California Fish and Game Commission

Wildlife Resources Committee

Meeting Binder

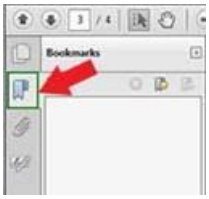
January 15, 2025

Sacramento

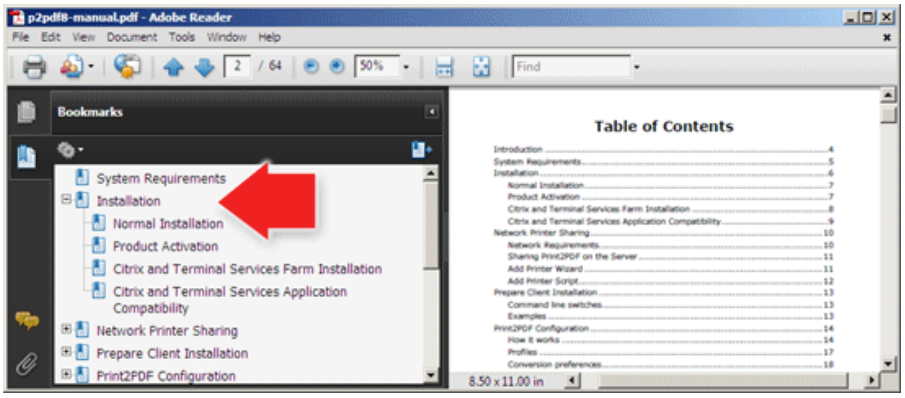
EASY GUIDE TO USING THE BINDER

1. Download and open the binder document using your Adobe Acrobat program/app.

2. If a bookmark panel does not automatically appear on either the top or left side of the screen, click/tap on the “bookmark symbol” located near the top left-hand corner.



3. To make adjustments to the view, use the Page Display option in the View tab. You should see something like:



4. We suggest leaving open the bookmark panel to help you move efficiently among the staff summaries and numerous supporting documents in the binder. It’s helpful to think of these bookmarks as a table of contents that allows you to go to specific points in the binder without having to scroll through hundreds of pages.

5. You can resize the two panels by placing your cursor in the dark, vertical line located between the panels and using a long click /tap to move in either direction.

6. You may also adjust the sizing of the documents by adjusting the sizing preferences located on the Page Display icons found in the top toolbar or in the View tab.

7. Upon locating a staff summary for an agenda item, notice that you can obtain more information by clicking/tapping on any item underlined in blue.

8. Return to the staff summary by simply clicking/tapping on the item in the bookmark panel.

9. Do not hesitate to contact staff if you have any questions or would like assistance.

Overview of California Fish and Game Commission Committee Meeting

- Welcome to this meeting of the Wildlife Resources Committee. The committee is comprised of up to two commissioners who co-chair each meeting; members are assigned by the Commission annually.

- Our goal today is informed discussion to guide future decision-making, and we need your cooperation to ensure a lively and comprehensive dialogue.

- We are operating under the Bagley-Keene Open Meeting Act. However, it is important to note that the committee cannot take action independent of the full Commission; instead, the committee makes recommendations to the Commission at regularly scheduled meetings.

- These proceedings are being recorded and will be posted to the Commission website or YouTube page for reference and archival purposes.

- Items may be heard in any order pursuant to the determination of the committee chair or co-chairs.

- Committee meetings operate informally and provide an opportunity for everyone to contribute to the discussion about agenda items. If you wish to contribute to an agenda item, please follow these guidelines:
    1. Raise your hand and wait to be recognized by the chair or a co-chair.
    2. Please share your name and affiliation (if any).
    3. Time is limited; please be concise to give others time to speak.
    4. If several speakers have the same concerns or ideas to express, please appoint a group spokesperson.
    5. Generally, participants in person are called on first, followed by participants joining by zoom or phone.
    6. As a topic discussion evolves, we encourage participants to continue contributing to the dialogue.
    7. If speaking during the general public comment agenda item, the subject matter you present should <u>not be related</u> to any item on the current agenda (public comment on agenda items will be taken at the time the committee discusses that item).

- Please note the nearest emergency exit for use in the unlikely event of an emergency.

- For those joining us in the meeting room, restrooms are located _____.

Introductions for California Fish and Game Commission Wildlife Resources Committee Meetings

California Fish and Game Commissioner(s)

Erika Zavaleta	Committee Co-Chair
Darius W. Anderson	Committee Co-Chair

Commission Staff

Melissa Miller-Henson	Executive Director
Ari Cornman	Wildlife Advisor
David Haug	Regulatory Analyst
Kelsey Leaird	Executive Analyst

California Department of Fish and Wildlife Staff

Chad Dibble	Deputy Director, Wildlife and Fisheries Division
Nathaniel Arnold	Deputy Director and Chief, Law Enforcement Division
Scott Gardner	Branch Chief, Wildlife Branch
Jay Rowan	Branch Chief, Fisheries Branch
Jonathan Nelson	Environmental Program Manager, Fisheries branch
David Kiene	Attorney, Office of General Counsel
Brandon Munk	Veterinarian, Wildlife Health Lab, Wildlife Branch
Brian Leo	Statewide Deer Coordinator, Game Conservation and Wildlife Connectivity Program, Wildlife Branch

I would also like to acknowledge special guests who are present:
(i.e., elected officials, including tribal chairpersons, and other special guests)

STATE OF CALIFORNIA
Gavin Newsom, Governor

Fish and Game Commission

Melissa A. Miller-Henson
Executive Director
P.O. Box 944209
Sacramento, CA 94244-2090
(916) 653-4899
fgc@fgc.ca.gov

www.fgc.ca.gov

Wildlife Heritage and Conservation
Since 1870

Wildlife Resources Committee

Committee Co-Chairs: Commissioner Zavaleta and Commissioner Anderson

Meeting Agenda
January 15, 2025; 9:00 a.m.

In Person

Natural Resources Headquarters Building
715 P Street, Second Floor
Sacramento, CA 95814

and

Zoom and Phone

To participate in the meeting remotely, you may join via Zoom or by telephone directly at https://wildlife-ca-gov.zoom.us/j/82507253166. For complete instructions on how to join the meeting via Zoom or telephone, click here or visit www.fgc.ca.gov/meetings/2025.

Notes: (1) See important meeting information and procedures, including written public comment deadlines, starting on page 5.

(2) Unless otherwise indicated, the California Department of Fish and Wildlife is identified as Department.

(3) All agenda items are informational and/or discussion only. The Committee develops recommendations to the Commission but does not have authority to make policy or regulatory decisions on behalf of the Commission.

Call to order

1. Approve agenda and order of items

2. Inland sport fishing

Discussion and potential recommendations for:

(A) Regulation changes related to the recommended striped bass slot limit

(B) Other Department-proposed changes for 2025-26 sport fishing seasons

3. Big game hunting

Discussion and potential recommendations for changes to regulations for big game preference points and the movement of cervid carcasses in chronic wasting disease management zones.

4. Falconry

Initial vetting for changes to falconry regulations.

5. Take of nongame mammals

Discussion and potential recommendations for change to the take of nongame mammals regulations.

6. Department updates

The Department will highlight items of note since the last committee meeting.

(A) Wildlife Branch

(B) Fisheries Branch

(C) Law Enforcement Division

7. General public comment for items not on the agenda

The Committee may not discuss or take action on any matter raised during this item, except to consider whether to recommend that the matter be added to the agenda of a future meeting [Sections 11125, 11125.7(a), Government Code].

8. Future agenda items

(A) Review work plan agenda topics and timeline

(B) Potential new agenda topics for Commission consideration

Adjourn

California Fish and Game Commission
Meeting Schedule

Note: As meeting dates and locations can change, please visit www.fgc.ca.gov for the most current list of meeting dates and locations. All Commission meetings will include a webinar/teleconference option for attendance and every effort will be made to ensure that committee meetings include the same.

Meeting Date	Commission Meeting	Committee Meeting
February 12-13, 2025	California Natural Resources Headquarters Building Auditorium 715 P Street, 1st Floor Sacramento, CA 95814	
March 13, 2025		**Marine Resources** California Department of Fish and Wildlife 1010 Riverside Parkway Poppy 154 Conference Room West Sacramento, CA 95605
April 15, 2025		**Tribal** Sacramento area
April 16-17, 2025	Sacramento area	
May 14, 2025	Teleconference Sacramento, Trinidad, Sonoma, Santa Cruz, and San Diego	
May 15, 2025		**Wildlife Resources** California Natural Resources Headquarters Building 715 P Street, 2nd Floor Sacramento, CA 95814
June 18-19, 2025	California Natural Resources Headquarters Building 715 P Street, 2nd Floor Sacramento, CA 95814	
July 16-17, 2025		**Marine Resources** California Natural Resources Headquarters Building 715 P Street, 2nd Floor Sacramento, CA 95814
August 12, 2025		**Tribal** California Natural Resources Headquarters Building 715 P Street, 2nd Floor Sacramento, CA 95814
August 13-14, 2025	California Natural Resources Headquarters Building 715 P Street, 2nd Floor Sacramento, CA 95814	

Meeting Date	Commission Meeting	Committee Meeting
September 11, 2025		**Wildlife Resources** California Natural Resources Headquarters Building 715 P Street, 2nd Floor Sacramento, CA 95814
October 8-9, 2025	Sacramento area	
November 6, 2025		**Marine Resources** California Natural Resources Headquarters Building 715 P Street, 2nd Floor Sacramento, CA 95814
December 9, 2025		**Tribal** Sacramento area
December 10-11, 2025	Sacramento area	

Other Meetings of Interest

Meetings listed here are organizations for which the Commission: (1) is a member, or (2) takes action based upon regulations developed by that organization.

