete for resources, it is important to move away from a sense of having territory and instead see us as all being on the same team.
- Would you comment on need to invest in authoritative datasets to inform regulatory processes and decision-making?
 - Authoritative datasets streamline regulatory processes, preventing conflicts over the legitimacy of different interpretations and cutting directly to implementing

CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
**Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT**

the regulatory work.

- To what extent are State, federal, and private efforts to preserve biodiversity being coordinated?
 - This coordination is the heart of the Biodiversity Collaborative, which focuses on bringing all actors to the same table. There will be a series of workshops to discuss and coordinate efforts, starting with the *30 by 30* effort.
- What structures and resources will help sustain the collaborative process?
 - Sustained collaborative efforts are smaller scale. The Biodiversity Collaborative helps bring people together, who then network and implement collaborative work in smaller teams. This allows building of relationships, processes, and common purpose.

Examples of Terrestrial Habitat Monitoring and Evaluation Efforts – Presentations and Discussion

Keali'i Bright, Department of Conservation (DOC): No Easy Habitat Metrics - Conserving Agricultural Lands and Building Capacity to Restore Watersheds

Mr. Bright presented on the Farmland Mapping and Monitoring Program (FMMP) and the DOC's efforts to improve watershed health through strategic farmland conservation efforts. Mr. Bright said that the DOC works largely at the project level, which creates challenges for tracking consistent metrics across projects. For example, many projects are related to habitat, yet habitat enhancement is not their central driver. The FMMP provides baseline data, in particular conversion from agriculture to other land uses, to track programs. It is a low-tech, tried and true process that supports land use planning and decision-making. With aerial photography and ground-truthing, data accuracy is continually improving.

The DOC funds permanent conservation of prime farmland through easements and some acquisitions, however there are limited monitoring tools once the easement is created and DOC relies on the easement holders to meet the easement requirements. In considering increasing tracking, it is important to ensure that partners on the ground have the capacity to carry it out effectively; for example, DOC works to build the capacity of their Resource Conservation District partners to this end.

Some of the challenges DOC faces to monitoring habitat benefits include:

- Habitat is not the focus of these DOC programs, but a priority and common benefit
- There are limited mechanisms for habitat conservation for agriculture-focused easements
- DOC supports broader capacity to improve habitat, not the projects themselves
- DOC relies on broad networks of regional and local partners



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

To address these, simple, replicable monitoring strategies and spatial tools to understand large-scale habitat benefits are needed.

Nic Enstice, Sierra Nevada Conservancy: A Forest or the Trees? Challenges of Monitoring after 100 Years of Fire Suppression

Mr. Enstice shared the Sierra Nevada Conservancy's monitoring efforts, highlighting the challenges posed by the impacts of a century of fire suppression and localized treatments. He said that assessing the viability of different management techniques is particularly challenging because species may move from a treatment area to an adjacent, untreated area. This behavior may be beneficial for a species in responding to immediate threats to their habitat in the short term, yet because this movement is difficult to track effectively with current methodologies, it is not clear how management activities are affecting the species of interest over the long-term. With the increased pace of change in habitats, adaptive management informed by landscape-scale understanding is more critical than ever.

Binary evaluation approaches, which focus simply on the presence or absence of a species from a given area, may obscure more complex relationships of selection or avoidance of certain areas. The complex relationship of treated areas to untreated, fire-suppressed areas points to the importance of habitat diversity. Monitoring needs to account for not just individuals on a given plot of interest but also contribute to understanding how the plot relates to the broader landscape. A lidar-based forest assessment on the Tahoe National Forest combined high-fidelity lidar with machine learning to create "Special Status Habitat maps which identify suitable habitat for Spotted Owl and other Federal and California Threatened species allowing land management agencies to complete restoration plans and CEQA/NEPA documents at greatly reduced costs." The lidar captured different forest structures and used color gradients to investigate potential habitat suitability. Hotspots can be identified and targeted for future projects and/or monitoring, supporting management of large landscapes with a higher level of precision. This work also integrates with other efforts such as the Watershed Improvement Program.

