

**WORKSHOP #5 DETAILED NOTES | ADAPTATION STRATEGIES & ACTIONS FOR
PRIORITY NATURAL RESOURCES
CENTRAL VALLEY LANDSCAPE CONSERVATION PROJECT
May 10th & 11th, 2016**

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General information about the project can be found on the Project website:

<http://climate.calcommons.org/cvlcp>

All workshop materials are available at the workshop webpage:

<http://climate.calcommons.org/cvlcp/adaptation-strategy-workshops>

For questions please contact:

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1. MEETING SYNOPSIS

The goal of this two-day-long workshop on May 10th and 11th, 2016 was to develop adaptation strategies and actions for Central Valley Priority Natural Resources based on the results of vulnerability assessments conducted at the October 2015 workshop.

Fifty-two experts in Central Valley species and habitats from twenty-four Central Valley resource management, scientific organizations, and agencies participated in the workshop.

Participants were distributed based on their expertise into Habitat Groups (Riparian/Riverine, Upland, Wetland, and Desert/Grassland). Each Habitat Group was split into two groups (identified as group A and B) of 5-9 individuals. Each group was asked to complete separate adaptation strategy and action worksheets for sub-habitats, species groups and individual species within their Habitat Group. Following group work, discussions were held with all the participants to clarify and further explore ideas proposed across the groups, and provide general feedback.

2. ACTION ITEMS

1. **All Participants:** If someone is missing from these workshops that should be here, inform the Project Team by emailing Deb Schlafmann at Debra_Schlafmann@fws.gov.
2. **All Participants:** If your contact information is missing from the attendee list (see section 10), please email Deanne DiPietro at ddipietro@pointblue.org.
3. **Project Team:** Post workshop slideshow presentations to workshop website.
4. **Project Team:** Complete worksheets for species not addressed in the workshop with the appropriate experts.
5. **Project Team and EcoAdapt:** Coordinate follow-up working group meetings (likely via WebEx) to complete data gaps on the worksheets.
6. **EcoAdapt** will complete the vulnerability assessments and assemble a formal Central Valley Vulnerability Assessment Report to inform landscape conservation adaptive planning processes
7. **EcoAdapt:** Compile the adaptation strategies and actions for inclusion in the full report with the vulnerability assessments that will be peer-reviewed.
8. **All Participants:** If possible review and comment on the draft vulnerability assessments currently posted the CVLCP website (climate.calcommons.org/cvlcp/draft-vulnerability-assessments-pdf).
9. **All Participants:** All participants are encouraged to complete the Toolbox questionnaire form, if not completed in person at the workshop. This questionnaire will inform the Project Team of intended uses and/or who else should provide their input on developing the Toolbox.

3. Welcome and Opening Remarks

Debra Schlafmann, California Landscape Conservation Cooperative (CA LCC) Coordinator, opened the fifth Central Valley Landscape Conservation Project (CVLCP) workshop. She thanked attendees for their participation, and noted that the workshop would focus on developing adaptations strategies and actions for high Priority Natural Resources (PNRs) based upon PNR vulnerability assessment results developed at a previous workshop. Ms. Schlafmann also thanked the project staff for their dedicated and thorough efforts to develop the materials used at this workshop, including the worksheets and the preparatory resources found on the workshop webpage.

Ms. Schlafmann introduced project staff, including special consultants Rachel Gregg and Whitney Reynier of EcoAdapt. Next, Ms. Schlafmann led brief introductions wherein participants identified their affiliation, sectors, and interests.

Following participant introductions, Meagan Wylie, facilitator from the Center for Collaborative Policy (CCP), California State University Sacramento, reviewed the agenda and materials, and workshop objectives:

Workshop Objectives:

1. Review the results of the vulnerability assessment for Priority Natural Resources.
2. Provide an introduction to and exploration of adaptation planning approaches, including presentation of case studies and examples.
3. Develop adaptation strategies and actions to reduce the identified stressors and/or increase the adaptive capacity of resources to climate change, and increase positive long-term outcomes for regional management goals.
4. Evaluate adaptation actions including implementation feasibility and effectiveness, and identifying what, where, and when to implement.
5. Discuss needs for spatial analysis and mapping to facilitate adaptation planning.

Andrea Graffis, CA LCC, provided a review of the project's overall vision, goals, objectives, outcomes, and organizational structure. Ms. Graffis reviewed the context of this workshop in relation to the previous workshops (which focused on scenario planning, PNR selection, and PNR vulnerability assessment development) and the next workshop (which will primarily focus on landscape-scale adaptation strategies and implementation strategies). She also requested participants consider the four future scenarios for the Central Valley region during the workshop's discussions. *(Please refer to slides available on the project website at <http://climate.calcommons.org/cvlcp/adaptation-strategy-workshops>)*

Topics reviewed were:

- CVLCP partnership:
 - CVLCP brings conservation partners together to collaboratively manage landscape-scale conservation to address the driving forces of change for Central

Valley biodiversity. To date, more than 180 individuals have participated in the CVLCP from 33 organizations, and the project supports continued expansion of this partnership going forward.

- CVLCP goal, conservation objectives, and outcomes:
 - **Goal:** In partnership with natural resource managers and scientists, identify climate-smart conservation strategies and actions that will maximize the adaptive capacity of priority species, habitats, and ecosystems to support an ecologically-connected Central Valley landscape.
 - **Objectives:**
 - Reduce the impacts of climate change and other stressors to Central Valley ecosystems.
 - Promote landscape-scale connectivity and ecological and physical processes that function within current and future ranges of variability to support a diverse and thriving Central Valley.
 - Conserve resilient and adaptable ecosystems that sustain future Central Valley biodiversity.
 - **Outcomes:**
 - Future scenarios for the Central Valley
 - Vulnerability assessments for priority natural resources
 - Partnership-led adaptation strategies and actions
 - Supporting maps, data, and literature online
 - A network of practitioners conducting coordinated, Climate-Smart conservation in the Central Valley region
- CVLCP Process and Timeline:
 - This workshop is related to Step #3 of the iterative climate-smart landscape conservation process.
 - Next step includes developing an online toolbox to assist with implementation of the adaptation strategies.
 - The organizational structure includes:
 - **Leadership Team/Steering Committee** – provides guidance and direction, approves the other team’s recommendations, and distribute/promote CVLCP products
 - **Project Development Team** – recommends products, priorities, and processes to Leadership Team
 - **Data Management Team** – conducts data management, facilitates data access, and recommends/conducts data analyses
 - **Conservation Community** – provides input on priorities and products to teams and the Steering Committee, uses CVLCP products, and provides feedback on products
- Future Scenarios:
 - The strategies developed at this workshop will be based on plausible futures developed at previous workshops. Four plausible futures for the Central Valley region were identified based on major drivers of change – water availability

- (amount and seasonal timing) and management for conservation (degree of economic, legislative, and regulatory support for functioning ecosystems and biodiversity)
- Climate change is part of all four future scenarios. Participants should assume increased temperatures, earlier timing of snowmelt runoff, reduced Sierra snowpack, and increase in human population.
 - The four scenarios:
 - **Central Valley Dust Bowl** – Low Water/Poor Conservation Management
 - **California Dreamin'** – High Water/Good Conservation Management
 - **Bad Business as Usual** – High Water/Poor Conservation Management
 - **Everyone Equally Miserable** – Low Water/Good Conservation Management

Ms. Graffis then oriented participants to several posters in the room that outlined the climate change stressors in the Central Valley, the four future scenarios, and the CVLCP goals and objectives.