Association of Fish and Wildlife Agencies

- September 21-24, 2025 – Tucson, AZ

Pacific Fishery Management Council

- March 5-11, 2025 – Vancouver, WA
- April 9-15, 2025 – San Jose, CA
- June 12-18, 2025 – Rohnert Park, CA
- September 18-24, 2025 – Spokane, WA
- November 13-19, 2025 – Costa Mesa, CA

Pacific Flyway Council

- March 11, 2025 – Louisville, KY
- September 2025 – Date and location TBD

Western Association of Fish and Wildlife Agencies

- June 2-6, 2025 – Provo, UT

Wildlife Conservation Board

- February 26, 2025 – Sacramento, CA
- May 22, 2025 – Sacramento, CA
- August 28, 2025 – Sacramento, CA
- November 20, 2025 – Sacramento, CA

Committee Meeting Procedures and Information

Welcome to a meeting of the California Fish and Game Commission's Wildlife Resources Committee. The Committee is composed of and chaired by up to two Commissioners; these assignments are made by the Commission each year.

The goal of the Committee is to allow greater time to investigate topics before the Commission than would otherwise be possible. Committee meetings are less formal in nature and provide additional access to commissioners. The Committee does not take action independent of the Commission; instead, the Committee makes recommendations to the full Commission at regularly scheduled Commission meetings.

The Commission's goal is preserving our outdoor heritage and conserving our natural resources through informed decision-making; Committee meetings are vital in developing recommendations to help the Commission achieve that goal. In that spirit, we provide the following information to be as effective and efficient as possible.

Persons with Disabilities

Persons with disabilities needing reasonable accommodation to participate in public meetings or other Commission activities are invited to contact the Department's Civil Rights Office at (916) 653-9089 or civilrights@wildlife.ca.gov. Accommodation requests for facility and/or meeting accessibility and requests for American Sign Language interpreters should be submitted at least two weeks prior to the event. Requests for real-time captioners should be submitted at least four weeks prior to the event. These timeframes are to help ensure that the requested accommodation is met. For those joining by Zoom, you may be able to enable closed-captioning via the Zoom platform. If a request for an accommodation has been submitted but is no longer needed, please contact the Civil Rights Office immediately.

Submitting Written Materials

The public is encouraged to attend Committee meetings and engage in the discussion about items on the agenda; the public is also welcome to comment on agenda items in writing. You may submit your written comments by one of the following methods (only one is necessary): **Email** to fgc@fgc.ca.gov; **mail** to California Fish and Game Commission, P.O. Box 944209, Sacramento, CA 94244-2090; **deliver** to California Fish and Game Commission, 715 P Street, 16th floor, Sacramento, CA 95814**;** or **hand-deliver** to a Committee meeting.

Comment Deadlines

The ***Written Comment Deadline*** for this meeting is 5:00 p.m. on **January 2, 2025**. Written comments received at the Commission office by this deadline will be made available to Commissioners prior to the meeting.

The ***Supplemental Comment Deadline*** for this meeting is noon on **January 10, 2025**. Comments received by this deadline will be made available to Commissioners at the meeting.

After these deadlines, written information may be delivered in person to the meeting; please bring **six** copies and provide them to staff during the relevant agenda item.

Note: Materials provided to the Committee may be made available to the general public.

Regulation Changes

The Committee **will not** consider comments regarding *proposed changes to regulations that have been noticed by the Commission*. If you wish to provide comment on a noticed regulation change, please provide your comments during Commission business meetings, via email, or by delivering to the Commission office.

As a general rule, requests for regulatory change must be redirected to the full Commission and submitted on the required petition form, FGC 1, *Petition to the California Fish and Game Commission for Regulation Change*. However, at the Committee's discretion, the Committee may request that staff follow up on items of potential interest to the Committee and possible recommendation to the Commission.

Speaking at the Meeting

Committee meetings operate informally and provide opportunity for everyone to contribute to the dialogue. If you wish to speak on an agenda item, please follow these guidelines:

- You will be given instructions during the meeting for how to be recognized by the Committee chair or co-chair to speak.
- If you have written information to share, please provide **six** copies to staff before you begin speaking.
- Once recognized, please begin by giving your name and affiliation (if any) and the number of people you represent.
- Time is limited; please keep your contributions concise so that everyone has an opportunity to speak.
- We encourage you to avoid repeating previous commentary. You may wish to appoint a spokesperson, or simply state you agree with a previous comment.
- If speaking during general public comment for items not on the agenda, the subject matter you present should not be related to any item on the current agenda (public comment on agenda items will be taken at the time the Committee members discuss that item). As a general rule, public comment is an opportunity to bring matters to the attention of the Committee, but you may also do so via email or standard mail. At the discretion of the Committee, staff may be requested to follow up on the subject you raise.

Visual Presentations/Materials

All electronic presentations must be submitted by the ***Supplemental Comment Deadline*** and approved by the Commission executive director before the meeting.

- Electronic presentations must be provided by email to fgc@fgc.ca.gov or delivered to the Commission on a USB flash drive by the deadline.
- All electronic formats must be Windows PC compatible.

- If participating in person, it is recommended that you bring a print copy of any electronic presentation in case of technical difficulties.

Committee Staff Summary for January 15, 2025 WRC

2. Inland Sport Fishing

Today's Item **Information ☐** **Action ☒**

Discussion and potential recommendations for:

(A) Regulation changes related to the recommended striped bass slot limit

(B) Other Department-proposed changes for 2025-26 sport fishing seasons

Summary of Previous/Future Actions

• Discussed striped bass slot limits and sport fishing changes, and developed initial recommendation	September 19, 2024; WRC
• Commission approved WRC recommendations	October 9-10, 2024
• **Today's discussion and potential additional recommendations**	**January 15, 2025; WRC**
• Commission to consider WRC recommendations	February 12-13, 2025

Background

Today, the Wildlife Resources Committee (WRC) will hear and discuss Department recommendations for regulation changes on sport fishing topics, and potentially develop recommendations for Commission consideration.

(A) ***Striped Bass Slot Limits***

At the September 2024 WRC meeting, the Department indicated it could support either no change to existing regulations or an amendment for an 18- to 30-inch slot limit for striped bass. While the committee previously recommended a slot limit to the Commission, today the Department will provide further background on the striped bass fishery and some details on the Department's proposal for a slot limit (Exhibit A1; see Exhibit A2 for previous report). Today is a further opportunity to discuss issues that were previously raised, such as salmonid predation, evidence of overall angler support for a slot limit, and striped bass size reduction impacts on subsistence fishing. WRC may make a recommendation for specific striped bass regulations.

(B) ***Other Recommended Regulation Changes***

WRC is expected to continue its discussion of the Department's recommended changes for inland sport fishing regulations. See Exhibit B1 for both a summary of previously recommended changes and four new recommendations being introduced at this meeting. Today WRC may develop a recommendation for Commission consideration at its February 2025 meeting.

Given the Commission's current regulatory staffing limitations, any recommendations made today for regulation changes necessarily includes a caveat that timing for developing rulemaking materials to implement the recommendations is uncertain. Staff appreciates input on the relative importance of different proposed actions.

Significant Public Comments

An angler supports a slot limit for striped bass to increase opportunities to catch larger fish (Exhibit A3).

Recommendation

Commission staff: Based on the Department's presentation and today's discussions, recommend the Commission support future rulemakings regarding striped bass slot limits and inland sport fishing.

Department: Support future rulemakings regarding striped bass slot limits and inland sport fishing.

Exhibits

A1. Department striped bass presentation

A2. Department report and appendices, *California Department of Fish and Wildlife Evaluation of Regulation Change Petition 2022-12: Proposed 20–30–Inch Harvest Slot Limit for Striped Bass (*Morone saxatilis*)*, received August 29, 2024

A3. Email from Michael Carney, received November 5, 2024

B1. *Inland Sport Fishing Special Waters, Bait, Gear, and Boundary Adjustments*, Department, received January 6, 2025

Committee Direction/Recommendation

The Wildlife Resources Committee recommends that the Commission support future rulemakings regarding striped bass slot limits and inland sport fishing based on the Department's recommendation and today's discussion.

Committee Staff Summary for January 15, 2025 WRC

3. Big Game Hunting

Today's Item **Information ☐** **Action ☒**

Discussion and potential recommendations for changes to regulations for big game preference points and the movement of cervid carcasses in chronic wasting disease management zones.

Summary of Previous/Future Actions

- Initial vetting — May 16, 2024; WRC
- Discussion — September 12, 2024; WRC
- **Today's discussion and potential recommendation** — **January 15, 2025**

Background

At the September 2024 Wildlife Resources Committee (WRC) meeting, a large number of potential regulation changes were discussed related to big game hunting and chronic wasting disease (CWD); staff also noted that, even without CWD, big game regulation changes are a significant workload, representing from five to seven rulemakings each year.

Given capacity concerns, WRC chose to split off from the Department's big game hunting proposal potential regulation changes related to refunding preference points due to public land closures resulting from wildfires. WRC requested that the Department return to today's WRC meeting with a refined proposal for regulation changes related to preference points.

Today, WRC will discuss how the preference point regulations might be changed to address difficulties in administration, and may potentially make a recommendation for Commission consideration.

Additionally, the movement of cervid carcasses in CWD management zones has been identified as a concern; WRC and the Commission have previously discussed with the Department the possibility of restricting carcass movement. Today, the Department will discuss with WRC whether, and if so how, to restrict cervid movement; WRC may potentially develop a recommendation for Commission consideration.