Adaptive management relies on widely available, detailed information, with clear communication about new findings and newly identified knowledge gaps. The RAPTR system will contribute to these needs.

Ryan Hill, California Department of Fish and Wildlife: Areas of Conservation Emphasis (ACE): Integrating Diverse Datasets from Across California to Generate Maps and Summary Information for a Suite of Conservation Priorities

Mr. Hill presented on the ACE tool, a suite of maps and information about biodiversity that supports conservation decision-making. Stakeholders can explore ACE data through a map



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

viewer tool to contextualize information. This information can support decisions by helping compare candidate sites for a restoration action and provide an overall sense of a landscape's biodiversity patterns. In particular, it helps identify the most vulnerable components of biodiversity. Like RAPTR, ACE acts as a data hub; it is a statewide data inventory that hosts information from internal State programs and external collaboratives.

ACE includes four principal categories of maps and data: biodiversity, significant habitats, climate resilience, and connectivity. The tool provides generalized scores across certain indicators such as species biodiversity, which is a summation of the analytical models for both terrestrial and aquatic biodiversity; it also allows users to drill down to more detailed scores such as terrestrial rarity. As a data hub, the value of ACE is dependent on its successful connection to and leveraging of other programs, such as the vegCAMP classification and mapping program and the California Wildlife Habitat Relationship System. Mr. Hill emphasized that data collection is important but not sufficient; exchange, ensuring that information collected gets into a pipeline and is utilized, is critical.

Nadia Tase, CalFire: Forest Inventory Analysis (FIA) and Monitoring

Ms. Tase described the FIA program's repository for periodic inventories by the U.S. Forest Service since the 1930s. For the past two decades, the FIA has been a nationally-standardized inventory, carried out on one permanent plot per 6,000 acres every ten years. States can contribute funding to "buy down" the cycle length to every five years.

The FIA is carried out in two phases: Phase 1 uses remote sensing to distinguish forest and non-forest plots and to determine which plots to visit each year, and Phase 2 is carried out through field visits to each plot. Phase 2 tracks multiple attributes, such as plot level data condition data, and tree data, and a subset of plots have additional data collected in a "Phase 2 Plus." The statistical design of the program makes FIA data a gold standard, with many forest structure and health metrics and the ability to make inferences about forest health and conditions that project-level tracking does not. However, this design also makes the FIA inappropriate for project-level tracking.

CalFire uses FIA data to determine whether the State is meeting its carbon sequestration target, using the robust annual reporting system that uses FIA data at various levels, owner types, disturbances, and forest types. CalFire is beginning to amass sufficient data to inform monitoring and management. For example, the data shows that:

- The standing dead pool is growing significantly
- The State is losing carbon through fire losses faster than tree growth
- Overall, forests are relatively undisturbed and there is significant growth
- Taking the State as a whole, California's forests are a net carbon sink, though not every



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

ecoregion is a net sink
The information can help identify opportunities for improvement.

CalFire is working on a temporal intensification of the FIA in the State to support improved understanding of the drivers of change in a context of increasing impacts from wildfire, insects and drought, increased pace and scale of forest restoration, and forest carbon and climate mitigation goals. 2020 was a “ramp up” year and the full switch to a five-year measurement cycle will commence in 2021. Depending on the outcome of this ramp up, CalFire may consider adding spatial intensification as well. Ms. Tase said that the keys to success of this work are partnerships, regular coordination meetings, support from leadership, patience, leveraging existing systems, and starting basic and adding complexity as the work progresses.