4. Review of Vulnerability Assessments Results Completed for Central Valley Priority Natural Resources

Whitney Reynier, EcoAdapt, provided an overview of the results of vulnerability assessments for PNRs from the October 2015 workshop. *(Please refer to slides available on the project website at <http://climate.calcommons.org/cvlcp/adaptation-strategy-workshops>).*

Topics reviewed were:

- Components for the vulnerability assessments
 - **Vulnerability** compares the potential impact of climate change on a resource to its ability to respond to changes. Numerically this relationship is represented as:
 - $(\text{Vulnerability}) = [(\text{Exposure}) \times (\text{Sensitivity})] - (\text{Adaptive Capacity})$
 - **Exposure** is a measure of how much of a change in climate and associated impacts a resource is likely to experience (e.g., increased air and water temperature)
 - **Sensitivity** is a measure of whether and how a PNR is likely to be affected by a given change in climate or related factors (e.g., sensitivity to disturbance regimes)
 - **Adaptive Capacity** reflects the resource's ability to accommodate or cope with direct and indirect climate change impacts (e.g., habitat extent and continuity)
- Purpose of the vulnerability assessments
 - These assessments can identify commonalities among systems (e.g., both dunes and permanent wetlands are degraded and isolated to some extent) as well as differences (e.g., dunes are exposed and sensitive to more drivers of change).

- By comparing sensitivity, exposure, and adaptive capacity across different habitat types and species, vulnerability assessments become useful tools by allowing managers to identify what resources are most vulnerable and why; this critical information can then be used to develop adaptation strategies to respond to the challenges of climate change.
- The process by which EcoAdapt developed the draft vulnerability assessments
 - Participants at the October workshop were asked to evaluate exposure, sensitivity, and adaptive capacity on a scale (e.g., 1=Low, 5=High) and also evaluate their confidence on each rating.
 - EcoAdapt consolidated the information shared at the October workshop and conducted a literature review for the vulnerability assessments
- Overview of the PNR vulnerability assessments results –

Habitats

- High Vulnerability: Dunes and Stream Channels
- Moderate-High Vulnerability: Riparian Vegetation, Grasslands, San Joaquin Desert, and Vernal Pools and Swales
- Moderate Vulnerability: Flooded Croplands, Permanent Wetlands, Seasonal Wetlands, Rice Croplands, Chaparral and Serpentine, and Oak Woodlands
- All habitat vulnerability scores had High Confidence Scores.

Species Groups

- High Vulnerability: Salmonids
- Moderate-High Vulnerability: Vernal Pool Crustaceans, Wetland-Obligate Plants, Burrowing Mammals, Riparian Birds, Western Bumblebee and Pollinators, and Wetland-Dependent Reptiles*
- Moderate Vulnerability: Amphibians, Cavity Nesters and Roosters,* Dragonflies and Damselflies,* and Breeding Waterbirds & Shorebirds*
- Low-Moderate Vulnerability: Wetland-Dependent Mammals,* Large Wide-Ranging Mammals,* and Wintering Waterbirds and Shorebirds*
- *Asterisk (*) indicates Moderate Confidence Scores, all others had High Confidence Scores*

Species

- Moderate-High Vulnerability: Blunt-Nosed Leopard Lizard, Green Sturgeon, California Tiger Salamander, Pacific Lamprey, and Yellow-Legged Frog*
 - Moderate Vulnerability: Tri-Colored Blackbird and Yellow-Billed Magpie*
 - Low-Moderate Vulnerability: Red-Legged Frog* and Valley Oak*
 - *Asterisk (*) indicates Moderate Confidence Scores, all others had High Confidence Scores*
- Approaches to interpreting the vulnerability results
 - **Adaptive Capacity compared to Sensitivity and Exposure** (e.g., Salmonids and Wetland-Obligate Plants both have high sensitivity/exposure, but Salmonids may be less vulnerable because they have a higher Adaptive Capacity).
 - **Vulnerability compared to Confidence scores.** Resource managers can create more targeted conservation strategies with greater confidence. They may also

- choose more conservative approaches to management for resources with greater uncertainty in vulnerability scores, or implement strategies that will have some level of guaranteed benefit to the PNR.
- Trends across all vulnerability assessments: identifying commonalities can provide opportunities to develop strategies that benefit multiple PNRs
 - **Climate Stressors:** Precipitation Variability, Drought, Soil Moisture (for habitats), Storms (for species groups), and Water Temperature (for certain species)
 - **Non-Climate Stressors:** Urban/Suburban Development, Agricultural and Rangeland Practices, Land Use Change, Invasive Species, Pollutions and Poisons (for species/species groups) and Dams, Levees and Water Diversions (for certain species)
 - Overall, Central Valley PNRs' adaptive capacity is diminished by low connectivity and degraded habitats and populations. However, the adaptive capacity benefits from substantial diversity and management potential of Central Valley PNRs.
- Next Steps for the Central Valley PNR draft vulnerability assessments
 - Draft assessments are available for review on the CVLCP website.
 - EcoAdapt will combine the assessments into a formal Central Valley Vulnerability Assessment Report to inform landscape conservation adaptive planning processes.

Questions and Discussion

- How were the PNRs selected for the vulnerability assessments?
 - **Response:** Participants at the June 2015 workshop identified priority sub-habitats, species groups, and species for a given overarching habitat, and then completed a prioritization exercise to determine which PNRs required vulnerability assessments. Some PNRs were chosen because they were identified as outliers that did not share sufficient similarities with other resources even if they existed in the same overarching habitat (e.g., vernal pools and dunes are part of the desert/grassland overarching habitat).
- What is the distinction between flooded croplands and rice croplands?
 - **Response:** Rice croplands tend to be flooded for a larger portion of the year. Flooded croplands include other croplands with more intermittent flooding (e.g. only flooding during a high precipitation event).
- Please explain the rationale for designating oak woodlands as having moderate vulnerability.
 - **Response:** Oak woodlands have a greater adaptive capacity due to a more continuous population range compared to other sub-habitats, such as vernal pools or dunes, which are often isolated from one another.

- Please explain why working groups will evaluate particular species if the species group will also be reviewed.
 - **Response:** Some species are unique enough that their vulnerability issues were not sufficiently covered by the species group vulnerability assessments, warranting a separate assessment.