Significant Public Comments (N/A)

Recommendation

Commission staff: Based on the Department's presentations and today's discussions, recommend the Commission support future rulemakings regarding refunding preference points due to public land closures and the movement of cervid carcasses in CMZs.

Department: Support a future rulemaking regarding refunding big game preference points due to public land closures from wildfires.

Exhibits (N/A)

Committee Direction/Recommendation

The Wildlife Resources Committee recommends that the Commission support a future rulemaking regarding refunding preference points due to public land closures resulting from wildfires and the movement of cervid carcasses in chronic wasting disease management zones.

Committee Staff Summary for January 15, 2025 WRC

4. Falconry

Today's Item **Information ☒** **Action ☐**

Initial vetting for potential changes to falconry regulations.

Summary of Previous/Future Actions

- **Today's initial vetting** **January 15, 2025; WRC**
- Discussion and potential recommendation May 15, 2025; WRC

Background

The Commission regulates the licensing and care of raptors, consistent with federal regulations promulgated by the U.S. Fish and Wildlife Service. California's regulations encompass the entire practice of falconry, including importation, handling, care, licensure, and hunting. The Department proposes several changes to falconry regulations (exhibits 1 and 2) regarding raptor housing, bird exhibition, and out-of-state examinations, in response to litigation (exhibits 3 and 4).

Today the Wildlife Resources Committee (WRC) will receive a presentation on, and discuss, the Department's recommendations. WRC's May 2025 meeting is the next opportunity to discuss and potentially make a recommendation to the Commission regarding the proposed regulation changes.

Significant Public Comments (N/A)

Recommendation (N/A)

Exhibits

1. Department presentation
2. Department's recommended amendments to regulatory language
3. Stipulated Judgment and Order of the United States District Court *(Stavrianoudakis, et al. v. USFWS, et al.*,Case 1:18-cv-01505-JLT-BAM), filed November 14, 2022
4. Opinion of the United States Court of Appeals, Ninth Circuit (*Stavrianoudakis, et al. v. USFWS, et al.*, Case 22-16788), filed July 24, 2024

Committee Direction/Recommendation (N/A)

Committee Staff Summary for January 15, 2024 WRC

5. Take of Nongame Mammals

Today's Item **Information ☐** **Action ☒**

Discuss concerns with, and the regulatory framework for, the take of nongame mammals.

Summary of Previous/Future Actions

- Initial discussion — September 19, 2023; WRC
- Discussion — May 16, 2024; WRC
- Discussion — September 12, 2024; WRC
- **Today's discussion and potential recommendation** — **January 15, 2025; WRC**
- Commission to consider WRC recommendations — February 12-13, 2025

Background

California Fish and Game Code Section 4150 provides that "A mammal occurring naturally in California that is not a game mammal, fully protected mammal, or fur-bearing mammal is a nongame mammal." Nongame mammals in California include species such as opossums, cottontail rabbits, raccoons, coyotes, red foxes, weasels, moles, and various rodents. Per Fish and Game Code Section 4152, nongame mammals that are causing damage may be taken for depredation purposes.

At previous meetings, WRC held discussions regarding the indiscriminate take of nongame mammals, some of the ambiguities in statute, regulation and Commission policy, and the appropriateness of allowing the indiscriminate and unlimited take of native California species. The discussions included an examination of the operation of Fish and Game Code, California Code of Regulations (Title 14), and Commission policies and how they are being employed in practice. See Exhibits 1 through 3 for the text of some laws and policies related to nongame mammals.

At the September 2024 WRC meeting, Commission staff committed to meeting with the Department to review potential consequences of a rulemaking to prohibit the take of nongame mammals except where "injuring growing crops or other property" (per Fish and Game Code Section 4152). The intent could be accomplished by amending Section 472, the regulation which permits take "at any time of the year and in any number" for specified nongame mammal species. In addition to potential enforcement challenges, there is limited evidence that significant take of nongame mammals outside of depredation is occurring and there is little to no recent data on population trends for nongame mammals.

Today is an opportunity to continue the discussion and potentially make a recommendation to the Commission on any desired regulatory amendment.

Significant Public Comments (N/A)

Recommendation (N/A)

Exhibits

1. *Three Sections of California Fish and Game Code Relevant to the Take of Nongame Mammals*, extracted January 2, 2024
2. *Section 472 of Title 14 of the California Code of Regulations, Relevant to the Take of Nongame Mammals*, extracted January 2, 2024
3. *Commission Policies Directly Related to the Take of Nongame Mammals*, dated January 2, 2024

Committee Direction/Recommendation

The Wildlife Resources Committee recommends that the Commission approve a future rulemaking to amend Section 472 to: _____.

Committee Staff Summary for January 15, 2025 WRC

6. Department Updates

Today's Item **Information ☒** **Action ☐**

The Department will highlight items of note since the last committee meeting.

Summary of Previous/Future Actions (N/A)

Background

This is a standing agenda item for the Department to provide updates on activities of interest related to wildlife and inland fisheries. Verbal updates are expected from:

(A) Wildlife Branch

(B) Fisheries Branch

(C) Law Enforcement Division

There are two news releases of potential interest: (1) The Department awarded 18 restoration and protection projects throughout the state, and (2) a resurgence of avian influenza in wild birds.

Significant Public Comments (N/A)

Recommendation (N/A)

Exhibits

1. *CDFW Awards $17M to Critical Restoration Projects Statewide*, Department news release, dated November 14, 2024
2. *Fall Migration Brings the Return of Avian Influenza in Wild Birds*, Department news release, dated December 6, 2024

Committee Direction/Recommendation (N/A)

Committee Staff Summary for January 15, 2025 WRC

7. General Public Comment

Today's Item **Information ☒** **Action ☐**

Receive public comment regarding topics that are not included on today's agenda.

Summary of Previous/Future Action (N/A)

Background

The Wildlife Resources Committee (WRC) receives two types of correspondence or comment under general public comment: (1) Informational items and (2) requests for WRC to consider new topics. As a general rule, requests for regulation changes must be submitted to the Commission on form FGC 1, *Petition to the California Fish and Game Commission for Regulation Change*. However, WRC may, at its discretion, request staff to follow up on items of potential interest for possible recommendation to the Commission.

Significant Public Comments (N/A)

Recommendation

Staff recommends any potential new agenda items — based on issues raised today — be discussed under Agenda Item 8, *Future agenda items.*

Exhibits (N/A)

Committee Direction/Recommendation (N/A)

Committee Staff Summary for January 15, 2025 WRC

8. Future Agenda Items

Today's Item **Information ☐** **Action ☒**

(A) Review work plan agenda topics and timeline

(B) Potential new agenda topics for Commission consideration

Summary of Previous/Future Actions

- Commission approved WRC agenda and work plan — December 12, 2024
- **Today's discussion and potential recommendations** — **January 15, 2025; WRC**
- Next WRC meeting — May 15, 2025

Background

Wildlife Resources Committee (WRC) work plan topics are referred by the Commission and scheduled as appropriate. Commission-referred topics and the current schedule are shown in the WRC work plan (Exhibit 1).

WRC Work Plan

Topics anticipated to be proposed for the May 2025 WRC meeting are shown in the work plan in Exhibit 1. Readiness considerations may lead to changes in proposed timing and type of anticipated action for Commission consideration at its April 2025 meeting, when it is scheduled to approve the May WRC meeting agenda. WRC may make recommendations to the Commission regarding scheduling specific topics in the work plan.

Discuss and Recommend New WRC Topics

Today is an opportunity to identify any potential new agenda topics to recommend to the Commission for referral to WRC.

Significant Public Comments (N/A)

Recommendation

Review the list of topics in the work plan identified by staff as potential agenda items for the May 2025 WRC meeting, review the Commission rulemaking timetable (Exhibit 2), determine if any work plan topics should be recommended for revision, and identify any new topics to recommend to the Commission for WRC evaluation.

Exhibits

1. WRC work plan, updated January 6, 2025
2. *California Fish and Game Commission: Perpetual Timetable for Anticipated Regulatory Actions*, updated January 7, 2025

Committee Direction/Recommendation

The Wildlife Resources Committee recommends that the Commission adopt the committee recommendations and update the committee work plan with the change(s) identified today.