Panel Discussion

Participants shared questions for the panelists:

- What management questions do your tracking efforts look to address?
 - Mr. Bright: We focus on protecting lands that are known to have high habitat values, however DOC does not have a good grasp of how to track lands whose habitat values are not yet known. This is a key gap in the monitoring program’s ability to support adaptive management.
 - Mr. Enstice: SNC is looking for management actions that support the viability of species on the landscape, which requires understanding the push-pull dynamic of stressor events and the impacts of scale and intensity in order to balance the need to maintain habitat and address the impacts of stressors.
 - Mr. Hill: The ACE project is focused on aggregating as much relevant data as possible to reflect everything known about biodiversity across the state. Incorporating and reflecting in the system the dynamism of changes in the landscape is a key challenge, particularly bringing in temporally relevant data to reflect changes in a more current timeframe. This requires tight integration with those doing the work on the ground.
 - Ms. Tase: Overall, CalFire is focused on using FIA to determine whether California’s forests are a carbon sink. The data is used more broadly to assess the condition and status of forest lands across the state. To understand whether resilience is being achieved, it is important to have long-term data to reflect trends as well as timely data to detect large disturbances more quickly. The FIA and remote sensing could be leveraged together to provide managers and policy makers the information needed to assess forest condition and manage adaptively.
- Is the USFS multiple species inventory, initiated by Patricia Manley, continuing?
 - Mr. Enstice: Yes, Ms. Manley and her colleagues are working extensive surveys

CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

amplifying deployment of sonic devices to capture bird calls to better track changes.

- Why is monitoring and adaptive management important?
 - Mr. Bright: It is important to ensure that the resources that the State invests in with taxpayer funding continue to provide their intended benefits over time. Since there are many projects that are not habitat-focused but have habitat co-benefits, it is important to develop simple monitoring techniques to flag where resources are located and determine whether they are being threatened. Monitoring provides an opportunity to capture program benefits beyond their primary purposes.
- How do you select metrics within your program?
 - Mr. Hill: There are numerous ways to assess biodiversity on the landscape, and it is important to balance monitoring in areas where species are predicted to be with observational data. Because there is no statewide systematic survey for all taxa, development of a statewide dataset relies on leveraging existing data and improving models to better predict where species are expected to be, for example using statewide vegetation information.
- What data gaps do the various tools and on-the-ground monitoring efforts highlight that need to be addressed to understand forest health and habitat integrity? What can be done to address those gaps?
 - One important gap is understanding how stressor events move across a landscape, for example how fires move through a landscape and whether we can impact this. As the climate changes and winters become milder, are there amplifications of impacts of stressors like beetles? A landscape-level analysis can help with these gaps, and this requires coordination of information.
- Might the FIA metrics and monitoring methods provide useful information if applied to grant funded forest management projects by asking grantees to report this information?
 - Ms. Tase: FIA data is useful for a large landscape. For a smaller project level, FIA is not helpful, since there is a high potential that the one plot within 6,000 acres is not representative. However, FIA data can be used on the front end and for calibration, for example to support development of predictions of how forest structure might change as a result of different forest management approaches. There may be additional nexuses to be found with other methodologies to leverage FIA data to understand project-level dynamics.

Guiding Principles and Screening Criteria for Monitoring and Evaluation Metrics

Elea Becker Lowe, Environmental Scientist, CNRA-MSU

Ms. Becker Lowe provided an introduction to the breakout sessions, which included one session on measuring project-level success and informing adaptive management and one on the RAPTR



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
**Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT**

system and its functionality. She said that the MSU team recognizes the challenges of developing a Statewide tracking and reporting system, yet believes that the challenges are manageable and the benefits of the system warrant working through the challenges together.

During the first breakout session, participants were asked to share how they monitor their projects, how they use the information they monitor, and what would be most beneficial for the RAPTR system to capture. The information gathered in RAPTR will support an adaptive management process by helping evaluate projects' contributions to management priorities. Ms. Becker Lowe highlighted how State-level policy and initiatives shape project-level priorities; she said that the metrics RAPTR tracks should be informed by State and program management priorities and contribute to answering their management questions. Participants were asked to provide input on metrics and methods:

- Metrics
 - Metrics that reflect our values and priorities.
 - Metrics that measure project performance over time.
 - Metrics that can inform and harmonize project-, program- and agency-level analysis.
- Existing tools, systems, and methodology that could be leveraged, not recreated.
- The information, analytical capabilities, and project management resources you need to conduct your work most effectively.