- What is the difference between precipitation variability and drought?
 - **Response:** Generally, precipitation variability refers to shorter time scales (e.g., seasonal changes) compared to drought periods. The working groups can develop their specific differentiation.
 - **Comment:** Recent studies suggest that localized drought conditions may not be a result of climate change.
 - **Response:** The vulnerability assessments did consider the differences between localized and regional drought.

- What would be considered non-climate stressors besides urban or agricultural land use changes?
 - **Response:** The working groups have discretion to create their own specific definitions. Specific examples could include land conversion to vineyards or land developed for solar energy fields.

- How can participants provide comments on the vulnerability assessment summaries?
 - **Response:** Contact EcoAdapt or the Project Team for general comments or referrals to additional experts. Visit the CVLCP website to access the assessments in google docs and make edits real-time. Several individuals have already suggested more recent resources, and the team strongly encourages participants to provide their input.
 - **Comment:** EcoAdapt did a good job at capturing so much of the information shared at the previous workshop.

- Did the vulnerability assessment incorporate previous assessment efforts (e.g., assessments conducted by California Department of Fish and Wildlife [CDFW])?
 - **Response:** The scoring methods and results may differ somewhat, but the assessments likely referenced much of CDFW's information. Furthermore, the Project Team spent significant time compiling vulnerability assessments that have been completed by other agencies/organizations in an effort for this project to avoid duplication of efforts and focus resources on conducting new Central Valley vulnerability assessments.

- Has EcoAdapt or the Project Team received input from entomologists?

- **Response:** We encourage attendees to suggest the names/contact information of additional entomologists that would want to provide their feedback.
- **Response:** The assessments are also living documents and will evolve as new information becomes available.
- Did EcoAdapt weight any of the vulnerability variables? For instance, adaptive capacity may vary depending on what policies or management actions might be implemented.
 - **Response:** The variables were not normalized. However, the vulnerability assessments speak to those specific subcomponents for a given PNR. The adaptive capacity score also is an average of 4-5 subcomponents, including management. Therefore, management variance may have a minimal impact.
- How will EcoAdapt normalize among each group's biases during today's workshop? At the last workshop, participants seemed to have insufficient time to evaluate adaptive capacity of PNRs, which led to greater variance in rankings and greater uncertainty.
 - **Response:** Today, each overarching habitat will have two separate working groups (an A and a B group), and the working groups will have an opportunity to share their ideas with their habitat working group counterpart, and with all participants and in plenary. Comments and discussion will be captured in the meeting summary and taken into consideration when worksheets are reviewed and revised in the afternoon.
 - **Response:** As a reminder, participants also have the opportunity to review the vulnerability assessments on the CVLCP website and provide feedback to the Project Team and EcoAdapt. Also, the working groups are free to unpack this issue in their discussions to reflect on the scoring methodologies.
- How did participants evaluate their level of confidence in the vulnerability scores?
 - **Response:** The overall level of confidence in the vulnerability score is an average of experts' confidence in the subcomponent rankings. The vulnerability assessments will have more specific information on the subcomponents.

5. Introduction to Adaptation Strategy Development and Case Studies

Rachel Gregg, EcoAdapt, oriented participants to the workshop activities they would conduct in small group discussions to generate adaptation strategies and actions, and how adaptation planning links to vulnerability assessments. She also provided case study examples that demonstrated the transition from vulnerability assessments, to adaptation planning , to

planning implementation. *(Please refer to slides available on the project website at <http://climate.calcommons.org/cvlcp/adaptation-strategy-workshops>)*

Topics reviewed included:

- Categories of adaptation approaches to decrease exposure and sensitivity, and increase adaptive capacity:
 - **Resistance** – Prevent the effects of climate change from reaching or affecting the resource
 - **Resilience** – Weathering the impacts of climate change for avoiding the effects of or recovering from changes
 - **Transition** – Intentionally accommodate change and enable resources to adaptively respond to changing and new conditions.
 - **Increasing Knowledge/Engagement/Coordination**
- Possible Approaches:
 - Reduce rate and extent of climate change impacts
 - Reduce local and regional climate change effects
 - Manage for uncertainty (e.g., contingency plans)
 - Protect adequate space for a changing world that can protect connectivity, refugia, gradients, heterogeneity, etc.
 - Reduce non-climate stressors (e.g. invasive species, agriculture, and habitat fragmentation).
- Case Study Examples
 - South Bay Salt Ponds Restoration Project, San Francisco Bay
 - Largest tidal restoration project in the West to address massive wetland loss in San Francisco Bay. Implementing restoration in several phases, with each phase informing the next phase.
 - Hamilton City Levee Setback, Sacramento River Watershed Program
 - Restoring habitat and river function along Sacramento River to decrease vulnerability to floods.
 - Bull Trout
 - Indicator species of habitat health, but difficult to manage due to its large spatial range. Research identified optimal thermal regimes for the species to develop management recommendations to control invasive species and restore riparian zones.
 - TomKat Ranch/Leftcoast Grassfed
 - Private owners of a ranch partnered with experts to develop and implement wildlife-friendly agricultural management practices in an effort to increase ecosystem resilience. The ranch also provides a research and outreach component by testing different management practices and educating local schools.
 - Sky Islands Region

- Isolated forested mountain ranges covering parts of New Mexico, Arizona, and Mexico, surrounded by grasslands with disrupted precipitation patterns, increased temperatures, and increased fire disturbance.
- The Sky Island Alliance focuses on adapting to climate change impacts and developed a comprehensive regional conservation plan.
- Held planning workshops similar to the CVLCP workshops.
- Workshop Activity Process
 - **“Umbrella” habitat groups.** Participants were pre-assigned to one of four overarching habitat groups based on their area(s) of expertise:
 - Upland
 - Riparian/Riverine
 - Wetland
 - Desert/Grassland
 - **Working Groups A/B.** Due to the high number of participants, each habitat group had two separate working groups (e.g., “Upland - Group A” and “Upland - Group B”). Each of the working groups planned to discuss “high priority” sub-habitats, species groups, and species (PNRs) associated with their overarching habitat and to complete separate Adaptation Strategies and Actions worksheets for each. PNRs for Group B were in reverse order to Group A’s list; therefore, working groups were asked to complete at least half of their assigned PNRs to ensure each PNR was covered by at least one working group.
 - These “high priority” sub-habitats were identified at the project’s *Priority Natural Resources* workshop held in June, 2015. Participants had vulnerability assessment summaries available as a reference for each PNR; some PNRs also had one-page overviews available.
 - Working groups were asked to review each PNR vulnerability assessment and identify adaptation strategies to reduce vulnerabilities and/or increase adaptive capacity.
 - Participants were also asked to consider both current and future management activities that could be modified; unintended consequences of these actions on other resources or sectors (e.g., agriculture); opportunities for balanced or multi-beneficial options to satisfy diverse interests; and opportunities for creative solutions.
 - For each strategy, working groups were to identify specific actions to implement.
 - **Worksheet Factors.** For each action, working groups evaluated:
 - **Implementation feasibility** (High, Moderate, Low)
 - **Effectiveness in reducing stressors** (High, Moderate, Low)
 - **When to implement:** Near (<5 years); Mid (5-10 years); Long (>10 years)
 - **Where to implement**

