

TITLE

Geographic Response Plans: Preparing for Inland Oil Spills in California Waterways

AUTHOR

Ms. Anna Burkholder, Senior Environmental Scientist, Specialist; California Department of Fish and Wildlife, Office of Spill Prevention and Response; 1010 Riverside Parkway, West Sacramento, California

ABSTRACT #1141189

Emergency regulations governing the development of oil spill contingency plans in California, along with financial responsibility for inland facilities, pipelines, refineries and railroads, became effective in 2015, with final regulations being adopted in January of 2019. With the California Department of Fish and Wildlife's (CDFW's) Office of Spill Prevention and Response's (OSPR's) authority for oil spill prevention, preparedness, and response being extended to inland waters of the State, the need to develop Geographic Response Plans (GRPs) for priority watersheds with higher risk of an oil spill became a top priority. Given the successful history with developing, implementing, and maintaining the California marine Area Contingency Plans (ACPs), OSPR has implemented a similarly effective GRP program.

GRPs are driven primarily by access to sites along river systems and lakes where response activities are feasible. The process of developing GRPs for the State has consisted of: 1) developing a consistent document framework based on recently developed GRPs including the Region 10 Regional Response Team (RRT) and Northwest Area Committee (NWAC) GRPs in the Pacific Northwest, the Feather River GRP developed by Union Pacific Railroad in California,

as well as previously developed GRPs by the United States Environmental Protection Agency (USEPA) Region 9 (California, Nevada, Arizona); 2) implementing a Statewide GRP Steering Committee (SGSC) consisting of State, federal and local agencies, industry, oil spill response organizations (OSROs), an environmental Non-Governmental Organization (NGO), and a tribal representative; and 3) developing partnerships with industry representatives, and federal, State and local agencies, including first responders [Local Emergency Planning Committees (LEPCs) and others] to ensure critical local expertise and information is incorporated in each, individual GRP.

With the emerging trend of oil by rail transportation; historical spill threats from pipelines, fixed facilities, and truck transportation; and the promulgation of emergency regulations extending OSPR's oil spill preparedness activities to inland waters, the development of GRPs for at-risk watersheds became critical.

INTRODUCTION

As an organization within CDFW, OSPR has trustee responsibilities for protecting the State's wildlife and natural resources. A core principle of OSPR's mission is to provide the best protection for California's natural resources by preventing, preparing for, and responding to spills of crude oil and petroleum products and by restoring and enhancing affected resources. For over 25 years, OSPR has been a leader in oil spill response, oiled wildlife recovery, and the development of marine Area Contingency Plans. With the increased threat of inland oil spills, emergency regulations were established in 2015 which expanded OSPR's jurisdiction and role beyond the marine environment to include all inland areas of the State. The inland jurisdictional expansion prompted the need to develop GRPs for at-risk waters of the State.

GRPs are not new to the State of California; the USEPA Region 9 lead the effort in producing five interstate plans between California and Nevada or Arizona, as well as one intrastate plan for the Upper Sacramento River. These plans were produced between 2005 and 2014 and engaged federal, State, and local agencies in the development process. Additionally, two industry plans, developed by Union Pacific Railroad and Burlington Northern Santa Fe Railroad were developed for the Feather River and Lake Almanor, respectively. These two industry plans were in the process of development just ahead of OSPRs efforts to launch its new inland preparedness program.

The Region 10 RRT and NWAC in the Pacific Northwest have developed a robust inventory of GRPs for the States of Washington, Oregon and Idaho. In 1992, the first GRP in Washington State was developed for the Columbia River Estuary. This document was termed a “response action plan,” and it, along with its development process, went on to serve as the prototype for the extensive GRP effort that has since emerged in Washington, Oregon and Idaho (Heimowitz, 1995). The Pacific Northwest plans were developed and continue to be maintained by the Region 10 RRT along with the Washington State Department of Ecology and the Oregon Department of Environmental Quality (WA Dept. of Ecology).

