

STAFF SUMMARY FOR APRIL 17, 2019

23. DEPARTMENT INFORMATIONAL ITEMS

Today's Item	Information <input checked="" type="checkbox"/>	Action <input type="checkbox"/>
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This is a standing agenda item to receive and discuss informational updates from DFW:

- (A) Director's report
- (B) Law Enforcement Division
- (C) Wildlife and Fisheries Division and Ecosystem Conservation Division
- (D) Marine Region

Summary of Previous/Future Actions (N/A)**Background**

Verbal reports are expected at the meeting for items (A) through (D).

- (A) The director's report will include an update on tricolored blackbird population estimates and progress with safe harbor agreements.
- (B) The Law Enforcement Division will provide a verbal update at the meeting.
- (C) The Wildlife and Fisheries Division report will include:
 - An update on DFW's recruitment, retention and reactivation (R3) program, which includes the recent release of an action plan focused on increasing hunting and angling participation in California (Exhibit C1).
 - An update on efforts to eradicate nutria in California, including the one year anniversary of launching a formal eradication effort (Exhibit C2), and showcasing nutria in CDFW's Invasive Species Program youth art contest (Exhibit C3), designed to increase public awareness.
- (D) The Marine Region report will include a presentation (Exhibit D1) covering:
 - The Marine Region 2018 year-in-review report (Exhibit D2).
 - An update on annual recreational ocean salmon and Pacific halibut regulations, automatic conformance to federal regulations, and any new information related to or resulting from the Pacific Fishery Management Council and the International Pacific Halibut Commission.
 - An update on federal fishery disaster declarations, including the status of National Marine Fisheries Service disaster assistance appropriated for West Coast determinations made in 2018, and the Feb 28, 2019 request from Governor Newsom to U.S. Secretary of Commerce Wilbur Ross to declare a fishery resource disaster for the commercial red urchin fishery in the Northern Management Zone (north of Monterey/San Luis Obispo County Line) (Exhibit D3).
 - An update on efforts and the timeline for transitioning commercial fisheries landing receipts to electronic format (E-Tix).

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Significant Public Comments (N/A)

Recommendation (N/A)

Exhibits

- C1. [DFW's California Hunting and Fishing Recruitment, Retention, and Reactivation \(R3\) Action Plan: A Path for Protecting the Future of Outdoor Activities and Conservation in California, dated Jan 2019](#)
- C2. [DFW News: CDFW Marks One-Year Anniversary of Nutria Eradication Effort, dated Mar 25, 2019](#)
- C3. [DFW News: Youth Art Contest Encourages Kids to Learn about Invasive Nutria, dated Apr 2, 2019](#)
- D1. DFW presentation, received Apr 3, 2019
- D2. [DFW's Marine Region 2018 Year in Review, dated Mar 7, 2019](#)
- D3. [Letter from Governor Gavin Newsom to U.S. Department of Commerce Secretary Wilbur Ross, dated Feb 28, 2019](#)

Motion/Direction (N/A)

R3

California Hunting and Fishing

Recruitment, Retention and Reactivation Action Plan



A Path for Protecting the Future of Outdoor Activities and Conservation in California

JANUARY 2019

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From the Director



In partnership with the hunting and fishing community, the California Department of Fish and Wildlife (CDFW) is excited to present this action plan focused on increasing recruitment, retention and reactivation of California hunters and anglers.

Although California is home to some of the nation's most diverse hunting and fishing opportunities, participation in these activities has declined significantly since the 1970s and 1980s. Hunters and anglers help sustain a multi-billion-dollar outdoor recreation industry and provide some of the primary funding to CDFW. The decline in participation poses an ever-increasing threat to wildlife conservation, our state's long-standing hunting and fishing heritage, and Californians' connection to the outdoors in general. One of the most visited, but ultimately unresolved issues is how to provide CDFW with

sustainable financing.

At CDFW, we are acutely aware of the issue and are dedicated to increasing hunting and angling participation in the Golden State. We cannot do this alone. We need the recreational fishing and hunting communities, our state and federal agency partners and others to continue working with us as we move forward together to address the barriers and opportunities to hunting and fishing in this state.

With an intended audience of fishing and hunting stakeholders, CDFW staff, Tribes and the Legislature, this action plan outlines a macro-level framework rather than specifying micro-level actions. This framework will help us think differently as a collective group—to change the historical dynamics that we've repeated for many years. For example, much of the work on hunter and angler recruitment has had great intentions but has been based on assumptions rather than data. By zooming out to a macro-level approach, we can initiate a well-informed implementation plan where we can learn as a group, identify and pool resources, and achieve mutually beneficial results through specific micro-level strategic actions.

CDFW has put staffing resources behind this effort, the fishing and hunting community has rallied, and we are now poised to tackle the challenges before us.

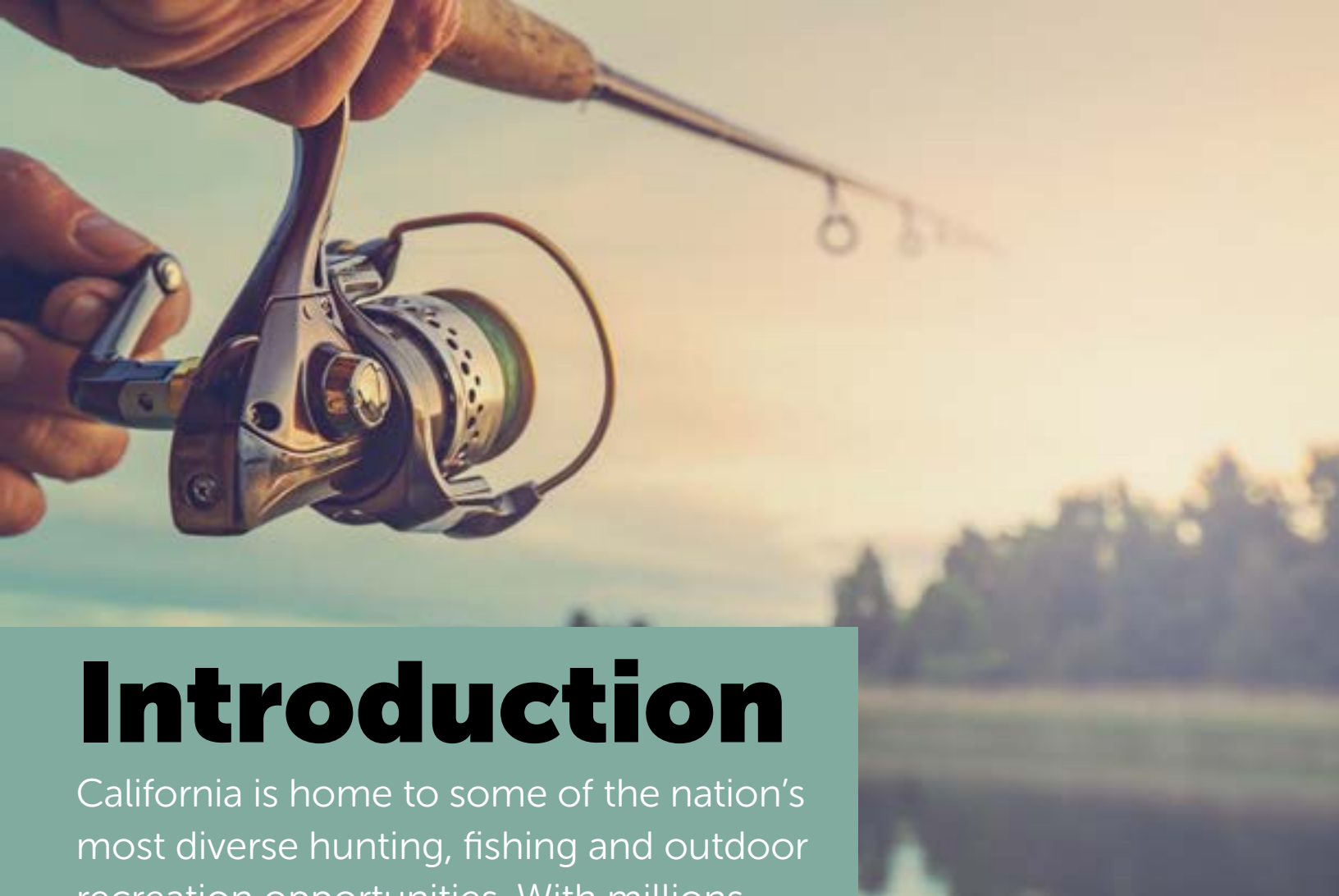
With more and more competing interests vying for the attention of Californians and those who visit this great state, there has never been a more crucial time to support and encourage people to get outdoors and enjoy California's wild places.

Charlton H. Bonham
Director, CDFW

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The California Department of Fish and Wildlife Hunting and Fishing Recruitment, Retention and Reactivation Program (R3) aims to increase statewide hunting and fishing participation by collaborating with diverse stakeholders to transform barriers into opportunities.

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Introduction

California is home to some of the nation's most diverse hunting, fishing and outdoor recreation opportunities. With millions of acres of public land, thousands of miles of rivers and streams, 1,100 miles of ocean coastline and more than 3,000 lakes and reservoirs, California provides many opportunities to recreate outdoors and harvest wild protein sources.

Declining participation in fishing and hunting in California since the 1970s is due to multiple cultural, societal and demographic changes. The decline in these activities has occurred over several decades and contributes to an ever-increasing threat to the conservation and management of our natural resources.

Hunters and anglers help manage our natural resources and wildlife by managing wildlife populations to maintain ecological and biological diversity, participating in wildlife surveys for scientific data collection, and reporting wildlife crimes like poaching. Hunters and anglers also fund a significant percentage of conservation work through their economic contributions. As revenue from these groups declines, there is a direct and measurable effect on California's ability to conserve its fish and wildlife and other natural resources.

The Federal Aid in Wildlife Restoration Act, also known as the Pittman-Robertson Act of 1937, is an excise tax on the sale of firearms, ammunition and archery equipment. Hunters self-imposed this tax to generate funding for con-

servation work. As of 2018, more than \$12 billion has been distributed across the nation through this federal program. In California, it has generated more than \$402 million since its inception. Similarly, the Federal Aid in Sport Fish Restoration Act, also known as the Dingell-Johnson Act of 1950, collects excise taxes on sportfishing tackle, fish finders, and trolling motors, and motorboat and small engine fuel. It also collects import duties on tackle, yachts and pleasure crafts. More than \$14.9 billion has been raised through this federal program since 1951 with over \$467 million of that being distributed to California. Revenue from both excise taxes are distributed to state wildlife agencies and directly fund critical conservation efforts such as research, management and education. In 2017, California received \$42.2 million from both acts (CDFW, 2018). From 2013-2017, revenue generated from the Pittman Robertson Act

abnormally spiked due to a short-term increase in firearm sales. This revenue spike helped generate a temporary abundance of conservation funding. However, economists expect these national trends to decline in the coming years. It is unclear at this time if the increased purchasing trends will continue in California.

According to the 2016 National Survey of Fishing, Hunting and Wildlife-Associated Recreation, 14 percent of Americans aged 16 years and older fished, 4 percent hunted, and 14 percent participated in the shooting sports. In California, sales of annual fishing licenses have declined 50 percent since 1980 and annual hunting license sales have decreased 65 percent since 1970 (USFWS, 2016). In 2017, the total number of hunters per capita in California was about 1 percent, the second lowest in the United States. Likewise, just under 5 per-

cent of the California population bought a fishing license. Despite the decline in overall license sales, California's hunter and anglers still generated more than \$91 million in 2017 through the sale of recreational hunting and fishing licenses, tags and stamps (CDFW, 2018). The outdoor recreation economy in California is significant and preserving that economy is vital to rural communities, California businesses, wildlife and habitat conservation, public lands and the health and well-being of Californians.

Through their participation in hunting and fishing, Californians can help keep the American legacy of public land conservation alive and fund the ever-growing need to manage our wildlands and wildlife in the face of human encroachment and urbanization, wildlife diseases, a changing climate and other challenges. The funds provided to state fish and wildlife agen-



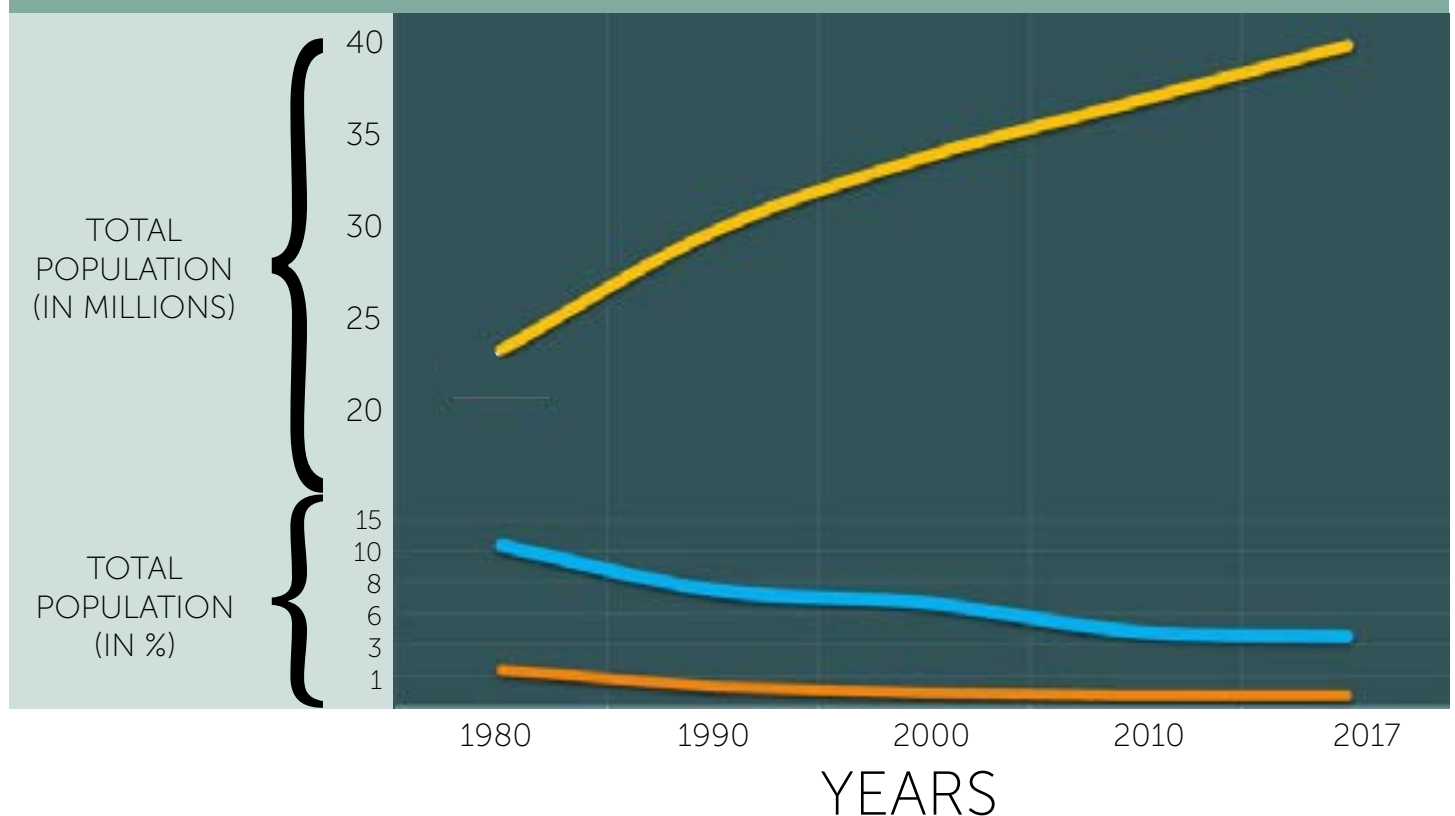
cies from the sales of hunting and fishing licenses, tags, validations and report cards are critical. Historically these funds have provided 40 percent of CDFW's budget (CDFW, 2018). With the decrease of hunting and fishing revenue and the increase of CDFW responsibilities, only 21 percent of CDFW's overall budget is funded from these sources today. This amount could increase and meet or exceed historical revenue figures if more people participated in fishing and hunting activities. The current decline in budgetary support from hunting and fishing puts CDFW at risk to adequately fund fish and wildlife conservation projects, wildlife law

enforcement, hunter's education, hunting, fishing and public access to wilderness and wildlife management areas for other types of outdoor recreation.

For decades, CDFW has administered programs aimed at providing hunting and fishing access and opportunities. Some examples include: Fishing in the City events, hunter education courses, the Fishing Passport Program, special youth hunting opportunities, the California Heritage Trout Challenge and others. Though most of these programs are open to everyone, some solely focus on youth. These efforts, although successful in many aspects, have been insuffi-

cient to stop or reverse the decline in participation or preserve the cultural and conservation benefits of hunting and fishing. CDFW stakeholders and leaders in the conservation community, such as Non-Governmental Organizations (NGOs) and industry leaders, have shown a willingness to help the situation for many years through special programs, proposed legislation and other coalition efforts statewide. These diverse stakeholders and CDFW have now joined together in a collaborative effort, called the "R3 program," to solve the state's decline in angling and hunting participation, access and opportunity.

Hunting & Fishing Licenses vs. California Total Population



Percentage of Anglers	10.39%	7.54%	6.71%	4.85%	4.53%
Percentage of Hunters	2.34%	1.28%	0.94%	0.77%	0.70%
Total Population (in millions)	24	30	34	37	40



Current CDFW Administered R3 Programs

- Fishing in the City
- Hunter's Education
- Fishing Passport Program
- Special Apprentice Hunts
- Youth Hunts
- Women's Hunts
- California Heritage Trout Challenge
- Trout Fest
- Vamos A Pescar Grant Program

What is R3?

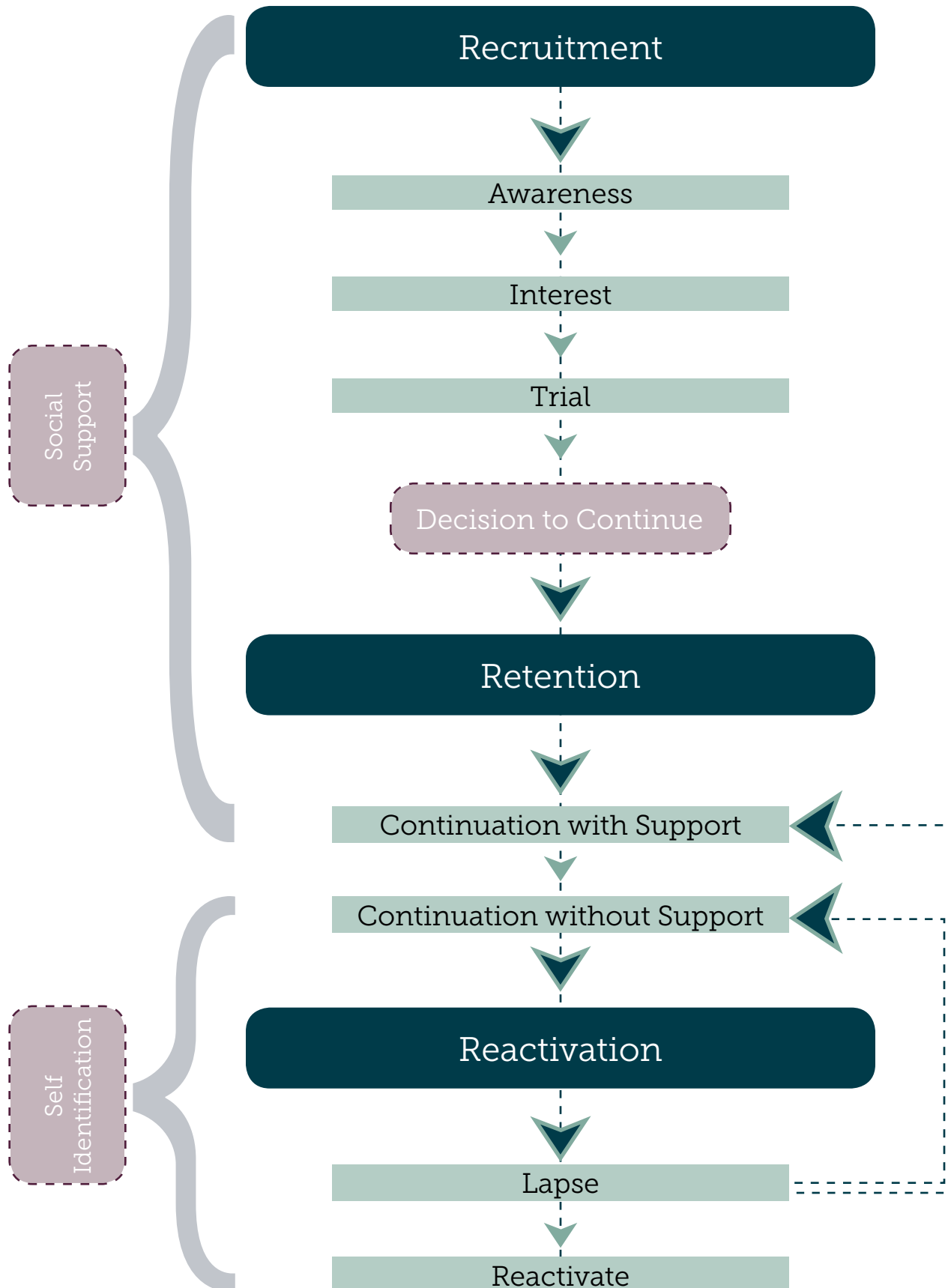
The Recruitment, Retention and Reactivation of hunters and anglers (R3), is a nationwide movement, "focused on strategically increasing participation in hunting, angling and the shooting sports" (CAHSS, 2017). The California R3 Program grew out of national R3 attention over the last decade, including research presented in the National Hunting and Shooting Sports Action Plan (2016), a collaboration between the Council to Advance Hunting and Shooting Sports (CAHSS) and the Wildlife Management Institute. In 2015, the Recreational Boating and Fishing Foundation (RBFF) also

introduced a national R3 program to support states in initiatives and strategies to increase fishing license and boat registration revenues. The R3 movement encompasses a diverse range of actions from the hunting, fishing and conservation NGO stakeholders executing specific programmatic level actions all the way to state agencies developing statewide strategic plans.

National R3 efforts focus on using the Outdoor Recreation Adoption Model (ORAM) which is based on over 50 years of social science research. The ORAM illustrates the process an individual will take as

they transition from non-participant to a participant in hunting, fishing and the shooting sports. Starting from recruitment activities (e.g. awareness, interest and trial) and then moving into retention activities (e.g. deciding to continue participating with and without help), this model highlights the significant link between recruitment, retention and reactivation. For example, social support is having assistance and reinforcement from other people along an individual's journey, which helps ensure they are retained as participants and increases their likelihood of reactivation if they lapse.

Outdoor Recreation Adoption Model



Reversing the Trend

To address the continued decline in fishing and hunting participation, CDFW, along with other agencies, NGOs, Tribes, and members of the hunting and fishing community are committed to creating a statewide R3 program to improve recruitment, retention and reactivation of hunters and anglers. Together, with national leaders in R3, CDFW has moved forward with creating the very first statewide California R3 program.