- **How to implement** (i.e. under what conditions)
- **Who could implement**

Questions and Discussion

- What are examples or suggestions for transition adaptation strategies?
 - **Response:** Active transition strategies may include supporting wildlife connectivity; passive strategies may include monitoring or abandoning certain areas due to feasibility constraints.
- The public possesses strong distrust in government and natural resource conservation management. Agencies and decision-makers need to expeditiously address political and technical bottlenecks to develop and implement sound conservation management. Agencies will also need to work with the public to build and strengthen trusting relationships.
 - **Response:** The increasing knowledge/education/coordination adaptation approach speaks to that issue that successful landscape-level conservation management requires a substantial paradigm shift in decision-making. Meetings such as these provide an opportunity for agencies and other organizations to work collaboratively and transition away from outdated “business-as-usual” management approaches.
 - **Ms. Schlafmann:** The overall commitment of the CVLCP speaks to that challenge. These workshops represent the early stages to reach that ultimate desired outcome. Local- and subject-matter experts will help develop technically sound and feasible adaptation strategies and actions for the Central Valley. Outreach communication responsibilities will be addressed at a later date.
- Management should include a range of the adaption approaches as appropriate to the scenario. Additional specific actions could include efforts such as breaching levees or expanding refuge areas.

6. Adaptation Strategies and Actions for Sub-Habitats, Species Groups, and Species

Copies of the **Priority Natural Resources List and Group Assignment** spreadsheet, and the **Adaptation Strategies and Actions Worksheets** can be found here:

<http://climate.calcommons.org/cvlcp/adaptation-strategy-workshops>

Working groups were allocated the majority of the workshop to complete the adaptation strategies/actions worksheets for the “high priority” PNRs. Participants generally remained in

their pre-assigned working groups, but were encouraged to temporarily relocate to another group if they had expertise regarding a particular PNR that was not included in their group’s list.

Based on approval by workshop participants to allocate more time to developing strategies and actions for the PNRs, groups were not specifically asked to prioritize strategies or develop landscape-scale strategies as originally outlined in the agenda for Day 2. However, many of the plenary report-outs included landscape-scale components and/or prioritization.

A. Worksheet Report-Outs

Each of the working groups reported on their high-level findings they wished to share with the group (e.g., findings for certain PNRs, across PNRs, interesting ideas, etc.). Some working groups reported out for both working group A and B of their associated habitat. Brief plenary discussion followed after each working group(s) report-out.

RIPARIAN/RIVERINE GROUPS

Associated “high-priority” sub-habitats, species groups, and species
Riparian Vegetation/Natural Riverbank
Stream Channel
Amphibians
Riparian Nesting Birds
Salmonids
Dragonflies & Damselflies
Pacific Lamprey
Green Sturgeon

Riparian/Riverine Groups A&B

Working group members identified several commonalities among the suggested strategies and actions, including:

- Improve linear connectivity of the riparian vegetation and the hydrologic connectivity between rivers and floodplains.
 - Set back levees, which will have a large impact but low feasibility in the short term due to the requirements to move so much land.
 - Explore alternatives to moving levees in the short term, especially for high-priority scenarios.
- Improve integration of policy with science. Substantial research has already been conducted to support the importance of habitat connectivity; therefore researchers should more actively work with decision-makers to support science-based policies.
 - Identify and analyze limiting factors to approaches that would improve connectivity of riparian systems.
 - Convene a commission to communicate with decision-makers to develop a direct line to the legislature that would improve connectivity and application of the currently available research.

- Develop transition strategies that support overall ecological function (not by an individual species-by-species basis)

Discussion

- What would be the desired role and scope of the suggested riparian commission? Would it focus solely on the associated habitats (e.g., floodplain), or also address access to water/water scarcity?
 - **Response:** Water availability could be included in the group’s charge. Both working groups spoke to the importance of environmental water (e.g., understanding what environmental water need is, identifying the policy mechanisms to obtain it, etc.)
- Did the working groups consider restoration hydrographs as a tool for river restoration?
 - **Response:** Yes, the groups suggested an adaptation action to develop a tool to mimic natural hydrographs. With climate change, the natural climate could shift what would be considered as “natural.” However, the hydrographs could help inform how to maintain the biological and physical functions of the riparian floodplain.
 - **Response:** Another action included storing flood waters on the flood plain rather than in dams as a way to maximize management of available water. This action would offer both water supply and ecological benefits.
 - **Response:** A working group also discussed how groundwater recharge can support riparian ecosystems in the next dry season.
- Did the working groups discuss the protection of riparian corridors along rivers as it relates to methods such as public ownership or floodplain easements?
 - **Response:** Most of the Central Valley riverine system is already constrained by levees. Central Valley riparian zones and floodplains are diminished by 80-90% of historic levels. The group suggested addressing levee restrictions first to have a floodplain available for water storage, then considering floodplain easements that would also support land-owner buy-in.

UPLAND GROUPS

Associated “high-priority” sub-habitats, species groups, and species
Oak Woodland/Foothill Pine Woodland
Chaparral And Serpentine Shrublands
Cavity Nesters And Roosters
Mast-Associated Species
Western Bumble Bee And Pollinators
Yellow-Billed Magpie
Red-Legged Frog
Yellow-Legged Frog
Valley Oak

Upland Group A

- Chaparral and Serpentine Shrublands: The group generally considered chaparral shrublands as a separate habitat from serpentine shrublands, because serpentine may be better described by its physical habitat, while chaparral may be better described by its vegetation. *(need to follow up with adjustment to the PNRs)*
 - Restore and retain habitat for future conditions. Address the phenomenon that the chaparral range is moving toward the north of the Central Valley in response to climate change.
 - Conduct a spatial exercise to integrate climate change information, and identify areas of greatest potential for persistence of habitat. These areas should take management priority rather than protecting a particular habitat type where persistence probability is lower.
 - Develop and incorporate genetic principles that facilitate resilience under future conditions in plans. If some areas will be lost, the genetic information needs to transfer to more sustainable areas where they might have greater adaptation success.
 - Protect and manage areas that may be climate refugia (e.g., land acquisition, better public land stewardship, and restoration as needed).
 - Certain chaparral strategies may need site-specific components (e.g., support natural fire regimes).
 - Map locations generally within a natural fire regime to identify locations that may need more or less fire.
- Valley Oak
 - Sustain viable groundwater levels and maintain/restore streamflow. Water is a critical actor for valley oak health. Old oaks need to have roots in the water and are thusly affected by changes in the water table. Regeneration of young valley oaks require established flooding regimes.
 - Manage water withdrawals and groundwater overdraft.
 - Encourage new groundwater recharge by enhancing natural flooding regimes (e.g., integrate with agriculture management, install permeable areas, etc.).
- Create and maintain appropriate conditions for regeneration and recruitment that can be sustained under current and future conditions.
 - Facilitate dispersal to appropriate sites to maintain connectivity (e.g., maintained connectivity, species translocation, etc.).
 - Actively restore riparian corridors associated with valley oaks where there is obvious lost or degraded habitat.
 - Manage grazing practices to maximize regeneration success and seedling survival (e.g., fencing sensitive areas, conducting outreach and education, etc.)
 - Manage invasive species in riparian areas.
- Conservation approaches should be multi-faceted. Several compatible activities exist; more research is needed to identify compatible land management practices and agriculture practices going forward.