OSPRs efforts to develop a new series of inland GRPs utilized the above-mentioned plans and processes as a model to develop a document template specific to the needs of the State of California. The purpose of this paper is to provide an overview of the efforts to produce GRPs to provide oil spill response strategies for inland waters throughout the State, as well as describe the process in which OSPR developed a standardized GRP template document, coordinated with stakeholders including federal, State, and local agencies as well as industry partners, and have produced six GRPs during the first planning cycle.

BACKGROUND

On March 24, 1989, the EXXON VALDEZ spilled approximately 11 million gallons of crude oil in Alaska. Less than a year later, on February 7, 1990, the AMERICAN TRADER spilled approximately 416,598 gallons of crude oil off Huntington Beach in southern California. These events prompted the enactment of the federal Oil Pollution Act of 1990 (OPA 90; an amendment to the Clean Water Act) and the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 (Act) by the California Legislature. OPA 90 created the first requirements for oil spill contingency planning in the nation. The United States Coast Guard (USCG) is designated as the lead agency for planning and response in coastal zones and certain major inland water bodies, whereas the USEPA is the designated lead for inland zones (USEPA, 2018).

The Act covered all aspects of marine oil spill prevention, preparedness, and response in California and established an Administrator who was given broad powers to carry out the provisions of the Act. In 1991 OSPR was implemented, guided by the Administrator (Lempert-Keene, 1990). The USCG and OSPR, through a Memorandum of Agreement, began to work collaboratively on marine Area Contingency Plans and co-chair the six coastal Area Committees which continues today (Sutkus, 1995).

During the early 2010's there was a boom in U.S. domestically produced crude oil, and there were several severe railroad tank car accidents. In light of this increased risk, in 2014 the Governor and the Legislature expanded the Act to cover all waters of the State at risk of oil spills, such as rivers, lakes, and streams, from any source, including pipelines, production facilities, and shipments of oil transported by railroads. The expansion provided critical administrative funding to broaden OSPR's core programs statewide which included development of inland GRPs. The need to strategically plan for a new, integrated statewide program

prompted the reorganization of OSPR's branches and led to the establishment of additional staffing positions including a Statewide GRP Coordinator (Gibson, Westervelt, Addassi, 2017).

Early GRP Development in California

Although spills of varying degrees occurred across the interior of the State, the development of inland oil spill contingency plans did not have the momentum of the marine ACPs due to significantly less available resources. A major spill on the East Walker River in late 1999 prompted the development of the first inland GRP in California. After the East Walker River GRP was completed, USEPA and OSPR began pursuing the development of more plans. With USEPA's engagement and some federal funding, interstate waterways and water bodies became a priority of USEPA Region 9 for GRP development. A majority of these early plans extend between California and either Nevada or Arizona; these plans include (along with the East Walker River) the Truckee River, Carson River, Lake Tahoe, and Lower Colorado River. In addition, the Upper Sacramento River GRP was completed in 2005 and covers the area where the Cantara Loop spill occurred in 1991, spilling a toxic herbicide that killed all aquatic life in a 45-mile stretch of the river. The Upper Sacramento River GRP was the only plan that did not cross State boundaries.

METHODS

GRP Development Process

There are numerous steps involved in the development of a GRP. In the early 1990's the Columbia River Estuary GRP was developed and would go on to serve as a prototype for a robust library of GRPs in Washington, Oregon and Idaho that would follow. The process began with convening a contingency planning committee who identified all-natural areas vulnerable to

the effects of oil spills in the designated area, followed by the prioritization of the identified sensitive areas. The committee then developed response strategies to protect the prioritized sites and developed a logistics database to include incident command post locations, staging areas, equipment cache locations, communications, and access points. The final step, prior to public review and incorporation into area contingency plans, was to field verify the feasibility of protection strategies (Christopherson and Slyman, 1992).