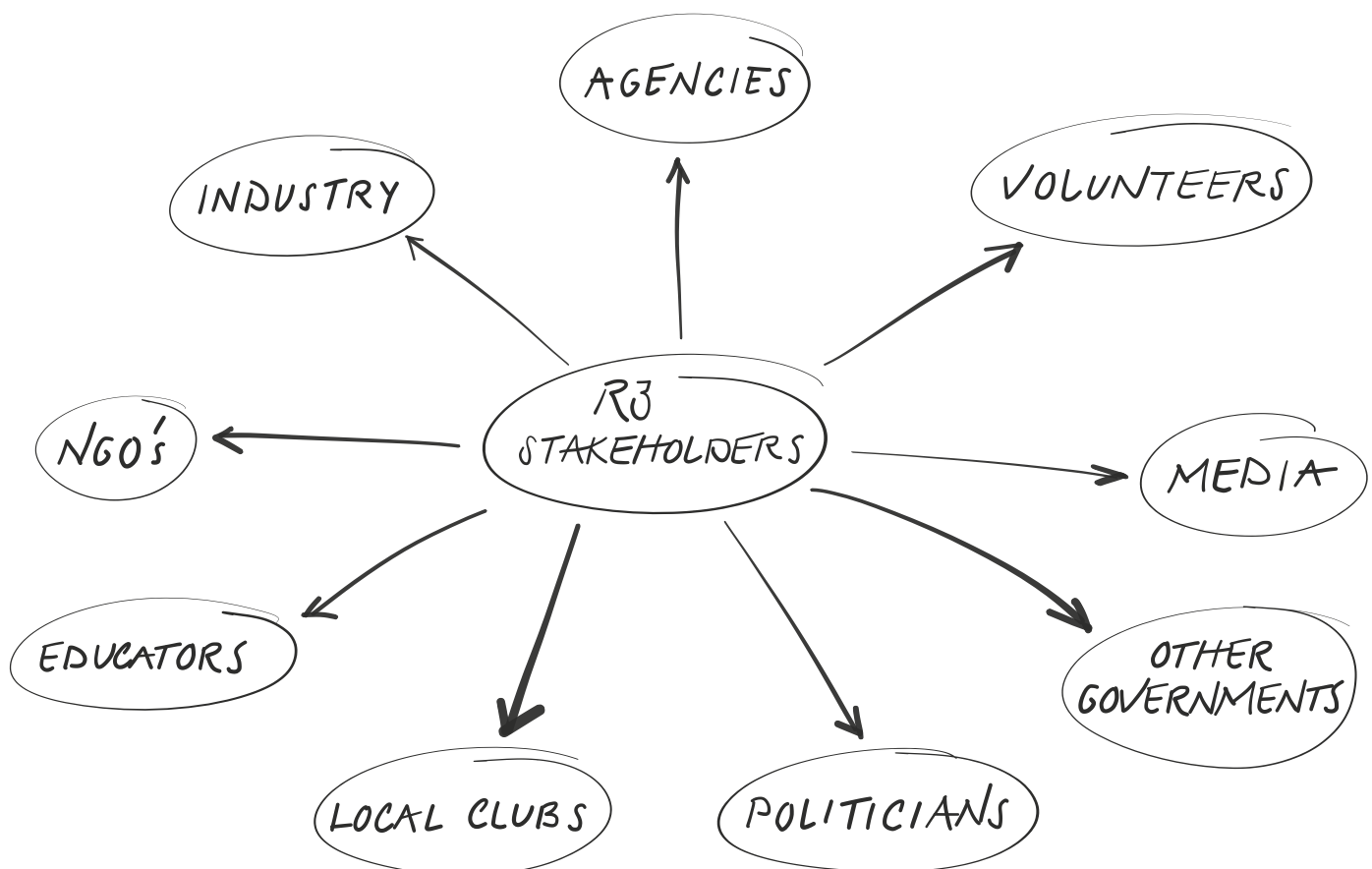
In 2017, CDFW began the first phase of the statewide R3 program and formed an internal executive-level R3 Task Force. The CDFW R3 Task Force began working with RBFF, CAHSS, the California Sportfishing League and the California Hunting and Conservation Coalition. In early 2018, the R3 Task Force created an internal R3 Team

and hired a full-time statewide R3 coordinator to oversee and coordinate the statewide California R3 efforts. The R3 Team held meetings to engage the fishing and hunting stakeholder community [See, Appendix II]. The goals of these meetings were to identify barriers to participation and to solicit ideas on how best to develop a plan to address these barriers in California.

After these initial meetings, eight R3 subcommittees were formed comprised of CDFW staff and fishing and hunting community stakeholders. The subcommittees convened over several months to discuss the state of fishing and hunting in California. The subcommittees evaluated and explored aspects of R3 specific to California. From this process, this California R3 Action Plan was created and is the final

document in successfully completing phase one of the CDFW R3 program.

This action plan will serve as the strategic framework for the development and implementation of a statewide California R3 program to improve recruitment, retention and reactivation rates of hunters and anglers. Reversing the trend in declining participation rates is important for California to help conserve and manage its natural resources and protect outdoor recreation, fishing and hunting activities for the future. CDFW cannot accomplish this task alone and is asking for full participation, pooled resources and a commitment from all stakeholders to fully execute the statewide R3 program successfully.

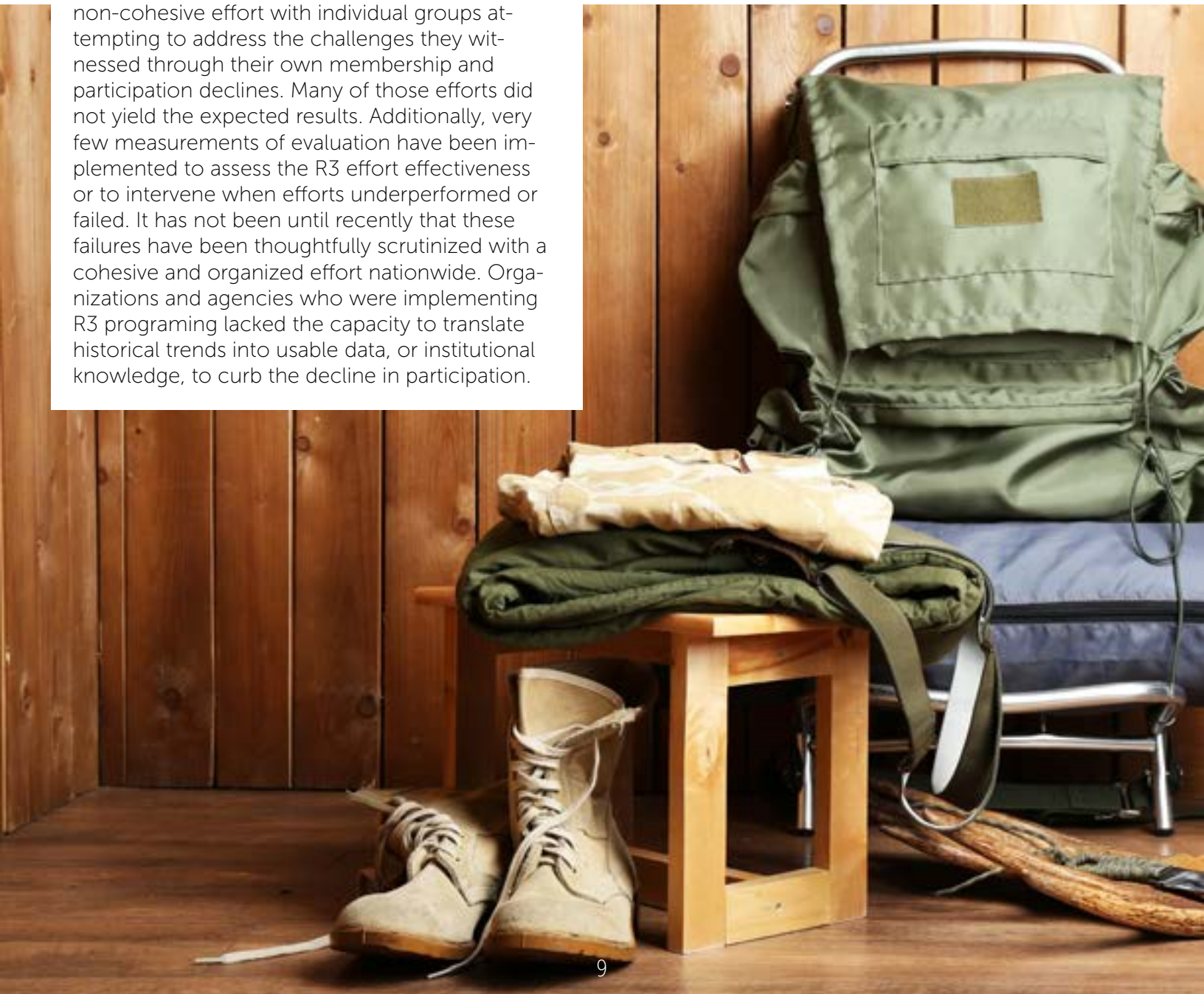


Challenges to Developing a Statewide R3 Program in California

While many specific challenges to R3 work will be addressed in this plan, there are three over-arching challenges that are consistent throughout the national R3 framework that effect California: (1) lack of a cohesive national effort, (2) no historical data collection, methodology or metrics for evaluation, and (3) lack of institutional knowledge from translating historical data into useful knowledge as it pertains to hunting and fishing participation.

National R3 efforts have historically been a non-cohesive effort with individual groups attempting to address the challenges they witnessed through their own membership and participation declines. Many of those efforts did not yield the expected results. Additionally, very few measurements of evaluation have been implemented to assess the R3 effort effectiveness or to intervene when efforts underperformed or failed. It has not been until recently that these failures have been thoughtfully scrutinized with a cohesive and organized effort nationwide. Organizations and agencies who were implementing R3 programming lacked the capacity to translate historical trends into usable data, or institutional knowledge, to curb the decline in participation.

One of the main themes that has risen from the work of the broader R3 efforts has been the importance of understanding the difference between recruitment, retention and reactivation and how to address each. The progression for adopting fishing and hunting as an activity and then as a lifestyle, was not understood and is still not fully understood or widely implemented. Addressing barriers to participation for lapsed and existing hunters and anglers has been virtually non-existent in the R3 landscape. CAHSS (2016), writes,



Prior to 2009, efforts to recruit, retain, or reactivate (R3) hunters, anglers, and recreational shooters were generally designed and implemented with very little consideration given to: a) identifying the audiences most in need of an R3 effort, b) the specific type of content or experiences a target audience needed before adopting the activity being promoted, or c) an evaluation system capable of documenting the effectiveness of the R3 effort being delivered.

If the challenges that exist are to be addressed effectively, it

requires an entirely new approach contingent on an in-depth and innovative education process. This education process is two-fold. First, in addition to the traditional hunter education and community outreach efforts that have been available for decades, this new education process must reach not only potential, lapsed and current hunting and fishing participants across the state, but become socially relevant and inclusive. Secondly, this education process must challenge existing assumptions and stereotypes by educating CDFW, stakeholders

and community members about potential, lapsed and current participants, their barriers and interests. Both educational processes necessitate ways to measure not only quantitative data but also qualitative data about the human experience. Creating spaces where both traditional hunting and fishing identities are celebrated, and new identities, inclusiveness, and difference are embraced is imperative to the future of hunting and fishing in California.



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Action Plan Design

This California R3 action plan serves as a macro-level adaptive, strategic framework to address the decline in hunting and fishing in California. This action plan paves a path for creating and executing phase two of the statewide R3 program, a micro-level implementation strategy, with efficacy, relevancy and efficiency.

This action plan will assist in tackling the three main challenges of R3 work – lack of a cohesive effort, data and institutional knowledge. It calls for a statewide effort among all participating stakeholders, initiates the creation of metrics for evaluation and data collection and helps establish and use institutional knowledge by establishing documented processes for the future.

The plan is structured under eight topics of interest that reflect the work of the R3 subcommittees: (1) Access and Opportunity, (2) Adult Onset Participation, (3) Mentorship, (4) Youth and Families, (5) Reactivation, (6) Marketing and Public Perception, (7) License Structure and (8) Funding and Grants. The topics were collectively chosen by CDFW staff and stakeholders based on observations, experiences, insight and sentiments. They are not meant to

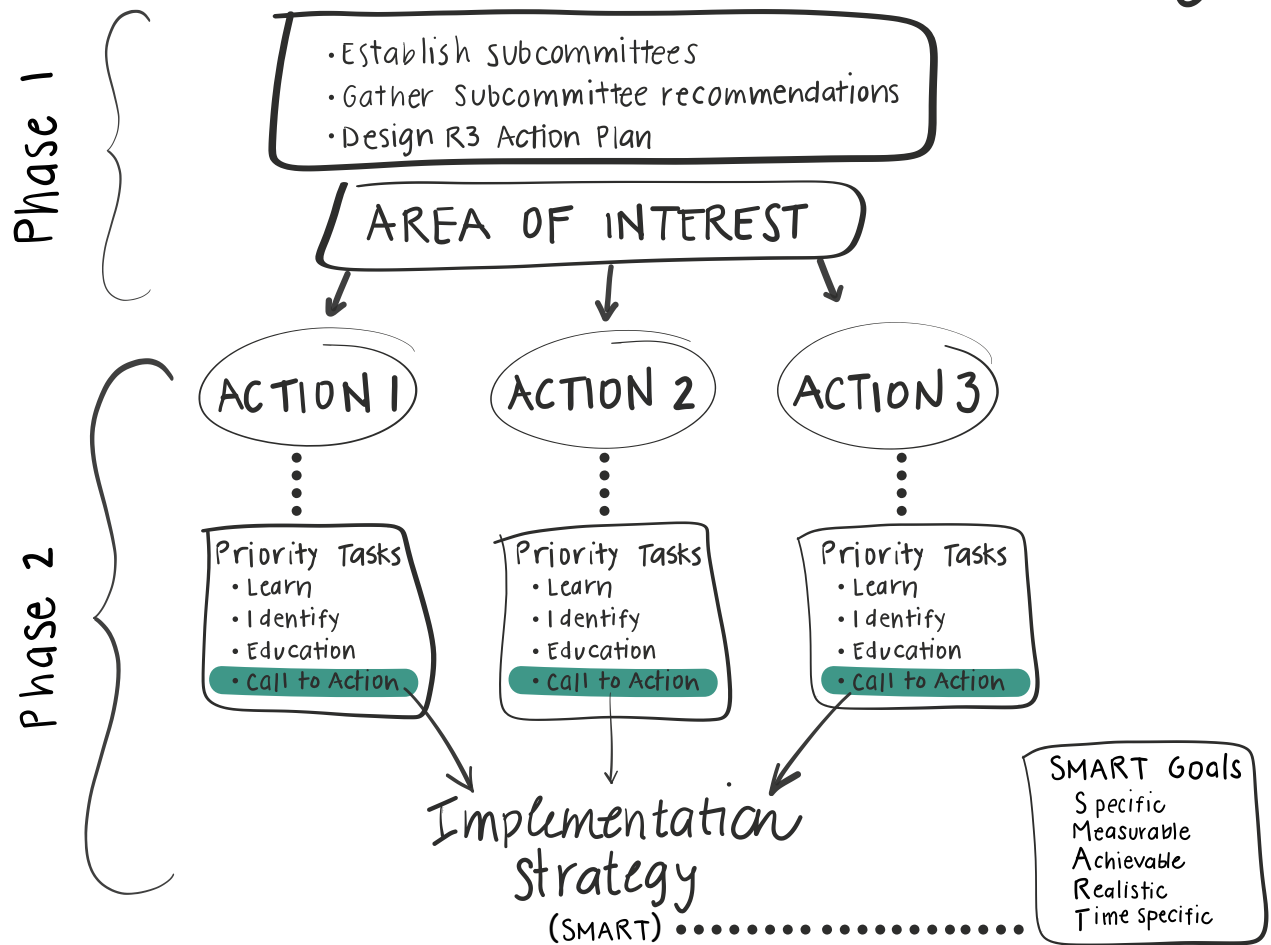
serve as an exhaustive list but rather were the most pertinent and complex R3 issues stakeholders were concerned about for California. Additionally, the topics are not mutually exclusive and often overlap. Each topic of interest is organized by three core actions or objectives. Each of the three actions will serve as a catalyst to address micro-level operations for an implementation strategy to be formulated in detail during the first 6 months of 2019 (See, timeline). These micro-level operations will be SMART (specific, measurable, achievable, realistic and time specific) R3 goals and have a direct correlation to the recruitment, retention and reactivation goal statement (see, page 2). Once the implementation strategy is fully developed, an ongoing metric-based evaluation of the R3 Program will occur to ensure continued progress.

8 Topics of Interest

- 1. Access and Opportunity**
- 2. Adult Onset Participation**
- 3. Mentorship**
- 4. Youth and Families**
- 5. Reactivation**
- 6. Marketing and Public Perception**
- 7. License Structure**
- 8. Funding and Grants**



California R3 Action Plan Design



PRIORITY TASKS: LEARN, IDENTIFY, EDUCATE AND CALL-TO-ACTION

Each action has a list of four types of priority tasks: Learn, Identify, Educate and Call-to-Action. The four priority tasks were developed by analyzing the data that came out of the subcommittee work around the topics of interest. Each of the four categories are intended to ensure an effective and efficient implementation strategy and are meant to be completed in order, with relational learning.

1. Learn

The Learn task is to explore topics that have not been historically addressed, have failed in previous applications, or require more understanding and information to be effectively applied.

2. Identify

The Identify task is meant to provide collaboration with existing relationships, resources and programs while utilizing current infrastructure to create community equity and forge new opportunities.

3. Educate

The Educate task is aimed at providing tools needed to participate in the R3 process.

4. Call-to-Action

The Call-to-Action task is how R3 efforts will be implemented to increase hunting and fishing participation and will create the well-informed and SMART final implementation strategy that will be developed in early 2019.



The approach to this plan is intentionally reflexive in nature and is an innovative tactic for solving the state's decline in hunting and fishing participation. Having reflexivity is understood as the ability to have awareness about the relationship

the stakeholders have to the field of study or problems presented and the ways that cultural practices involve consciousness and commentary. In general, it means that the data will allow for a more socially and culturally relevant approach

to implementation. Furthermore, each section of this plan should be utilized with consideration to what was learned and identified in the other sections before finalizing any implementation strategies.

California R3 Action Plan Timeline

TASK	2019					
	JAN	FEB	MAR	APR	MAY	JUN
Final R3 Action Plan to Stakeholders						
Reconvene Stakeholder Subcommittees & Establish Priority Task Work Groups						
Build Broader Stakeholder Base for Implementation						
Priority Task: Learn						
Priority Task: Identify						
Priority Task: Educate						➤
Priority Task: Call-to-Action						➤
Finalize Implementation & Evaluation Strategies						➤



Topics of Interest

TOPIC 1: ACCESS AND OPPORTUNITY

Participation in hunting and fishing is limited by many types of access barriers. Access barriers include anything that prevents or obstructs participation. Opportunity barriers include circumstances that make it impossible to participate. Having access to fishing and hunting opportunities is contingent on addressing multiple types of barriers within both. For example, some

opportunity barriers are physical or related to resources, like having access to land and water, technical equipment, and the training or skill required for participation. Other access barriers are social and cultural and consist of inclusivity barriers, like feeling welcomed, supported and safe in the community and relevancy barriers, like social acceptability, cultural sensitivity, and creating a relatable and consumable lifestyle with identity buy-in to potential participants. Inclusivity barriers are usually experienced by those who know they are interest-

ed in participating but feel excluded while relevancy barriers are usually experienced by those who haven't given participation much thought because it's unknown or not salient to their lifestyle. By adopting actions under all three barrier categories, the California R3 efforts will address topics that have traditionally been unintentionally or unconsciously excluded. This translates into creating an inclusive fishing and hunting community where opportunity to recruit, retain and reactivate participants with past access barriers is possible.

Action 1:

Address opportunity barriers to make hunting and fishing more accessible

PRIORITY TASKS:

Learn:

Learn about opportunity barriers, what they are, how they affect communities, why they should be addressed and how opportunities to succeed can be amplified.

Identify:

Identify how stakeholders can work together to address limitations, remove barriers and increase access and success.

Educate:

Develop resources for stakeholders to address opportunity barriers.

Call-to-Action:

Create new programming and implement changes to existing programs that address opportunity barriers in creative, relevant and inclusive ways.

Opportunity barriers may include:

- land/water-use liability issues
- land/habitat availability
- opening land-locked areas
- working with private landowners to increase access through the SHARE program
- mobility limitations at facilities
- capacity building for programs
- coordinating agency and organizations collaboration efforts
- developing new special hunting and fishing programs
- addressing socio-economic needs of potential participants
- non-user education
- facility upgrades
- technology upgrades
- funding limitations of organizations and agencies, etc.

Action 2:

Address inclusivity barriers to make hunting and fishing more accessible

PRIORITY TASKS:

Learn:

Learn about inclusivity barriers, what they are, how they affect communities and why they should be addressed.

Identify:

Identify how stakeholders can work together to create educational opportunities to address inclusivity barriers.

Educate:

Develop resources for stakeholders on addressing inclusivity barriers.

Call-to-Action:

Create and implement changes to make a more inclusive culture in social spaces for fishing and hunting.

Inclusivity barriers may include:

- unintentional oversights like lack of signage or information in multiple languages
- historic or cultural bias (e.g. racism, sexism, ageism)
- hunting and fishing intra-community divisions
- communication
- support systems
- phobias (e.g. homophobia, Islamophobia, xenophobia, etc.)
- cultural and historical trauma
- other intolerances and prejudices

Action 3:

Address relevancy barriers to make fishing and hunting accessible and relevant in 2019 and beyond

PRIORITY TASKS:

Learn:

Learn about relevancy barriers, what they are, how they affect communities, why they should be addressed and how to predict trends for the future.

Identify:

Identify how stakeholders can work together to create educational opportunities to address relevancy barriers.

Educate:

Develop resources for stakeholders on how to address and predict relevancy barriers.

Call-to-Action:

Create and implement changes to lessen relevancy barriers and participate in emerging relevancy trends.

Relevancy barriers may include:

- cultural practices
- lifestyle choices
- societal pressures
- religious beliefs
- gendered spaces
- technological gaps
- competition for time





TOPIC 2: ADULT ONSET PARTICIPATION

There has been much discussion in California and on a national level about how to connect with, encourage, and support potential and new adult participants. Adult onset participation already makes up a large percentage of the fishing and hunting community. Over the last four years in California, 90 percent of first time hunting license purchasers were over the age of 18 and only 10 percent were youth. Similarly, 97 percent of all first-time fishing license purchasers were 18

or older (CDFW, 2018). However, while the fishing statistic is not a true reflection of youth participants because only those 16 and older require a license, based on the 3 percent youth purchase rate it is likely that the majority of first-time anglers are adults. Focusing on adults is particularly important in the R3 landscape because adults have the means to make decisions with purchasing power and they make up the largest segment of the California population at 77.1 per-

cent. (Census, 2017). Furthermore, promoting adult onset hunting and fishing participation can indirectly increase youth participation in activities. Many adults have children who will organically engage if their parents are participating. Many fishing and hunting activities require adult supervision and provide critical opportunity to span across generations—if adults aren't engaged, it is less likely that youth will be supported to become engaged.

Action 1:

Provide opportunity for the adult onset (AO) group to connect with the hunting and fishing community

PRIORITY TASKS:

Learn:

Learn about the social and community-based needs, interests, fears, challenges and motivations of the AO group.

Identify:

Identify how stakeholders are providing community experiences, programming and resources to the AO group, and what gaps exist in these services.

Educate:

Develop tools for stakeholders on how to develop community experiences that increase and maintain AO participation.

Call-to-Action:

Create and implement new spaces (online and physical) to promote the collaboration and participation of adults in hunting and fishing activities.

Topics may include:

- perceived investment of time and money,
- community acceptance,
- lack of information
- identity and political hesitations,
- generational gaps
- lack of age or topic appropriate programming/ events
- safety
- field-skills and etiquette,
- laws and regulations
- access and opportunity barriers
- social media utilization, etc.



Action 2:

Modernize educational tools to increase relevancy, appeal and accessibility

PRIORITY TASKS:

Learn:

Learn about the educational needs, interests and barriers of the AO group.

Identify:

Identify how stakeholders can collaborate to address the educational needs and interests that exist for the AO group.