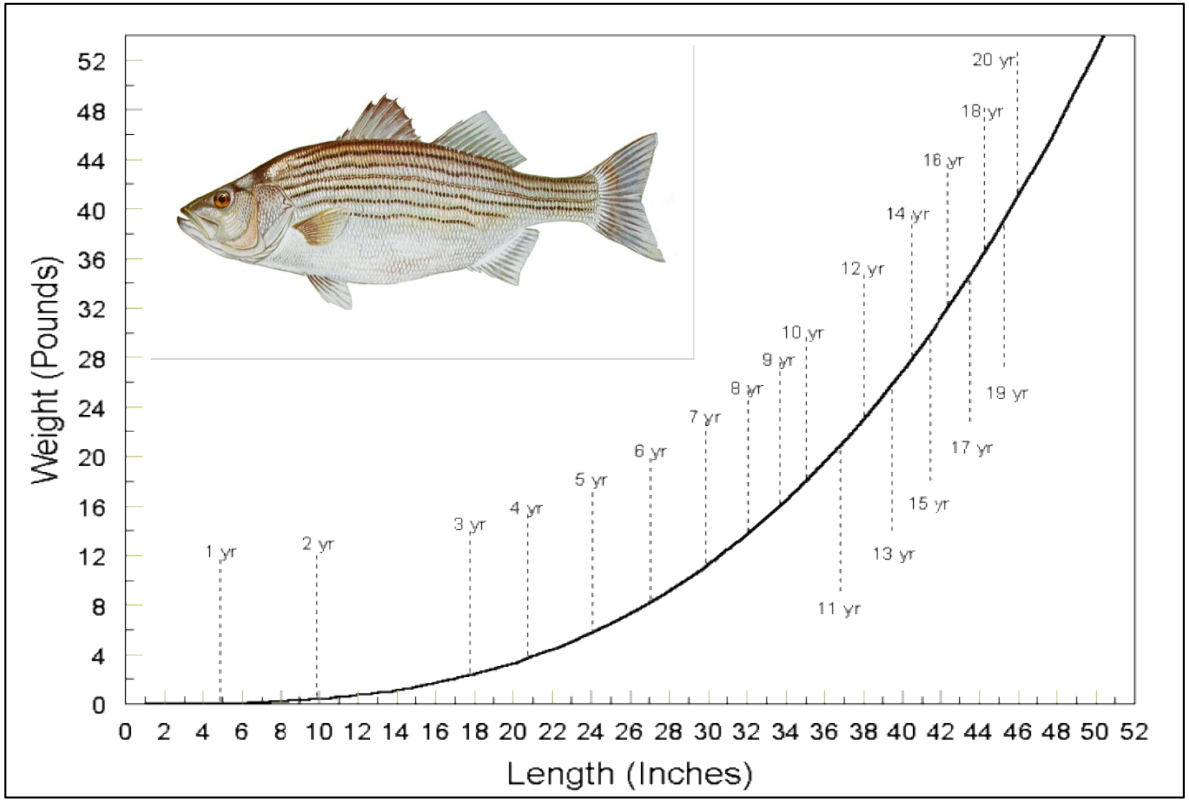
Proposed Regulation Change for Striped Bass Slot Limit Petition

Jonathan Nelson
Environmental Program Manager
CDFW Fisheries Branch

Wildlife Resources Committee Meeting
January 15, 2025

Striped Bass (*Morone saxatilis*)

- Native to East Coast
- Long-lived
  - Up to 30 years
- Anadromous
  - Highly migratory
- Maturation
  - Females: age 4-5 (22-24 inches)
- Broadcast spawners
- Opportunistic predators
  - insects, fishes, and crustaceans
  - cannibalistic



Wildlife.ca.gov – Striped Bass Fishing Map

Current Anadromous Inland/Marine regulations:

18-inch minimum length limit; 2 fish daily bag limit

FGC Striped Bass Policy

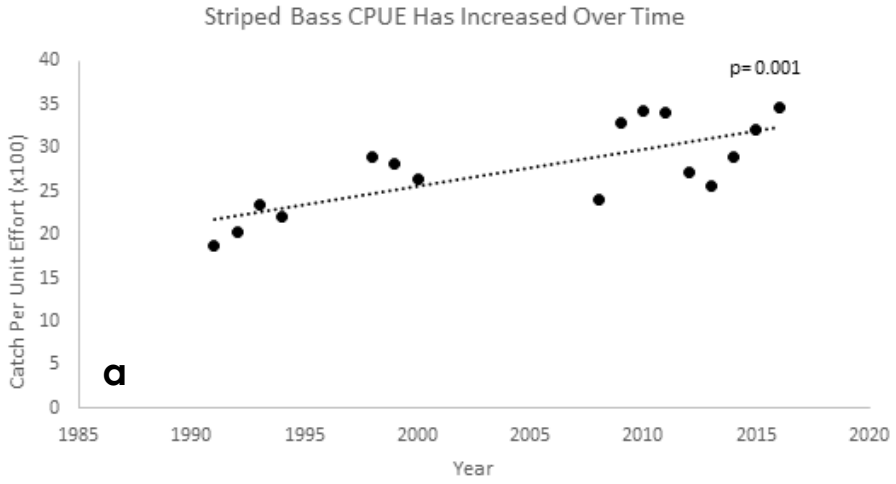
The Department of Fish and Wildlife shall…

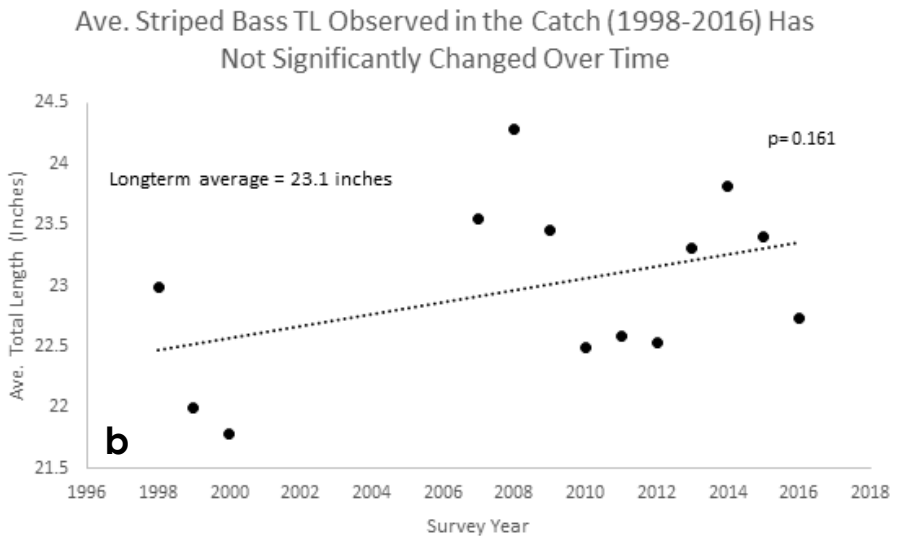
- Ensure, enhance, & prevent loss of sport fishing opportunities
- Aim to maintain a self-sustaining Striped Bass population in support of a robust recreational fishery *while adhering to the Department's long-term mission related to threatened, endangered species, and other species of greatest conservation need*
- Work with relevant stakeholders, organizations, and the public to develop appropriate objectives to achieve these broad aims

Fishery Trends

1991-2022 Creel Data (fishery dependent surveys)

- Angling effort targeting Striped Bass **has not** significantly changed
- Catch and Catch-per-unit-effort (CPUE, Fig. a) **have** significantly increased
- Harvest **has not** significantly changed over time
- Number of SB released over time **has** significantly increased
- Mean size of SB harvested **has not** significantly changed (~23 in; Fig. b)





Petition Background

- Nor-Cal Guides and Sportsmen's Association (NCGASA) submitted a regulation change petition to implement a 20-30-inch harvest slot limit (HSL) for Striped Bass (SB) in Anadromous inland and marine waters
- Petition is supported by all CA SB Association Chapters
- CDFW presented a petition evaluation summary at the September 12, 2024 WRC meeting
- CDFW recommended either "no change" or could support an 18-30-inch HSL
- NCGASA, associated SB groups, and science advisor confirmed support of the 18-30-inch slot limit as recommended by CDFW
- WRC recommended moving an 18-30-inch proposal for discussion at the FGC

CDFW Petition Evaluation Summary

CDFW <u>could</u> support implementing a 30-inch upper harvest slot limit

- More favorable outcomes for nearly all management priorities (stock conservation and fishery) when implementing an HSL compared to an MLL
- Probability of recruitment overfishing decreased by 18% with a 18-30-inch HSL compared to the current 18-inch MLL (53% probability)
- Reproductive contributions from older (thus larger) females increase under evaluated HSL vs MLL
- Predicted increase in catch and trophy catch under 18-30-inch HSL
- Many anglers already report catch-and-release practice for large SB
- 64% of questionnaire respondents were in favor of a catch-and-release trophy fishery however the proposed size varied:
  - 30 inches (26%), 36 inches (15%), ≥ 40 inches (21%)

Proposed Regulation Changes for Striped Bass Harvest Slot Limit

- **Proposed Regulation Change**
  - 18-30-inch harvest slot limit
  - Season - All year (current)
  - Daily bag limit – 2 fish (current)
  - No changes to methods of take outlined in T14 CCR § 7.00, § 7.40, § 7.50 (Inland) and T14 CCR § 27.85 (Ocean)
    - Includes spearfishing outlined in T14 CCR § 2.30 (Inland) and T14 CCR § 1.76 (Ocean)
- **Geographic Range Includes:**
  - Central Valley and Coastal Anadromous Waters and Ocean, Bays and Estuaries north of Point Conception
- **Excludes:**
  - Non-anadromous inland Lakes, Reservoirs, streams/rivers, including CV Aquaduct and Ocean, Bays and Estuaries south of Point Conception

Questions?

Thank you!

California Department of Fish and Wildlife
StripedBass@wildlife.ca.gov

Department Report *and* Appendices

California Department of Fish and Wildlife Evaluation of Regulation Change Petition 2022-12: Proposed 20–30–Inch Harvest Slot Limit for Striped Bass (*Morone saxatilis*)

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE EVALUATION OF REGULATION CHANGE PETITION 2022–12: PROPOSED 20–30–INCH HARVEST SLOT LIMIT FOR STRIPED BASS (*MORONE SAXATILIS*)

Petition submitted August 1, 2022 by Nor–Cal Guides and Sportsmen's Association (NCGASA)

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Striped Bass Fishery Background

Native to the East and Gulf Coasts of North America, Striped Bass (*Morone saxatilis*) were introduced to Pacific waters in 1879 when 132 individuals were planted in San Francisco Bay (Scofield 1930). After one additional fish transfer in 1882 (Smith 1895), a commercial fishery was established in the San Francisco Bay area by the late 1880s (Hart 1973). To protect the increasingly popular sport fishery, the commercial Striped Bass fishery closed in 1935. Prior to 1956, fishing regulations generally included a 12–inch minimum length limit (MLL) and a five fish daily bag limit. From 1956–1981 the MLL increased to 16 inches with a daily bag limit reduction to three fish (Stevens and Kohlhorst 2001). In response to declines in legal–size Striped Bass in the 1970's (Kohlhorst 1999) and at the request of anglers, the California legislature established a short–lived Striped Bass Management program in 1981, which included stocking Striped Bass in California rivers using private and state–run hatcheries. In the same year, Striped Bass regulations were further restricted to an 18–inch MLL and a daily bag limit of two fish, (14 CCR 5.75; 14 CCR 27.85) which remain in effect today.