Discussion

- Given research efforts (e.g., McLaughlin and Heusser) analyzing the potential future of valley and blue oak outside of the Central Valley under projected climate change scenarios, should planting valley oak support transitions, or translocations from where it currently is to where it might be more sustainable in the long term?
 - **Response:** Part of the group's strategy was to conserve the current location of the species where those species also have strong long-term survivorship probabilities. However, the group also suggested facilitating dispersal by improving/maintaining connectivity wherever possible (e.g., banking acorns, translocating acorns or plants) It is important to consider a large suite of possible methods to facilitate dispersal. Then managers can identify which options to invest their time and energy in efficiently, and with the greatest probability of success.
- **Comment:** Individual groves of valley oaks pose a greater challenge for valley oak resilience than its resilience as a species. Planting strategies should focus on augmenting nucleated spots of valley oaks to enhance valley oak woodlands.
 - **Response:** The group considered that type of expansion, and agreed more data and analysis are required to support management decisions. The group wanted to consider options in addition to reforesting existing natural habitats (e.g., reforestation of degraded habitat).
- **Comment:** Removing competing species like eucalyptus may offer a relatively simple and highly-effective approach.
- **Comment:** The black walnut trees also outcompete valley oaks.
- **Comment:** More information is needed to better understand the Central Valley water regime (surface and groundwater) as it pertains to the valley oak distribution and cohort structure to inform management decisions.
- **Comment:** The success of riparian and flood plain connectivity restoration and valley oak woodland restoration are interlinked in several ways.

Upland Group B

- Oak Woodlands – Developed four strategies: land protection, improve land management practices, reforestation or restoration, and valuation of regulatory framework
 - Land protection
 - Explore different types of land protection such as fees, easements, application of the Williamson Act, zoning (e.g., go to counties and encourage best practices for land use planning of rural areas), etc.
 - Prioritize land protection approaches by conducting modeling using spatial data.
 - Look at current conditions and future opportunities to protect oak woodlands; identify and protect existing refugia, corridors, and areas that might be refugia in future.

- Improve land management practices that would address oak woodlands' very slow natural regeneration success.
 - Manage grazing (e.g., enclosures) to increase survivorship of saplings and overall recruitment.
 - Use fire management to reduce competitive species that can also dry out the soil.
- Reforestation/Restoration – Manage active reforestation
 - Reforest or restore areas that used to possess oaks or would be suitable habitats for oaks to expand the spatial range of oak woodlands.
 - Plant in urban settings.
- Valuation and regulatory framework
 - Create value for maintaining the existing oaks via payments for ecosystem services (e.g., pay the ranchers to keep their oaks, have landowners pay for their oaks, etc.).
 - Consider the policy, “No net loss of woodlands.”
- Cavity/roosting nesters – this species group requires larger oaks.
 - Focus management efforts to protect and/or enhance high-quality suitable habitat.
 - Secure accessible wildlife-friendly water sources (especially important for species such as bats).
 - Improve forest practices that support spatial heterogeneity.
 - Allow a range of different-sized trees.
 - Keep snags on the landscape.
 - Create cavities for habitat-producers such as the woodpecker
 - Support management practices that encourage those species' health as well.
- The group had also discussed pollinators and bumble bees, red-legged frog, etc.

Discussion

- Did the group consider strategies that would assist scatter hoarders?
 - **Response:** Yes, but the group did not develop management practices specifically for those species.
- Did the group consider species that are not necessarily restricted to woodland habitats, but do rely on remnant oaks (e.g., hogs)?
 - **Response:** Yes, the group specifically discussed magpies, who require tall trees for nesting but can also utilize urban areas. The group recommended maintaining habitat quality opportunities in the urban setting.
 - **Response:** The group considered these more habitat/food-generalists as part of the criteria for habitat improvements.
- Did the group discuss valley oaks specifically?
 - **Response:** Yes.
- Did the group discuss carbon sequestration potential in oak woodlands?

- **Response:** In comparison to other habitats, oak woodlands have a lower carbon sequestration potential on small scales. However, a statewide project would have greater potential.
- **Response:** The group’s suggestion on ecosystem services was intended to speak to broad benefits such as carbon sequestration.
- **Comment:** The riparian river restoration efforts of the San Joaquin Restoration River Program struggled with competing for carbon sequestration funding because the carbon sequestration potential was so low in the project areas.
- **Comment:** A carbon sequestration strategy would likely need to incorporate other species in addition to oaks to be more viable.
- **Comment:** Oaks and sequestration should still be considered. Some research exists on old growth trees and carbon sequestration. There may be interest in protecting old valley oaks and ensuring oak survivorship.
- **Discussion:** Participants discussed the State and local legal framework for oak woodland protection. A participant commented that oak woodlands may have some protection under the State Public Resources Code that requires counties to create a forest resource management plan. Another participant caveated that oaks may be considered a commercial tree species and not subject to reforestation requirements on private property. It was suggested this topic may require additional discussion at a later time.

WETLANDS GROUPS

Associated “high-priority” sub-habitats, species groups, and species
Rice Croplands
Flooded Croplands
Seasonal Wetlands
Permanent Wetlands
Wintering Waterbirds & Shorebirds
Breeding Waterbirds & Shorebirds
Wetland-Dependent Mammals
Wetland-Obligate Plants
Wetland-Dependent Reptiles
Tricolored Blackbird

Wetlands Groups A & B

Both working groups combined many strategies for permanent wetlands and identified additional more-nuanced strategies for seasonal wetlands. The report-out focused on strategies that were cross-cutting, landscape-scale, and supportive of a varied flooded habitat:

- Promote connectivity of wetland, riverine, and upland habitats. Connectivity / corridors can provide benefits to other species beyond birds and wetland-dependent mammals.