Educate:

Develop an "educate the educator" series and continued educational support to help R3 educators make their classes, workshops and events relevant and interesting.

Call-to-Action:

Create and implement appealing and relevant AO curriculums and tools for hunting and fishing educators that are both easy to navigate (online and physical) and address the educational needs of this group with the help of industry partnerships.

Topics may include:

- appealing to millennials
- resources outside the classroom
- field-skills
- technology and fishing/hunting
- advanced hunter education topics
- alternative topics in fishing
- foraging and wild food
- regulations
- community participation, etc.

Action 3:

Create tools and resources to increase adult onset participation

PRIORITY TASKS:

Learn:

Learn about the strengths, weaknesses, opportunities and threats (SWOT Analysis) for the AO group

Identify:

Identify how stakeholders can work together to analyze existing tools and resources and compare them to outcomes of the AO SWOT analysis.

Educate:

Develop a toolkit for stakeholders to effectively create AO participation tools and resources.

Call-to-Action:

Create and implement tools and resources that are useful and relevant to AO groups to increase participation.

Topics might include:

- DIY guides
- mentorship
- incentivized opportunities
- how-to videos
- developing a hunting passport program
- increasing cellular service ranges
- content database
- app development that includes fish stocking schedules and public access areas with location-specific information, etc.



TOPIC 3: MENTORSHIP

In fishing and hunting, mentors are those people who act as advisers, guides or teachers formally, informally or both. Formal mentorship includes those who lead or volunteer through educational and outreach programming or technical workshops, and often require certification or formal training to serve. Informal mentorship includes those who offer to take new participants into the field through social or family connections.

The International Hunters Education Association (2000) found that the three motivations for becoming involved and staying involved include achievement, affiliation and appreciation. Mentorships provide new participants with the technical knowledge and skill that makes participation safe, fun, and often provides achievement or merit-based motivation opportunities (achievement motivation). Information is often passed down through

the oral traditions in the fishing and hunting community through community and organizational connection, story-telling, comradery and social knowledge (affiliation motivation). During this process, sporting ethics, appreciation for wildlife and conservation knowledge is often passed down from mentor to mentee (appreciation motivation). Along with establishing the three motivations to participation, mentorship is important in assisting participants through the stages of the ORAM that require social support (see, page 7).

The National Shooting Sports Foundation (2017) states that, “[The] most avid participants are those who were brought into the sports through mentors.” While much of the literature on the topic stresses the importance of mentorship, it is also commonly noted that there is a general difficulty in potential participant’s ability to find and connect

with a mentor. It is even harder to find a formal mentorship program that is not youth-oriented, leaving a gap in mentorship services. Current youth programming generally does not yield high recruitment or retention rates. The cause of this is multifaceted, but youth often do not control how resources, time and money is invested in their household. Therefore, mentorship efforts should be amended to include groups who control how their resources, time and money is spent, and youth will get involved as a secondary outcome of involving their parents or family members. Specifically, efforts should be focused on potential participants, adult onset, and retention and reactivation groups. The recruitment and mentoring of potential and new youth participants is still a vital component of California’s R3 efforts but further evaluation is needed to determine the most effective approach.

Action 1:

Conduct a program evaluation process for current mentorship programs, analyze data, make and implement recommendations

PRIORITY TASKS:

Learn:

Learn about mentorship programs both inside and outside of hunting, fishing and shooting programs, the standards, modalities, models and techniques used and how they are evaluated to ensure sustainability and efficacy.

Identify:

Identify how stakeholders can work together to identify the types of program evaluations that are needed and develop a continued evaluation plan to be effective, efficient, relevant, inclusive and forecast trends for the future.

Educate:

Develop and provide stakeholders with guidance on how to create and participate in a program evaluation and analysis process.

Call-to-Action:

Implement a statewide effort to conduct program evaluations of mentorship programming, pool data, identify gaps, successes, failures, forecast future evaluation needs and identify how future programs can be shaped from this information.

Examples may include:

- creating a program evaluation plan template
- standardized measurable metrics
- hire a program evaluation analyst
- statewide data pooling efforts
- statewide mentorship program standards
- producing an annual report on the status of hunting and fishing mentorship programming, etc.



Action 2:

Improve mentorship programs to include methodologies that address the three motivations for fishing and hunting participation (achievement, affiliation and appreciation) and that develop social competence in addition to technical aptitude

PRIORITY TASKS:

Learn:

Learn about social competence, how to integrate it into programs and how the three motivations inform participation for both mentees and mentors.

Identify:

Identify how stakeholders can work together to modernize mentorship programs to include social competence and the three motivations for participation.

Educate:

Develop and provide stakeholders with guidance on how to implement social competence techniques and new teaching modalities under the three motivations into their mentorship programs.

Call-to-Action:

Implement new mentorship experiences that address opportunities for currently excluded groups and expand existing programs to include components of social competence and all three participation motivations for both mentees and mentors.

Examples may include:

- online profile-match mentorship matching through the ALDS license sale platform
- ambassador programs
- achievement awards
- ongoing programs with skill/species/motivation/ideology-specific mentor tracks
- mentorship pledge program
- annual statewide awards banquet
- certification programs
- creating specific mentorship tracks
- adjust outreach and recruitment efforts for both mentors and mentees, etc.





Action 3:

Provide greater access to and support for mentorship programming through increased time investment, tools and options that are effective, relevant and inclusive

PRIORITY TASKS:

Learn:

Learn about what types of mentorship tools are effective, relevant and inclusive. This means they might take into consideration things like: access, skills, needs, limitations, expectations, value, generational and ideological appeal, learning styles, time, etc. for both mentors and mentees.

Identify:

Identify how stakeholders are currently prioritizing time spent on mentoring and mentoring programs, utilizing tools, and if they are effective/ineffective, relevant/irrelevant, and inclusive/exclusive and how to address the discrepancies

Educate:

Provide stakeholders with guidance on how to develop effective, relevant and inclusive mentorship opportunities and effective time investment strategies.

Call-to-Action:

Implement tools that are effective, relevant and inclusive to increase access to and support for mentorship programming.

Examples may include:

- different options to take hunter's education, mentorship matching tools
- hire a mentor specialist
- digital mentorship options
- defined and measurable goal setting techniques
- systems of mentorship evaluation and feedback
- reasonable time and resource commitments
- recruitment plans
- monthly newsletter, etc.



TOPIC 4: YOUTH AND FAMILIES

Currently, there are a myriad of hunting and fishing programs and events surrounding youth and families through CDFW, NGO partners, Tribes clubs/organizations and the outdoor industry, but due to increasing options and demands on time, youth and families have become a challenging audience. Many kids are growing up in areas with limited access to nature and as society moves toward more structured group activities, higher expectations and increased safety concerns for youth, participation in fishing and hunting has become obsolete in many places. Even in areas with access and opportunities, there is less time for children to freely wander the parks, fields, streams, woods and lakes in their neighborhoods. Families have

become burdened with mounting responsibilities that limit the amount of free time available to be spent traveling to nature-rich destinations.

The decline in youth and family hunting and fishing is partially attributed to the fact that hunters and anglers are most often the children of other hunters and anglers or have relatives who hunt and fish. As overall participation has declined, hunters and anglers have not been able to reproduce historical participation rates themselves. Only one in 20 millennials (born 1981-1996) is a hunter, according to the 2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (USFWS, 2018). Larger participation numbers from millennials and their children could prevent the current

decline trends in lack of participation from generational trickle-down. Programs and education specifically geared toward millennials and Gen Z or the "iGen" (1997 to mid-2000s) group that can evolve relationships with nature and wildlife-based recreation in a safe and appealing way may also have positive long-term participation benefits to hunting and fishing. Likewise, as other generations retire and age, hunting and fishing can provide opportunities to spend positive entire-family time together spanning many generations. Awareness of various generational interests and the accessibility needs of youth and family programs as well as evaluating their efficacy will be imperative in increasing and maintaining interest across many generations.

Action 1:

Conduct a program evaluation process for current youth and family (YF) programs, analyze data, make and implement recommendations

PRIORITY TASKS:

Learn:

Learn about both internal and external YF programs, the standards, delivery methods, models and techniques used and how they are evaluated to ensure sustainability and efficacy.

Identify:

Identify how stakeholders can work together to identify the types of program evaluations that are needed and develop a continued evaluation plan to be effective, efficient, relevant, inclusive and forecast trends for the future.

Educate:

Develop and provide stakeholders guidance on how to create and participate in a revolving program evaluation and analysis process.

Call-to-Action:

Implement a statewide effort to conduct program evaluations of YF programming, pool data, identify gaps, successes, failures, forecast future evaluation needs and identify how future programs can be shaped from this information.

Examples may include:

- creating a skeleton program evaluation plan
- standardized measurable metrics
- creating a tracking system for participation
- statewide data pooling efforts
- statewide youth and family program standards
- producing an annual report on the status of hunting and fishing youth and family programming, etc.





Action 2:

Create partnerships with youth and family programs outside of traditional fishing and hunting spaces

PRIORITY TASKS:

Learn:

Learn about how external YF programs already collaborate with hunting, fishing and shooting sports programs, what other external YF programs may be interested in collaborating and what stigmas exist around hunting and fishing with each group.

Identify:

Identify stakeholders who are willing to collaborate with external YF programs to create new or alter their existing YF programming to break down stigmas and meet the needs of new partnerships.

Educate:

Develop tools for stakeholders on creating, maintaining and evaluating external partnerships.

Call-to-Action:

Implement a system to create and foster partnerships with external YF programs, especially with programs who serve populations with access barriers to hunting and fishing.

Strategies might include:

- researching mutual benefits
- hiring organizational liaisons
- developing needs assessments
- developing a programs profile matching system
- co-marketing strategies
- co-funding opportunities, etc.

Action 3:

Create statewide best practices for youth and family programming to help ensure programs are effective, relevant and inclusive

PRIORITY TASKS:

Learn:

Learn about best practices and guidelines currently used in external YF programs, how they maintain relevancy and inclusivity and if intended outcomes have been achieved.

Identify:

Identify how stakeholders can work together to establish a set of effective, relevant and inclusive statewide YF programming best practices that are mutually beneficial to those who will institute them and those who will be served by them.

Educate:

Develop and provide stakeholders resources on adopting best practices into YF programs.

Call-to-Action:

Implement effective, relevant and inclusive statewide best practices at the YF program-level.

Strategies might include:

- developing tracking and idea worksheets
- templates
- best practices toolkit
- individualized guideline planning
- hiring a program guideline specialist, etc.





TOPIC 5: REACTIVATION

Reactivation efforts are perhaps the most challenging of the “3 Rs”. There hasn’t been much in-depth research done on why people abandon participation in hunting and fishing. There are three categories of people who have ceased participation: (1) permanent non-participants, those people who no longer participate, no

longer wish to participate, and no longer consider themselves part of the lifestyle or community, (2) situational lapsers, those who no longer participate due to situational events like disability, relocation, lack of social network, time or economic constraints, reduced success rates, negative experience with the activity or with people they know,

etc. and (3) reactivators, those who were situational lapsers and now participate again but who don’t yet consider themselves fully transitioned into the fishing and hunting lifestyle or community. It’s important to note that those who no longer participate may still contribute to the social landscape and overall support of hunting and fishing.

Action 1:

Determine how situational lapsers can become reactivators

PRIORITY TASKS:

Learn:

Learn about situational lapsers, why they cease participation, what could initiate renewed interest and what barriers exist to reactivate them.

Identify:

Identify how stakeholders can work together to address lapsed participants, renew interest, and overcome barriers through existing and new tools and programming.

Educate:

Develop and provide stakeholders with guidance on helping lapsers overcome barriers to reactivation.

Call-to-Action:

Implement a statewide marketing and outreach plan to address the identified barriers for situational lapsers.

Tactics may include:

- workshops
- reactivation tool kit development
- adding program extensions
- cross-promotions and program integrations
- program evaluations
- targeted audience recruitment and outreach training, etc.

Action 2:

Create programs to address the needs of reactivators and assist them in making a return to full participation

PRIORITY TASKS:

Learn:

Learn about the needs, desires, interests and barriers for reactivators.

Identify:

Identify how a stakeholder can work together to develop or enhance resources and programs to address the needs, desires, interests and barriers for reactivators.

Educate:

Develop and provide stakeholders with guidance on how to develop effective reactivation resources, programs and outreach plans to assist reactivators in their return to full integration and participation.

Call-to-Action:

Implement new spaces (online and physical) and modify existing programming to address the integration needs of reactivators.

Tactics might include:

- hosting social events
- user-matching program
- organizing trips
- re-learning technical skills
- learning to hunt or fish for different species
- implementing a guided-trip/mentorship reactivation program
- maintaining better contact
- hiring a reactivation coordinator
- region-specific location access-guides
- CDFW experts at NGO events, etc.

Action 3:

Create alternative participation options for situational lapsers who no longer can or want to be active hunters or anglers

PRIORITY TASKS:

Learn:

Learn about participation opportunities and roles in the fishing and hunting community beyond the act of hunting and fishing, why these roles are important, what the incentives and positive benefits are, and how they can be used to re-integrate situational lapsers.

Identify:

Identify the needs of stakeholders and compare them to the needs of situational lapsers to determine how collaboration between stakeholders and situational lapsers can occur.

Educate:

Develop resources for stakeholders on integrating situational lapsers into alternative roles.

Call-to-Action:

Implement alternative participation options for situational lapsers.

Tactics may include:

- mentorship opportunities
- alternative hunting and fishing opportunities with adaptive technology
- becoming a hunter education instructor
- writing and story-telling opportunities
- volunteering with conservation projects
- developing programming or resources for other hunters and anglers, etc.



TOPIC 6: MARKETING AND PUBLIC PERCEPTION

In recent years, R3 experts and researchers have begun to identify the complexity of the challenge facing stakeholders working to stabilize and increase the population of fishing and hunting participants in the U.S. There is a growing recognition that R3 efforts must expand beyond simply providing hands-on learning opportunities. Generating more supporters and participants from an expansive target audience will require multi-pronged marketing campaigns, outreach efforts and business practices that provide customer-centric resources such as easy-to-access and understandable information. By honing marketing strategies through stakeholder collaboration

and expertise, resources can be combined to connect potential participants to multiple opportunities. Furthermore, this type of approach will concurrently provide a larger public presence to educate and introduce hunting and fishing into spaces where conversation on these topics have been void.

Public opinion polls show that the public is generally in favor of fishing and hunting as a means of sustenance, invasive species/population control and habitat conservation. However, there is also strong indication that while the public is generally in support of fishing and hunting, support declines dramatically when asked about issue-specific topics. To garner

stronger public support for hunting and fishing activities, a social and cultural ideology shift around these activities is required. However, there are many limitations in this work because such a shift is contingent on large and seemingly impenetrable bodies of power, like the media and formal educational spaces.

The largest challenge of addressing and changing public perception is developing rapport and funding to shift media and educational content delivery on a large-scale. This challenge will be best addressed through concerted and organized efforts of many stakeholders presenting as a unified body with a clear and deliverable action plan and pooled resources.

Action 1:

Improve public perception of hunting and fishing activities

PRIORITY TASKS:

Learn:

Learn about public perception, how it is formed, why opinion formation is dependent on individual experiences and group influence, and how framing methodologies can help change and influence perceptions and opinions.

Identify:

Identify how stakeholders can work together to determine who their target audience is and who it could be, what the assumptions, biases, factors of influence and heuristics are for each target audience, and how resources can be pooled to address improving public perception.

Educate:

Develop tools and guidelines for stakeholders to improve public perception.

Call-to-Action:

Create and implement a diversified and relevant marketing and media strategy that targets both internal and external media outlets and audiences.

Approaches may include:

- how to appropriately and effectively engage with the public
- a set of community standards
- collaborating with mainstream media and public affairs groups
- working with first point of contact staff and law enforcement
- understanding trigger words/ actions/ideologies, PSA's
- relevant messaging campaigns
- community outreach in non-traditional spaces
- using problem solving techniques and factors of influence
- impact trends of historically used marketing/messaging
- the use of media influencers, etc.





Action 2:

Update broad-scale content marketing and media strategies

PRIORITY TASKS:

Learn:

Learn about marketing and media strategies from companies and organizations that have maintained a relevant image, far-reaching platform and consumable lifestyle outside of the outdoors industry, what the marketing needs of the whole-industry are, what R3 target audiences' media and marketing preferences are and compile a cost-benefit analysis of the various marketing strategies for each.

Identify:

Identify how stakeholders can work together to develop new strategies and address the marketing and media needs of the future based on the cost-benefit analysis.

Educate:

Develop resources for stakeholders about marketing and media strategies appropriate to R3 target audiences.

Call-to-Action:

Implement an updated approach to marketing and media strategies with a focus on the whole industry.

Approaches may include:

- creating a media and messaging toolkit for various platforms
- branding new markets, rebranding existing marketing
- utilizing young adult and millennial-aged writers outside of the hunting and fishing community
- publishing in non-traditional spaces
- internet-driven media campaigns
- diversifying images/content
- collaborative advertising and marketing
- cross-marketing techniques
- 4P's: product, placement, price and promotion
- consumable lifestyle and emotional lifestyle marketing
- crisis marketing
- Hollywood influence and education

Action 3:

Create marketing and outreach strategies that can be applied to the programming and resources developed through the Call-to-Action tasks in this plan

PRIORITY TASKS:

Learn:

Learn about marketing and promoting the outcomes of each Call-to-Action through appropriate, relevant and socially aware methods how to identify future market trends, what considerations should be made in developing marketing plans, and what limitations, barriers and negative implications may exist for each.

Identify:

Identify how stakeholders can work together to develop and implement needed marketing plans and outreach strategies.

Educate:

Develop resources for stakeholders on creating marketing plans and how to plan to evaluate efficacy and future market trends.

Call-to-Action:

Implement a creative, relevant and inclusive marketing and promotions plan for any programming and resources developed through the Call-to-Action tasks.

Approaches may include:

- workshops
- toolkits
- professional development training
- hiring a marketing/promotions specialist
- utilizing human dimensions research
- using trend and analytic tools
- branding strategies, etc.





TOPIC 7: LICENSE STRUCTURE

It is difficult to over emphasize the importance of funds provided to CDFW from the sales of hunting and fishing licenses, tags, validations and report cards. These funds provide over 20 percent of CDFW's overall budget and make fish and wildlife conservation projects, Fish and Game Code enforcement, and hunting and fishing access possible. The number of annual hunting licenses sold in the state has plummeted from a high of 850,000 in the 1970s to a low of 270,000 in recent years. The number of resident annual fishing license sales have dropped from a high of over 2 million to roughly 1 million over the same timeframe. This has happened when the state's population has increased from 20 million to 40 million.

Over the past several years, there has been much debate in California about the current hunting and fishing licenses structure and pricing. Sales of hunting or fishing licenses, like any consumer product, can

be significantly affected by pricing and packaging. California currently has the second most expensive fishing license in the country. Fees for annual hunting license, tags and validations are also among the highest in the country. These products should provide as much value, consumer choice and convenience to CDFW customers as possible. Currently, annual fishing licenses are valid from January 1 to December 31 and annual hunting licenses are valid from July 1 to June 30. There has been much discussion about offering a fishing license valid for 365 days from date of purchase, offering a combination hunting and fishing license, modifying certain hunting and fishing privileges, auto-renewal options, etc. Several bills sponsored by CDFW stakeholders have been introduced over the past few years aimed at addressing the issue. Many economic studies have been conducted in other states and nationally but there has not been a modern

economic analysis of fishing and hunting license structure and pricing in California. Likewise, the online Automated License Data System (ALDS) is not fully utilized in a way that meets today's technological purchasing culture.

More convenient purchasing and display options for hunting and fishing licenses are long overdue. Californians are more and more frequently using smartphones for commerce. As the state at the forefront of technological innovation, California needs to modernize the way we sell and display hunting and fishing licenses. Several states have implemented smartphone applications that make purchasing and displaying licenses much more convenient for hunters and anglers, while improving customer service and compliance with regulations. Customer expectations are changing and there is increased reliance on mobile apps with more convenient, relevant and connected user experiences.

Action 1:

Reassess License Pricing

PRIORITY TASKS:

Learn:

Learn about the optimum pricing for license, tags and report cards by utilizing an outside contractor who will work with CDFW License and Revenue Branch and ALDS staff to conduct a California-specific economic impact and viability study.

Identify:

Identify the impacts of license, tag and report card pricing along with alternative pricing authority options and carefully analyze the data using statistical processes that consider the various factors that are pertinent to both California residents and out-of-state users.

Educate:

Provide the outcome of the economic study along with the various possibilities to adjust the license, tag and report card pricing and alternative pricing authority options to the Legislature, Fish and Game Commission, CDFW and stakeholders.

Call-to-Action:

Implement changes to the CDFW license pricing structure and potentially shift pricing authority based on results of a California-specific economic impact and viability study.

Options may include:

- changing the pricing on certain items to accommodate current consumer trends
- providing more flexibility to change pricing annually based on wildlife management plans
- offering savings programs through bundling options
- shifting the who has authority to determine pricing options, etc.

Action 2:

Reassess License Configuration

PRIORITY TASKS:

Learn:

Learn about optimum configuration and structure for license, tags and report cards by utilizing an outside contractor to work with CDFW License and Revenue Branch and ALDS staff to conduct a California-specific evaluation.

Identify:

Identify the impacts of license, tag and report card configuration and carefully analyze the data using statistical processes that consider the various factors and trends that are pertinent to both California and out-of-state users.

Educate:

Provide the outcome of the evaluation along with the various possibilities to adjust the license, tag and report card configuration to the Fish and Game Commission, CDFW and stakeholders.

Call-to-Action:

Implement changes to the CDFW license configuration based on results of a California-specific evaluation.

Options may include:

- combination packages for both hunting and fishing
- salt or fresh water angler only packages
- small game packages
- learners permit
- total sports package with all hunting and angling options
- draw packages
- mentorship and new participant packages in conjunction with hunter's education and NGO programming, etc.



Action 3:

Modernize License Technology

PRIORITY TASKS:

Learn:

Learn about the technology needs of both resident and non-resident users in California.

Identify:

Identify how the technology needs of users can be met through stakeholder collaboration and outside vendors to determine the best option to address user needs.

Educate:

Develop tools/training for stakeholders, outside vendors and users to acclimate to new technologies before they've been integrated.

Call-to-Action:

Implement new license technologies to increase engagement and ease of access to make purchases, renewals and streamline the user experience.

Options may include:

- smart phone applications for draws
- downloadable license and tags for smart phone wallets
- individual QR codes for GO-IDs
- linked zone maps to each tag
- linked species identification guides
- hunting and fishing regulations
- photo and video upload with liability release capability
- ability to sign up for educational events
- links to outside resources
- location amenities list



TOPIC 8: FUNDING AND GRANTS

One of the most visited, but ultimately unresolved issues is how to provide CDFW with sustainable financing. It is not a new problem. Since at least the 1950s, countless reports identify funding as the most important problem to solve. This issue certainly carries over to how CDFW and stakeholders might fund R3 activities.

There are several existing grant programs that can provide funds for R3 activities. The U.S. Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program (WSFR) works with states to conserve, protect and enhance fish, wildlife, their habitats,

and the hunting, sport fishing and recreational boating opportunities they provide. RBFF currently offers two R3 grant programs, the State R3 Program Grants that help fund state programs that are sustainable and replicable, and the George H.W. Bush Vamos a Pescar™ Education Fund grants awarded to organizations bringing conservation, education and fishing and boating experiences to Hispanic families.

A CDFW R3-specific grant program could award funding to projects aimed at helping further CDFW R3 goals. The grant program would be focused on increasing partic-

ipation in hunting and fishing by funding projects that specifically address barriers as they pertain to recruitment, retention and/or reactivation throughout the state. Similarly, funding that has not been fully utilized is currently available through the CDFW Hunter Education Program to modernize, enhance and build new archery and gun ranges and training facilities. Gun and archery ranges are key to developing the skills of current and future hunters as well as providing recreational opportunities. Ranges funded through this program should be available to hunter education classes at low or no cost.