Whereas traditionally the locations and prioritization of booming and response strategies in a GRP are based on the locations and sensitivity of ecological, economic and cultural resources at risk, there are inland settings where access to the water is limited. Many river systems in California, for example, run through steep-walled canyons and are otherwise inaccessible other than by remote, unmaintained dirt roads. With access locations being a limiting factor for many river systems in California, the prioritization of response strategies for GRPs is based on access locations (McGowan, Algots, and Gravenmier, 2017).

Waterway Prioritization List

The method for developing GRPs under OSPRs new inland program had concurrent processes at work. OSPRs Field Response Teams (FRTs) were first tasked with identifying the waterways/river systems in each of the three FRT jurisdictions; northern, central and southern, that were at risk of an oil spill. Each FRT went through a careful analysis of the waterways in their respective areas, analyzed their potential for risk of oil spills by rail, pipeline, or other industry accidents; history of spills; and presence of threatened and endangered species to develop a comprehensive list of waterways to potentially develop GRPs for in the future. Prioritization for developing GRPs was given to waterways within ¼ mile of pipelines, facilities, or high-risk rail; areas with higher risk to sensitive fish and wildlife and the habitats that they

depend on; and areas with cultural and historic concerns. And unlike the GRPs developed in the Pacific Northwest, GRPs in California are driven by access to sites along river systems and lakes where response activities are feasible (California State Oil Spill Contingency Plan, 2019). For the first planning cycle, the FRTs selected six water bodies from the comprehensive list to produce GRPs, corresponding to one GRP per LEPC region across the State.

Each FRT conducted field reconnaissance for their designated GRP to identify access points along each respective river system, determining the level of response per site or whether the access point would serve as an observation site which could be used for Shoreline Cleanup Assessment Technique (SCAT), etc. FRTs continued their process by collecting site data and worked with oil spill prevention specialists and oil spill response organizations to develop booming strategies for each response location and identified staging areas.

GIS App Development for Field Data Collection

The GIS Lead Analyst for GRPs developed an Environmental Systems Research Institute (ESRI) “Survey 1, 2, 3” form for the field data collection component of GRP development. Survey 1, 2, 3 provides a form for field staff to collect Global Positioning System (GPS) points, enter notes and location information as well as incorporate photos of the site. Data is stored in the cloud and on ESRI’s ArcGIS Online website where it can be downloaded into GIS layers and excel spreadsheets which can be utilized in maps and response strategy detail sheets. After the GRP is finalized, the GIS data is available in the Environmental Response Management Application® (ERMA), OSPR’s Common Operating Picture (COP), that has been developed in partnership with the National Oceanic and Atmospheric Administration (NOAA). ERMA is a web-based mapping program which displays real time and static data, including spatial GRP Data.

Create a Document Template

Concurrently with field data collection, the Statewide GRP Coordinator was developing a new GRP template, convening a Statewide GRP Steering Committee and internal GRP Working Group, meeting with LEPCs across the State, and coordinating the information being provided by field staff and maps developed by our GIS Unit. FRT staff provided information on ecological and economic resources at risk and the Statewide GRP Coordinator conducted tribal outreach and developed contact information for local tribes and cultural and historic resources at risk.

The process of creating a GRP document template began with research. Overarching document review included the National Contingency Plan and several Regional Contingency Plans, along with California marine ACPs, the California Oil Spill Contingency Plan, and the LEPC Guidance Document template. The aforementioned existing GRPs were also reviewed and were crucial to development of the first table of contents (TOC) and subsequent GRP document template.

OSPR not only wanted to take the best parts from existing GRPs, but ensure that OSPRs authorities, policies and procedures were clearly stated. A framework in the form of a TOC was developed and the newly formed internal GRP Workgroup, consisting of environmental scientist field staff, Geographic Information System (GIS) support, and upper management began the arduous process of shaping the document contents and populating each chapter.

Key sections of the GRPs include an extensive contact sheet immediately following the cover page; a chapter on safety, source control, and emergency management; a chapter dedicated to response site strategies which house the critical information on response locations, implementation strategies, equipment needs, and detailed maps; and the resources-at risk chapter

addresses sensitive species and habitats as well as economic resources and tribal communication and protection of cultural and historic resources.