The Striped Bass Management Plan was terminated in 2004 due to observed increases in the Striped Bass population and growing concern over the impact of Striped Bass predation on native fish species (SB 692, 2003). In 2020, the Fish and Game Commission unanimously adopted an amendment to the Striped Bass policy that eliminated a numeric target for population size and replaced it with a broader commitment to sustain Striped Bass populations in support of a robust and self-sustaining recreational fishery (FGC 2020).

Summary of Proposed Regulation Change Petition

The Nor–Cal Guides and Sportsmen's Association (NCGASA) submitted a regulation change proposal to the Fish and Game Commission on August 1, 2022 (Tracking number [TN] 2022–12). The proposed regulation change would impose a slot limit within anadromous and marine waters whereby only Striped Bass from 20 to 30 inches would be available for harvest in the sport fishery, with no proposed change to the bag limit. Currently, any Striped Bass 18 inches or greater may be harvested within anadromous and marine waters with a daily bag limit of two fish. The NCGASA–proposed Striped Bass regulation change did not consider or propose any changes to the current bag limit, season, or geographic range.

The NCGASA stated need for the proposed shift from 18 to 20–inch minimum harvest length:

"This will allow more opportunity (at least one more year) for females to spawn after initial maturity (which is around 18 inches). It would also protect any unripe Striped Bass (male or female) that fall between 18 to 20 inches from harvest." (M. Smith, personal communication, November 1, 2022).

The NCGASA stated need for the proposed 30–inch maximum harvest length:

"This will allow protection to the most fecund female spawners and contributes to increased spawning success of the population." (M. Smith, personal communication, November 1, 2022).

Communication between NCGASA and the California Department of Fish and Wildlife (Department)

Since petition TN 2022-12 was submitted, the Department has met with NCGASA and their scientific advisors multiple times. The meetings and email correspondences helped to clarify desired short- and long-term Striped Bass fishery outcomes and share available data so that the Department could fairly and accurately evaluate the contents of the petition on its face, as well as the intent of the petitioner. Through those discussions the Department also tracked these additional comments from the petitioner.

Additional comments from NCGASA:

- *"The Striped Bass population is in desperate trouble at each life stage. The population is collapsing and is no longer viable," (Page 2, TN 2022–12).*
- *"Current regulations allow for the removal of female Striped Bass before they reach sexual maturity as well as removal of the largest females from the system," (Page 3, TN 2022–12).*
- *"20 inches may not be ideal for protecting reproductive females (that would be 24 or 26 inches) but it is an initial starting point that balances at least one more year toward maturity and maintains recreational angler opportunity. We are open to adjusting the lower slot upwards in a phased approach as populations sizes gradually increase."* (M. Smith, personal communication, November 1, 2022).

- *"20–30 inches was what the majority of the Striped Bass fishing organizations and angling community contacted by NCGASA from Monterey to Yuba City were in agreement to for socio economics and food for fishing families."* (J. Stone, personal communication, November 1, 2022).

Evaluation Summary

The Department received and evaluated a regulation change petition (TN 2022–12), whereby if implemented, would impose a Harvest Slot Limit (HSL) of 20–30 inches on Striped Bass in marine and anadromous waters. The Department evaluated if the Striped Bass population warrants further protection through changes to current angling regulations, and if the proposed HSL would produce the biological and fisheries improvements desired by the petitioners.

Within Striped Bass native ranges, Atlantic states have adopted various combinations of regulatory practices to meet their management goals (Figure 15, ASMFC 2022). Examples include various harvest slot ranges, split slot limits, seasonal and geographic regulations, changes to bag limits, gear restrictions, and others. The petition only requested a specific HSL and did not include alternative HSL options or other considerations such as changes to season, bag limit, or geographic range; therefore the Department's evaluation is focused on the proposed 20–30–inch HSL and does not include evaluation of these other factors. The Department gathered available data from inland and marine creel surveys, juvenile and adult abundance surveys, and a Striped Bass Angler Preference Questionnaire. Additionally, modeled population and fishery responses under the current 18–inch MLL regulation were compared to the proposed 20–30–inch HSL and an alternative 18–30–inch HSL that maintains the current 18–inch MLL.

The Department could support a regulation change for Striped Bass, including a HSL, if it were determined that the population warranted further regulatory protections or that regulatory protections would improve the angler experience.

Harvest slot limits can provide effective population and fisheries benefits such as increased productivity, population growth, reduced overfishing, and trophy fisheries. Harvest slot limits are best determined using species–specific biological

metrics, population dynamics, consideration of environmental influences, impacts to fisheries participants, and management goals and objectives.

Relative to the current MLL, a HSL is estimated to decrease the risk of recruitment overfishing, defined as exploitation at a rate beyond stock replacement (Goodyear 1980, Mace and Sissenwine 1993) (Figure 13a). Therefore, implementation of an HSL may result in increased Striped Bass population growth if carrying capacity is not constrained. Population model simulations resulted in a 53% probability of recruitment overfishing (i.e., probability of a spawner potential ratio [SPR] < 0.35; Figure 13a) under the current 18–inch MLL, suggesting that the current regulation may not be adequate for long–term population sustainability and growth. Under an 18–30–inch and 20–30–inch HSL, model simulations resulted in a decreased risk of recruitment overfishing by 14% and 19%, respectively (Figure 13a), indicating that a harvest slot may improve recruitment success.

Population model simulations resulted in a higher proportion of fecundity contribution from older (age 10+) females under HSLs compared to the current MLL (Figure 13b), which may have positive implications on recruitment for Striped Bass. However, there was *no difference* in this metric between the 18–30–inch HSL and the 20–30–inch HSL. Thus, it is unlikely that raising the lower limit from 18 to 20-inch (while maintaining the 30–inch upper limit) will have substantial impacts on reproductive output.

Relative to the current MLL, the evaluated 18–30 inch and 20–30–inch HSL regulations resulted in similar improvements to catch and trophy–sized catch (Figure13e-f), but harvest was substantially lower under the 20–30–inch slot (21%; Figure 13d). Population model simulations resulted in 13% lower harvest under the proposed 20–30–inch HSL compared to the 18–30–inch HSL.

Prioritizing harvest numbers above other fishery objectives (e.g., increased catch, size of catch, fishing opportunities, angler satisfaction, etc.) is best supported by the current 18–inch MLL or implementing a wide harvest slot that encompasses the majority of sizes that are vulnerable to catch modeled for the recreational fishery. If the management objective is to enhance recreational fishing opportunities in the form of catch numbers, HSLs better achieve this goal compared to the current MLL. Possibly the most realized benefit of HSLs in terms of catch comes in the form of catch size, as HSLs produced substantially higher numbers of trophy–sized catch compared to the current MLL (Figure 13f). Thus, HSLs can provide multiple benefits to the angler experience, including higher catch rates and improved quality of catch (as defined by fish size). If the fishery objective is to be more protective and increase spawning opportunity, then the HSL needs to be set to minimize harvest of the most abundant spawning size classes, which will inherently decrease harvest opportunity.

As stated above, the focus of this evaluation was to determine if (1) the population warrants further protection through changes to current angling regulations and (2) to assess if the proposed HSL would produce the biological and fisheries improvements desired by the petitioners. While the Department is in support of an HSL for the Striped Bass fishery as a concept, available monitoring data suggest that the adult population is relatively stable and further protections to the population in the form of regulatory changes may not be warranted at this time; however, regulatory changes in the form of a slot limit could enhance recreational fishing opportunities in both catch numbers and catch size.

Declines in recruitment to age–0 in the Delta (Figure 8) suggests some level of reduced spawning and/or recruitment success, though recent abundance estimates (2011–2016) imply relative stability in the adult (> 18 inches TL) population.

Recent abundance estimates calculated using the combined inland and marine harvest estimated from the Central Valley Angler Survey (CVAS) and the California Recreational Fisheries Survey (CRFS) creel surveys, as well as harvest rate from tag returns, resulted in an average of 1,157,275 legal–sized (> 18–inches TL) Striped Bass estimated from 2011–2016. Relative measures of angler catch/harvest of adult Striped Bass collected in the CVAS also suggest stability in the adult (> 18 inches) population. Angler effort targeting Striped Bass has not significantly changed during 1991–2016, however, angler catch-per-unit-effort (CPUE) has increased significantly over the same period (Figure 2). Data collected from Commercial Passenger Fishing Vessels (CPFV) during 1995–2020

also indicate that CPUE has significantly increased over time (Figure 3). The average size of Striped Bass harvested by anglers has not changed significantly over time (Figure 5). However, length data on fish released was not historically recorded, and thus it is possible that the size of fish released in the fishery has changed over time.

Despite evidence of stability in the adult population, the Department is not opposed to implementing a HSL to benefit the angling experience. However, our evaluation has concluded that a 20–30–inch HSL, as proposed by petitioners, may not be adequate in meeting the petitioner's stated fishery and population objectives.

The Department does not support increasing the MLL from 18 to 20 inches because it would likely not produce the biological or fisheries responses described in the petition.