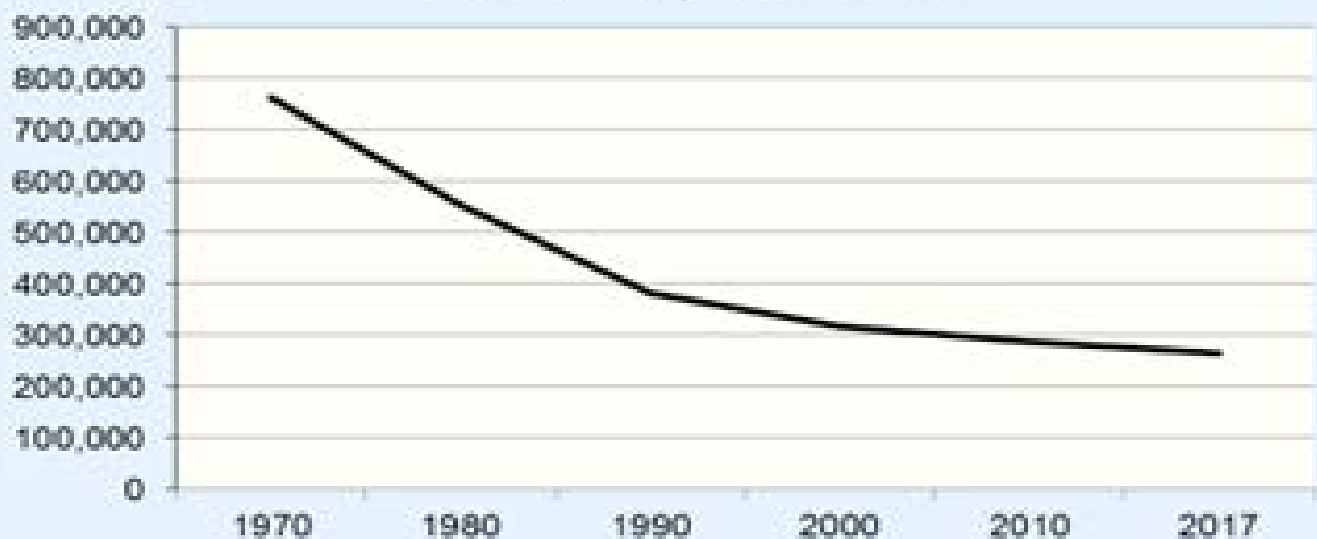
All Sport Fishing Licenses

1980-2017 Licenses in Millions



Total Hunting Licenses Sold

1970-2017 Licenses Issued



Action 1:

Establish a California Department of Fish and Wildlife R3 grant program

PRIORITY TASKS:

Learn:

Learn about available R3 funding, how it can be utilized, and what the benefits and limitations are for each option.

Identify:

Identify a set of standards and/or project criteria that grant applicants must meet, an appropriate RFP process, and a program evaluation model for grant-funded projects.

Educate:

Develop resources for stakeholders to help navigate the grant application process and developing programs for unmet R3 needs.

Call-to-Action:

Create and implement a CDFW R3 grant program to address R3 barriers in California, under advisement of a grant advisory committee.

Methods may include:

- RFP guide
- grant calendar
- hiring a grant coordinator
- programmatic ideas
- increasing access to and building more shooting and archery ranges
- outreach to underserved communities
- marketing/communications, etc.

Action 2:

Utilize existing grant opportunities to increase R3 activities

PRIORITY TASKS:

Learn:

Learn about existing R3 grant opportunities, how R3 activities may meet criteria for applying to non-R3 specific grants, what the RFP or application requirements are, and what the annual funding calendar looks like.

Identify:

Identify how stakeholders can collaborate to create competitive R3 programs and apply for funding.

Educate:

Develop resources and tools for stakeholder collaboration on developing R3 programming and navigating grant processes.

Call-to-Action:

Implement a collaborative grant identification and application process where partner organizations can leverage staffing, expertise and resources to apply for existing grant opportunities to increase R3 activities.

Methods may include:

- grant think tanks
- shared grant RFP and funding calendar
- hiring a grant writer
- collaboration toolkits, etc.



Action 3:

Integration of resources to leverage additional R3 funding

PRIORITY TASKS:

Learn:

Learn about other resources available for R3 funding, how partnerships can help leverage resources, and discover benefits, opportunities, limitations and barriers.

Identify:

Identify stakeholders interested in collaborating to leverage resources and in what capacity.

Educate:

Develop resources for stakeholders on opportunities to collaborate and the positive benefits of joint R3 efforts.

Call-to-Action:

Implement a process to leverage available funding through integration of resources and partnerships.

Methods may include:

- create R3 funding campaigns through ALDS license sales and organizational membership fees
- partnerships with the federal government and NGOs to helping fund R3 events
- increase funding for outdoor K-12 education
- leveraging NGO money and volunteer hours to provide match
- toolkit securing collaborative funds for R3 projects
- utilizing non-hunting and non-fishing outdoor recreation industry partners, etc



Conclusion

This macro-level action plan is a representation of diversified interests and community collaboration and is only the beginning of the statewide California R3 effort. It is meant as a guide to develop and deliver implementation strategies with thoughtfulness and consideration to the gaps identified from previous R3

efforts without making assumptions about how to best solve R3 issues. It is not exhaustive and cannot possibly predict every barrier to participation in hunting and fishing. But, for the first time in California history, this plan allows for place to learn, identify, educate and call into action sustainable and well formulated solutions to address fishing and hunting recruitment, retention and reactivation barriers.

Next Steps

Phase 2 of the CDFW statewide California R3 program will begin in early 2019. The CDFW R3 Team will create the necessary strategy and planning tools for stakeholders to start Phase 2. Concurrently, invitations to participate in statewide R3 efforts will be extended to potential stakeholders who were unintentionally excluded or who are not yet involved. The goal to embrace Tribes and more diverse stakeholders, including industry, volunteers, educators and media, in Phase 2 is to expand R3 equity, resources, reach and reputation. CDFW will use Tribal Notifications to extend participation invitations to Tribes. Additionally, engaging more diverse stakeholders can create a mutually-beneficial collaborative approach that considers varied interests and perspectives to ensure long-term viability and success of the statewide California R3 Program.

CDFW will then begin to reconvene stakeholders to start completing the priority tasks listed under each action in February 2019. Once the first three priority tasks (learn, identify and educate) have been completed, the creation of in-depth micro-level implementation strategies will occur to fulfill the call-to-action tasks over the next several years. The micro-implementations will include SMART (specific, measurable, achievable, realistic, and time specific) R3 goals. These goals will be based on what was learned collaboratively during the first three priority tasks and will fulfill the call-to-action statement listed. In addition to overseeing these efforts, CDFW will continue to provide resources, develop various tools for success and act as a liaison on all national R3 initiative findings and R3 science during this time.

CDFW is committed to reversing the declining fishing and hunting participation trends by executing this R3 Action Plan into implementation strategies that will create a sustainable environment for community-driven processes. CDFW is hopeful that mutually-beneficial successes with stakeholders will be fostered through this Action Plan. To protect the future of hunting, fishing and conservation, identifying recruitment, retention and reactivation barriers and turning those barriers into opportunities is imperative. In conclusion, the CDFW is confident that with the full engagement and support of stakeholders, the California R3 program will pave the way to address the decline in hunting and fishing across the state.

SMART Goals

Specific
Measurable
Achievable
Realistic
Time specific



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Appendix I: Key Terms

R3 the 3 “Rs” stand for: Recruitment, retention and reactivation. They are the three most influential factors determining participation in hunting and fishing activities in the Outdoor Recreation Adoption Model (ORAM). They were established to create a shared nationwide vocabulary and unified effort for R3 work.

Factors of Influence are aspects of life that include past-experience, cognitive bias, age and individual difference, belief in personal relevancy, and an escalation of commitment.

First Point of Contact is any person who the public has direct contact with as a first line of communication. Examples include wildlife officers, interpreters, front desk representatives, those who answer telephone and email inquiries, hunter education instructors, program or event coordinators and volunteers, etc.

Framing Methodology In the social sciences, framing comprises a set of concepts and theoretical perspectives on how individuals, groups and societies, organize, perceive and communicate about reality, situations and activities. Framing methodology involves intentional social construction of a social phenomenon – by mass media sources, political or social movements, political leaders, or other actors and organizations.

Group Influence is when two or more people share a set of norms, values, ideologies, social or cultural beliefs, or sentiments and convey them to others who can be persuaded to join their thinking, practice and behavior. Typically group influence produces an interdependent set of social norms that inform everyday decision making from purchasing power, social activities and sometimes political or religious beliefs and practices. This term should be utilized with the understanding of social influence.

Heuristics is an approach to problem solving, discovery, inquiry and learning that utilizes practical self-educating methods often through experimentation or trial-and-error, not guaranteed to be optimal, perfect, logical or rational, but instead reasonable and actionable to reach immediate goals that can satisfy multiple interests. Heuristics can help lead groups to quicker decision making without the limitations of other models of problem solving but participants of heuristics should be aware that unconscious and cognitive bias is sometimes a limitation.

Institutional Knowledge is the ability for organizations to utilize preserved memory or historical data to determine usable information and knowledge to improve the organization’s effectiveness.

Permanent Non-Participant are people who no longer participate in hunting and/or fishing, no longer wish to participate and no longer consider themselves part of the community.

Reactivators people who stopped participating in hunting and/or fishing and now participate once again but who don’t yet consider themselves fully transitioned into the fishing and hunting community.

RFP is an initialism for “Request for Proposal”, a document that is used to solicit proposals for funding opportunities.

Three Participation Motivations consists of achievement, affiliation and appreciation. **Achievement** defines those who participate based on merit opportunities like awards, size/weight/species records, becoming an instructor/guide/coach, or otherwise meeting performance-based markers. **Affiliation** defines those who participate because of others they know, like family or friends, or because of organizational or group membership. **Appreciation** defines those who participate based on the appreciation of sport, nature, wildlife, food acquisition, and other mental, emotional or spiritual connections to participation. People who participate because of multiple motivations are more likely to stay engaged in an activity and participate in multiple activities.

Shooting Sports refers to the recreational shooting of various types of targets with firearms and/or archery.

Situational Lapsers is a person who no longer participates in hunting and/or fishing activities due to situational events like disability, relocation, lack of social network, time or economic constraints, reduced success rates, negative experience with the activity or with people they know, etc.

Social competence consists of social, emotional, cognitive and behavioral skills needed for successful social adaptation. Social competence also reflects having an ability to take another's perspective concerning a situation, learn from past experiences, and apply that learning to the changes in social interactions.

Social Influence is when a person's opinions, emotions, beliefs, ideologies and behaviors are influenced and changed by others.

Social Landscape is the context, situation and understanding that an event, activity or lifestyle takes place in.

Stakeholder include government agencies, non-governmental organizations, Tribes, industry, media, educators, local clubs, politicians and volunteers with an interest in increasing fishing and hunting participation who are also willing to invest in time and resources into the R3 effort.

SWOT Analysis (alternatively SWOT matrix) is an initialism for strengths, weaknesses, opportunities, and threats—and is a structured planning method that evaluates those four elements of a project, program or business.

APPENDIX II: Acknowledgements

CDFW R3 Task Force

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Craig Shuman, Regional Manager, Marine Region

Chief David Bess, Deputy Director, Law Enforcement Division

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CDFW News



DELTA, ECOSYSTEM RESTORATION, ENVIRONMENTAL SCIENCE, GRANTS, HABITAT CONSERVATION, INVASIVE SPECIES

CDFW Marks One-Year Anniversary of Nutria Eradication Effort: Biologists Report More Than 400 Invasive Rodents Captured to Date

MARCH 25, 2019 | PTIRAWILDLIFE

One year after launching an Incident Command System and a formal effort to eradicate invasive nutria from the state, the California Department of Fish and Wildlife (CDFW) reports significant progress in combatting the destructive, South American rodents, though much work remains.

In the early 1900s, nutria were imported and farmed in California for the fur trade. Following the market collapse, escaped and released nutria established small populations that were eventually eradicated by the late 1970s. In 2017, nutria were again discovered within the San Joaquin Valley.

Nutria pose a “triple threat” to California’s future as a top-rated agricultural pest, a destroyer of critical wetlands needed by native wildlife, and a public safety risk as their destructive burrowing jeopardizes the state’s water delivery and flood control infrastructure. CDFW has formed partnerships with both the U.S. Department of Agriculture and the California Department of Food and Agriculture to survey and eradicate nutria from the state.

To date:

- CDFW and USDA have taken or confirmed the take of 410 nutria in five counties – 330 from Merced County, 65 from San Joaquin County, 12 from Stanislaus County, two from Mariposa County and one from Fresno County. Nutria have also been confirmed in Tuolumne County.
- The eradication efforts have prioritized the one known nutria population in the Sacramento-San Joaquin Delta in order to limit their spread and impact on California’s most important water resource and the heart of the state’s water delivery and infrastructure. Of the 65 nutria taken from San Joaquin County, 64 were captured within Walthall Slough near Manteca. Survey crews have not detected nutria elsewhere in the Sacramento-San Joaquin Delta.
- Nutria are a semi-aquatic species never far from water. CDFW has identified approximately 1.8 million acres of habitat suitable for nutria in California, mostly in the state’s central regions. CDFW so far has assessed more than 300,000 acres in three counties: Merced, Stanislaus and San Joaquin.
- In suitable nutria habitat, CDFW and its partners set up trail cameras to monitor for nutria presence and deploy traps to catch the nutria once their presence has been confirmed. Over the past year, the project has set up 487 camera stations, conducted more than 1,600 camera checks and deployed 995 trap sets for a total of 12,930 trap nights.
- CDFW’s eradication efforts have the broad support of the state’s agricultural community. As a top-rated agricultural pest, nutria threaten California’s nearly \$50 billion agricultural industry. San Joaquin Valley farmers have donated five tons of sweet potatoes to use as bait to trap nutria.
- Nutria have been documented on federal, state and private property. Gaining access to private property is key to eradication efforts and to prevent isolated populations from re-infesting the state. More than 2,400 private property owners have granted CDFW written permission to survey and trap nutria on their land, which CDFW does at no cost to property owners.
- CDFW has received widespread public support for its eradication efforts. CDFW’s Invasive Species “hotline” and corresponding e-mail account has received 357 nutria reports from the public over the past year. While most of these have turned out to be false reports – either sightings of other wildlife mistaken for nutria or reports that lack enough information to confirm – public reporting will continue to be important to determine the full extent of the infestation. When possible, reports should be accompanied by photos and videos. CDFW’s toll-free reporting hotline is (866) 440-9530. The e-mail address to report nutria sightings is invasives@wildlife.ca.gov (<mailto:invasives@wildlife.ca.gov>). CDFW’s nutria eradication webpage at [wildlife.ca.gov/nutria](http://www.wildlife.ca.gov/nutria) (<http://www.wildlife.ca.gov/nutria>) offers references for distinguishing nutria from other similar aquatic animals.
- Public education and outreach are key components of CDFW’s eradication efforts. In addition to numerous nutria presentations in front of scientific, agricultural and community organizations, CDFW has partnered with the Delta Stewardship Council to produce a nutria identification pocket

guide. The guide is available at <http://deltacouncil.ca.gov/nutria-pocket-guide> (<http://deltacouncil.ca.gov/nutria-pocket-guide>).

- CDFW has secured more than \$3 million in state and federal grants to support nutria eradication. The Sacramento-San Joaquin Delta Conservancy has awarded CDFW \$1.2 million over three years; California's Wildlife Conservation Board has awarded CDFW \$600,000 over three years; and the U.S. Fish and Wildlife Service's State Wildlife Grant Program has awarded CDFW \$1.25 million over three years.
- Future CDFW nutria efforts include using detection dogs to help locate remnant nutria or confirm their absence. CDFW also is in the early stages of developing a "Judas nutria" project where surgically sterilized nutria, which are social animals, are outfitted with radio telemetry collars and released back into the environment to lead biologists to other nutria.
- CDFW's eradication efforts are modeled after those in the Chesapeake Bay in the 2000s. That ongoing effort is led by the federal government and has removed more than 14,000 nutria from 250,000 acres in the Delmarva Peninsula. Though nutria are established in more than a dozen U.S. states, including Washington, Oregon, and, most notably, Louisiana, the Chesapeake Bay effort remains the only successful, large-scale nutria eradication in U.S. history.

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◀ **NEWS**

CDFW News



CONSERVATION EDUCATION, HABITAT CONSERVATION, INVASIVE SPECIES, PUBLIC PARTICIPATION, YOUTH

Youth Art Contest Encourages Kids to Learn about Invasive Nutria

APRIL 2, 2019 | KMACINTY

The California Department of Fish and Wildlife (CDFW) is pleased to announce the sixth annual California Invasive Species Youth Art Contest, which this year challenges students to creatively present messages about nutria (*Myocastor coypus*), a relatively recent – and destructive – invasive species in California.

The contest is offered by CDFW's Invasive Species Program as part of California Invasive Species Action Week, June 1-9.

There are three age divisions, for youths in grades 2-4, 5-8 and 9-12. All types of media are welcome and encouraged, including (but not limited to) drawings, paintings, animations, comic strips, videos and public service announcements. Entries should be in keeping with the 2019 theme, "Say No to Nutria."

Nutria are large, semi-aquatic rodents from South America that have been found in California's Central Valley and southern Delta. Nutria cause extensive damage to wetland habitats, agricultural crops, streambanks and levees. More information about nutria can be found on CDFW's Nutria Incident page (<https://www.wildlife.ca.gov/nutria>).

The top three winners in each division will receive awards and have their entries displayed on CDFW's Invasive Species Action Week webpage.

The deadline for art contest entries is May 3. Completed entries and entry forms should be sent to:

CDFW Invasive Species Program
P.O. Box 944209
Sacramento, CA 94244-2090

The entry form and entries may also be emailed to invasives@wildlife.ca.gov (<mailto:invasives@wildlife.ca.gov>).

The goal of California Invasive Species Action Week is to increase public awareness of invasive species issues and encourage public participation in the fight against California's invasive species and their impacts on our natural resources.

Action Week activities will include presentations on aquatic and terrestrial invasives, guided outings to observe and assess infested areas, invasive species removal efforts, habitat restoration projects and the announcement of the winners of the youth poster contest. Opportunities for youths and adults to participate or volunteer will be available across the state through participating agencies, organizations and volunteer groups, with information and details to be provided on the Action Week webpage.

Please visit www.wildlife.ca.gov/conservation/invasives/action-week/poster-contest (<http://www.wildlife.ca.gov/conservation/invasives/action-week/poster-contest>) for details about the 2019 contest, to view past winning entries and find more information on how to participate in Action Week.

The mission of CDFW's Invasive Species Program is to reduce the impacts of invasive species on the wildlands and waterways of California. The program is involved in efforts to prevent the introduction of these species into the state, detect and respond to introductions when they occur and prevent the spread of those species that have established.

###

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◀ **ART CONTEST** ◀ **CALIFORNIA INVASIVE SPECIES ACTION WEEK** ◀ **INVASIVE SPECIES** ◀ **NUTRIA** ◀ **YOUTH**



Department Informational Items – Marine Region

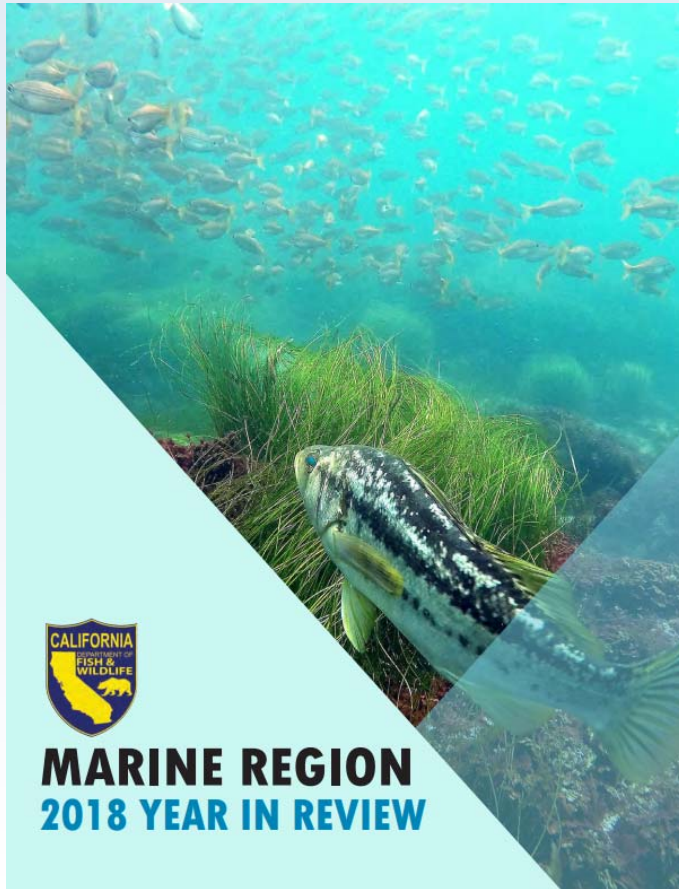
**Fish and Game Commission Meeting
Santa Monica, CA
April 17, 2019**

Presented by:

**Craig Shuman, D. Env.
Regional Manager
Marine Region**



Marine Region 2018 Year in Review



MARINE REGION 2018 YEAR IN REVIEW



California Sheephead

Staff collaborated with the Sportfishing Association of California to develop sampling protocols and collect California Sheephead for a potential fillet length regulation. A total of 180 California Sheephead collected via live trapping were measured and filleted on three sampling trips at Long Beach, Dana Point and Point Loma. The relationship between total length and average fillet length was used to inform a proposed minimum fillet length. The information was presented to the California Fish and Game Commission as a proposed California Sheephead fillet length regulation.



California Spiny Lobster

New regulations to implement the Spiny Lobster Fishery Management Plan went into effect during the 2017-2018 commercial and recreational lobster seasons. Regulation changes included a commercial lobster trap limit of 300 traps, a trap tag program, a new recreational season opening time of 6:00 a.m. (previously midnight), and hoop net marking requirements. Staff produced outreach materials and answered a variety of questions from the public regarding the new regulations. The 2017-2018 lobster fishing season saw just over

688,000 pounds of lobster landed in the fishery, a 5 percent increase from (~656,000 pounds were landed in season). The 2017-2018 recreational season saw a lobster report card return rate that has held steady for the past several years. The estimated catch for the recreational season was approximately 275,000 pounds, compared to a total (commercial plus recreation) of approximately 933,000 pounds.

In 2018, the first annual review of the Fishery Management Plan harvest was completed, evaluating the 2016-2017 indicators (catch, catch per unit effort, and potential ratio) fell above the three management actions were triggered to monitor and adaptively manage changes in fishery and ocean conditions.

The 2017-2018 commercial lobster season in which lobster operators were required to complete and submit a Spiny Lobster Trap Loss Report (affidavit, CDFW Form 1020). This new requirement is part of a suite of changes to commercial lobster fishing regulations associated with the fishery management plan. The data collected from the affidavit will help CDFW estimate the number of traps lost during a season as well as inform gear recovery programs and studies aimed at minimizing the impacts of fishing gear interactions in the marine environment.

Upon the conclusion of the 2017-2018 commercial lobster season, CDFW saw an affidavit submittal rate of about 90 percent. The estimated average trap loss per active permit holder was approximately 12 percent of the maximum allowed number of traps (300 traps per lobster operator permit). An updated estimate of trap loss based on the reported number of deployed traps will be provided once commercial lobster fishing logbook data become available.