The second breakout focused on the RAPTR system and its functionality and participants were asked to consider its benefits, challenges, and how those challenges might be addressed.

Small Group Discussion: Measuring Project-Level Success and Informing Adaptive Management

Attendees used Miro boards to share their feedback about:

- The purpose/objective/goals of their program.
- How they determine if their work was successful, including the specific variables (metrics) that they track to determine success and methods used for monitoring these.
- What additional data could help inform the achievement of their project/program goals, including any particular metrics they do not already monitor but would like to track and any existing databases or systems that could be leveraged in pursuit of their stated metrics of interest.

See Appendix 1 for tables showing attendees' input on metrics and methods.



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
**Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT**

Small Group Discussion: The RAPTR System and its Functionality

As summarized in the table below, attendees again used Miro boards to share their feedback about:

- What other opportunities could the RAPTR System help to achieve, describing how the RAPTR System could be used to inform State programs and decision-making.
- What potential challenges or concerns (other than financial and staff capacity) should be considered throughout the system development and roll-out phases, including any suggested solutions.

See Appendix 2 for attendees' input on benefits and challenges related to RAPTR.

Takeaways for Day 2

Ms. Ford gave a recap of some of the key takeaways and new ideas the MSU team heard from workshop participants. A group of participants discussed incorporating citizen science to mobilize local expertise. Another group suggested focusing on features that will support collaboration and information sharing across agencies to learn from one another's work. Participants wrestled with how to determine which metrics to track, in particular the scientific elements, as well as which existing databases RAPTR should connect to. Ms. Ford said that the workshop series is the beginning of the process of identifying metrics for RAPTR and it will continue through working groups and technical advisory committees with subject matter experts. She also noted that RAPTR is conceived as a living system that will evolve over time.

Closing Remarks

Ms. Ford thanked participants for their time and input. She said that the MSU team would use participants' feedback as they continue to work on developing the RAPTR system and invited participants to share any additional feedback via email following the workshop or by joining the working groups and technical advisory committees to continue developing the set of metrics.



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

Appendix 1. Breakout Outcomes: Measuring Project-Level Success and Informing Adaptive Management

#1 - First Breakout					
PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
Delta Conservancy Proposition 1 Grant Program	Fund capital outlay projects that restore or enhance habitat in the Delta, improve water quality, and sustainable agriculture. Also fund projects that plan for such projects.	1) number of projects funded, 2) number of projects completed, 3) number of acres/linear feet of habitat restored/enhanced .	Site visits, physical evaluations.	Native species population responses (aquatic and terrestrial); invasive species population responses (aquatic and terrestrial); and increase in water quality.	The SharePoint system used by the Sierra Nevada Conservancy. WebGrants used by CDFW.
Parks - Natural Heritage Stewardship Program	Large Resource Restoration Program - same info applies, just different funding source Fund habitat restoration within SP	Funding data, some pre-project baseline very basic data capture	Site visits and fiscal evaluation	Standardized post project evaluation/ long term monitoring for success, treatment acres, and much, much more	Post completion monitoring - long term management resources



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

Grant Monitoring (SNC)	Acres treated, water sources protected, habitat conserved https://sierranevada.ca.gov/funding/snc-grants/	Implementation area, treatment type, funding used	Site visits, and fiscal evaluation	Long-term monitoring of change and evaluation if fire then hits the project area after completion	Lidar/remote sensing - longer-term contracts with funding for follow-up
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#2 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
San Diego River Watershed Invasive Non-Native Plant Control and Restoration Program	Identify and map Invasive Plant Species to be removed	Progress Reports, site visits and Aerial Imagery	Existing methods (Cal IPC etc.)	Reduce Invasive Plant Coverage replace with native vegetation	Local Experts, Regulatory Agencies (USACE, CDFW, Regional WQCB)
Sierra Nevada Conservancy Watershed Improvement Program - (multiple grant programs)	Create socio-ecological resilience across forested landscapes in the Sierra Nevada	Note: this is a selection of currently established and tracked performance measures. We are in the process of revising this approach. - acres of land	Currently, for grant programs, all are dependent on grantee reporting at the close of project. Various methodologies described at https://sierranevada.ca.gov/funding/snc-grants/manage-your-grant/performance-measures/	Forest resilience: - tree density - basal area - clump/gap structure and	Clearly, these cannot all be collected with ground-data for every project, but a combination of select ground