Tribal Outreach and Cultural and Historic Resources

Incident Command System (ICS) principles provide for tribal involvement during response activities which occur on tribal lands, where representatives can be part of the Unified Command (UC). Treaty rights also allow tribes to be a partner in the planning process and to potentially become a resource owner (or trustee) should those resources become impacted during an oil spill. Oil spills which occur off of federally recognized tribal land may still have the potential to impact cultural resources on traditional ancestral lands. These ancestral lands may be of importance to several federally and non-federally recognized tribes. The CA Public Resource Code (PRC) Section 21073 states “California Native American tribe means a Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission (NAHC) for the purposes of Chapter 905 of the Statutes of 2004.” This list may include non-federally recognized tribes. When it is determined that an oil spill has the potential to impact cultural resources, the NAHC will be called to obtain a contact list of those tribes with a traditional cultural connection to the area of the incident. The listed tribes will then be contacted and invited to participate in the response for the purpose of cultural resource protection (California State Oil Spill Contingency Plan, 2019). Tribal outreach was conducted early in the GRP development process, informing area tribes of the planning efforts and inviting their participation in review and commenting on the GRP documents and participating in the local GRP Subcommittees.

GRP Committees and Workgroups

Early in the process of GRP development, the SGSC was formed, the purpose of which to provide a forum for stakeholders (industry and oil spill response agencies) and local, State, and federal agencies to help guide effectiveness, efficiency and consistency with developing inland GRPs for the State of California. Agency and stakeholder input ensured all elements of a comprehensive GRP would be included and provide for oil spill and first responders to efficiently and effectively respond to an incident as well as provide for the protection of the public and sensitive environmental and cultural resources. The SGSC provides for a transparent process inclusive of the partners that OSPR and USEPA work with closely during spill response, recovery, and remediation.

The SGSC participated in the TOC and template document development process. Once the template was approved and GRPs were being developed, the committee continued to meet to discuss the progress of each GRP, how the process was going with GRP Subcommittees and LEPC's and what could be done to improve that process. As individual GRPs are finalized, there will be ongoing maintenance of the documents to keep them current and make any appropriate updates and improvements. Additional GRPs will continue to be produced as others are completed; the second planning cycle will need to be selected and approved of by the SGSC.

An OSPR internal GRP Workgroup was formed and consists of staff and supervisors from each of the three FRTs, GIS support, as well as upper management. The State is divided up into three FRTs; northern, central and southern. Each of the FRT supervisors hand selected the staff to participate in the GRP workgroup to include each of the GRP Leads as well as supporting staff. The OSPR GIS team assigned a primary GRP Lead Analyst to create maps and work with each GRP Lead on mapping, operational division boundaries, segments, naming conventions,

etc. Upper management assignments included the Preparedness Branch Chief, Environmental Response Branch Chief, and Scientific Deputy Director.

The Statewide GRP Coordinator facilitates monthly meetings with the GRP workgroup to develop and refine the GRP template and content, development and layout of the response strategy detail sheets, populating species and economic resources-at-risk tables and tribal representative contact lists, and development and refinement of maps.

Each GRP Lead convened a local GRP Subcommittee to review and comment on each respective GRP for their area. Each subcommittee is unique and may be comprised of assigned USEPA staff, State agencies local to the area such as the Regional Water Quality Control Board, local governments including water agencies and county and city emergency managers, as well as local industry partners. Together this group reviewed the individual plan for their area and made recommendations on local information such as contacts, water intake and flood control gate information, location of emergency response equipment and potential Incident Command Posts, and shoreline access and boat launch information.

The California State Emergency Response Commission (SERC) established Six Emergency Planning Districts having the same boundaries as the six Mutual Aid Regions for the State. The SERC appointed an LEPC for each planning district and supervises and coordinates their activities.