- Create and maintain an ongoing decision-support tool that tracks the location of riverine and wetland habitats to identify opportunities to maintain hydrologic connectivity.
- Prioritize water allocation to locations that will enhance connectivity.
- Prioritize acquisition of lands for management that would enhance connectivity.
- Provide opportunities and grants to enhance existing wetlands by redesign.
- Increase water use efficiency (e.g., coordinated flooding of the habitat) and water management to ensure the water is on the landscape in the appropriate locations and at the appropriate times.
 - Coordinate Central Valley-wide flooding to sync spatially and temporally with bird migration, including shifting areas where the water is needed in a knowledge-based manner.
 - Implementation would require a coordinated water management network, a coordinator, data-driven management, agencies' representatives, refuges, agriculture groups, etc. to buy in to that process. Participation could be incentivized across all flooded wetlands in some way.
 - Build on existing partnerships for drought management (e.g., drought group with the Central Valley Project Improvement Act).
 - Research relative wildlife benefits of various current and potential flooding and irrigation methods.
 - Explore possible improved and more efficient agriculture irrigation methods. For example, research different timing methods especially with alfalfa crops, research how to transfer the flood waters more efficiently, etc.
 - This would need the support of non-governmental organizations, agriculture extensions, CA LCC, etc.
 - Consider the possible tradeoffs between methods that decrease irrigated water use and methods that benefit the habitat.
- Enhance overall water availability to wetlands and flooded habitat (relates to water rights and policy, and coordinating transfers for new kinds of storage).
 - Off-channel storage.
 - Improve conveyance infrastructure. Prioritize areas for pipes and lining to avoid negatively impacting snake habitat.
 - Improve soil retention and rangeland practices.
 - Involve public health policies to use good practices (address disease and vector issues).
 - Influence water rights policies, such as exploring ways to modify water rights to support more cooperative sharing without legislatively adjusting water rights.
- Expand and restore habitat, maintain flooded habitat, and implement actions that capitalize on the value of wildlife.
 - Assist restoration and creation of new habitat and protection of old habitats.
 - Enhance permanent and semi-permanent wetlands.

- Support existing incentive programs such as easement programs to protect existing wetland and newly-restored habitats in the future.
- Develop and implement invasive species management strategies.
- Develop climate-smart planting guides for the refuges. Conduct outreach to encourage wide-spread adoption of those new methods and practices.

Discussion

- **Comment:** Improving water delivery efficiency while being careful of the impacts on the garter snake reflects an important issue of unintended impacts on certain species. For example, water smart grants and other programs that line canals to decrease water loss may negatively impact species that may benefit from that water loss (e.g., the Buena Vista Lake Shrew in southern San Joaquin Valley).
- **Comment:** Consider the impact from water use efficiency measures (e.g., lining channels) aimed to help groundwater recharge but may hinder restoration and enhancement of wetlands and riparian ecosystems.

DESERT/GRASSLANDS GROUPS

Associated “high-priority” sub-habitats, species groups, and species
San Joaquin Desert
Dunes
Grasslands
Vernal pools & swales
Large wide-ranging mammals
Burrowing mammals
Vernal pool Crustaceans
Blunt-nosed leopard lizard
California Tiger salamander

Desert/Grasslands Groups A & B

The working groups identified overarching and recurrent themes that emerged from their discussions, then shared overarching and several unique ideas to address the ecosystem’s conservation needs.

- All habitats have suffered marked decline. Many of the taxa are endangered or threatened. Several of the strategies may already be present in regional recovery plans (e.g., Recovery Plan for Upland Species of the San Joaquin Valley).
 - One of the major strategies recommended land protection through methods such as acquisition, easements, and fee titles. Analysis is needed to prioritize land acquisition (?)GIS is also needed to identify species location and distribution of habitats.

- Strategies and actions should aim to preserve the biodiversity of these sub-habitats and ecological diversity.
 - Consider the genetic diversity and variability of sub-habitat taxa and account for ecotypes and cryptic species.
 - Consider various climate scenarios to inform habitat restoration.
 - Do not just rely on nursery stocks that may not possess sufficient genetic diversity or insufficiently resilient genomes.
- Connectivity between sub-habitats and species' populations is critical to increasing adaptive capacity.
- Strategies and actions require monitoring and evaluation of progress to inform next steps.
- Vernal pools.
 - Protect the north-south and east-west habitat gradients.
 - Protect vernal pool habitat, including dry vernal pools that will likely fill in after a drought. Climate change will likely lead to prolonged periods of dry, dormant vernal pools in the southern part of the Central Valley. Several of the vernal pool organisms have adapted to prolonged drought.
 - Conduct education and outreach on the importance of protecting dried vernal pools.
- Dunes
 - Dunes face restoration challenges: few sand sources remain, dunes are few in number and fairly isolated from one another, and dune habitats are degraded. Restoration feasibility is fairly low.
- Grasslands
 - Invasive annual grasses are a ubiquitous problem. Different invasive species occur in different regions (e.g., red broom in the southern region).
 - Utilize integrated pest management strategies (e.g., grazing and managed burning).
 - Manage fire fuel loads to prevent fire from spreading to systems ill-adapted to fire (e.g., deserts).
- Unique ideas related to conservation management of the desert/grassland ecosystem:
 - Roads and canals pose as extreme barriers to connectivity; long-term connectivity actions are needed to soften these barriers.
 - Identify suitable locations for reintroductions or assisted migration based on current and future conditions.
 - **Establish meta-populations across the landscape** to enhance connectivity and increase resilience. *(needs follow-up to clarify)*
 - Enhancing connectivity between dunes has low feasibility. Viable dune management will likely require difficult conservation decisions going forward. Therefore, the group suggested convening a working group to identify and review dune conservation options and provide recommendations to implementing entities.

- Explore restoration opportunities on retired and fallowed agriculture lands, especially in the southern San Joaquin Valley. Compliance with recent State groundwater legislation will likely lead to hundreds of thousand acres of fallowed lands. Managers should work with local agencies and land owners to restore that area and develop added habitat and connectivity.

Discussion

- **Comment:** Review the Central Valley Project Improvement Act (CVPIA) Land Retirement Program on fallowed land and restoration efforts. A great portion of a demonstration project occurred in the Tulare area.
- **Comment:** Many of the fallowed grounds depends on whether they were deep-ripped or leveled. If deep-ripped, more research on the success for restoration may be warranted.
 - **Comment:** Most irrigated cropland was deep-ripped, but it depends on the crop. Deep-rip methods often are implemented for tree crops and clay soils. Alfalfa lands do not need deep ripping.

B. Plenary Discussion

- **Ms. Gregg:** Several groups mentioned synergistic suggestions, tradeoffs, etc. during the report-outs, which helps prioritize and develop landscape-scale strategies. For instance, synergies across habitats can help develop “No Regret” strategies. Based upon report-outs, “No Regret” strategies may address connectivity, maintaining water and landscapes, prioritized sites based on future climate change scenarios, and/or protection of areas with low restoration feasibility.
- **Comment:** Feasibility also changes with the political climate (e.g., California Foothills Legacy Area [CFLA]). Approaches that would be less feasible given the possible future legislative landscape should take higher priority in the near term.
- **Comment:** More targeted actions may improve a strategy’s feasibility. For example, managers could explore levee setbacks at certain key locations or conduct smaller modifications where possible and where most needed.
- **Comment:** Transparency is critical to building trust between agencies and other stakeholders (e.g., ranchers). The leading implementation agencies also matter. Certain stakeholders may feel more comfortable working with particular agencies over others.
 - **Comment:** Another challenge for easements is that private landowners may fear protected lands will attract more at-risk animals, which they worry will lead to more stringent management restrictions.
 - **Ms. Schlafmann:** The CVLCP team plans to have future meetings to identify which agencies should take a lead role to implement a particular adaptation strategy or action.
- **Comment:** Connectivity is a key component to increase a PNR’s adaptive capacity. Managers may not have the capacity to physically move species to more appropriate

areas, but those species can transition into those areas on their own if the sufficient linkages exist between locations.