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

#2 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
	<p>Support projects that create or improve forest conditions that result in a combination of multiple watershed, ecosystem, and community benefits.</p> <p>Support the planning and implementation of projects that will increase</p>	<p>improved or restored</p> <ul style="list-style-type: none"> - tons of carbon sequestered or emissions avoided - % of pre-project and planning efforts resulting in project implementation - number of collaboratively developed plans and assessments - linear ft of streambank protected or restored - acFt per annum of water supply conserved or enhanced - acre feet per annum of streamflow improved - # and types of jobs created 		<ul style="list-style-type: none"> composite index - seral stage - snag density - veg community type - tree species diversity - disturbance loss of forest cover Biodiversity conservation: <ul style="list-style-type: none"> - habitat for focal species / listed species 	<p>data collection and remote sensing efforts already underway and clear geospatial information would support the larger-scale project impacts and decisions needed in the region. All dependent on clear data coordination among all forest management entities.</p>



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

#2 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
	community resiliency against, and recovery from, natural disasters and ecological and economic challenges.	- # of people reached - resources leveraged for the Sierra Nevada		- species & community diversity - non-native distribution - functional group diversity	
Areas of Conservation Emphasis/ Wildlife Habitat Relationship System. (Conservation Analysis Unit Projects, CDFW, BDB)	Summarize elements of biodiversity across the landscape Accurately associate wildlife with suitable habitat types based on latest	Contacts from individuals with local, site-specific knowledge, as to whether ACE conclusions match local knowledge We have not undertaken this yet, but strategic sampling to corroborate our modeling efforts is in	We have opportunistically engaged local land managers during our ACE training sessions, but we need more systematic meetings with land managers to discuss what ACE is getting right and what elements are missing Explore to greater degrees how partner project monitoring can help validate ACE conclusions	Statistically rigorous error rates for model predictions Increased strategic sampling across the state of vulnerable species	As mentioned, better statewide vegetation data sets Targeted species surveys in areas of the state with little species data, likely resulting



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

#2 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
	research/monitoring efforts	order		populations	<p>from absence of surveys, not necessarily absence of data</p> <p>Greater enduring partnerships for data collaboration and exchange across numerous programs</p> <p>Unobfuscated citizen science data-coordinated outreach with e-bird, inaturalist, etc.</p>



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

#2 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
					Greater funding/resources for the indispensable work of CNDDDB staff who are woefully backlogged with critical sensitive species data occurrences
CDFW Proposition 1 / Prop 68 - Watershed & Delta grant programs	Implements California Water Action Plan, SWAP, other state and regional plans. Specific	Individual project objectives met; deliverables received; proposed and final project acreage; wetland condition; water quality, vegetation response,	Project-specific performance measures; deliverable tracking; GIS project boundary & data submission to EcoAtlas Project Tracker, CRAM, photo points, reporting to CNDDDB. Wide variety of monitoring methods associated with specific project objectives	Ecosystem functional response (e.g., water storage, carbon sequestration, response	Pool resources: coordinated monitoring across offices & programs; reference site program; Long



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

#2 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
	program priorities include protect/enhance /restore watersheds, fire recovery (which may include forest management), Cross-border ecosystems (i.e., north of Mexican border), Mountain meadows, estuaries, anadromous fish habitat.	presence of listed species; Wide variety of metrics associated with specific project objectives	(EPA/WRAMP level 3) - program recommends using standardized methods. ResilienceMetrics.org (Susi Moser's work), World Bank, RAND, OEHHA indicators, etc. (OPR will have a more comprehensive list)	to climate stressors); fish, wildlife & plant population response; long term response and adaptive management actions	term monitoring and reporting; simplify and automate data collection; figure out how to encourage/enforce long term participation from grantees after the grant period is ended. Develop State-funded monitoring program focused on long term monitoring. Look at Fisheries



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

#2 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
					Restoration Grant Program monitoring program as a model.