Due to human health concerns caused by high levels of domoic acid in lobster, waters around Anacapa Island, Ventura County and the east end of Santa Cruz Island, Santa Barbara County were closed to the commercial take of spiny lobster on October 16, 2018, as recommended by state health agencies. Staff coordinated with the California Department of Public Health and the Office of Environmental Health Hazard Assessment to inform the public and commercial fishery participants of the area closures via press releases and updates on the CDFW website. The commercial spiny

E-Tix is a notable accomplishment for CDFW and a significant step forward in modernizing the state's fisheries landing reporting system.



- Update on annual recreational ocean salmon and Pacific halibut
- Update on federal fishery disaster declaration requests



E- Tix Timeline and Status Update

- October 12, 2017
Adopted Electronic Landings Reporting
- July 1, 2018
Voluntary e-Reporting
- July 1, 2019
Mandatory e-Reporting
- As of March 22, 2019
238 Fish Businesses Registered with E-Tix
115 Currently Using E-Tix



E-Tix Outreach Efforts

- Phone Calls to 45 Fish Businesses
Submitted high volume Landing Receipts in 2018

- Email to 590 Fish Businesses
Reminder with E-Tix Flyer

- MR Field Staff Site Visits
Continue the Conversation, E-Tix Flyer

- Communication with Industry Associations and Networks

Continue spreading the word



New Fish Ticket Reporting Requirements



As of July 1, 2019 all commercial landings
must be submitted through the E-Tix application.
Start today!

Visit the E-Tix Portal to establish your account – <https://etix.psmfc.org/Account/Login>

- Solefish and groundfish trawl landings must be submitted via E-Tix within 24 hours.
- All other landings must be submitted via E-Tix **within three business days**.
- Electronic fish tickets should be filled out immediately upon landing using the E-Tix system. If not feasible, a Dock Ticket including all required information must be filled out when fish are landed (an example dock ticket is provided on the reverse side of this flyer).
- If you have internet access (mobile, tablet, or computer) to enter a landing directly into E-Tix at the time of offloading, the system will automatically generate a fish ticket number for the landing information.
- If there is no internet available at the time of offloading – you must plan ahead by signing into the E-Tix system to generate a fish ticket number (or multiple ticket numbers) and use paper dock tickets.
- If you use dock tickets, an electronic fish ticket number must be generated via E-Tix prior to receiving a landing and must be included on a dock ticket. You can also print out a dock ticket with the fish ticket number before buying fish.
- Paper copies of the electronic fish ticket or dock ticket must be signed by both the buyer and fisherman and a copy must be given to the fisherman at the time of the landing.
- Both buyer and fisherman must keep the paper copies of electronic fish tickets or dock tickets for four years and make them available for inspection by the Department.
- Existing requirements to keep paper records onboard the vessel for Groundfish, Sheephead, Tanner Crab, Rock Crab, non-Cancer Crabs, and Salmon still apply.

Additional information:

Procedures and Resources for Commercial landings –
<https://www.wildlife.ca.gov/Fishing/Commercial/Landing-Resources>. This website includes the User Guide, Dock Ticket example and a link to PSMFC's E-Tix website.

The Pacific States Marine Fisheries Commission maintains the E-Tix application and offers free one-on-one training. **Avoid the rush, sign up today!** Contact (503) 595-3100.

For any other questions regarding electronic fish tickets, contact the Marine Fisheries Statistical Unit at ElectronicFishTicket@wildlife.ca.gov or by phone at (562) 342-7130.





E-Tix Outreach Efforts (cont.)

- Traveling Roadshow

Informal Q&A, E-Tix Live Demo, E-Tix Registration

4 Locations:

- April 30, 2019, **Sausalito**, USACE Bay Model Visitor's Center
- May 7, 2019, **Santa Barbara**, Waterfront Dept. Marine Center Classroom
- May 8, 2019, **San Pedro**, Cabrillo Marine Aquarium
- May 9, 2019, **San Diego**, Hubbs-Sea World Research Institute



Thank You

- Commercial Landings Resources

<https://www.wildlife.ca.gov/Fishing/Commercial/Landing-Resources>

- Marine Fisheries Statistical Unit

(562) 342-7130

ElectronicFishTicket@wildlife.ca.gov

- PSMFC E-Tix Portal

<https://etix.psmfc.org/Account/Login>



MARINE REGION

2018 YEAR IN REVIEW

Message from the Regional Manager

We are fortunate to live in an era where we have massive amounts of data at our fingertips. With a few clicks of the mouse, we can pull up almost any fact from recorded or geologic history. When I come across something extraordinary, I often find it comforting to look back across the historical record to see that this is not the first time that society or, in some cases, the planet has experienced that event.

It is with this in mind that I find the numerous climatic records broken in 2018 troubling. Many of you may recall that it was really hot throughout much of California last summer. The Van Nuys airport broke the all-time record at a blistering 117° F on July 6, 2018, with downtown Los Angeles and UCLA recording 108° F and 111° F, respectively. This was part of a global heat event that saw what is possibly an all-time high for Africa of 124° F and numerous [heat records around the globe](#). These heat records correlate with the global trend of rising carbon dioxide. As measured in ice cores, over the past 400,000 years [global carbon dioxide levels never rose above 300 parts per million](#). The planet reached that level in 1950 and is [currently over 400 parts per million](#). These records are consistent with the unprecedented rates of change in our climate that are manifested in more pronounced periods of drought, heat waves, floods, and fire. Fire “season” in California continues to grow longer and more widespread. Tragically, 2018 saw both the [largest](#) (Mendocino Complex fire in July) and [deadliest](#) (Camp Fire in November) wildfires in California history.

The ocean is also experiencing a wave of new records. 2017 was proclaimed the warmest year on record for the global ocean in a [peer-reviewed article](#) published in the journal *Advances in Atmospheric Sciences* and on August 1, sea surface temperature at the [Scripps Pier hit 78.6° F](#), the warmest sea surface temperature recorded there since measurements began in 1916. [Arctic sea ice](#) and [ice sheets](#) are continuing to decrease and sea level continues its rising trend.

While many of us enjoyed basking in the warm ocean waters this past summer, and some took advantage of the great fishing opportunities, I can’t help but wonder what price we might pay for these record-setting conditions.

Will periodic closures of our iconic Dungeness crab and lobster fisheries due to harmful algal blooms become the norm rather than the exception? Are the warm waters in Southern California related to the conditions in Central and Northern California that have led to widespread loss of kelp, urchin barrens and the closure of our beloved recreational abalone fishery?

The [Fourth National Climate Assessment](#) released in late November 2018 found that coastal communities and the ecosystems that support them are increasingly threatened by the impacts of climate change. We must be prepared to manage the impacts of warmer water temperatures, ocean acidification, sea level rise, and coastal erosion that are projected to change coastal ecosystems, threatening historic fisheries, ecosystem services, and our coastal communities.

The ocean is unpredictable and dynamic, but we have been able to use our observational records to tease out recurring trends such as the El Niño Southern Oscillation and the Pacific Decadal Oscillation to inform our approaches to management. We must now learn to adapt to possible new and unforeseen ocean events such as the warm water blob of 2015 that may not follow a predictable cycle, or recur in a cycle we do not yet understand.

While all this possible doom and gloom may seem overwhelming, we must remember that we have overcome huge environmental problems before. Over the last 50 years our air and water have gotten considerably cleaner and we have brought back several species from the brink of extinction, including California’s iconic brown pelican. As the group of individuals responsible for the sustainable management of California’s marine resources, staff in the California Department of Fish and Wildlife’s Marine Region will remain vigilant. Working with our partners, we will continue to enact data collection and management measures that account for both the anticipated and unanticipated changes we see on the horizon. This will enable us to meet daunting challenges head-on and fulfill our mission to *protect, maintain, enhance, and restore California’s marine ecosystems for their ecological value and their use and enjoyment by the public through good science and effective communication.*

- Dr. Craig Shuman, Marine Region Manager

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2018 Marine Region-Wide Updates

Administration

The accomplishments of the Marine Region would not be possible without the work of our administrative staff. Administrative staff work tirelessly behind the scenes to support Region staff, ensuring that they have the tools they need to get the job done. Marine Region administrative staff manage storage and office facilities for staff and vessels, procure supplies for field work, laboratories, and offices while managing and staying within the Region's budget. Administrative staff also help staff conform to state laws and California Department of Fish and Wildlife (CDFW) policies as they work to help the Marine Region achieve its goals.

California Cooperative Fisheries Investigations (CalCOFI)

The Marine Region hosted the 2018 CalCOFI meeting in December that included a [symposium](#) titled "Spatial Dynamics and Organization of Populations in Response to Environmental Parameters." The symposium highlighted current efforts to better understand the spatial dynamics of marine resources in response to environmental factors and the ability to predict or forecast them. Topics included population shifts, egg production, modeling, applications for stock assessments, and other areas with management implications. In addition, the Marine Region joined UC Davis to host a special mini-symposium that included a panel session moderated by Marine Region staff. The mini-symposium focused on "Emerging Tools in Adaptive Management of California's Marine Protected Areas." Staff presented several informational posters about coastal pelagic and highly migratory fisheries, and marine protected area management. Staff also gave a presentation on the MPA Monitoring Action Plan.

Electronic Reporting for Commercial Fisheries Landings

CDFW, in collaboration with Pacific States Marine Fisheries Commission, launched a web-based fish ticket application called "E-Tix" that will be used for all California commercial fisheries landings. E-Tix went live for California state fisheries on July 1, 2018 for a transitional one-year period. The use of E-Tix is a notable accomplishment for CDFW and a significant step forward in modernizing California's fisheries landing reporting system. In addition, CDFW's Data and

Technology Division replaced the outdated Commercial Fisheries Information System with a new, modern Marine Landings Data System (MLDS) to house and manage landings data. All data submitted using E-Tix will be automatically transferred to MLDS twice a day to produce near real-time landing records.

Staff from across the Marine Region played instrumental roles in the Region's transition from paper landing receipts to electronic records, as well as replacing the Commercial Fisheries Information System with the new MLDS. Staff identified data management concerns with the new system and developed changes to field data collection methods to ensure that management needs are met during the transition.

Staff also developed new ways to conduct the needed QA/QC to ensure the maintenance of accurate data when paper receipts are no longer available to compare with the electronic data. Prior to its rollout, project staff spent significant time testing MLDS functionality to identify technical issues and ensure data accuracy and accessibility. In addition to these internal support needs, staff assisted with preparation of outreach materials for fish buyers to inform them of the new processes for submitting and recording landings information.

Marine Life Management Master Plan

At its June 2018 meeting in Sacramento, the California Fish and Game Commission voted unanimously to adopt the [2018 Master Plan for Fisheries: A Guide for Implementation of the Marine Life Management Act](#). Adoption of the 2018 Master Plan was the culmination of over [two years of collaborative efforts](#), and sets the stage for implementation of the plan.

Initial implementation included work throughout the Marine Region on the development of Enhanced Status Reports for various state-managed species, which will be released in 2019. In addition, Marine Region staff worked with partners to develop a socioeconomic guidance document that would inform implementation of the 2018 Master Plan. This document will help staff to build socioeconomic narratives that can be incorporated into management documents (for example Enhanced Status Reports, Fishery Management Plans, and California Fish and Game Commission rulemakings) to better describe socioeconomic conditions and impacts related

to how fisheries are managed. The final guidance document can be accessed at www.opc.ca.gov/socioeconomic-guidance-for-fisheries-management/

New Resources for the Marine Region

The [2018-2019 State Budget](#) allocated new funding and positions to CDFW to (1) continue the current level of service for core fish and wildlife program; (2) augment high-priority programs that are consistent with the priorities identified in the most recent update to the Strategic Vision report; and (3) initiate an independent, service-based budget review and develop a tracking system to support an analysis of CDFW's existing revenue structure and program activities.

The augmentation of high-priority programs included eleven new positions to focus on marine fisheries management and data streamlining. Working in conjunction with CDFW's Data Technology Division, Marine Region staff spent the second half of 2018 filling the new positions and working on the focal areas that include state-managed sustainable fisheries under the 2018 Master Plan for Fisheries, climate change and fisheries, fisheries innovation, whale-safe fisheries, and centralized electronic data collection, monitoring, and reporting.

Whale and Turtle Safe Fisheries

Maintaining whale and turtle safe fisheries continues to be a high priority for the Marine Region. Leveraging existing resources with new positions established in the 2018-2019 budget, we expanded our efforts and prepared for new authority from the State Legislature in an effort to reduce whale and turtle interactions with state-managed fisheries.

The [Dungeness Crab Fishing Gear Working Group](#) met throughout the year to continue to develop the [Risk Assessment and Mitigation Program \(RAMP\)](#). The 2017-2018 Dungeness crab pre-season assessment identified a moderate entanglement risk due to the potential overlap of whale distributions and gear deployment. Aerial surveys conducted shortly after the season opened in both the northern and southern fishery management areas suggested that risk was low because whales were largely offshore, away from the majority of trap gear. In early June, an evaluation team was convened in response to an increase in reported entanglements. Since the season was nearly over and scheduled to close in the area of concern on June 30th, the Working Group recommended a low level of management intervention by encouraging the fleet to follow the Best Practices Guide. During 2018 and 2019

the RAMP will assess entanglement risks for both blue and humpback whales in relation to forage, fishing activity, and ocean conditions. New legislation (SB 1309) gives the CDFW Director interim authority to close the Dungeness crab fishery based on increased marine life entanglement risk while the RAMP is developed. The RAMP will be formalized in regulation on or before November 1, 2020.

The Working Group distributed an [updated Best Practices Guide](#) prior to the 2018-2019 Dungeness crab fishing season, and obtained funding from the California Ocean Protection Council to install solar data loggers on 40 commercial fishing and 20 whale watching vessels. Solar data loggers are expected to improve data streams and allow for real-time analyses of fishing activity and whale distributions.

On November 26, 2018, CDFW formally notified NOAA National Marine Fisheries Service of its intent to pursue an Incidental Take Permit under Section 10 of the Endangered Species Act, which would consider whale and turtle interactions with gear from the Dungeness crab fishery. Additional updates will be available at www.wildlife.ca.gov/Crabs.

New regulations were enacted to reduce the risk of marine life entanglements in commercial Dungeness crab fishing gear. These new regulations establish limits on the number of additional buoys that can be attached at the surface after the main buoy and the maximum length of line.

E-Tix is a notable accomplishment for CDFW and a significant step forward in modernizing the state's fisheries landing reporting system.

State-Managed Marine Programs

These programs are responsible for fisheries managed by the State alone.



Abalone dive survey briefing

photo by K. Joe

Abalone

Recreational Red Abalone Fishery – The red abalone stock continued to decline due to sustained poor environmental conditions along the North Coast. At its December meeting, the California Fish and Game Commission approved keeping the red abalone fishery closed for two more years. During the closure, CDFW will complete work on a fishery management plan which will specify conditions for reopening the red abalone fishery along with other management parameters.

Over the past five years, ocean warming and a massive purple sea urchin population explosion have taken their toll on red abalone. Normal ocean temperatures in recent years have not offset the detrimental effects from the expanded purple sea urchin population, and abalone populations continued to decline.

Dive survey efforts in 2018 covered more than the equivalent of 2.7 football fields across seven fished sites with more than 250 hours spent executing underwater surveys. Reproduction was poor in the fishery with few larvae or newly settled red abalone found during the summer of 2018. Surveys revealed that extremely low kelp and algal abundances, likely reduced by large numbers of herbivorous purple sea urchin, continued from previous years and resulted in significant mortality of red abalone in 2018. Red abalone densities continued to decline, with an overall average density of 0.11 abalone per square meter for seven fished sites (closure trigger is 0.3 abalone per square meter).

Red Abalone Fishery Management Plan Progress – The

Red Abalone Fishery Management Plan's proposed management strategies and frameworks were peer reviewed in 2018, which is a major milestone in the development process. The year started with several public meetings with the Recreational Abalone Advisory Committee and interested stakeholders to present two proposed fishery management strategies, one put forward by CDFW and the other by a Nature Conservancy-led collaborative stakeholder group. Shortly after the public meetings, CDFW worked with the California Ocean Science Trust to develop and conduct the scientific peer review process to critically review the science supporting the two management proposals. The peer review ran from late spring through early fall and the final report was presented to the California Fish and Game Commission in October. The review found that over all, both management proposals were sound, but each had strengths and weaknesses that resulted in a high level of uncertainty in managing the fishery moving forward. The overarching recommendation was to integrate both management strategies to help reduce the uncertainty and capitalize on the best available science. Further recommendations and advice were provided on how to reduce the management uncertainty of all fishery management indicators. CDFW and the California Fish and Game Commission will work with all interested partners in 2019 to continue development of an all-encompassing management strategy that addresses the peer review recommendations and completes the draft fishery management plan.

Abalone Restoration: Captive Breeding Program for Endangered White Abalone – The White Abalone Restoration Consortium (consisting of CDFW, university, federal, and aquarium scientists), which focuses on restoration of this critically endangered species, continued their work in 2018. The growing production of the Captive White Abalone Breeding Program is progressing towards the first ocean stocking of captive-bred animals. To prepare for that next milestone, staff led efforts to scout potential sites for the outplant of captive-reared white abalone. The first outplant is planned for the fall of 2019. Additionally, staff worked with program partners to generate and submit the next grant project proposal to NOAA Fisheries' Section

6 grant program. If successful, the project grant will continue the restoration program for the next three fiscal years starting July 1, 2019.

For more information about abalone, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Invertebrates/Abalone.



Barred Sand Bass and Kelp Bass

To help evaluate the 2013 regulation changes for the basses, staff completed 48 sampling trips aboard commercial passenger fishing vessels to collect information on numbers, sizes, and mortality of released fish. Staff collected data on more than 2,093 Kelp Bass and 462 Barred Sand Bass. Most discards were between 13 and 14 inches long. In 2018, three percent of Kelp Bass and 20 percent of Barred Sand Bass released suffered barotrauma. All Barred Sand Bass were released alive, while half of one percent of Kelp Bass suffered release mortality.

Staff submitted a research article about using Kelp Bass to assess trophic indicators of ecosystem health in MPAs (Davis, J.P., Valle, C.F., Haggerty, M.B., Walker, K., Gliniak, H.L., Van Diggelen, A.D., Win, R.E. and S.P. Wertz. 2019. *Testing trophic indicators of fishery health in California's marine protected areas for a generalist carnivore*. Ecological Indicators. 97: 419-428. doi.org/10.1016/j.ecolind.2018.10.027). The study was a collaboration between Marine Region scientists on the Southern California Fisheries Research and Management Project and the Statewide Marine Protected Area Management Project. The results showed that non-lethal sampling of fin tissue from Kelp Bass will be effective for future stable isotope studies assessing their feeding level. The study also found that impacts of no-take marine protected areas on kelp forest food webs were variable across locations, and that opportunistic feeding by generalist predators on pelagic sources may mask the effects of management.

Staff completed fishery-independent surveys of Barred Sand Bass for the second consecutive year during fall 2018. Preliminary results from a pilot study in 2017

indicated that Barred Sand Bass were more common during the fall at artificial reefs off Los Angeles County. Results from the pilot study are currently being analyzed and prepared for publication in 2019. Between September and November 2018, CDFW divers and staff completed fall fish surveys aboard the R/V *Garibaldi* at two natural and four artificial reefs near Los Angeles Harbor and the Palos Verdes Peninsula. Standardized counts of Barred Sand Bass were recorded on scuba and baited remote underwater video. An additional survey site was investigated at the Hermosa Beach artificial reef, which appeared promising and will be incorporated into the 2019 survey design. Surveys using both methodologies will continue to provide a long-term dataset of Barred Sand Bass abundance annually.

Staff continued to test the use of length-at-age-based models and management strategy evaluation for managing the bass fisheries. The Data Limited Methods Toolkit is being explored as an option for using management strategy evaluation, with Kelp Bass as one of the new test case species. Staff worked on gathering and analyzing data to be used in the toolkit. A completed manuscript of the Barred Sand Bass age and growth study was submitted for publication.

For more information about bass research and management, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/SCFRMP.



Fish sampling on the Eel River Estuary

CDFW photo by A. Frimodig

Bay and Estuary Management

Humboldt Bay – Staff completed the final year of field sampling and associated reporting for a project evaluating the spawning and larval distribution of Longfin Smelt in Humboldt Bay and its tributaries, which was funded by a state wildlife grant program.

In collaboration with California Sea Grant, Humboldt State University, Hog Island Oyster Company and the Wiyot Tribe, staff assisted with the design and implementation of a multi-year project to 1) understand

how physical and biological factors in Humboldt Bay may alter ocean acidification conditions compared to open coastal waters; 2) investigate the extent to which eelgrass reduces the impact of ocean acidification on the growth of commercially grown oysters in Humboldt Bay, and 3) expand eelgrass monitoring within Humboldt Bay as the foundation for a collaborative bay-wide eelgrass management plan.

Eel River Estuary – In collaboration with CDFW's Northern Region, staff participated on the management team for the Ocean Ranch Estuary Restoration Project to restore 473 acres of tidal wetlands in the Eel River estuary. As part of the baseline data collection effort, staff designed and implemented a monitoring plan to characterize the seasonal fish assemblage within CDFW's Ocean Ranch Unit.

Russian River Estuary – Staff completed an accuracy assessment of the 2010 Ocean Imaging marine protected area eelgrass spatial data on the Russian River Estuary, which misclassified 11.36 acres of widgeon grass (*Ruppia maritima*) as eelgrass in that estuary; the determination was made that there is no eelgrass habitat in the Russian River estuary.

Estero Americano and Estero de San Antonio Estuaries – In collaboration with the Environmental Review Project, staff surveyed and mapped eelgrass habitat in these two estuaries located in Sonoma and Marin counties, respectively.

Tomales Bay – Staff received the 2017 Greater Farallones National Marine Sanctuary Tomales Bay eelgrass spatial dataset. These data were incorporated into the Northern California eelgrass spatial dataset, replacing the previous 2013 CDFW Tomales Bay Eelgrass spatial dataset. The dataset is a valuable resource for managing aquaculture leases.

Staff began developing methodology for using unmanned aerial vehicles to map eelgrass habitat and gauge potential associated sport clamming impacts, in collaboration with CDFW (non-Marine Region), GIS, and Invertebrate Management Project staff.

San Francisco Bay – Staff received 2,500 new Bay Shrimp Logs (= 50 logbooks) from the Office of State Publishing. In 2018, staff distributed 900 logs to four of the six active trawlers in the bay shrimp fishery and worked with CDFW's Law Enforcement Division to address bay shrimp fleet compliance issues. Staff also provided boat support to the National Parks Service Golden Gate National Recreation Area for a federal sea cave mapping study.

For more information about bay and estuary management, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/ABMP/Research.



Box crab

CDFW photo by J. Coates

Box Crab

Commercial landings of non-*Cancer* crab species caught incidentally in other targeted trap fisheries increased dramatically in 2017. The interest in (and increased landings of) brown box crab was particularly large. In response, the CDFW Director declared non-*Cancer* crabs to be an emerging fishery in April 2018. CDFW staff developed a regulatory proposal to limit incidental take of these species, which was adopted by the California Fish and Game Commission in October. Concurrent with the regulatory proposal, staff developed a proposal for a collaborative research program with fishermen to investigate the feasibility of creating a target fishery for box crab under experimental gear permits. Recommendations for the program were shaped by constituent feedback through regular communication with CDFW staff, public constituent meetings, and the California Fish and Game Commission's Marine Resources Committee meetings. With support from the California Ocean Protection Council, the research program will use electronic fishery monitoring tools both in studying box crabs and to provide guidance to the State on potential future use of this technique. Experimental permits were approved at the December California Fish and Game Commission meeting and will allow for program initiation in 2019.

For more information about box crab, download the CDFW presentation available at nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=160457.

Researchers confirmed that there is no eelgrass habitat in the Russian River estuary.