Within their region, the LEPCs carry out community right-to-know requirements of the Emergency Planning and Community Right-to-Know Act (EPCRA). They provide a forum for emergency management agencies, responders, industry and the public to work together to evaluate, understand, train about, coordinate and communicate chemical hazards in the community and develop hazmat emergency plans, which provide information about chemicals in

the community to citizens, government agencies and emergency responders. Plans are developed with stakeholder participation (LEPC, 2019).

The LEPCs provide a public forum for communication on GRP development. Many LEPC members also serve on the local GRP subcommittees. The Statewide GRP Coordinator periodically participates in and presents information to the LEPCs on the area GRPs being developed.

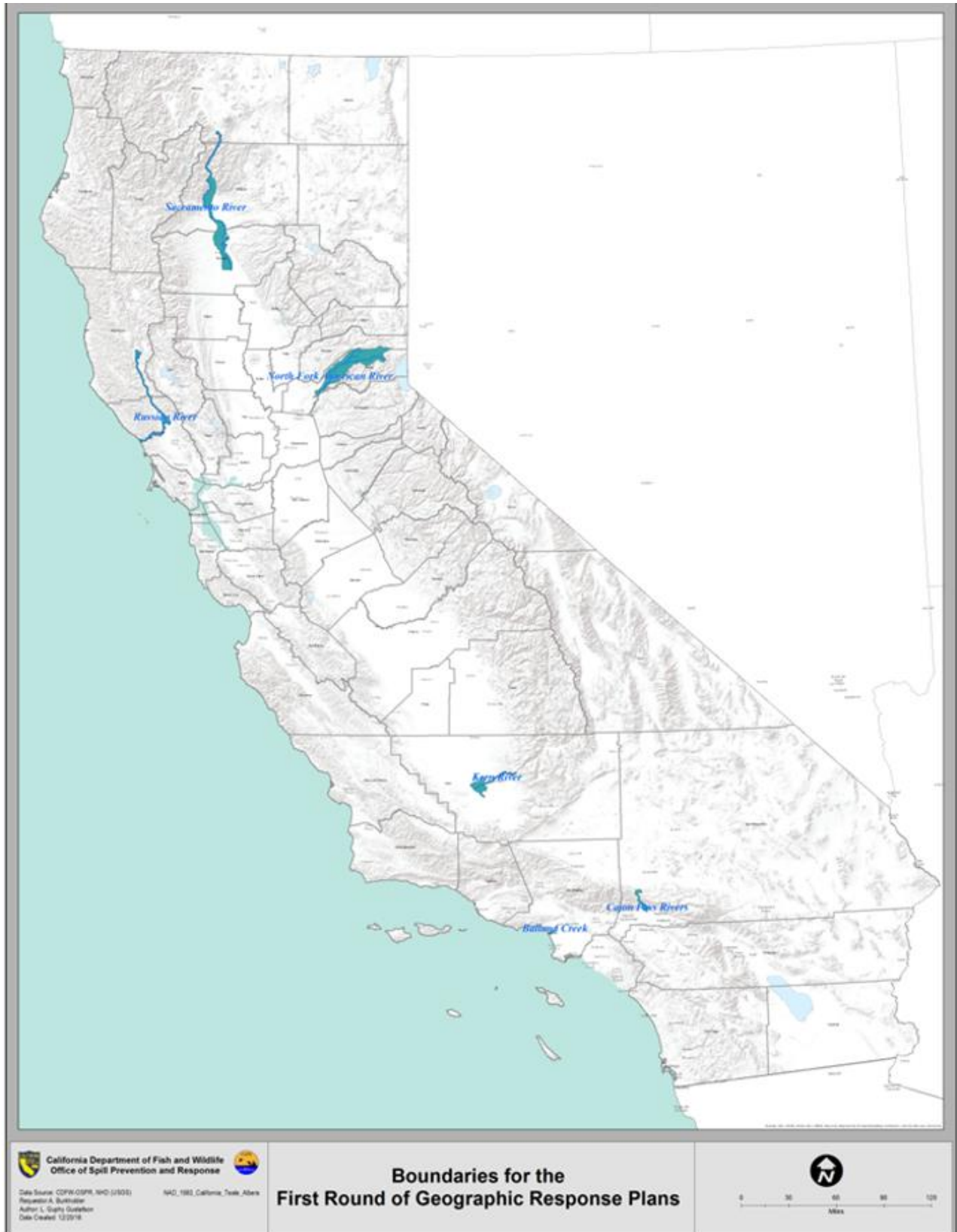
GRP Review and Comment Process

The GRP review and comment process consists of a three-tiered approach. Once a GRP draft is ready for review, it first goes to the local GRP Subcommittee. The GRP Lead distributes the draft plan and requests comments within 30 to 45 days. Comments are then incorporated into the next draft. The second step in the review process is with the GRP Workgroup. This review period may be anywhere from 30 to 45 days. The majority of comments come in from this larger, internal group. Working directly with the GRP Lead on comments received, the Statewide GRP Coordinator incorporates changes that are appropriate for the plan. The final step in the review process lies with the upper management team. Once their feedback is received, all comments are incorporated, and the GRP is finalized and posted to OSPRs website.

RESULTS/DISCUSSION

Development and Update Processes

During the first planning cycle, it was anticipated that each LEPC would serve as the GRP Subcommittee, providing review and comment on each local GRP. In an effort not to overwhelm any one LEPC with more than one plan to review, it was decided that one plan would be developed per LEPC region. In reality, each GRP Lead convened a separate GRP