#3 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
Environmental Enhancement and Mitigation Program	Contribute to mitigation of the environmental effects of transportation projects through Urban Forestry and Resource Lands Projects	Acres of open space protected, acres restored	Progress reports, field inspections		
SWGP	Implement Integrated Regional Water Management Plan	Water quality and quantity. Metrics vary according to plan	Investigate ground water and well contaminants		
Watershed	Capacity building	Varies by contract	Personal contact,		



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

#3 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
Coordinator Series	for RCD's to conduct forestry work (capacity networks)	and work proposal (debris removal, cleanup, watershed concerns)	feedback with RCDs, tribal representatives		
Regional forest and fire capacity program	Capacity building Improve tribal relationships				

#4 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
Wildlife Conservation Board (WCB): Multiple grant funding programs	Objectives focus on climate change resilience, public access, ecosystem services, partnerships, and monitoring.	Various funding directives (e.g.: "Ensure 40 percent of all acquisition projects are in areas identified as habitat for vulnerable species."	Field site visit confirmation, project site analysis through geospatial tools such as BIOS, ground-truth applicant claims of project benefits through technical review.	Depends on specific funding program (WCB has 16). More habitat-specific carbon sequestration methodologies and biodiversity and connectivity indices are examples for the climate resilience objective.	Region-scale analyses of how climate change is likely to affect habitat availability and conditions (some of these are under production, many more are yet-to-be completed).



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

#4 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
Sierra Nevada Conservancy (SNC): Multiple Grant-Funded Programs	<p>Support projects that restore, protect, and enhance Sierra Nevada watersheds and communities.</p> <ul style="list-style-type: none"> • Large landscape level planning • Implementation of prescribed fire • Fund forest health programs • Partner with underserved partners and communities 	<p>- Tracking performance measures as outlined in project agreement</p> <p>- Alignment w/ legislation outlined in state bond-funded programs</p>	<ul style="list-style-type: none"> • Meeting grant program eligibility of grant guidelines • Site visits are an integral component of evaluating the program's success • Input from project partners • Long-term grant monitoring • Progress reports and final reports 	<p>Quantifying/measuring input from project partners as an indicator of program success - data collection and mapping resources to capture before and after conditions (pre- and post- treatment), some other method than a photograph. What would be the best way to illustrate how many acres were treated successfully?</p>	<p>collaborate and info-share with other conservancies to learn what has worked well across the state</p>



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

#4 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
DWR Long-term Habitat Management Program (Delta)	Monitor and manage habitat created by Delta Levees Program	Habitat condition Plot/node data multi taxa, veg, habitat elements	Avian point counts, Node surveys, CNPS, CWHR	Indicator species, key elements, special studies	multi taxa wildlife assessments statewide, adaptive management indicators in response to treatments. Tech for low impact surveys: eDNA, acoustic monitoring, etc.
Parks, Statewide Bond Office (SBO)	Monitor bond funding and spending by program and project	Cash balances, spending reports, program/project monitoring, budget allocations.	ABCRS, FI\$Cal	Track spending and fund balances more accurately, monitor progress and diversity of programs beyond dollar amounts, see "big picture" milestones, post-program monitoring, integration with ABCRS and other financial systems.	