Juvenile California Halibut

CDFW photo by B. Mattioli

California Halibut

The California Halibut (halibut) fisheries in Central California continued to be monitored and sampled by staff in the Monterey Bay, San Francisco, and Eureka areas. In all areas, recreational catch and commercial landings increased, primarily due to strong recruitment of legal-sized fish. Commercial trawl and hook-and-line landings and recreational catch were sampled dockside, trawl bycatch samples were collected, and observations were made onboard commercial passenger fishing vessels. Juvenile halibut were collected from a research trawler in San Francisco Bay. Observations of new fishery recruits declined, and most juveniles appeared to be from past recruitment events. Due to previous episodes of good recruitment likely associated with prolonged warm water events three to four years ago, significant amounts of under-sized halibut were encountered in the recreational hook-and-line fisheries for the second year in a row.

Staff have now determined ages for 4,000 halibut otoliths (ear bones) from Northern and southern California by examining thin sections, and an age validation study is under way using captive juvenile halibut injected with oxytetracycline, which marks the otolith.

Staff collaborated with the National Marine Fisheries Service to conduct oral interviews with halibut trawl fishermen about the history of the industry. This project was funded through a grant with Preserve America. Fisherman summary profiles accompanied by selected clips and photos will be made available to the public on CDFW's Finfish Management Project web page, with a link to the full interview and transcript, which will be housed in the NOAA Fisheries "Voices from the Fisheries" database.

The first year of fishery-independent trawl surveys were conducted to begin quantifying an index of juvenile halibut abundance across multiple embayments and nearshore locations in Southern California. Eleven locations from Oceanside Beach in San Diego County to Santa Monica Bay in Los Angeles County were surveyed in spring and fall 2018. During the spring surveys, 247

Fishery-independent trawl surveys began in 2018 to help determine juvenile California Halibut abundance.

halibut ranging in size from 3½ in. to 25 in. (89 to 643 mm) were caught in 85 ten-minute trawls. In the fall, 415 individuals ranging in size from 1.2 in. to 16 in. (32 to 409 mm) were caught in 97 ten-minute trawls. One halibut tagged during the spring surveys was recaptured in the same location in the fall; it was caught in the Dana Point Harbor and grew .66 in. (17 mm) in the five months between surveys. These index-focused trawl surveys and collaboration with the Southern California Bight 2018 Regional Monitoring Program contributed 38 halibut to the Northern/Central California Finfish Research and Management Project's aging study.

Staff developed separate stock assessments for northern and southern California populations of halibut. The process involved analyzing more than 47 years of fisheries, survey, and biological data obtained from a variety of sources, including CDFW, NOAA Fisheries, and the Pacific States Marine Fisheries Commission. Staff applied sex-structured statistical catch-at-age models to those data using the NOAA Fisheries program Stock Synthesis, and critically evaluated the model output. An external peer review panel will be convened to review the results in 2019 after an internal review of the results is completed.

Staff continued to develop a management strategy evaluation for halibut in conjunction with the Data Limited Methods Toolkit project. Staff built an operating model that simulates halibut population dynamics and continues to test this 'virtual fishery' under a wide range of management scenarios. The goal is to determine the likelihood of achieving certain sustainability and performance metrics into the future, given different management approaches.

For more information about California Halibut, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/NCCFRMP/Halibut-Studies and wildlife.ca.gov/Conservation/Marine/SCFRMP/Halibut.



California Sheephead

CDFW photo by M. Elyash

California Sheephead

Staff collaborated with the Sportfishing Association of California to develop sampling protocols and collect California Sheephead for a potential fillet length regulation. A total of 180 California Sheephead collected via live trapping were measured and filleted on three sampling trips at Long Beach, Dana Point and Point Loma. The relationship between total length and average fillet length was used to inform a proposed minimum fillet length. The information was presented to the California Fish and Game Commission as a proposed California Sheephead fillet length regulation.



California spiny lobster

CDFW photo by B. Mattioli

California Spiny Lobster

New regulations to implement the Spiny Lobster Fishery Management Plan went into effect during the 2017-2018 commercial and recreational lobster seasons. Regulation changes included a commercial lobster trap limit of 300 traps, a trap tag program, a new recreational season opening time of 6:00 a.m. (previously midnight), and hoop net marking requirements. Staff produced outreach materials and answered a variety of questions from the public regarding the new regulations.

The 2017-2018 lobster fishing season saw just over

688,000 pounds of lobster landed by the commercial fishery, a 5 percent increase from the previous season (~656,000 pounds were landed in the 2016-2017 season). The 2017-2018 recreational lobster season saw a lobster report card return rate of 50 percent, a rate that has held steady for the last few years. The estimated catch for the recreational fishery was approximately 275,000 pounds, or 29 percent of the total (commercial plus recreational) catch.

In 2018, the first annual review of the Spiny Lobster Fishery Management Plan harvest control rules was completed, evaluating the 2016-2017 season. All three indicators (catch, catch per unit effort, and spawning potential ratio) fell above the threshold value and no management actions were triggered. Staff will continue to monitor and adaptively manage the fishery as prescribed by the fishery management plan, in response to changes in fishery and ocean conditions.

The 2017-2018 commercial lobster season was the first season in which lobster operator permit holders were required to complete and submit an End of Season Spiny Lobster Trap Loss Reporting Affidavit (affidavit, CDFW Form 1020). This new requirement is part of a suite of changes to commercial lobster fishing regulations associated with the fishery management plan. The data collected from the affidavit will help CDFW estimate the number of traps lost during a season as well as inform gear recovery programs and studies aimed at minimizing the impacts of fishing gear interactions in the marine environment.

Upon the conclusion of the 2017-2018 commercial lobster season, CDFW saw an affidavit submittal rate of about 90 percent. The estimated average trap loss per active permit holder was approximately 12 percent of the maximum allowed number of traps (300 traps per lobster operator permit). An updated estimate of trap loss based on the reported number of deployed traps will be provided once commercial lobster fishing logbook data become available.

Due to human health concerns caused by high levels of domoic acid in lobster, waters around Anacapa Island, Ventura County and the east end of Santa Cruz Island, Santa Barbara County were closed to the commercial take of spiny lobster on October 16, 2018, as recommended by state health agencies. Staff coordinated with the California Department of Public Health and the Office of Environmental Health Hazard Assessment to inform the public and commercial fishery participants of the area closures via press releases and updates on the CDFW website. The commercial spiny

lobster fishery closure was lifted on November 16, 2018.

For more information about California spiny lobster, visit the Marine Region website at wildlife.ca.gov/Conservation/Marine/Invertebrates/Lobster. The Spiny Lobster Fishery Management Plan and the first harvest control rule report can be found at wildlife.ca.gov/Conservation/Marine/Lobster-FMP.



CDFW divers practice rescue techniques

CDFW photo by D. Osorio

Diving Safety Program

The Diving Safety Program maintained an enviable safety record in 2018 while supporting an unprecedented level of collaborative dive activity. CDFW divers completed 2,100 dives (amounting to 48½ days under water) while conducting research and monitoring for fisheries and conservation work, and enforcement and light maintenance tasks. In addition to re-qualifying 70 active divers, six new candidates were qualified as CDFW Scientific Divers at the 100-hour training course in the spring.

CDFW's underwater efforts were achieved with the assistance of divers from 18 scientific diving organizations (universities, agencies, and others) that provided 92 visiting divers to work on collaborative projects.

The acquisition of two new breathing air compressor systems funded through the California Ocean Protection Council was a significant infrastructure improvement that will support ongoing fishery management and MPA monitoring efforts throughout California.

For more information about the Diving Safety Program, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Diving-Safety.

**CDFW divers completed
2,100 dives, equal to
48½ days under water.**



Dungeness crab in recreational crab trap

photo by K. Joe

Dungeness Crab

The 2017-2018 commercial Dungeness crab season opened on schedule in the central management area, but the northern management area opening was delayed due to poor meat recovery results. Although the northern area opened on January 15, 2018, the fleet voluntarily remained tied to the docks until early February given concerns of persistent low crab meat recovery in Northern California. Statewide commercial landings for the season totaled 20.2 million pounds, 75 percent of which was landed in the northern ports. Low meat recovery-associated delays in the northern management area have historically correlated with high crab yields for the region.

In June, CDFW was notified of the allocation of \$25.6 million in federal disaster relief for the 2015-2016 Dungeness and rock crab fishery disasters. CDFW staff held two informational webinars to discuss and receive feedback from the public on disbursement options. A spending plan was developed that allocated the majority of disaster funds to direct payments to industry (\$22.8 million) to build resiliency within the fisheries. The remaining amount will be used for mitigation (\$2.6 million) to help plan and prepare for future domoic acid events. The disaster funding is expected to be received in early 2019.

For the first time, a contract to facilitate the Dungeness Crab Task Force was managed by staff using funds from the Dungeness crab trap limit account. The contract allowed for continued administration of the task force, participation in a task force meeting, and a tour of Northern California ports in October. During the port tour, staff were able to meet with the Dungeness crab fleet to discuss recent changes to the fishery with the passage of the Dungeness crab urgency bill (SB1310) and the fisheries omnibus bill (SB1309). Based on feedback received during the port

tour, staff prepared several "frequently asked questions" documents that include the information on disaster relief, vessel length restrictions, and changes to fair start rules due to domoic acid-related season delays.

New legislation (SB 1309) authorized CDFW to implement a program for the retrieval of lost or abandoned commercial Dungeness crab trap gear left in the water once the fishing season has ended. Staff worked with individuals participating in a pilot retrieval program, the Dungeness Crab Task Force, and the [Dungeness Crab Fishing Gear Working Group](#) to develop the regulations governing this program, which will be available for public comment in early 2019.

The start of the 2018-2019 Dungeness crab season was subject to closures and delays due to both domoic acid and poor results from meat recovery testing. Domoic acid was responsible for a recreational fishery closure in northern Humboldt and Del Norte counties and a commercial fishery delay from Bodega Head to the Sonoma-Mendocino county line from November 15 until December 8. The CDFW Director announced several meat recovery delays for the northern management area with a final date set for January 15, 2019, the latest the area can be delayed due to poor meat recovery test results. At the time of this report, it is unclear when the two remaining areas in Northern California, which continue to test high for domoic acid, will open to fishing.

For more information about Dungeness crab, visit the CDFW website at wildlife.ca.gov/Crabs.



Bull kelp

CDFW photo by R. Flores-Miller

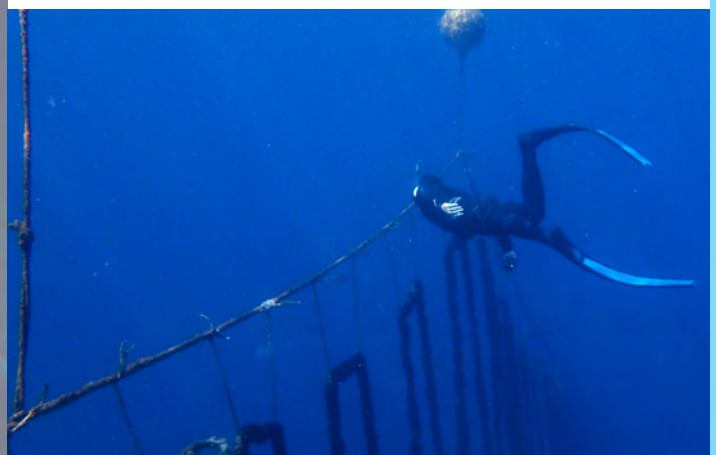
Kelp and Other Marine Algae Management

Staff continued work on the commercial kelp and other marine algae rulemaking, including identifying areas for potential changes, presenting updates to the California Fish and Game Commission's Marine Resources Committee, and meeting with the InterTribal Sinkiyone

Wilderness Council to discuss input and concerns.

Staff provided review and feedback on various permits and projects involving kelp and marine algae, including Letters of Authorization, Wild Broodstock Collection Permits, Scientific Collecting Permits, and commercial kelp harvest plans and kelp bed lease renewal applications. Staff also participated in several working groups and broader collaborative efforts focusing on kelp during 2018. For example, the Greater Farallones National Marine Sanctuary and CDFW Kelp Recovery Working Group developed [recommendations](#) that were approved by the Sanctuary Advisory Council in November. Staff also participated in a Monterey Bay National Marine Sanctuary Advisory Council panel discussion on purple sea urchins and kelp restoration activities, and collaborated with The Nature Conservancy on advancing kelp conservation and science in California.

For more information about kelp and other marine algae, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Kelp.



CDFW diver inspects mussel mariculture operation

CDFW photo by D. Stein

Marine Aquaculture

Staff processed, reviewed, and approved 59 Live Importation Permits, 60 Aquaculture Registrations and nine Restricted Species Permits. Staff also prepared four Budget Change Proposals, three Private Stocking Permits, and four Letters of Authorization.

In collaboration with the State Shellfish Pathologist, State Aquaculture Coordinator, and Director's Aquaculture Disease Committee, staff worked to develop a management response to a newly discovered micro-variant of the oyster herpes virus in San Diego Bay.

Staff completed a survey and summary analysis of 110 acres of aquaculture gear on the 12 state-administered waterbottom leases in Tomales Bay. The results of this study informed the financial surety requirements for

those leases and were distributed to the California Coastal Commission and NOAA Fisheries. Staff worked with the California Coastal Commission to address issues related to gear and infrastructure on a subset of the Tomales Bay leases.

Staff assisted Humboldt Bay shellfish growers maintain compliance with permitting requirements regarding the avoidance of disturbing spawning Pacific Herring.

Staff updated the state waterbottom lease spatial dataset (available on CDFW's MarineBIOS spatial data viewer at wildlife.ca.gov/Conservation/Marine/GIS/MarineBIOS).

Staff performed spatial analysis to determine interactions between lease infrastructure and eelgrass habitat in Tomales Bay, and worked with the Environmental Review Project to provide comments on a State Water Board 401 Certification for Tomales Bay Oyster Company.

Staff coordinated with the State Aquaculture Coordinator and California Fish and Game Commission staff on several administrative and oversight activities related to the state's shellfish aquaculture leases, including: 1) discussion of shellfish aquaculture best management practices and regulations; 2) evaluation of shellfish aquaculture methods through reconciliation of regulatory language; 3) renewal of Santa Barbara Mariculture's state water-bottom lease; and 4) receipt and consideration of Santa Barbara Sea Ranch's new lease application off the coast of Santa Barbara.

For more information about marine aquaculture, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/ABMP/Aquaculture and wildlife.ca.gov/Aquaculture.



White Seabass release in Dana Point Harbor

CDFW photo by K. Johnson

Ocean Resources Enhancement and Hatchery Program (OREHP)

CDFW, in collaboration with California Sea Grant, released the OREHP [Evaluation Report](#). The report was the result of an extensive multi-year evaluation by

an independent Scientific Advisory Committee and included a suite of recommendations for better meeting the OREHP's objectives and goals. To help inform CDFW and the Ocean Resources Enhancement Advisory Panel in their discussions of the evaluation, CDFW partnered with California Sea Grant to gather public opinion on the social values and potential direction of the OREHP from public stakeholder groups in Southern California.

CDFW and California Sea Grant facilitated three town hall meetings to provide an opportunity for stakeholders to comment on the evaluation report's results and recommendations, as well as the future direction of the OREHP. CDFW also accepted written comments from those who were unable to attend the town hall meetings. Preferences for the future of the OREHP varied among stakeholder groups. Most participants expressed interest in continuing the OREHP in some form, whether with White Seabass or another species, particularly California Halibut. Discontinuation of the OREHP was also mentioned by some, with a preference for using collected funds for other efforts that may benefit fisheries and ocean health rather than hatchery operations. CDFW and the OREHP will use the results of the evaluation along with public input to guide the OREHP's next steps and to decide on the future direction of the program.

For more information about the OREHP, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/ABMP/OREHP.



Offloading Pacific Hagfish from a commercial vessel

CDFW photo by T. Tanaka

Pacific Hagfish

In 2018, program staff sampled Pacific Hagfish (hagfish) fishery from Port San Luis, Morro Bay, Moss Landing, and Eureka. Since 2007, despite market demand fluctuations, commercial landings for hagfish have remained relatively stable and have ranged from one to two million pounds annually. Market orders from

Korean importers improved over last year, with hagfish dealers taking all the fish provided by fishermen. However, with the increased demand, ex-vessel price did not increase. While California-caught hagfish are normally exported live to Korea, exporters are experimenting with packaging frozen hagfish. Effort and demand are driven by external market conditions such as the South Korean economy and the fishing activities of Oregon and Washington. Local factors such as bait supply and fuel costs also influence fishing effort.

For more information on Pacific Hagfish, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/NCCFRMP/Hagfish-Studies.



Pacific Herring research on foggy San Francisco Bay

CDFW photo

Pacific Herring

Fishery management plan (FMP) development continued for California's Pacific Herring (herring) fishery in 2018. Through the year, staff worked closely with the FMP Project Management Team on drafting and editing the FMP. Staff also coordinated with California Ocean Science Trust for an external, independent [peer review](#) of the scientific and technical merits of the proposed management strategy, including the harvest control rule framework and essential fishery information. Progress continued on developing ecosystem indicators that will be used to inform the harvest control rule for inclusion in the final FMP, which will likely be presented to the California Fish and Game Commission in 2019.

Staff completed their annual population estimates for herring in San Francisco Bay. Sampling efforts included trawl and egg deposition surveys, as well as coordination with the San Francisco Bay Herring Research Association to continue collaborative research. The 2017-2018 herring season in San Francisco Bay ended with a below average spawning biomass estimate of 15,300 tons. The historical average is 48,500 tons (1979-present), and this was the fourth consecutive

year of below average herring returns. There were 14 spawn events through the season starting in mid-December 2017 and ending in mid-March 2018. The largest spawn event occurred along the San Francisco waterfront in January, which involved an estimated 5,783 tons of herring. Staff also monitored the herring spawning population in Humboldt Bay and Crescent City Harbor, documenting and mapping five and two spawn events, respectively.

The total fishery quota for San Francisco Bay was set at 834 short tons for the 2017-2018 season. Nine commercial fishing vessels participated and landed 611 short tons of herring in San Francisco Bay. The herring fisheries in the northern management areas, Tomales Bay, Humboldt Bay and Crescent City Harbor, remained inactive with quotas set at 350, 60, and 30 short tons, respectively.

For more information about Pacific Herring, visit the CDFW website at wildlife.ca.gov/Fishing/Commercial/Herring and the CDFW Pacific Herring Management News blogsite at cdfwherring.wordpress.com.



Razor Clams

CDFW photo

Razor Clams

2018 marked a second year that the recreational razor clam fishery was closed in both Humboldt and Del Norte counties due to high levels of domoic acid. In Humboldt County, staff collected clams on nine different days between January and November while volunteers in Del Norte County conducted six clam collections between January and August. At least one clam from all sampled areas consistently tested at or above the alert level for domoic acid at 20 parts per million. All 11 razor clams sampled in mid-November were found to exceed the action level and ranged in concentration from 130 to 300 parts per million. For

more information about clams, visit the Marine Region website at wildlife.ca.gov/Conservation/Marine/Invertebrates/Bivalves. For more information about finfish and shellfish health advisories, visit the Marine Region website at wildlife.ca.gov/fishing/ocean/health-advisories.



R/V *Mystinus*

CDFW photo by D. Osorio

Research Vessel Operations

The number of vessels in the Marine Region's research fleet remained unchanged at 15 in 2018, but fleet capabilities were greatly improved. Last year's initiative to enhance capacity culminated in the delivery of one repowered vessel and two new replacement vessels to the fleet. The upgrades and acquisitions were made with support from the California Ocean Protection Council. The new workboats are efficient, reliable, and will make significant contributions to research and monitoring.

R/V Irish Lord – This 32-ft. fiberglass workboat originally built in 1987 was repowered with clean, efficient, and reliable outboard engines. The fuel tanks were replaced, and the work deck was reconfigured to improve capacity and workflow. The R/V *Irish Lord's* home port is Ventura.

R/V Megathura – The 21-ft. fiberglass workboat was constructed by Parker Marine in 2018. This day-boat can support four divers and conduct trap surveys and light oceanographic work. Since delivery in June, it has supported dive surveys to monitor warty sea cucumber abundance around the northern Channel Islands. The R/V *Megathura's* home port is San Diego.

R/V Mystinus – The 29-ft. R/V *Mystinus*, constructed in 2018 by Don Radon Boat Building in Goleta, was purchased with funding from the California Ocean Protection Council in May 2018. Designed as a short-range dive platform with a capacity of six divers, it can also support hook-and-line and trap surveys, light oceanographic work, and remote sensing. The R/V *Mystinus* deployed for 20 field days and more than

200 dives during its inaugural first season from July through October.

R/V Garibaldi – The 45-ft. flagship of the Marine Region, based in San Pedro, assisted in a variety of CDFW research studies as well as collaborative studies from San Diego to Point Conception, including the Channel Islands. The vessel was at sea for 118 days on 33 cruises, traveled 3,748 nautical miles, and used 5,539 gallons of fuel. The R/V *Garibaldi* was out of service for four weeks during the year to reinstall an A-frame, trawling winch, and to replace the auto pilot. During this time, other additions and modifications were made to enable the vessel to trawl.



State record Calico Surfperch

CDFW file photo

Saltwater Angling and Diving Records

Five new saltwater angling and diving records were accepted in 2018 (previous records in parenthesis):

Calico Surfperch angling record: 1 lb. 15 oz. (1 lb. 14 oz.)

Grass Rockfish diving record: 6 lb. 7 oz. (6 lb. 3 oz.)

Vermilion Rockfish diving record: 10 lb. 10 oz. (10 lb. 6 oz.)

Canary Rockfish diving record: 3 lb. 4 oz. (this is a new species for the diving record category)

Dolphinfish (dorado, or mahi mahi) diving record: 28 lb. 0 oz. (24 lb. 4 oz.)

For more information about record saltwater fish and invertebrates, visit the CDFW website at wildlife.ca.gov/Fishing/Ocean/Records.

Marine Region research vessel capabilities were greatly improved in 2018.



Numerous purple sea urchins off Fort Bragg

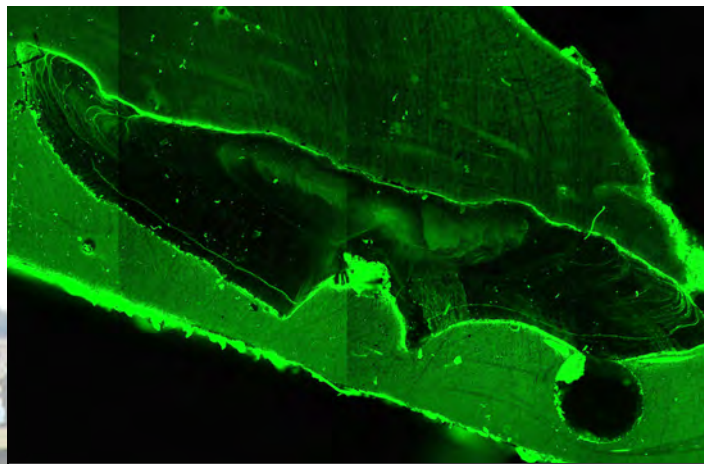
CDFW photo by K. Joe

Sea Urchin

In recent years, purple sea urchins have become so numerous throughout Mendocino and Sonoma counties that food resources for abalone have become greatly reduced, causing starvation conditions for abalone. With increased public interest in reducing purple sea urchin numbers, CDFW staff recommended, and the California Fish and Game Commission adopted, an increase in the recreational daily bag limit from 35 urchins (the general invertebrate bag limit) to 20 gallons for Mendocino and Sonoma counties. This higher bag limit was quickly utilized at several purple sea urchin harvest events at Ocean Cove, Albion Cove and Caspar Cove, coordinated by the Watermen's Alliance and sampled by CDFW. Data from these efforts supported a request by stakeholders that the California Fish and Game Commission increase the bag limit for purple urchins from 20 gallons to 40 gallons in 2019.