One of the stated desires of the petitioners is to protect the earliest spawners. The Department has determined that increasing the current MLL from 18 to 20 inches fails to provide sufficient protections to sexually mature female Striped Bass and would not provide the fisheries response sought. The potential for increased population fecundity contributed by mature females between 18 and 20 inches is negligible based on the percentage of female maturity in that size and age range. Females are roughly 3 years old at 18–20 inches. Literature on the fecundity and maturity of Striped Bass on the West Coast suggests that most females mature between ages 4 and 5 when they are around 22–24 inches, and nearly all females are mature by age 6 when they are approximately 27 inches (Collins 1982, Raney 1989, Scofield 1930). In Atlantic stocks, recent studies have found less than 10% of individuals mature at age 3 (Brown et al. 2024), and stock assessments for Atlantic Striped Bass use a sexual maturity of 0% for age–3 females in population models (ASMFC 2014, ASMFC 2022).

To incorporate natural variation in age–at–maturation in our population model of West Coast Striped Bass, we set the mean length at maturation for females at 22.8 inches with a 95% probability between ~ 20–26 inches (Appendix A2f). There was no difference in the proportion of fecundity contributed by older females when comparing the model simulations between the proposed 20–30–inch HSL inch to the alternative 18–30–inch HSL (Fig. 13b). In other words, increasing the lower limit from 18 to 20 inches does not translate into an increase in egg contribution by older fish. This is important for population persistence considering energy investment into individual offspring changes with female size, such that

larger fish produce offspring that are greater in size and number compared to smaller fish (Lim et al. 2014). This can have implications on recruitment success, as larger offspring are less vulnerable to size–dependent mortality and therefore typically experience higher survival rates (Conover and Schultz 1997). The difference in the probability of recruitment overfishing (probability of SPR < 0.35) under an 18–30–inch HSL vs 20–30–inch HSL was relatively small (5%; Figure 13a), suggesting that recruitment gains under each lower limit are similar.

It is estimated that harvest would decrease by 21% under a 20–30–inch HSL compared to the current 18-inch MLL (Fig. 13d). This may have an outsized impact on disadvantaged communities that utilize Striped Bass for sustenance. Additionally, increasing the MLL to 20 inches is not supported by the angling public contacted through an electronic questionnaire distributed by CDFW (n = 18,751). The Striped Bass Angler Preference Questionnaire indicated that 71% supported the current 18–inch MLL. Data from inland and marine creel surveys indicate that Striped Bass CPUE, size of the catch, and harvest have been stable for decades, and both fisheries have seen an increase in the number of released Striped Bass.

Increasing the MLL from 18 to 20 inches will likely minimize potential population benefits due to an increase in discard mortality. Discard mortality (i.e., release mortality) can be high (Table 2.3), especially during unfavorable environmental conditions such as elevated water temperatures, which are common as climate change increases the severity and frequency of drought conditions in California. Discard mortality rates for California Striped Bass fisheries are not currently monitored; however, the Department's Central Valley Angler Survey qualitatively observes an increase in moribund Striped Bass during late–spring through summer when water temperatures are elevated. Mortality rates of discarded Striped Bass are well documented in Atlantic Coast recreational fisheries (see Appendix 2.1.2).

CDFW is supportive of an upper HSL to support a trophy fishery but has not determined if 30 inches is the most appropriate size.

The upper 30–inch HSL proposed by the petitioner was not determined based on biological evidence or supporting scientific data, but instead informed by angler preference in the Striped Bass fishing organizations and angling communities contacted by petitioners. The narrow focus of the current evaluation precluded additional analysis of what the most biologically appropriate HSL, or combination of regulatory strategies (as observed in the East Coast regulations), would be best to meet the goals of both the Department and the petitioners.

While it would be prudent to compare additional HSLs, the Department could support an upper HSL of 30 inches (as proposed by petitioners) to create opportunity for a trophy fishery. Results from the Striped Bass Angler Preference Questionnaire indicate that 63% of respondents were supportive of a catch–and–release trophy Striped Bass fishery. 'Trophy' size was also defined as ≥ 30 inches by most respondents in that survey). Based on the creel surveys, a 30–inch upper HSL would likely not have substantial impacts on harvest patterns. Creel data indicate that reported harvest of fish > 30 inches is low and many anglers informally report to creel clerks that they currently release larger fish for various reasons. Based on model results, implementing an upper slot limit of 30 inches with the current 18–inch MLL only decreased estimated harvest by approximately 8% (Figure 13d).

In concept, an upper HSL of 30 inches could be more protective of the female spawning biomass and may contribute to increased recruitment. Model simulations resulted in an 8.1% increase in the proportion of fecundity contributed by older fish under both evaluated HSLs (20-30 and 18–30 inch) compared to the current 18–inch MLL (Fig. 12b). However, a number of factors could minimize the expected recruitment response resulting from a 30-inch HSL. Anglers harvest a very low proportion of > 30–inch fish (< 6%; Figure 6 and Figure 7), and the Department lacks the data necessary to determine if this observation is driven by (1) anglers choosing to release larger fish, (2) low abundance of > 30–inch fish in the population, (3) larger fish being less vulnerable to catch in the fishery (see Appendix section 2.1.3), or (4) a combination of these factors.

Decreasing the upper slot limit (< 30 inches) may be necessary to be more protective of the greatest proportion of the female spawning biomass. Regardless, for significant spawning and recruitment gains to be realized, the benefit would likely come at the cost of harvest opportunity. With these considerations in mind, additional analysis would be necessary to determine if 30 inches is the most efficient upper HSL in terms of maximizing stock conservation gains while minimizing impacts to the fishery (i.e., loss of catch or harvest opportunity).

Implementation of a harvest slot may necessitate removal of spearfishing as a method of take for Striped Bass.

It is common to allow spearfishing for fish species with MLLs based on the assumption that anglers can visually estimate if a fish is larger than the minimum size. It becomes extremely difficult, if not impossible, for an angler to accurately visually estimate the size of a fish that has a minimum and maximum size limit. In addition, the lethal nature of a speargun would make it impossible to release a fish in good condition if outside the harvest slot. This can result in illegal harvest if retained and put the angler at risk; or the angler releases a moribund fish that can no longer contribute to future spawning and catch, which is counter to the purpose of the HSL. Additionally, the release of a moribund fish is considered wanton waste of fish by definition in regulation. California currently does not allow spearfishing take for any species with a harvest slot limit, however, a few regions on the East Coast allow take by spear where Striped Bass have slot limits (Figure 15).

Based on available data in California, there is insufficient evidence to support that Striped Bass predation is a primary contributor to declining salmonid and smelt populations.

Observations of salmonids in Striped Bass stomachs vary by life stage and season, but overall remains relatively low (Stevens 1966, Michel et al. 2018, Stompe et al. 2020, Peterson et al. 2020, Brandl et al. 2021). An extensive review of literature pertaining to Striped Bass predation in the Sacramento– San Joaquin River Delta suggests that sub–adult size classes are more likely to encounter and consume native fish due to their longer Delta and freshwater residency and more optimal predator–to–prey ratio (PPR) (see Appendix 3).

While older (larger) Striped Bass consume more prey on an individual basis, total consumption is often greater for sub–adults compared to adults due to a higher abundance of younger (smaller) fish (Loboschefsky et al. 2012). It is likely that smaller sub–adult Striped Bass (ages 1 and 2) that are present year–round and have a wide geographic distribution in the Delta and Central Valley rivers have more opportunity to contact native fish species. A shift in MLL from 18 to 20 inches may contribute to an increase or shift in predation habits for Striped Bass between 18 and 20 inches.

The majority of larger Striped Bass (> 21 inches, Dorazio et al. 1994) are migratory, spend less time in the freshwater environment, and are less likely to target smaller sized prey due to PPR. There may also be a contingent of large Striped Bass that are freshwater residents, posing some constant, yet unquantified, level of predation pressure. Establishing an upper HSL at 30 inches will not likely have a noticeable impact on predation of juvenile salmonids and smelt due to (1) PPR, (2) high variation in the size of prey consumed, and (3) little evidence of prey specialization.

Department Recommendation

The Department does not recommend a 20–30–inch HSL as proposed in the petition. The Department recommends maintaining the current 18–inch MLL regulation and is supportive of establishing an upper HSL. Modeling suggests a 30-inch upper limit could result in decreased risk of recruitment overfishing (and thus stock conservation benefits) and increased catch and trophy fishing opportunity, but it cannot confirm if 30 inches is the most appropriate size due to the narrow scope of the current analysis. While there is public support for maintaining the 18–inch MLL (71% or respondents) and establishing a catch–and–release trophy fishery (64% of respondents), the highest percentage of respondents supported no change in harvest regulations (54% of respondents) in the Striped Bass Angler Preference Questionnaire. Creel data suggest that the Striped Bass fishery in California is currently stable, and the current regulations are not contributing to perceived population declines; however, modeling results suggest that the current 18-inch MLL on its own may not be adequate for long-term population stability and growth.

The Department will continue to support harvest opportunity for anglers as long as the available data reflect trends that are in line with the guidance laid out in the Fish and Game Commission Striped Bass Policy. In the absence of additional funding, monitoring, and staffing that would be necessary to conduct a more comprehensive, multifaceted approach to determine the most effective angling regulation, the Department believes there could be some benefit to the Striped Bass fishery by implementing a HSL and could support a HSL of 18-30 inches.