- **Comment:** The suggestions to protect resources where they currently exist seems to conflict with other suggestions to protect where those resources will likely succeed in the future. Perhaps a better approach is to focus on the transition approaches.
 - **Response:** The decision to protect the current state, the future state, and/or the transition for PNRs will likely vary depending on the scenario. Depending on the location and the temporal components, one strategy may be more appropriate than the other.
 - **Ms. Schlafmann:** This workshop is also our first attempt to develop adaptation strategies. The Project Team plans to draft landscape-scale strategies based upon this workshop, the climate smart principles, consultation with partners and subject-matter experts.
- **Comment:** Feasibility is multifaceted, and the worksheet does not provide a method to guarantee that groups approached feasibility determination with the same interpretation and approach. Therefore, technical and political feasibility should be ranked independently.
 - **Comment:** These conversations would greatly benefit from Central Valley planning and legislative experts' input to better understand what is politically feasible.

7. Upcoming Workshop and Next Steps

A. Central Valley Landscape-Scale Adaptation Strategies and Case Study

Ms. Gregg shared several slides on moving from PNR adaptation strategies to landscape-scale adaptation strategies. She provided the Sky Island Alliance case study as an example of this process. *(Please refer to slides available on the project website at <http://climate.calcommons.org/cvlcp/adaptation-strategy-workshops>)*

Topics covered included:

- Sky Island Alliance Case Study
 - Workshops
 - Pre-workshops - Completed a survey to identify the most pressing regional threats.
 - Workshop 1 - Considered regional climate vulnerabilities and explored potential adaptation strategies
 - Workshop 2 - Assessed specific vulnerabilities and developed strategies by habitat.
 - Workshop 3 – Developed practical adaptation strategies, actions, and implementation plans for landscape-scale topics.

- Landscape-Scale cross-cutting issues (drying springs, fire, connectivity) and strategies
 - **Springs:** Maintain and improve (where possible) spring integrity to support hydrology and biodiversity in a changing climate
 - **Fire:** Manage public lands for healthy ecosystems by restoring fire regimes
 - **Connectivity:** Preserve and increase (where possible) connectivity to support ecosystem resilience in a changing climate
- One of the outcomes included developing the Landscape Connectivity Project to improve and maintain wildlife connectivity in the face of habitat fragmentation, human population growth, and climate change.
 - The Alliance then developed a more specific adaptation strategy, adaptation actions, identified leads and partners, obtained funding sources, identified resources available and resources needed, and developed short- and long-term milestones and additional strategies and actions.
- CVLCP application
 - Before developing more specific landscape-scale adaptation strategies, the CVLCP team suggested they will revise certain worksheet issues (e.g., feasibility evaluation), and working groups should schedule a web-ex meeting to complete and/or refine their worksheets.

B. Plenary Discussion

- The working groups should try to consolidate strategies and actions as much as possible on the web-ex calls to create a few strategies that would address multiple factors.
 - **Ms. Wylie:** The goal of the web-ex meetings is primarily to ensure completion of the worksheets. EcoAdapt will coalesce the strategies in its final report that will identify key themes and synergies. Participants will be able to review that information in the fall at the next workshop.
- Some groups did not complete the worksheet for certain species because they did not have an expert on that particular species.
 - **Comment:** Would those species be covered by the sub-habitat worksheets associated with that species?
 - **Ms. Schlafmann:** Not necessarily, as those species were intentionally identified for discussion because the habitats did not sufficiently capture the issues of that species.
 - **Ms. Wylie:** The CVLCP project team will follow-up directly with experts familiar with those species. Participants are encouraged to recommend additional species-specific experts.
- Will there be multiple landscape-scale strategies for each sub-habitat / species group / species, or will strategies be combined to cover multiple PNRs?
 - **Ms. Schlafmann:** Both.

8. Spatial Analysis and Mapping to Inform Adaptation Planning

Deanne DiPietro and Zhahai Stewart, CALCC, provided an overview of efforts to develop a “Toolbox” to support Central Valley climate-smart conservation, which is planned to include a library of information as well as spatial analysis and mapping to support implementation of the adaptation strategies and actions developed by the project. Partners were briefed on the plans for outreach to learn about their needs for spatial data and new analyses. *(Please refer to slides available on the project website at <http://climate.calcommons.org/cvlcp/adaptation-strategy-workshops>)*

Topics covered included:

- Toolbox purpose
 - Build upon existing tools and Central Valley planning processes by including information that addresses climate change adaptation, the landscape-scale management approach, and supporting partnerships / coordination.
 - Support implementation of adaptation strategies and actions collaboratively identified by the CVLCP and support coordinated landscape-level conservation efforts in the Central Valley.
- Potential Toolbox components:
 - Spatial data and visualization tools
 - Document library
 - Shared collections of datasets
 - Guidance materials
 - Community of practice
- Timeline to develop the Toolbox:
 - Phase 1 (Fall-Winter 2016): Outreach to partners, decide upon and describe initial contents and functions the toolbox needs to have
 - Phase 2 (2017): Gather or develop the data, conduct any needed analyses, and build the website for the Toolbox
 - Phase 3 (2017): Teach and support use of the Toolbox among the Central Valley Partners
 - Phase 4 (ongoing): Maintain and update the Toolbox
- Immediate Next Steps:
 - **Project Development Team:**
 - Conduct per-use-case brainstorming sessions about needed data, analysis, and tools.
 - Prioritize these.
 - **Data Management Team:**
 - Create plan to accomplish priorities
 - Outline work for future phases
 - **Leadership Team:**
 - Approval of Toolbox Plan
 - Workshop Attendees :

- Contact CVLCP planning team if they would like to participate on a particular project team.
- Workshop Attendees :
 - complete the Toolbox questionnaire form to inform the team of intended uses and/or who else should provide his/her input on developing the Toolbox.
- Examples of Toolbox Specific Uses:
 - Prioritizing lands for acquisition or conservation easements
 - Regulatory planning: Habitat Conservation Plans (HCP), Natural Community Conservation Planning (NCCP)
 - Incorporating climate change into existing programs
 - Developing climate adaptation plans and identifying potential partners