Staff have also been key in the formation of the Kelp Ecosystem and Landscape Partnership for Research and Resiliency program (or *KELPRR*) which has drawn more than a dozen partners from agencies, academia, sport diver organizations, environmental groups, and the fishing industry. The organization is addressing the problems caused by the recent explosion in purple sea urchin numbers and how to restore Northern California kelp forests. *KELPRR* partners are developing ecosystem monitoring programs, educational materials, and options for use of harvested urchin materials. For more information about sea urchin, visit the Marine Region website at wildlife.ca.gov/Conservation/Marine/Invertebrates/Sea-Urchin.

Public interest spurred efforts to reduce purple sea urchin numbers in 2018.



Thin-sectioned Barred Surfperch otolith

CDFW photo

Surfperch and Other Surf Fishes

Staff continued to monitor surfperch commercial and recreational hook-and-line fisheries in Central and Northern California. Barred Surfperch and Redtail Surfperch continued to dominate commercial landings and the recreational catch. The Morro Bay port complex is the hub of the Barred Surfperch commercial fishery while Redtail Surfperch are landed primarily in Eureka. Preliminary 2018 statewide Barred Surfperch and Redtail Surfperch annual commercial landings indicate catches were slightly above 10-year averages. Neutral to favorable oceanographic conditions following the 2014 to 2016 El Niño event continued in 2018.

Staff continued collecting essential fishery information using fishery-independent surveys with hook-and-line gear from San Luis Obispo County to Mendocino County, and completed progressive angler surveys to document angler effort along Monterey County sandy beaches. Since 2007 approximately 1,300 fishery-independent surveys have been completed by staff and more than 16,900 anglers have been documented during approximately 500 progressive angler surveys.

In collaboration with San Francisco State University, the lab analysis portion of an age validation study was completed for Barred Surfperch treated with oxy-tetracycline, an otolith marker. A fluorescence laser microscope was used to observe and photograph the otoliths after they were thin-sectioned and mounted on slides. The photos are being examined and measured digitally using Fiji ImageJ software to validate the whole-otolith ageing method.

Staff began developing a management strategy evaluation for Redtail Surfperch in conjunction with the Data Limited Methods Toolkit project. Staff built an operating model for both the recreational and commercial beach fisheries for this species and began evaluating the effects of applying a wide range of management

scenarios to this virtual fishery into the future.

Staff continued to analyze data from the surf fish beach seine study. Preliminary results showed no strong relationships between most environmental factors including temperature, tide height, and tidal flux (incoming vs. outgoing) and fish abundance for each of the project species (Barred Surfperch, Walleye Surfperch, California Corbina, Spotfin Croaker, Yellowfin Croaker).

For more information about surfperch and surf fish studies, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/NCCFRMP/Surfperch-Studies and wildlife.ca.gov/Conservation/Marine/SCFRMP/SurfFish.

Preliminary commercial landing totals for Night Smelt show a 24 percent increase over 2017.

True Smelt

Preliminary commercial Night Smelt landings totaled 219,494 pounds in 2018, increasing 24 percent from 2017. Surf Smelt or “day fish” landings increased slightly from an all-time low of 688 pounds in 2017 to 1,654 pounds in 2018. Historically, both species were targeted in California from Monterey County to the Oregon border; however, the majority of the landings originate in Northern California. These fisheries, commercial and recreational, are shore-based and fishermen use A-frame dip nets for taking Night Smelt and Surf Smelt, while cast nets are also used for Surf Smelt.

For more information about true smelts, visit the CDFW website at www.wildlife.ca.gov/Conservation/Marine/NCCFRMP/True-Smelts



Warty sea cucumber amid feather stars

CDFW/MARE photo

Warty Sea Cucumber

Staff implemented the first commercial seasonal closure to protect spawning groups of warty sea cucumber. The closure, which spans 3½ months from March 1 -June 14 was adopted by the California Fish and Game Commission in 2017 and went into effect for the 2018 season. Staff completed the fifth consecutive year of dive and laboratory research to collect essential fishery information for warty sea cucumber populations at the northern Channel Islands. Staff performed seasonal dive surveys at six different locations (inside and outside of marine protected areas) to measure seasonal changes in densities and to characterize size distributions. This is the first fishery in California where essential fishery information from within MPAs is being actively used for management. To date, more than 4,000 warty sea cucumber have been enumerated and measured, with an additional 2,201 individuals collected and dissected. Data collected by CDFW during this year's first seasonal closure suggest that spawning aggregations were largely protected by the closure period. A collaborative investigation using a remotely operated vehicle was also performed in spring and fall of 2018 with [Marine Applied Research and Exploration](#) to examine the seasonal depth distribution of warty sea cucumber during spawning and non-spawning periods. The information collected by this remotely operated vehicle research will assist in evaluating the degree to which populations use shallow depths for reproductive purposes and the role that deeper depths may play in providing refuge to warty sea cucumber, which are primarily targeted by divers. In addition, this information will assist in assessing the effectiveness of current CDFW surveys in monitoring populations of warty sea cucumber. For more information about the collaborative warty sea cucumber remotely operated vehicle density study, read the [MPA Management Project newsletter](#).

Catching Surf Smelt with an A-frame dip net

CDFW photo by K. Lesyna





White Seabass school near Anacapa Island

CDFW/MARE photo

White Seabass

Staff continued to collect samples for a study updating the age at maturity for White Seabass. Collaborating with sport fishermen, staff collected an additional 11 samples and 42 individual fish. Collecting fish within the size range needed has been very challenging, but staff anticipate a stronger sampling season in 2019 with the help of additional staff members targeting fishing trips in the Santa Barbara area.

Staff collected and analyzed commercial and recreational data as part of the annual review of the White Seabass Fishery Management Plan for the 2017-2018 season. Staff evaluated the numbers and sizes of White Seabass landed, information on forage fish availability, and socioeconomic data to determine if points of concern had been met. None of the five main points of concern were met for the season and no further action was needed.

For more information about White Seabass, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/NCCFRMP/White-Seabass and wildlife.ca.gov/Conservation/Marine/SCFRMP/White-Seabass.



State/Federal Marine Programs

These programs are responsible for fisheries jointly managed by state and federal entities.



Bin of rockfish offloaded from a commercial vessel

CDFW photo by J.B. Batten

Groundfish

Management and Research – California's sport and commercial groundfish fisheries (which include more than 90 species of rockfish, roundfish, ratfish, skates and sharks) remained within prescribed annual catch limits and accountability measures in 2018 due to active monitoring and management by state and partner agencies and stakeholders.

The regulatory activities for the 2019-2020 groundfish fisheries were finalized in 2018. These resulted in several increased opportunities for California's sport and commercial fisheries, due in part to nearly all overfished stocks being declared rebuilt, and more optimistic stock assessments for Yelloweye Rockfish and Cowcod — two overfished species that continue to limit access to healthy stocks. For Yelloweye Rockfish, less restrictive annual catch limits were implemented for 2019 due to a more positive stock status outlook in the most recent assessment, and the continuing need for stability in groundfish fishing opportunities for California's coastal fishing communities. For Cowcod, due to the stock being projected to be rebuilt by 2019, staff was able to document that there would be low risk to the stock if the annual catch target and allowable fishing depths were increased.

However, not all the new stock assessment information was optimistic, as the Lingcod stock assessment off California was found to be in the precautionary zone. Consequently, recreational anglers in much of California will face a reduced bag limit from two fish to one fish in 2019, while commercial fishermen will experience a reduction in their vessel-based trip limits. Staff answered questions and responded to numerous

comments about the new science and management actions during the 2018 state and federal regulatory processes which implement these reductions, and conducted a number of outreach efforts.

Staff also completed a California Fish and Game Commission regulation change package that will apply the new federal recreational groundfish fishing regulations for 2019 and 2020 in state waters.

In collaboration with federal agency partners and nongovernmental organizations, staff participated in developing recommendations for essential fish habitat for groundfish, and adjustments to the trawl rockfish conservation areas, which are depth-based closures to protect overfished species. The goals were to minimize adverse effects on sensitive habitat that can occur when fishing with trawl gear, to allow increased access to productive fishing grounds, and to increase resource-use efficiency.

Staff provided analyses to inform two Endangered Species Act biological opinions related to take of listed salmon in the Pacific Coast groundfish fishery and the Pacific Halibut fishery. Staff also developed management measures to implement the federal Incidental Take Statements for California fisheries. Staff also participated in reviews of Eulachon and seabirds, other Endangered Species Act-listed species that are taken in the groundfish fishery.

Staff reviewed, supported, and recommended terms and conditions for several new federal Experimental Fishery Permits that will commence in 2019. One will authorize new commercial midwater trawl fishery activities off California, while others have the goal of developing a midwater hook-and-line commercial fishery targeting underutilized midwater rockfish species.

Staff completed a regulation change package for state logbook requirements that the California Fish and Game Commission adopted on December 12, 2018. Starting April 1, 2019, commercial fishermen participating in the federally-managed groundfish trawl fishery will no longer be required to fill out state logbooks.

Staff continue to lead efforts to evaluate visual survey data collected from nearshore waters during remotely operated vehicle studies. Developing a fishery-independent method for determining groundfish abundance in nearshore waters has the potential to

enhance future stock assessments.

Education and Outreach – Staff participated in the biennial Western Groundfish Conference held in February in Santa Cruz by contributing to the planning committee and presenting information about barotrauma in rockfish and the benefits of using various types of descending devices in the recreational groundfish fishery.

With help from CDFW's California Recreational Fisheries Survey project, staff completed 23 outreach assignments during season-opening weekends in the Northern, Mendocino, San Francisco and Central recreational groundfish management areas. Staff provided anglers with more than 400 packets containing the 2018 recreational groundfish regulations, species identification flyers, and information on the CalTIP program. Staff also distributed more than 160 descending devices.

Staff prepared a number of groundfish-related press releases and blog posts in 2018 and maintained and updated several CDFW web pages and our recreational groundfish phone hotline throughout the year.

Visit the CDFW website at wildlife.ca.gov/conservation/marine/groundfish for more information about groundfish.



Offloading commercially-caught Pacific Halibut

CDFW photo by J.B. Batten

Pacific Halibut

CDFW continues to actively manage the recreational Pacific Halibut fishery in California waters. Based on projected early attainment of the 2018 California quota, an in-season fishery closure was implemented on September 21, 2018, following discussions with the International Pacific Halibut Commission, Pacific Fishery Management Council and National Marine Fisheries Service. Final 2018 recreational catch estimates totaled 31,156 net pounds – or 101 percent of the quota. The average net weight per kept fish in 2018 was approximately 24 pounds, the highest in the last ten years.

In 2018, four commercial vessels participated across three of the opening days in the directed fishery; the preliminary landings were 2,457 net pounds. The landings were made into the port of Eureka and sale of the fish produced an estimated \$17,800 in ex-vessel revenue for Northern California coastal communities. CDFW staff were present at the offloads to conduct biological sampling in coordination with the International Pacific Halibut Commission's commercial fishery sampling program. Visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Pacific-Halibut for more information about Pacific Halibut.



Collecting data on commercially-caught tuna

CDFW photo by M. Horeczko

Pelagic Fisheries and Ecosystems

Highly Migratory Species – Involvement in the Pacific Fishery Management Council (Council) process required substantial contributions this year from Marine Region Highly Migratory Species (HMS) Management Project staff representing CDFW in high-priority issues on the HMS Management Team. Team members participated in numerous meetings and contributed reports to support decisions regarding deep set buoy gear, a new commercial gear type to sustainably target swordfish off the West Coast, and adoption of a new methodology for determining bycatch performance metrics in the large-mesh drift gillnet fishery. Staff also contributed to the dynamic management needs for international stocks important to commercial and recreational fisheries such as Pacific Bluefin Tuna and North Pacific Albacore Tuna.

HMS Project staff completed another year of in-season catch monitoring for Pacific Bluefin Tuna and other tunas and expanded commercial dockside Pacific Bluefin Tuna sampling to include smaller volume landings in the hook-and-line and gillnet fisheries. Hundreds of Pacific Bluefin Tuna genetic samples were collected, contributing to a Pacific-wide population study.

Staff continued to improve HMS data quality, revising and enhancing automated error checking through the Commercial Landings Data Improvement Process database management system. The HMS team also coordinated with CDFW's Law Enforcement Division to improve data tools that review permitting and license compliance, and participated in a multi-agency collaborative team to improve and coordinate federal and state HMS data quality, product development and standardization for the Eastern and Tropical Pacific.

Federal Ecosystem Planning – The Marine Region supported the Council's Ecosystem Work Group, participating in climate change scenario planning for the West Coast and initiating a five-year review of the Pacific Coast Fishery Ecosystem Plan for the U.S. portion of the California Current Large Marine Ecosystem. The review consists of revising and updating the goals and objectives of the Council's Fishery Ecosystem Plan to be more specific and measurable, as well as developing an outline of revisions to the plan that reflect updated science and the results of Fishery Ecosystem Plan initiatives.

Coastal Pelagic Species – The Coastal Pelagic Species (CPS) Management Project continued to engage in federal fishery management as members of the Council's CPS Management Team. The team held meetings throughout the year and prepared various reports. Importantly, this work supported the CPS Fishery Management Plan amendment processes for the live bait fishery, setting harvest specifications for Pacific Sardine, evaluating Northern Anchovy management status, and approving exempted fishing permits to provide CPS stock assessment information.

CDFW was a partner in the California Pelagic Species Aerial Survey, which started in 2012 as a collaborative effort with the California Wetfish Producers Association. In addition to regular surveys, staff participated in the California Wetfish Producers Association summer nearshore collaborative survey with NOAA Fisheries, conducting sampling aboard purse seine vessels.

Staff continued dockside commercial CPS fisheries sampling, collecting 97 samples and ageing 575 otoliths for use in stock assessments.

The CPS Management Project participated in various outreach activities, including meetings with the commercial live bait industry and attending the annual California Wetfish Producers Association meeting.

Visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Pelagic for more information about the pelagic fisheries and ecosystem management.



Sport-caught Chinook Salmon at Noyo Harbor, Fort Bragg

CDFW photo

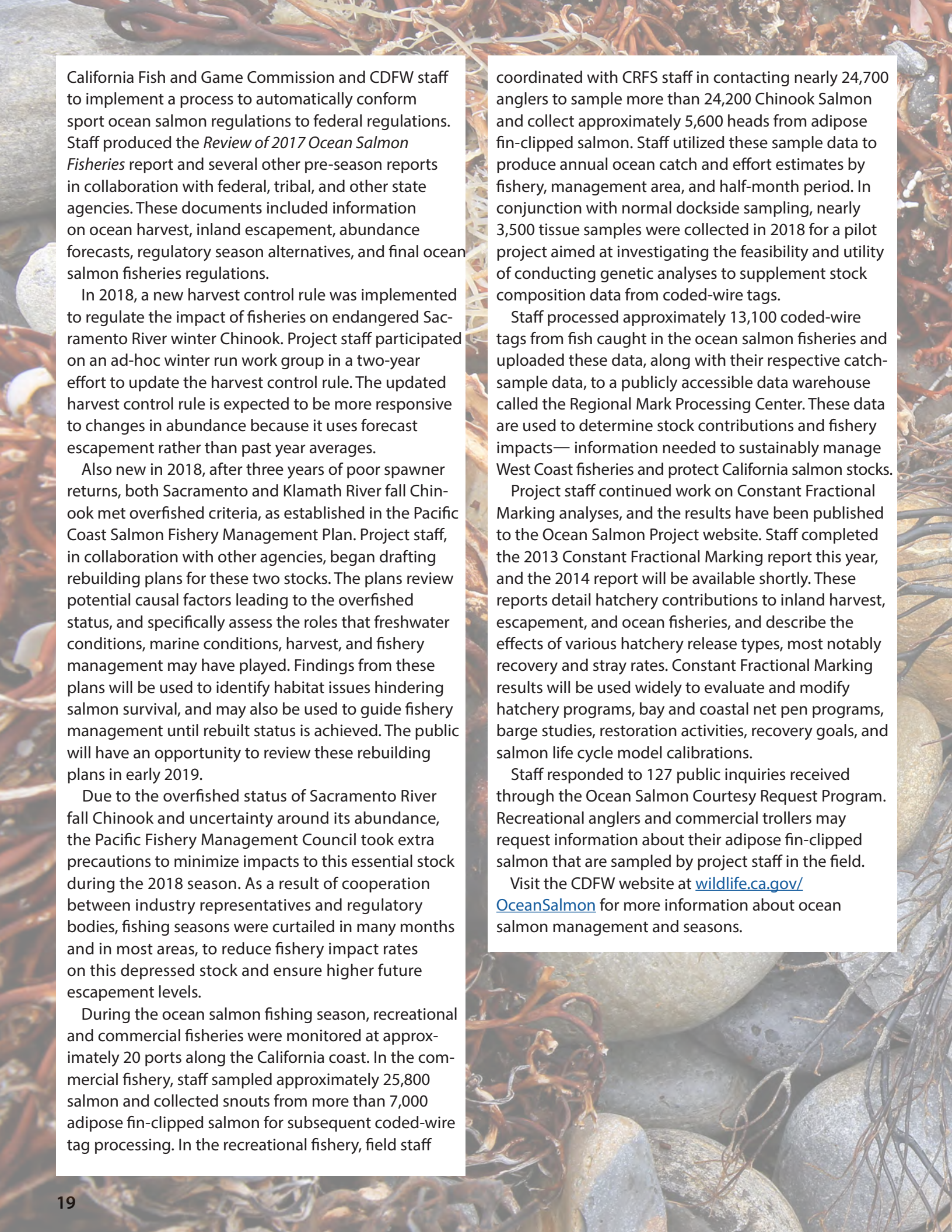
Salmon

At the beginning of the 2018 ocean salmon management cycle, project staff conducted the annual California Ocean Salmon Information Meeting, which attracted about 120 interested stakeholders. Staff provided information on 2017 ocean salmon fisheries, spawning escapement, stock-specific abundance forecasts, and the outlook for 2018 sport and commercial ocean salmon fisheries. Members of the public provided input to a panel of California salmon scientists, managers, and representatives for consideration in the development of 2018 ocean salmon regulations.

Project staff involved on the Klamath River Technical Team coordinated with federal, tribal, and other state agencies to consolidate and summarize catch and other survey information on Klamath River fall Chinook for use in the 2018 management cycle.

Staff participated in the process of drafting 2018 ocean salmon seasons with the Pacific Fishery Management Council and worked together with the

**Genetic samples
were collected from
hundreds of Pacific
Bluefin Tuna as part
of a Pacific-wide
population study.**

The background of the page is a photograph of a rocky shoreline covered in various types of seaweed. The seaweed includes long, thin, reddish-brown strands and thicker, more complex brown and orange structures. The rocks are dark and smooth, partially covered by the seaweed.

California Fish and Game Commission and CDFW staff to implement a process to automatically conform sport ocean salmon regulations to federal regulations. Staff produced the *Review of 2017 Ocean Salmon Fisheries* report and several other pre-season reports in collaboration with federal, tribal, and other state agencies. These documents included information on ocean harvest, inland escapement, abundance forecasts, regulatory season alternatives, and final ocean salmon fisheries regulations.

In 2018, a new harvest control rule was implemented to regulate the impact of fisheries on endangered Sacramento River winter Chinook. Project staff participated on an ad-hoc winter run work group in a two-year effort to update the harvest control rule. The updated harvest control rule is expected to be more responsive to changes in abundance because it uses forecast escapement rather than past year averages.

Also new in 2018, after three years of poor spawner returns, both Sacramento and Klamath River fall Chinook met overfished criteria, as established in the Pacific Coast Salmon Fishery Management Plan. Project staff, in collaboration with other agencies, began drafting rebuilding plans for these two stocks. The plans review potential causal factors leading to the overfished status, and specifically assess the roles that freshwater conditions, marine conditions, harvest, and fishery management may have played. Findings from these plans will be used to identify habitat issues hindering salmon survival, and may also be used to guide fishery management until rebuilt status is achieved. The public will have an opportunity to review these rebuilding plans in early 2019.

Due to the overfished status of Sacramento River fall Chinook and uncertainty around its abundance, the Pacific Fishery Management Council took extra precautions to minimize impacts to this essential stock during the 2018 season. As a result of cooperation between industry representatives and regulatory bodies, fishing seasons were curtailed in many months and in most areas, to reduce fishery impact rates on this depressed stock and ensure higher future escapement levels.

During the ocean salmon fishing season, recreational and commercial fisheries were monitored at approximately 20 ports along the California coast. In the commercial fishery, staff sampled approximately 25,800 salmon and collected snouts from more than 7,000 adipose fin-clipped salmon for subsequent coded-wire tag processing. In the recreational fishery, field staff

coordinated with CRFS staff in contacting nearly 24,700 anglers to sample more than 24,200 Chinook Salmon and collect approximately 5,600 heads from adipose fin-clipped salmon. Staff utilized these sample data to produce annual ocean catch and effort estimates by fishery, management area, and half-month period. In conjunction with normal dockside sampling, nearly 3,500 tissue samples were collected in 2018 for a pilot project aimed at investigating the feasibility and utility of conducting genetic analyses to supplement stock composition data from coded-wire tags.

Staff processed approximately 13,100 coded-wire tags from fish caught in the ocean salmon fisheries and uploaded these data, along with their respective catch-sample data, to a publicly accessible data warehouse called the Regional Mark Processing Center. These data are used to determine stock contributions and fishery impacts—information needed to sustainably manage West Coast fisheries and protect California salmon stocks.

Project staff continued work on Constant Fractional Marking analyses, and the results have been published to the Ocean Salmon Project website. Staff completed the 2013 Constant Fractional Marking report this year, and the 2014 report will be available shortly. These reports detail hatchery contributions to inland harvest, escapement, and ocean fisheries, and describe the effects of various hatchery release types, most notably recovery and stray rates. Constant Fractional Marking results will be used widely to evaluate and modify hatchery programs, bay and coastal net pen programs, barge studies, restoration activities, recovery goals, and salmon life cycle model calibrations.

Staff responded to 127 public inquiries received through the Ocean Salmon Courtesy Request Program. Recreational anglers and commercial trollers may request information about their adipose fin-clipped salmon that are sampled by project staff in the field.

Visit the CDFW website at wildlife.ca.gov/OceanSalmon for more information about ocean salmon management and seasons.

Resource Assessment Programs

These programs are responsible for collecting and disseminating recreational and commercial fishery-dependent data.



Scientific aid collects information from a recreational fisherman

CDFW photo

California Recreational Fisheries Survey (CRFS)

CRFS field operations are supported by 15 permanent staff and, on average, 65 temporary Fish and Wildlife scientific aids. Annually, CRFS collects data on the catch of more than 100,000 anglers and examines more than 190,000 of the retained fish and invertebrates. In 2018, CRFS conducted several thousand private and rental boat surveys at launch ramps, piers, jetties and breakwaters, and party/charter boat dockside surveys. During these assignments, CRFS samplers collected data on angler effort, demographics, and catch, and collected biological measurements on recreationally caught finfish. CRFS also conducted party and charter boat onboard assignments to collect additional data on fishing location and discarded finfish.

In 2018 CRFS, in collaboration with the Recreational Fisheries Data Project, designed and implemented two beach and bank pilot studies to estimate effort and catch. The new catch rate survey was designed based on recommendations from a national review of CRFS methods in 2011. The survey implemented weighted probability sampling to increase the precision of the estimates and to lower survey costs. Preliminary results show a 20 percent increase in the number of angler interviews with anglers who had completed a fishing trip, using the same level of staffing as the legacy survey. CRFS conducted hundreds of beach and bank catch rate surveys along California's 1,100 miles of coastline. CRFS staff entered the data collected during the field surveys and the pilot studies into the CRFS data system (see Recreational Fisheries Data Project, pg. 21). [California Recreational Fisheries Survey Outreach](#) – CRFS field staff provide outreach to the recreational fishing

CRFS data and estimates are essential for managing California's diverse marine fisheries.

community by sharing informational materials on sportfishing regulations, species identification, marine protected areas, barotrauma and the use of descending devices, whale entanglement, and domoic acid.