Scientific Evaluation of Striped Bass Fishery

Evaluation of the health and performance of a fishery includes understanding angler usage and participation, appropriate regulatory tools to control the impact of recreational angling on fish stocks, biological fisheries metrics, and how these factors relate to management objectives and realized fisheries responses. In order for regulatory tools, such as daily bag and size limits, to be effective, responses in angler effort must be reliably estimated relative to regulatory adjustment or management objectives. However, predicting angler effort responses to regulatory adjustment is difficult because responses depend on many factors, including the structure of prevailing and proposed regulations and the drivers of angler behavior (Carr–Harris and Steinback 2020). While quantitatively accounting for angler effort responses in fishery outcomes was beyond the scope of this evaluation, data on angler preference and sentiment regarding the current fishery and alternative regulations were considered alongside biological fisheries metrics.

Female spawning stock biomass is a metric of stock performance that is often relied on in fisheries management. Understanding the biological consequences of alternative harvest size restrictions such as minimum length limits, harvest bag limits, harvest slots (minimum and maximum length limits), and protected harvest slots is important in preventing recruitment overfishing, a condition in which the spawning stock is depleted to a level at which future recruitment declines strongly (Allen et al. 2013). In practice, harvest slot policies have been proposed as alternatives to minimum length regulations in some recreational fisheries because they are more likely to preserve natural age structures, positively affect spawning and recruitment potential, increase total harvest and trophy catch numbers, and reduce risk of population decline (Arlinghaus et al., 2010, Koehn and Todd, 2012, Ayllón et al., 2019). The Department must evaluate if the Striped

Bass population is at risk of recruitment overfishing under current regulations, as well as weigh stock conservation outcomes against fishery objectives under alternative length–based harvest scenarios.

The Department's scientific evaluation of the Striped Bass fishery contains a summary of the Department's public outreach efforts in the form of results from the Striped Bass Angler Preference Questionnaire, proceedings from a town hall meeting, Striped Bass angling regulations from their native range of the Eastern United States, and assessments of available Department data sets (inland and marine creel surveys and juvenile and adult abundance monitoring). Additionally, the Department has leveraged current and historic data, literature, and life history modeling tools to inform an age and size–structured population model to evaluate potential fishery tradeoffs resulting from changes in harvest regulations. Lastly, considerations for how changing the current Striped Bass fishing regulations may impact native species is reviewed. This information was used to inform the Department's assessment of the necessity, effectiveness, and feasibility of implementing a 20–30–inch slot limit in the Striped Bass fishery.

Public Input

Understanding angler usage and participation is key to evaluating the health and performance of a fishery, as failing to consider angler effort responses can result in regulations that are insufficient in meeting intended objectives. (Carr–Harris and Steinback 2020). In response to the NCGASA proposal, the Department developed a Striped Bass Angler Preference Questionnaire and hosted a public Town Hall to gather information from the Striped Bass angling community on their thoughts about the overall fishery and determine if there was a general desire for changes to the Striped Bass fishery.

Striped Bass Angler Preference Questionnaire

The questionnaire was sent out electronically to ~1 million angling license holders and was available in 7[1] languages. Prior to distribution, the questionnaire was

[1] The initial Striped Bass Angler Preference Questionnaire (APQ) was only distributed in English due to the timing aligned with the change of the State of California fiscal year (July 1) and the need for renewal of the translation services contract. Upon contract renewal, the survey was redistributed (through email and social media posts) in Spanish, Tagalog, Vietnamese, Russian, Simplified Chinese, and Traditional Chinese.

reviewed by Fisheries Branch managers, the Human Dimensions Unit (who reviewed content for bias, leading language, etc.), and final approval was given by the Office of Communication and Outreach Branch (OCEO). There were 26,410 responses to the questionnaire, of which 18,751 indicated they do fish for Striped Bass and 7,659 did not. Briefly, results show that ~71% of Striped Bass anglers (11,981 out of 16,875) support the current minimum size for retention at 18 inches. When offered options for changing the minimum size limit, 54% of responses (8,975 out of 16,621) did not support increasing the minimum size from 18 inches while ~28% (4,653 out of 16,621) supported either lowering the minimum or no minimum at all (Table 1). However, 64% of responses (10,750 out of 16,797) supported a catch–and–release fishery for trophy sized Striped Bass even if it would require setting a maximum size limit (in effect a slot limit) on Striped Bass that could be harvested (Table 2). The definition of a trophy Striped Bass varied widely between responses, with 30, 36, and >40 inches reported most frequently (Figure 1). Complete results can be found in Appendix 1.

Table 1. Results from Question 4 in the 2022 Striped Bass Angler Preference Questionnaire. Results reflect responses to the question "Would you like to see the minimum size limit for harvest of Striped Bass".

No change (%)	No minimum size (%)	Lower than 18 inches (%)	Higher than 18 inches (%)	Number of Responses
54	8	20	18	16,621

Table 2. Results from Question 6 in the 2022 Striped Bass Angler Preference Questionnaire. Results reflect responses to the question "Would you support a catch and release fishery for trophy sized Striped Bass? This would require setting a maximum size/slot limit on Striped Bass".

Yes (%)	No (%)	Number of Responses
64	36	16,797

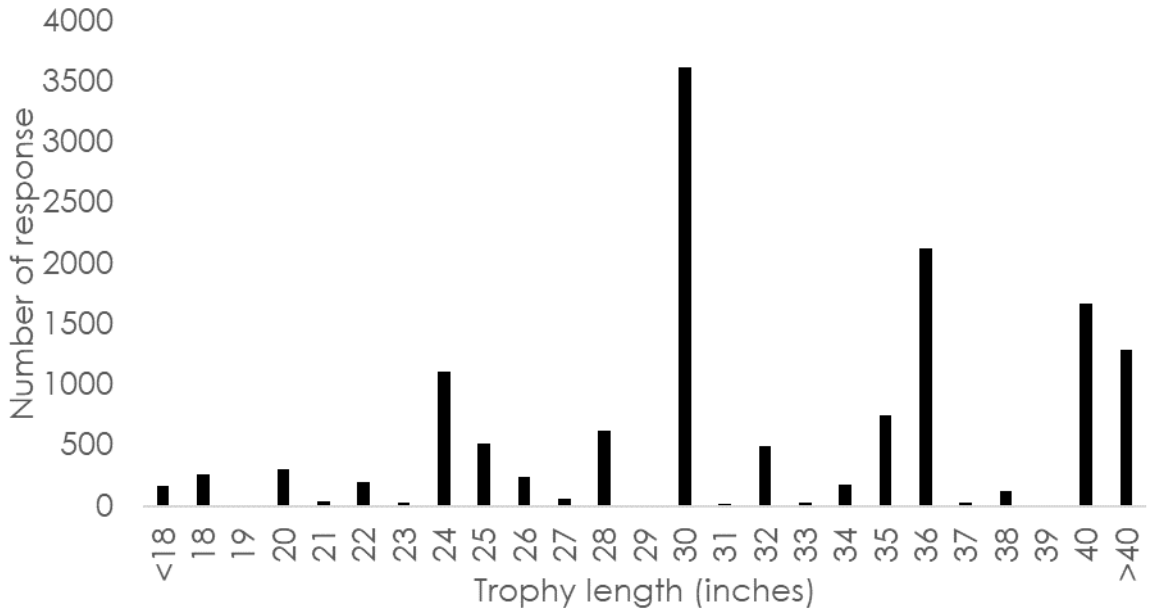


Figure 1. Figure 1.2 in Appendix 1, 2022 Striped Bass Angler Preference Questionnaire Results Summary. Fill–in–the blank responses to what size Striped Bass anglers considered a trophy. Data source: 2022 Striped Bass Angler Preference Questionnaire.

Joint Town Hall Meeting

The Department hosted a joint public town hall meeting with the NCGASA on August 24, 2022. The meeting platform was hybrid with the option to attend in–person at the Fisheries Branch headquarters in West Sacramento or virtually via Zoom. The purpose of the meeting was to discuss the regulation change petition brought forth by the NCGASA, the Department's evaluation of the petition to date, and allow public questions and comments to the NCGASA and the Department.

The meeting was well attended with approximately 50 members of the public in attendance and 100 more attending virtually. Forty–five public comments were made at the meeting with 40 commenters supporting the proposed slot limit (20–30 inches TL), two commenters opposing the proposed slot limit, and three commenters who were neutral on the issue.

CDFW Monitoring Studies

Angler Derived Fishery Data: Creel Surveys

There is limited monitoring data for Striped Bass in California, restricting the Department's ability to accurately estimate population and size class abundance. The Department's primary sources of recreational angling data are collected by our Inland (Central Valley Angler Survey) and Marine (California Recreational Fisheries Survey) creel programs. From these programs, fishery metrics such as effort, catch, harvest, and size of the catch can be estimated; however, the size ranges observed in the fishery may not be reflective of the size class distribution or abundance in the population.

CPUE as a relative measure of abundance, for the purpose of monitoring trends in the Striped Bass fishery, can be used when absolute population estimates do not exist (Hilborn and Walters 1992, Quinn and Deriso 1999). However, these measures are best used in conjunction with population estimates to better understand CPUE trends in a broader context (Ward et al. 2013). Hyperstability is the "illusion of plenty", where CPUE is not linearly related to fish density. This often occurs when fisheries target aggregations of fish. Catch rates can remain stable, while abundance of the population declines (Erisman et al. 2011). Hyperstability has been documented in many commercial fisheries and a few recreational fisheries (Shuter et al. 1998, Rose and Kulka 1999, Erisman et al. 2011), and is often attributed to fish aggregations and changes in gear efficiency in commercial fisheries. However, the mechanisms driving hyperstability in recreational fisheries can be attributed to improved fishing techniques (technology, gear, and bait) and information sharing (social media, etc.).