Discussion Period

- Ms. DiPietro conducted a straw poll of the attendees to gauge how many represent an organization that might use the Toolbox for the example specific uses provided in the presentation slides. The following results represent the general number of individual participants, not organizations:
 - Prior lands for acquisition for easements/stewardship: approx. 20 individuals
 - Regulatory planning: approx. 12 individuals
 - Incorporating climate change approx. 30 individuals
 - Develop climate adaptation plans: approx. 15 individuals
 - Identifying partners: approx. 15 individuals
- Ms. DiPietro then invited suggestions for other possible uses. Participants provided the following suggestions:
 - Education/outreach
 - Identifying which policies are incongruent with climate smart conservation
 - Providing a basis for conducting policy outreach with the needed data to support that engagement. Using the toolbox as an outreach tool to introduce the information to decision makers (e.g., maps). Supporting or creating opportunities for better integration of the technical information with policy decisions.
 - Justifying funding needs
 - Tracking project performance
 - Providing a platform for multiple conservation planning efforts in the same region
 - Providing easy access to summarized information to those who make the planning decisions in the Central Valley
- Is the Toolbox intended for policy-makers to use?
 - **Ms. DiPietro:** Not particularly. Most of the information will likely be too detailed and technical to suit a decision-maker's needs.

- Agencies and NGOs will likely require a “data ambassador” to help deliver the appropriate information to decision-makers.
 - **Ms. Schlafmann:** The Toolbox could include an outreach plan to guide those engagement efforts.
 - **Comment:** Create a condensed list of key messages to assist the “data ambassadorship.”
 - **Comment:** Provide multiple methods for outreach and engagement (e.g., questionnaires)
 - **Comment:** Offer easy-to-understand outreach documents that provide background information on specific geographic future scenarios incorporating climate change.
 - **Ms. DiPietro:** Many similarly described outreach materials can be found on the Climate Commons website. The Toolbox could serve as a hub to other related tools by providing links to existing information resources and tools.

9. Next Steps and Closing Remarks

A. Workshop Feedback

Participants were invited to provide feedback on the workshop structure and various components. Several folks made remarks:

Positive aspects:

- Time devoted to CVLCP background that occurred prior to this workshop.
- Useful to have a note-taker and a table facilitator
- Appropriate group sizes and representation from a variety of expertise.
- Mascot name tags

Suggested Changes:

- Still felt completion of the worksheets was rushed. Would have liked to have had an opportunity to thoroughly review what the groups completed prior to the workshop completion.
- NGO presence appears to have significantly decreased. Consider methods to compensate for their time (e.g., the Environmental Defense Fund is deeply-embedded in climate change and should be involved in these discussions)
 - There are organizations that would likely object to several of the workshop’s suggestions; however these entities were absent from the workshop. Consider methods to receive their input and encourage their participation in these workshops.

B. Next Steps

Ms. Wylie reviewed the next steps following completion of this workshop:

- The comprehensive workshop summary will be distributed to participants in approximately three to four weeks.
- The Project Team will develop an executive summary of the workshop based on the comprehensive summary.
- The Project Team and EcoAdapt will coordinate completion of the adaptation strategies and actions worksheets with the four umbrella working groups, including:
 - Compiling the information from the worksheets
 - Receiving input from the appropriate experts to develop strategies and actions for species not addressed during the workshop (e.g., red-legged frogs and yellow-legged frogs)
 - Coordinating follow-up working group meetings to finalize the worksheets
- EcoAdapt will compile the adaptation strategies to develop a full report with the vulnerability assessments that will be peer-reviewed.
- Participants are highly encouraged to review and comment on the draft vulnerability assessments on the CVLCP website.
- Participants seemed generally available and willing to attend the next workshop .
- Participants are also strongly encouraged to complete the Toolbox questionnaire form to inform the Project Team of intended uses and/or who else should provide his/her input on developing the Toolbox.

Ms. Schlafmann then thanked the participants and the project team for their tremendous efforts that went into to preparing for and completing the adaptation strategies and actions workshop, and closed the workshop.

10. Attendance

PARTICIPANTS

Riparian/Riverine Habitat Group:

Reyn	Akiona	US Fish & Wildlife Service
Brad	Burkholder	CA Dept. of Fish & Wildlife
Ted	Frink	CA Dept. of Water Resources
Kaylene	Keller	US Fish & Wildlife Service
Javier	Linares	US Fish & Wildlife Service
Chad	Moore	Bureau of Reclamation
Miriam	Morrill	Bureau of Land Management
Chad	Roberts	Riparian Habitat Joint Venture
James	Roberts	US Fish & Wildlife Service
Nat	Seavy	Point Blue Conservation Science
Kim	Webb	US Fish & Wildlife Service

Upland Habitat Group:

Justin	Epting	US Fish & Wildlife Service
Kim	Forrest	US Fish & Wildlife Service
Melanie	Gogol-Prokurat	CA Dept. of Fish & Wildlife
Denny	Grossman	Strategic Growth Council
Tom	Hedt	Natural Resources Conservation Service
Bronwyn	Hogan	US Fish & Wildlife Service
Junko	Hoshi	CA Dept. of Fish & Wildlife
Mark	Pelz	US Fish & Wildlife Service
Larry	Rabin	US Fish & Wildlife Service
Kif	Scheuer	Local Government Commission
Kristina	Sullivan	Independent
Tara	Ursell	CA State Parks
Jim	Weigand	Bureau of Land Management

Wetlands Habitat Group:

Whitney	Albright	CA Dept. of Fish & Wildlife
Steve	Greco	UC Davis
Brian	Halstead	US Geological Survey
Matt	Hamman	US Fish & Wildlife Service
Elizabeth	Hubert	Wildlife Conservation Board
Miguel	Jimenez	US Fish & Wildlife Service
Karen	Laing	US Fish & Wildlife Service
Elliott	Matchett	US Geological Survey
Bart	McDermott	US Fish & Wildlife Service
Kara	Moore-O'Leary	US Fish & Wildlife Service
Matt	Reiter	Point Blue Conservation Science
Khara	Strum	Audubon California
Greg	Yarris	Central Valley Joint Venture
Guthrie	Zimmerman	US Fish & Wildlife Service

Desert/Grassland Group:

Kristin	Byrd	US Geological Survey
Tom	Gardali	Point Blue Conservation Science
Armand	Gonzales	CA Dept. of Fish & Wildlife
Patrick	Huber	UC Davis
Bobby	Kamansky	Kamansky's Ecological Consulting
Amber	Kerr	USDA Climate Hub
Thomas	Leeman	US Fish & Wildlife Service

CVLCP WORKSHOP #5 DETAILED NOTES | Adaptation Strategies and Actions

Dustin	Pearce	Conservation Biology Institute
Joe	Silviera	US Fish & Wildlife Service
Justin	Sloan	US Fish & Wildlife Service
Dan	Strait	Bureau of Reclamation
Greg	Suba	CA Native Plant Society
Clark	Thompson	Fresno Council of Governments

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