Subcommittee consisting of local agency and industry expertise. Many GRP Subcommittee members participate in LEPC meetings, but it was necessary to outreach to specific local agencies to engage them in the process and access their knowledge of the area and particular river system as well as hazardous materials response. For the second planning cycle, it was determined that the focus should be on waterways with the highest risk of an oil spill, even if an LEPC had more than one plan in its regional boundary being developed at the same time.

Through the internal review process, the GRP Workgroup identified some key improvements to make on the second planning cycle. These improvements include ensuring that there is a highway or major road visible on the strategy sheet direction maps as well as consistency with map scales. Improvements also include alphabetizing the common names of species in the resources-at-risk tables and ensuring that the capitalization of species common names uses the same convention as other OSPR and CDFW documents. The standardization of response site photos and ensuring that field staff capture the date the photo was taken will ensure that responders can assess the site conditions based on time of year. Finally, for some aerial maps, it may be beneficial to use Unmanned Aircraft Systems (UAS) photos as many sites have a riparian canopy making it difficult to see the streambed/waterway from aerial imagery. With numerous FRT staff trained as UAS pilots, the incorporation of UAS photos in GRPs may become more commonplace.

Data and Plan Management

Survey 1, 2, 3 data is managed and maintained by the GIS unit; data is stored in the cloud and on ESRI's ArcGIS Online website where it can be downloaded into GIS layers and excel spreadsheets which can be utilized in maps and response strategy detail sheets, as well as uploaded to a future Access database. GRP documents are housed internally with OSPR on the

common network drive, only accessible by OSPR staff. The GRPs are also posted, as a secure Portable Document Format (PDF) document, on the publicly available OSPR website. Plan management includes an annual update to the contact sheet as well as a complete document update at year three. After the first update, each plan will be updated every five years. The update process will include working with the SGSC, GRP Workgroup and local GRP Subcommittees.