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

#4 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
CNRA Climate Change Program	Doubling down on our climate action (resilience/adaptation and mitigation) through policies, programs, and partnerships that also increase equity, improve public health, and create economic opportunity.	We do not have criteria to measure success but have relied on other programs who are more "in the weeds". We are working with OPR on developing resilience metrics (for the built, natural, and social environment) for the State Adaptation Strategy effort. We will likely rely on the great work of our departments for specifics.			resiliencemetrics.org (Susi Moser's work), World Bank, RAND, OEHHA indicators, etc. (OPR will have a more comprehensive list)



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

#4 - First Breakout

PROGRAM DESCRIPTION		EVALUATING SUCCESS		WISHLIST	
Program Name	Objectives/Goals	Metrics	Methodology	Desired Metrics	Possible Resources
Los Angeles River restoration and public access	<p>Objective to acquire and protect habitat linkages, e.g., wildlife bridge</p> <p>Objective to acquire and protect habitat linkages, Los Angeles River restoration and public access</p> <p>Preservation of wild and urban open space parklands in a ring around Los Angeles area, for biodiversity, habitat, climate resilience, public recreation, watersheds protection</p>	<p>Acreage acquired</p> <p>Trail miles acquired and maintained</p> <p>Public information</p>	<p>Challenges to agencies to staff up/train for timely and accurate data entries</p>		



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CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

Appendix 2. Breakout Outcomes: The RAPTR System and its Functionality

Group 1

RAPTR Benefits

- Coordinating across agencies - building off other projects
- Common language and metrics
- Info sharing for landscape scale management analysis tools

RAPTR Challenges

- Common language for efforts, datasets that don't have 1000s of attributes needed for all different agencies
- Aligning to non-state projects - Fed/NGO
- Establishing a system for long-term tracking of projects, making that system usable by a wide range of state agencies and other stakeholders, and conduct outreach to inform a stakeholder of the system and how to use it.
- Seasonality of funding/ short-term funding for long-term management
- Fiscal year closeout occurs mid field season potential project stoppage mid-field season/need for bridge funding
- Past projects that are not spatial yet - uploading the backlog
- Doubling workload - creating a system that is not duplicative of processes already required
- To establish standard habitat types that are accepted across multiple agencies. 2) Provide funding for long term management. 3) Making the system user-friendly for applicants, external reviewers, and internal reviewers and staff.

Overcoming Challenges

- LiDAR and remote sensing with project polygons to remotely track change in a consistent way
- Extended encumbrance/ reversion deadlines or continuous funding for long term management post project.

Group 2

RAPTR Benefits

- Creates an "institutional memory" of projects already embarked upon. This should reduce redundancy of project efforts.
- Spatial footprint of projects will enable greater understanding of potential complimentary objectives/ windows for



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

collaboration

- Aggregation of projects in a single database makes project discovery/ data pipelines more streamlined
- Simplify and standardize applications, program tracking & reporting; enhance project selection process; enhance opportunities for collaborative monitoring across offices and programs.
- Our programs would try to use the conglomerated information to take a more strategic approach to program priorities and project selection.
- Perhaps, a better geospatial picture of the large-scale impacts of state investment.
- All information in one place

RAPTR Challenges

- Multiplicity of project types will make it challenging to find unifying metrics for project successes, intermediate milestones
- Can RAPTR embed data sharing agreements as part of grant disbursements or project support? E.g., by supporting project x, grantee agrees that the data developed under said grant can be used by various other programs. Interestingly, with ace, we explicitly obtain data use permissions, regardless of whether the data is already public or developed with public monies.
- This challenge is by no means particular to RAPTR. In my limited experience with the state however, I have found that grant deliverables are often "accepted" with little review. By the time I'm able to look at the data and say, "this is all total junk, we'll have to redo it ourselves," the check has already been written and cashed. I suggest implementing some kind of "deliverable review" prior to sign-off
- Identifying common metrics across programs; program workload to move to new system & change workflow; finding funding for additional long-term monitoring. Simplifying communication and coordination among offices.
- Data collection. Collecting consistent, quality information at the project scale. With a wide variety of grantees and project-implementers, how do we assure data quality? They have varying capacity to collect the data requested. Can we financially support them to provide data over time? If the state collects the data, there are likely some challenges to access on private lands, even with the offer of funding projects with state \$.
- Echoing others - standard metrics within the vast diversity of projects across even the RAPTR-identified subgroups.
- Agreement across state agencies on remote data, database platforms, decisions support tools, etc. ... There are multiple systems and platforms in use and development; how can RAPTR coordinate, support, and complement them?