For more information about the California Recreational Fisheries Survey, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/CRFS.



Commercial fishing vessel at sea

CDFW photo

Marine Fisheries Statistical Unit

Staff collects, processes, and audits commercial fishery landings data, including landing receipts, commercial passenger fishing vessel logbooks, spiny lobster logbooks, and transportation receipts. Staff design, order, and distribute all paper landing receipts and commercial passenger fishing vessel logs for constituents. Marine Fisheries Statistical Unit staff also process all commercial fishery data requests received from commercial fishing license holders and other authorized requestors.



Recreational saltwater fisherman

CDFW photo by E.W. Roberts III

Pacific Recreational Fisheries Information Network (RecFIN)

Marine Region submits California Recreational Fishery Survey (CRFS) estimates to RecFIN on a monthly basis. RecFIN provides a centralized data system to house recreational fisheries information from California, Oregon, and Washington. CRFS and the Recreational Fisheries Data Project staff represent California on the RecFIN Technical Committee, Data and Technology Subcommittee and the Statistical Subcommittee. Through these committees, staff support RecFIN efforts to coordinate the coastwide collection of marine recreational finfish data and procedures for estimating catch, effort and participation. CRFS and the Recreational Fisheries Data Project also collaborated with RecFIN programmers on validating estimates and routines in the new RecFIN database, which was launched in spring 2017. RecFIN enhancements for CRFS data and estimates continued through 2018 and are expected to continue into 2019. For more information about RecFIN, visit the website at www.recfin.org.



CRFS data is used to monitor Yelloweye Rockfish catches

CDFW/MARE photo

Recreational Fisheries Data Project

The Recreational Fisheries Data Project and CDFW's Data and Technology Division staff continued to develop and maintain a data system for CRFS catch,

effort, biological, and spatial data and estimates.

The system includes a centralized relational database to store information, a data entry system with built-in error checks, validation routines to improve data accuracy, and automated reports. The data system increases CDFW efficiency, improves data accuracy and provides the flexibility to align data capture with changing management needs.

CRFS data and estimates are essential for managing California's diverse marine fisheries. CDFW, the California Fish and Game Commission, the Pacific Fishery Management Council, the International Pacific Halibut Commission and the National Marine Fisheries Service used CRFS data and estimates for fishery management in 2018. These uses included: in-season monitoring for species of concern such as Cowcod, Yelloweye Rockfish and Pacific Halibut; developing harvest guidelines; conducting regulatory analyses, and making other critical management decisions. CRFS data were also used in the Marine Protected Area Monitoring Action Plan to examine historical recreational fishing effort across the State as well as local fishing mortality.

Statistical and Technical Support – Recreational Fisheries Data Project staff provided statistical and technical assistance to various projects in support of the management and restoration of fish stocks. These included:

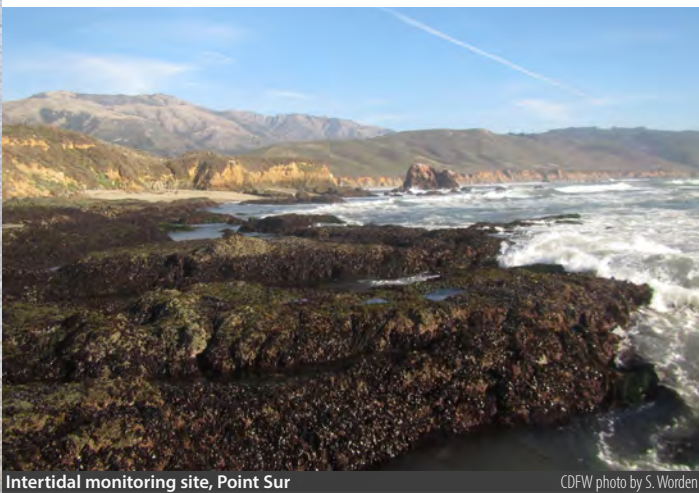
- Providing CRFS data, estimates, and data summaries to various CDFW projects, stock assessors, university researchers, graduate students, the Pacific Recreational Fisheries Information Network (RecFIN), and other State and federal agencies
- Providing advice on use of CRFS data and estimates
- Providing statistical advice on survey design and developing estimation procedures for CRFS pilot studies. These studies are testing use of an online survey to collect recreational fishing effort data, and use of field surveys for collecting recreational catch rate and effort data on beaches and banks
- Providing statistical advice on data analyses for several CDFW research projects including a comparison of the total length of California Sheephead with corresponding fillet lengths
- Reviewing publications that used CRFS data and estimates

For more information about the Recreational Fisheries Data Project, visit the CDFW website at wildlife.ca.gov/Conservation/Marine/Recreational-Fisheries-Data

Habitat Conservation Programs

Agreements for Sharing Confidential Data

Staff from CDFW's Marine Region, Office of the General Counsel, and Data and Technology Division worked together to incorporate State data security requirements into new data sharing agreements. Eight data-sharing agreements were approved to allow federal and academic fishery and socioeconomics scientists to incorporate confidential state fisheries data into their project analyses.



Intertidal monitoring site, Point Sur

CDFW photo by S. Worden

Climate Change Activities

Staff participated on the Advisory Group for the Coast and Ocean Summary Report that was published as part of California's Fourth Climate Change Assessment. Staff also provided updates to the Natural Resources Agency on CDFW's current status for actions included within the 2018 and 2014 Safeguarding California documents and the 2009 Climate Adaptation Strategy. Staff participated in several workshops that focused on climate-related topics: monitoring harmful algal blooms to inform seafood safety and fisheries management, integration of ocean acidification hotspots into management of California fisheries, and potential direct and indirect effects of climate change on fisheries and communities. Starting in August, staff also met monthly with individuals from the California Ocean Science Trust and the California Fish and Game Commission, and more recently the California Ocean Protection Council, to discuss the coordination of climate-related efforts. This group noted several federal and state efforts that focus on climate and fishing communities that would benefit from this synergism, and identified several associated

objectives and tasks including a workshop to be hosted by the California Ocean Science Trust in 2019.

Staff participated on the Coastal Ocean Working Group of the State's Climate Action Team. Staff also represented West Coast fishery managers on the California Current Acidification Network steering committee.



Taking samples of mud shrimp in Humboldt Bay

CDFW photo by R. Garwood

Environmental Review and Water Quality Project

During 2018, staff in the Environmental Review and Water Quality Project continued to work on a wide variety of projects, permits, and statewide plans. Staff participated in more than 60 pre-project review meetings and reviewed over 600 environmental documents (plans, surveys, reports, permits, public notices, California Environmental Quality Act, California Endangered Species Act, etc.). The review effort included more than 120 California Environmental Quality Act documents, 90 U.S. Army Corps of Engineers Public Notices, 150 monitoring plans and reports, 40 invasive species survey reports, 85 permits from various agencies and over 50 scientific collection permits. Topics reviewed included: wave energy, desalination plant impacts, power plant impacts, dredging impacts, beach nourishment projects, contaminant site remediation, mitigation projects, California Endangered Species Act impacts, tribal concerns, State Water Resources Control Board policy review, artificial reefs, mitigation proposals, eelgrass restoration, invasive species control projects, Scientific Collecting Permits, aquaculture projects, alternative energy projects, and dock and pier construction impacts. In addition, staff participated

in the review and development of several U.S. Navy, U.S. Marine Corps and U.S. Air Force Integrated Natural Resource Management Plans.

Environmental Review and Water Quality Project Coordination and Collaboration – Staff worked closely with other agencies, applicants, and CDFW regions to coordinate environmental review activities. 2018 activities included:

- Participating on the Humboldt Bay Eelgrass Management Plan Team
- Participating on the CDFW Mitigation Banking Team
- Addressing sand mining, dredging and oyster shell harvesting impacts in San Francisco Bay as part of the San Francisco Bay Conservation and Development Commission
- Participating on the Statewide and Regional Coastal Sediment Management teams
- Participating on the Los Angeles Dredge Material Management Team
- Participating in the development of a monitoring plan to determine impacts to Longfin Smelt from hydraulic dredging operations in San Francisco Bay
- Participating as part of an internal working group to develop a mitigation plan for impacts associated with the Poseidon Desalination Facility in Carlsbad
- Completing Amendment No. 7 for Caltrans San Francisco-Oakland Bay Bridge Seismic Retrofit Project Incidental Take Permit
- Representing CDFW on the newly formed California Ocean Renewable Energy Taskforce
- Participating in several Department of Defense Integrated Natural Resource Management Plan reviews and meetings
- Participating at Beach Ecology Coalition meetings
- Helping to develop and implement structural changes to the CDFW-wide Scientific Collecting Permit program through both a rulemaking change and a new online application and reporting system.
- Developing an online survey for anglers and divers to better understand how artificial reefs are utilized by California's recreationalists.
- Coordinating eelgrass restoration and monitoring efforts with the Morro Bay National Estuary Program
- Completing the 2016-2017 Grunion Spawning Habitat Field Report
- Completing the Mission Bay Ferry Terminal and Water Taxi Project Incidental Take Permit



Statewide Marine Protected Area (MPA) Management Project

California is home to the largest ecologically connected network of MPAs in North America, including 124 MPAs and 14 special closures encompassing 16 percent of state waters. CDFW manages the MPA Network using a partnership-based approach through the [MPA Management Program](#), which includes four core components: 1) outreach and education, 2) research and monitoring, 3) enforcement and compliance, and 4) policy and permitting. This approach ensures that the MPA Network is adaptively managed with active engagement across the ocean community to meet the goals of the [Marine Life Protection Act](#).

Outreach and Education — Staff continue to focus on increasing public awareness to enhance compliance with MPA regulations. More than 14,600 guidebooks; 36,300 brochures; 7,500 posters; 1,300 logo stickers, and 400 information cards were distributed. These publications were shipped to 235 locations such as sporting goods stores, scuba and ecotourism groups, aquariums, schools, parks, campgrounds, harbors, non-profit businesses, commercial fishing enterprises, and various individuals. The [guidebooks and brochures](#) were also available online, through CDFW offices, and at special events.

To spotlight individual MPAs, staff continued writing articles for the Marine Management News blogsite series, [Exploring California's Marine Protected Areas](#). Staff wrote an article that was published in the March-April issue of *Outdoor California*, [Crystal Cove: Exploring California's Undersea Wilderness off Orange County's Protected Wild Coast](#), which featured a state marine conservation area. In addition, two new products were released in 2018, including an MPA educational video

[Safeguarding an Underwater Wilderness](#) and the MPA Management Project [e-newsletter](#).

Through a cooperative partnership with the California Ocean Protection Council (OPC) and California Marine Sanctuary Foundation, interpretive and regulatory signs were developed and installed at key marinas, harbors, and other ocean access points throughout the state. To date, there are 450 signs installed statewide, with 33 “Interpretive Signs” that highlight individual MPAs, 11 “You Are Here” signs, 11 “No Fishing” signs, and four “Harbor” signs installed in 2018.

More than 15,600 students participated in the [MPA Parks Online Resources for Teachers and Students program](#) in 2018. More than 60,000 students have participated since this CDFW and California Department of Parks and Recreation partnership began in 2014. The program connects resource experts in the field with students in their classrooms, and core curriculum teaches students about the MPA Network. Modules have been created for Año Nuevo State Marine Reserve, Point Lobos State Marine Reserve, Crystal Cove State Marine Conservation Area, and Pyramid Point State Marine Conservation Area, that teach students about elephant seals, kelp forests, tide pool ecology, and the salmon lifecycle, respectively.

Research and Monitoring – The Marine Life Protection Act requires the MPA Network be monitored to evaluate progress toward meeting its goals, and that the results of monitoring inform adaptive management decisions. The vehicle for guiding research and monitoring activities across California’s MPA Network is the MPA Monitoring Program. CDFW, OPC, and the California Fish and Game Commission collaboratively lead the MPA Monitoring Program, which includes two phases: 1) regional baseline monitoring and 2) statewide long-term monitoring.

Phase 1 concluded in February 2018, with data and results for the North Coast MPAs described in [technical reports](#) for eleven funded research projects and summarized in a [“State of the Region” report](#). This information was used to develop an initial [5-year management review](#) regarding regional MPA implementation. Phase 1 was completed in the Central Coast in 2013, the North Central Coast in 2016, and the South Coast in early 2017; all [Phase 1 products](#) are available on the CDFW website.

With the completion of Phase 1 for all four coastal planning regions, CDFW, OPC, and the California Fish and Game Commission began to develop Phase 2: long-term, statewide monitoring. To guide long-term

monitoring, CDFW and OPC developed a [MPA Monitoring Action Plan](#) which was adopted by the California Fish and Game Commission and OPC in October 2018. Staff worked with partners to develop quantitative and expert approaches to inform the Action Plan, including co-mentoring three post-doctoral researchers from UC Davis. OPC approved \$9.5 million for long-term monitoring projects, and released a [solicitation for proposals and statement of qualifications](#) on November 1, 2018. Projects will be selected based on their alignment with the Action Plan and will begin data collection in 2019 upon OPC’s approval at their May 2019 meeting.

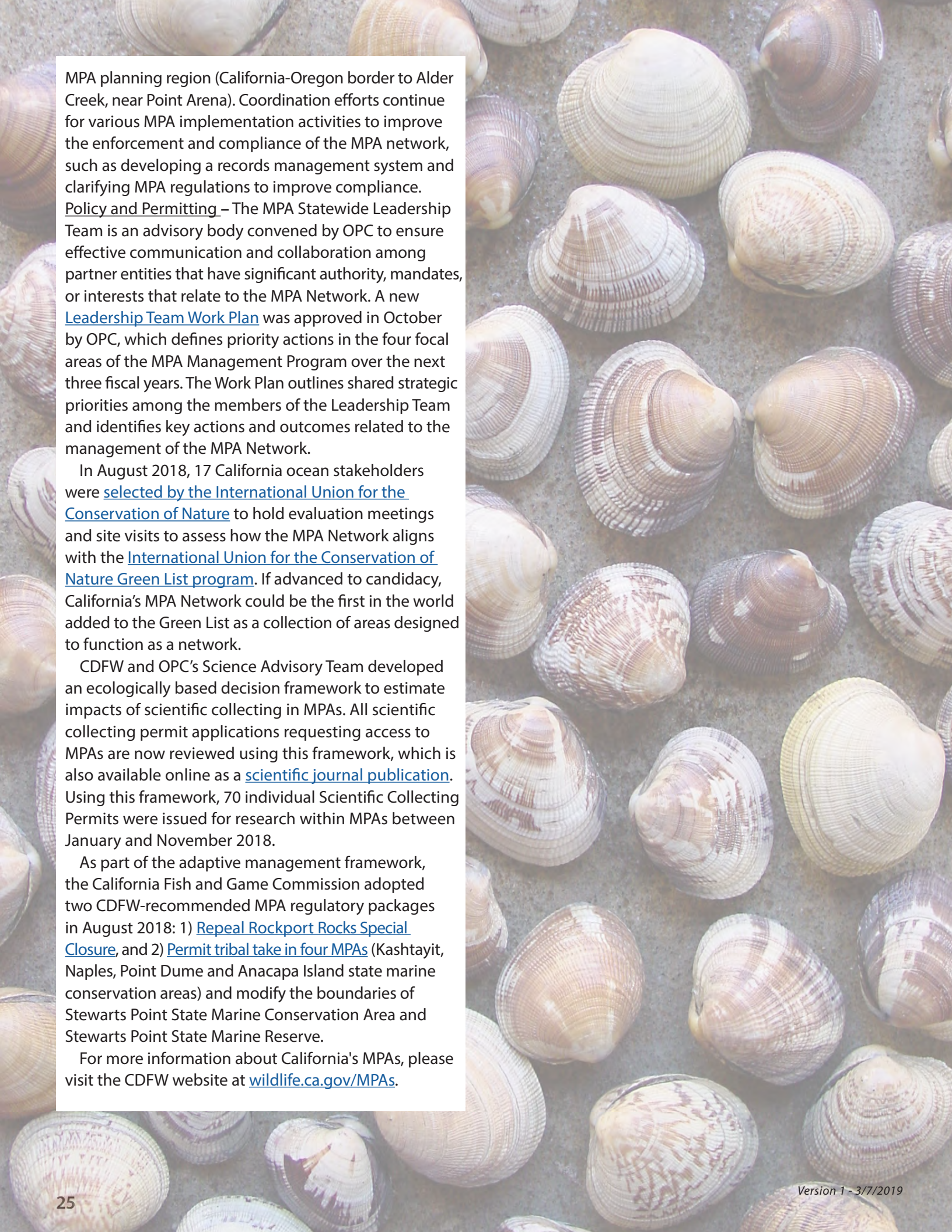
Staff continue to build cooperative working relationships with many of our partners by participating in more than 40 days in the field on research projects in 2018. Collaborators included The Partnership for Interdisciplinary Studies of Coastal Oceans, Reef Check California, the Multi-Agency Rocky Intertidal Network, Redwood National and State Parks – Redwood Creek Estuary, Monterey Bay National Marine Sanctuary, National Oceanic and Atmospheric Administration, National Parks Service, Channel Islands National Marine Sanctuary, Scripps Institution of Oceanography, and Vantuna Research Group. Staff also represented CDFW at more than ten MPA research and monitoring meetings and workshops, and made 19 presentations related to the management of the MPA Network.

Enforcement and Compliance – From January through June 2018, more than 11,000 MPA-related contacts were made by CDFW’s Law Enforcement Division (LED) staff, resulting in 396 warnings and 222 citations.

Assembly Bill 2369 was signed by Governor Brown on August 24, 2018 and will go into effect January 1, 2019. This bill increases the fine amount for a commercial fishing violation (which includes commercial passenger fishing vessels/party boats) in an MPA to be consistent with other illegal-take-for-profit penalties.

Management program staff coordinated with LED to compile, analyze, and interpret LED citation data for the first five years of MPA implementation in the North Coast

MPA research staff and partners spent more than 40 days in the field in 2018.



MPA planning region (California-Oregon border to Alder Creek, near Point Arena). Coordination efforts continue for various MPA implementation activities to improve the enforcement and compliance of the MPA network, such as developing a records management system and clarifying MPA regulations to improve compliance.

Policy and Permitting – The MPA Statewide Leadership Team is an advisory body convened by OPC to ensure effective communication and collaboration among partner entities that have significant authority, mandates, or interests that relate to the MPA Network. A new [Leadership Team Work Plan](#) was approved in October by OPC, which defines priority actions in the four focal areas of the MPA Management Program over the next three fiscal years. The Work Plan outlines shared strategic priorities among the members of the Leadership Team and identifies key actions and outcomes related to the management of the MPA Network.

In August 2018, 17 California ocean stakeholders were [selected by the International Union for the Conservation of Nature](#) to hold evaluation meetings and site visits to assess how the MPA Network aligns with the [International Union for the Conservation of Nature Green List program](#). If advanced to candidacy, California's MPA Network could be the first in the world added to the Green List as a collection of areas designed to function as a network.

CDFW and OPC's Science Advisory Team developed an ecologically based decision framework to estimate impacts of scientific collecting in MPAs. All scientific collecting permit applications requesting access to MPAs are now reviewed using this framework, which is also available online as a [scientific journal publication](#). Using this framework, 70 individual Scientific Collecting Permits were issued for research within MPAs between January and November 2018.

As part of the adaptive management framework, the California Fish and Game Commission adopted two CDFW-recommended MPA regulatory packages in August 2018: 1) [Repeal Rockport Rocks Special Closure](#), and 2) [Permit tribal take in four MPAs](#) (Kashtayit, Naples, Point Dume and Anacapa Island state marine conservation areas) and modify the boundaries of Stewarts Point State Marine Conservation Area and Stewarts Point State Marine Reserve.

For more information about California's MPAs, please visit the CDFW website at wildlife.ca.gov/MPAs.



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OFFICE OF THE GOVERNOR

February 28, 2019

The Honorable Wilbur Ross
Secretary, U.S. Department of Commerce
1401 Constitution Ave NW
Washington, District of Columbia 20230

Dear Secretary Ross:

California is experiencing an economic disaster to our Red Sea Urchin fishing industry and communities due to oceanic conditions that have affected the kelp forest ecosystems.

Persistent warm ocean conditions that began in 2014 and the resulting trophic cascade of ecological impacts has affected the fishery in the Northern Management Zone. The warm water event devastated kelp production (93% loss of surface kelp canopies compared to 2008 levels), a primary food source for urchins that created persistent starvation conditions. Starvation has led to reductions in the food value of the urchins targeted by the fishery in northern California. In addition, a population explosion of the less marketable purple sea urchin continues to overgraze the recovering kelp beds, adding further stress to the fishery.

The California Red Sea Urchin Fishery is managed under two distinct Management Zones. Take in the Northern Zone (north of Monterey/San Luis Obispo County Line) largely occurs north of San Francisco Bay. Take in the Southern Zone (south of Monterey/San Luis Obispo County Line) largely occurs at the Channel Islands and along the mainland coast south of Point Conception. Commercial take in the two zones is differentiated by a distinct size limit and season structure. In addition, a stock assessment completed in 2009, analyzed northern and southern fisheries separately due to differences in catch histories and life history parameters.

In 2016 and 2017, ex-vessel revenue in the Northern Management Zone fell by 76% and 78%, respectively compared to the previous 5-year average (2011-2015) of \$2,577,105 (Table 1).

Table 1. Comparison of ex-vessel revenue in 2016 and 2017 to average ex-vessel revenue from 2011 to 2015 in the Northern Management Zone.

Average Revenue 2011-2015	\$2,577,105
2016 Revenue	\$607,611
% Difference from Average	-76%
2017 Revenue	\$577,254
% Difference from Average	-78%

These estimated impacts are based on ex-vessel value of commercial landings and do not account for additional impacts to fish processors or to other businesses that rely on the fishery.

Given the significant impacts, I request you declare a fishery resource disaster for the fishery in the Northern Management Zone under section 308(d) of the Interjurisdictional Fisheries Act of 1986 (16 U.S.C. § 4107(d)), and a commercial fishery failure under section 312(a) of the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (16 U.S.C. § 1861a(a)).

As you know, declaring a commercial failure will enable the affected fishing communities to receive essential economic assistance, which will be critical for the well-being of our fishing industry and our state. Red sea urchin is a vital component of California's natural resources and provides significant commercial, cultural, and economic benefits to our state. I also ask National Oceanic and Atmospheric Administration Fisheries to work directly with the California Department of Fish and Wildlife (CDFW) to expeditiously complete the required review process.

The CDFW contact is Dr. Craig Shuman (Craig.Shuman@wildlife.ca.gov), and the designated alternate is Sonke Mastrup (Sonke.Mastrup@wildlife.ca.gov).

Thank you for your consideration of this critical issue.

Sincerely,

Governor Gavin Newsom

cc: The Honorable Diane Feinstein
The Honorable Kamala Harris
The Honorable Jared Huffman
The Honorable Jackie Speier
The Honorable Jimmy Panetta
The Honorable Salud Carbajal
The Honorable Anna G. Eshoo
The Honorable Mike Thompson
The Honorable Mike McGuire, Chair
Joint Committee on Fisheries and Aquaculture
California State Senate

The Honorable Jim Wood, Vice Chair
Joint Committee on Fisheries and Aquaculture
California State Assembly
Charlton H. Bonham, Director
California Department of Fish and Wildlife
Melissa Miller-Henson, Acting Executive Director
California Fish and Game Commission