Utilization of and Testing Strategies

The Sensitive Site Strategy Evaluation Program (SSSEP) for marine waters is a program by which OSPR tests and evaluates the readiness and effectiveness of oil spill response strategies that protect designated environmentally sensitive shoreline resources within the bays, estuaries, and coastal areas of the State (California State Oil Spill Contingency Plan, 2019). Unlike the ACPs that have an SSSEP Program to test booming strategies to protect sensitive locations in the marine environment, there is no process in place to test GRP response strategies. GRP response strategy sites are driven by access to the waterways and locations where equipment can be deployed and oil recovery operations can occur, as opposed to specific sensitive sites that can be protected by boom in the more readily accessible marine environment. With existing ACPs often being drilled in association with industry-lead vessel or facility drills, we hope that as the inland GRPs get approved, they will be exercised as a part of industry-lead exercises as well. Additionally, OSPR is communicating with USEPA and industry partners to leverage other drills and exercises being conducted, such as a swift water boom training courses, to incorporate some aspects of the GRPs.

LOOKING AHEAD**Second Planning Cycle**

The second planning cycle to produce eight new GRPs throughout the State began in June 2019. FRTs determined which waterways in each respective area were a priority for GRP development. Some rivers will be broken up into three plans, such as the Santa Ana River, and others, such as the Klamath River, will be one comprehensive document. Plan development for the second planning cycle includes the Klamath River, Lower Sacramento River, Lower American River, Salinas River, Santa Ana River (divided into 3 plans), and the Santa Margarita River. Each plan, except for the Lower American River and the middle and upper sections of the Santa Ana River, will terminate at the Pacific Ocean or the Sacramento-San Joaquin River Delta and connect with the corresponding ACP. The Lower American River GRP will terminate at the confluence with the Sacramento River which flows into the Sacramento-San Joaquin River Delta, which is included in the Sector San Francisco ACP.

Database Development for Site Strategy Pages

OSPRs application development team is creating a front-end Access database with a Microsoft SQL Server back end to produce the 2-page access/observation and 3-page response strategy sheets included in the GRPs. Currently, the sheets are created in a Microsoft Word table that was proven to be less than efficient during the first planning cycle. Field data and photos collected with the Survey 1, 2, 3 App will be imported into the database. Additional site information such as detailed directions, contacts, and other pertinent information can be added and edited in Access by FRT staff and GRP Leads. The benefits of using Access as a front-end user interface include ease of entering, retrieving, and editing GRP site information, as well as automated consistent and clean reports. Utilizing Microsoft SQL server as a back-end database

will allow secure data access, user permission levels to restrict deletions/editing, routine backups, and data integrity.

ERMA Southwest

ERMA is a vehicle for organizing, managing, and sharing both planning and response information. ERMA was designed by NOAA's Office of Response and Restoration. OSPR has worked closely with NOAA to develop ERMA Southwest as a repository for California's oil spill response strategies (e.g., ACPs, GRPs), and for use as a comprehensive COP during a spill response. ERMA is accessed using a common web browser and provides the end user with overall situational awareness plus the ability to create interactive maps. ERMA provides several credential based levels of access from "Public" to "Responder Only" thus providing necessary data security (ERMA, 2019).

ERMA Southwest is populated with a robust dataset from the ACPs including the location of booming strategies, environmental sensitive sites, operational divisions, and shoreline access locations. A similar effort to incorporate GRP data into ERMA is underway. GRP response strategy locations will be incorporated along with a link to the corresponding response strategy detail sheet; this will provide information on the implementation strategy, equipment needs, staging area locations, and site hazards and restrictions. This information can also be a valuable resource when ERMA is used as the COP during a spill; oil spill source location and trajectories can be viewed along with downstream locations of access/observation sites, response strategy sites, staging areas, and maps with operational division and segment information for wildlife recovery and SCAT teams to utilize.

CONCLUSION

As a leader in oil spill preparedness, response and recovery of oiled wildlife for over 25 years, OSPR embodies a wealth of knowledge and experience in the development of oil spill response plans. As an organization within CDFW, OSPR has trustee responsibilities for protecting the State's wildlife and natural resources along with a mission to provide the best protection for California's natural resources by preventing, preparing for, and responding to spills of crude oil and petroleum products and by restoring and enhancing affected resources.