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

- Standardized procedures and methodologies for a wide range of project types and locations

Overcoming Challenges

- Possible development of "high level" goals within which many project-specific goals could be subsumed: e.g., "accepted survey protocols are employed" these will vary by project. Or "metadata has been developed to accompany the data."
- Make it user friendly. In addition to basic metrics across programs, configure so that programs can track unique metrics; integrate with existing tools. Automate reporting tools. Create robust & flexible interface for interactive geospatial data.
- Use remote sensing data and database platforms, coupled with project geospatial boundary and treatment data, to get a larger view across targeted geographic regions.
- More workshops and consultation at various regional levels, federal, state, local

Group 3

RAPTR Benefits

- Consolidation of data at the project and program levels
- View projects geo-spatially over time and assess levels of investment, where needed

RAPTR Challenges

- Grouping projects at the regional or watershed scale, or groundwater basin
- Much of our investments have already taken place so we've lost a significant amount of information

Overcoming Challenges

- Use RAPTR to organize projects at the desired geographical unit

Group 4

RAPTR Benefits

- I'll echo what's been mentioned several times today about the invaluable benefit of overall data collection. The more specific data we can provide decision-makers, the better. Organization of this data will be a benefit as well.
- Public communication tool



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT
Resources Agency Project Tracking and Reporting (RAPTR) System
Stakeholder Workshop
AQUATIC HABITAT

- Potential for consolidation and distribution: if monitoring data could be collected into in a larger central resource, smaller programs with little overhead would not need to house their own data and find ways to make it available to a greater knowledge base.
- "Big picture" and post-project monitoring.
- One-stop-shop for data entry related to bond management leading to better bond fund oversight
- Perhaps have examples of adaptive management like impacts of habitat management on wildlife
- Organize monitoring information under the broad-scale performance objectives outlined in statewide conservation documents.

RAPTR Challenges

- Coordinating with all of the other related state tools -- ensuring they can "talk" to each other and be integrated when the time is ripe. A related challenge is communicating the differences, benefits, coordinated between all of our tools to the public.
- Hot to measure "success"
- How to measure project partner's input and observations of project success. Their input is incredibly important so what is the best way to measure spoken success and stories from the field.
- I'll also second the point about there being a challenge to ensure successful integration between state financial systems.
- Successful integration between financial systems; ABCRS, Fi\$Cal, etc. Past difficulties in uniting systems tells us this may be more difficult than anticipated.
- How to measure a "successful" project beyond meeting budget requirements.
- Not sure how to do this, but if we can get info on how climate is impacting projects over time to help iterate programs/funding/policies/etc., that'd be great
- Reconciling the many different monitoring objectives present.
- Make it super easy with nice GUI interface
- The ability to track and report the project lifecycle. Showing a project coming under budget is one thing, showing successful rehabilitation of a stream is another. Results like this are not necessarily as visible as say a highway project.
- Agreeing on authoritative datasets that can then be used among tools as appropriate



CALIFORNIA NATURAL RESOURCES AGENCY - MONITORING AND STEWARDSHIP UNIT

Resources Agency Project Tracking and Reporting (RAPTR) System

Stakeholder Workshop

AQUATIC HABITAT

- Have biodiversity goals or metrics based on historic/reference communities to compare with restoration projects to show success or not.
- Successful collaboration with related departments and programmers, easy to use APIs, data import/export features, linking data, etc.
- Understanding how this could relate to/advance our equity (climate and access) would be great. One idea to help with this could be bringing in communities/CBOs on defining "success"