With the emerging trend of oil by rail transportation, historical spill threats from pipelines, fixed facilities, and truck transportation; and the promulgation of emergency regulations extending OSPR's oil spill preparedness activities to inland waters, OSPR responded by expanding its organization through additional staffing and launching its efforts to develop GRPs throughout the State. With a solid GRP template document now in place, active GRP committees and workgroups, and consistent development procedures, the process of producing inland GRPs statewide can move forward into the second planning cycle and beyond with expediency.

RESOURCES

For additional information and to access GRPs for CDFW OSPR (California), USEPA Region 9 (California, Nevada, and Arizona), and Region 10 RRT and NWAC (Washington, Oregon and Idaho) please use the following links:

- CDFW OSPR GRPs, <https://wildlife.ca.gov/OSPR/Contingency>
- USEPA Region 9 GRPs, <https://ndep.nv.gov/environmental-cleanup/environmental-assistance-program>.

- Region 10 RRT and NWAC GRPs,

<https://www.rrt10nwac.com/GRP/Default.aspx>.

REFERENCES

- 1) California Department of Fish and Wildlife, Office of Spill Prevention and Response, 2019. California State Oil Spill Contingency Plan, July 2019.
<http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=172767&inline>.
- 2) Christopherson, Sharon K. and Slyman, Paul M. (1993) Oil Spill Response Planning on the Columbia River Estuary. International Oil Spill Conference Proceedings: March 1993, Vol. 1993, No. 1, pp. 63-66.
- 3) Environmental Response Management Application® (“ERMA, 2019”),
<https://response.restoration.noaa.gov/resources/maps-and-spatial-data/environmental-response-management-application-erma>.
- 4) Gibson, L., Westervelt, J., Addassi, Y., 2017. Standing Up a Comprehensive Training and Position Qualifications Program for a Response and Regulatory Agency. International Oil Spill Conference Proceedings May 2017, Vol. 2017, No. 1, pp. 419-430.
- 5) Heimowitz, Paul (1995) Getting a “GRP.” The Geographic Response Planning Effort in Washington State. International Oil Spill Conference Proceedings: February 1995, Vol. 1995, No. 1, pp. 933-934.
- 6) Lempert-Keene-Seastrand Oil Spill Prevention and Response Act, 1990 (“Lempert-Keene, 1990”),
http://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=GOV&division=1.&title=2.&part=&chapter=7.4.&article=1.

- 7) Local Emergency Planning Committee, 2019 (“LEPC, 2019”),
<https://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials/state-emergency-response-commission/local-emergency-planning-committee>.
- 8) McGowan, Greg, Algots, Michael, and Gravenmier, Josh (2017) Inland Geographic Response Plan (GRP) for Complex, Variable, Limited Access River Settings. International Oil Spill Conference Proceedings: May 2017, Vol. 2017, No. 1, pp. 1784-1794.
- 9) Oil Pollution Act of 1990, (“OPA 90”), <https://www.bsee.gov/sites/bsee.gov/files/federal-register-notice/presentations/opa90.pdf>.
- 10) Region 10 Regional Response Team and the Northwest Area Committee (RRT/NWAC), Geographic Response Plans, <https://www.rrt10nwac.com/>.
- 11) Sutkus, Adam. California's Area Contingency Plans: A Successful State/Federal Partnership. International Oil Spill Conference Proceedings Feb 1995, Vol. 1995, No. 1 (February-March 1995) pp. 924-925 <https://ioscproceedings.org/doi/pdf/10.7901/2169-3358-1995-1-924>.
- 12) United States Environmental Protection Agency (USEPA), Area Contingency Plan Handbook, v. 2.0, August 2018, https://www.epa.gov/sites/production/files/2018-10/documents/acp_handbook_10-18-2018.pdf.
- 13) Washington State Department of Ecology (WA Dept. of Ecology), Oil Spills 101.wa.gov, Geographic Response Plans, <https://www.oilspills101.wa.gov/northwest-area-contingency-plan/geographic-response-plans-grps/>.