Department creel surveys try to account for sampling factors that could contribute to hyperstability through their study designs. Sampling occurs over a large geographic area, year–round, and applies other randomly selected factors (start times, launch locations/ports, sample day, etc.). Building random stratification into the study design captures variability in angler effort (spatially and temporally), fish distribution and/or seasonality, and the range of angler experience (catchability).

Based on The Department's Central Valley Angler Survey (CVAS) data, angler effort (total angler hours) targeting Striped Bass has not significantly changed during 1991–2016, however angler CPUE has increased significantly over the same period (Figure 2). Similarly, data collected from Commercial Passenger

Fishing Vessels (CPFV) during 1995–2020 also indicate that Striped Bass CPUE has significantly increased over time (Figure 3), providing evidence that fishery performance is improving in both fresh and marine waters.

While CPUE from angler–based surveys have remained relatively stable or even increased over time (potential hyperstability), recruitment to age–0 has precipitously declined in the Delta (see Juvenile and Adult Monitoring section below). However, recruitment to age 3 (size of entry to the fishery) has been shown to be strongly density dependent (Figure 4, Kimmerer et al. 2000). This may buffer changes in fishable sized Striped Bass from the decline in recruitment of age–0 fish.

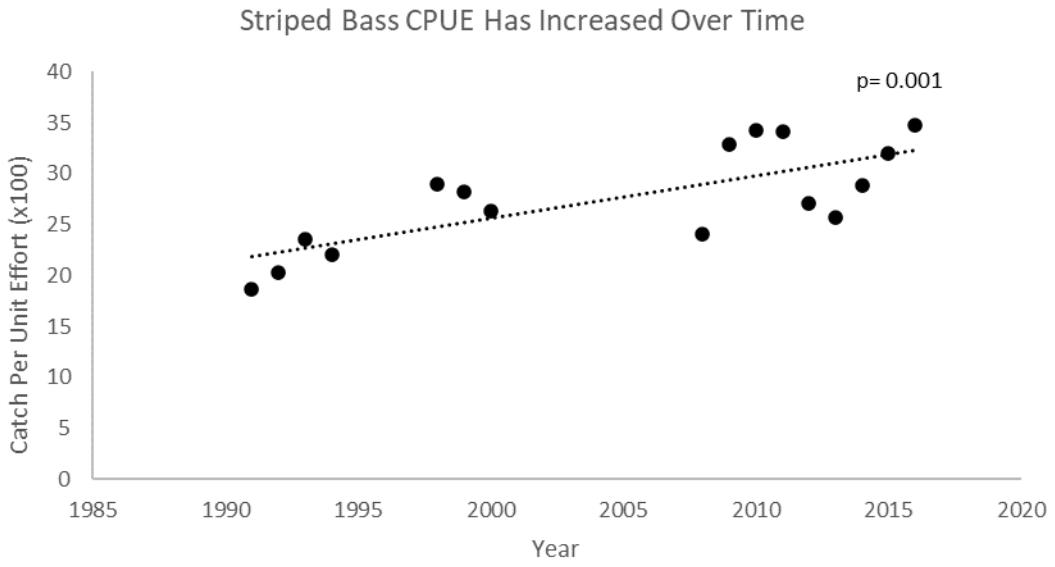


Figure 2. Average catch of Striped Bass per angler hour. Striped Bass CPUE has significantly increased over time (p = 0.001). Data source: CVAS data.

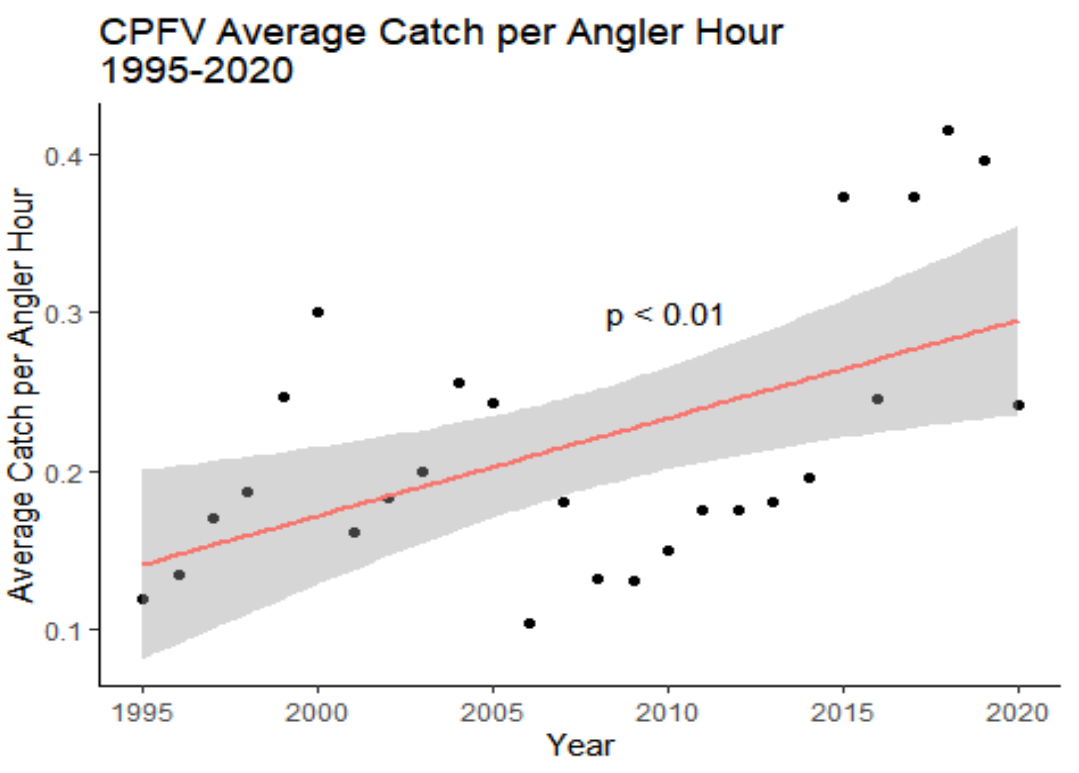


Figure 3. Average catch of Striped Bass per angler hour. Data source: CPFV Logs.

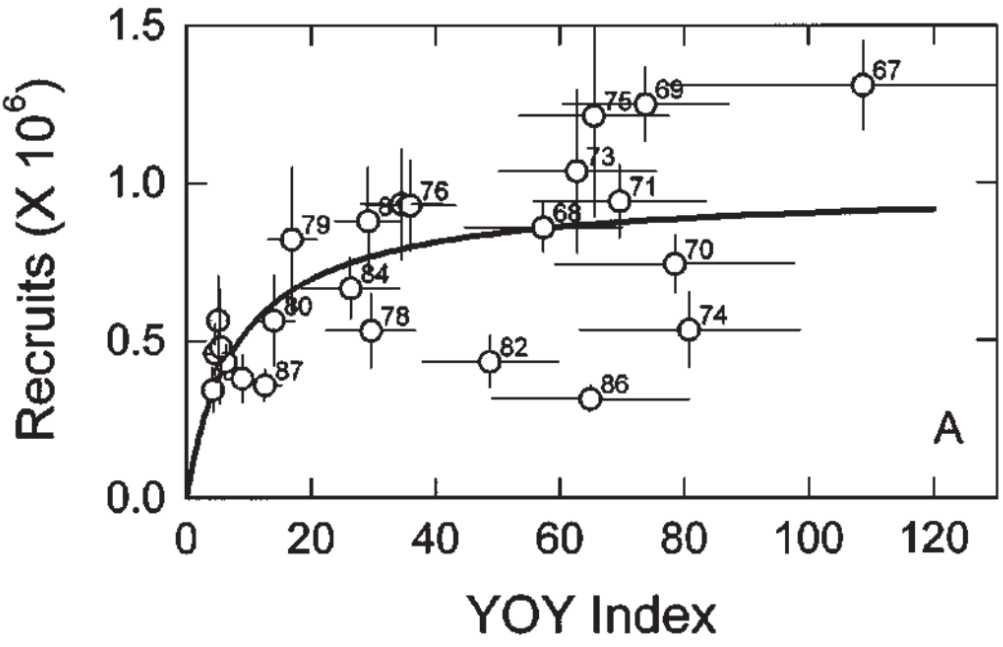


Figure 4. From Kimmerer et al. 2000 Fig 5(A). Young–of–the–year (YOY) index was estimated from a combination of Summer Townet Survey, Fall Midwater Trawl Survey and the San Francisco Bay Study. Recruits refers to abundance estimates of age–3 fish in the Adult Striped Bass Study.

Catch-per-unit-effort is one metric which is often used to evaluate fisheries stability. A declining CPUE may be an indication of overexploitation by recreational anglers. While an increasing CPUE may result from improvements in fishing technology (lures, fish finders, etc.) that increase anglers' ability to locate and catch fish, and/or may be an indication of an increasing Striped Bass population, particularly of sub–adults that are sub–legal size (<18 inches) for harvest in the fishery. Evidence of the latter comes from the significant increase in numbers of Striped Bass reported as released in both the inland and ocean/bay fisheries. Anglers typically report releasing Striped Bass because they are 1) practicing catch–and–release fishing, 2) the fish is larger than they find desirable, and most commonly 3) because the fish is smaller than what they can either legally keep or want to keep. However, angler catch data alone cannot be used to assess the status and trends of the Striped Bass population; fishery–independent population studies and assessments are also needed to address these questions.

Another metric that can be evaluated for fisheries performance is fish size. An indication that a fishery may be in decline is a significant decrease in the size of fish harvested. The average size of Striped Bass harvested by anglers has not changed significantly over time (Figure 5). Inland harvest from 1998–2016 has remained around 23 inches total length (average), while Striped Bass harvested in the ocean/bay from 2010–2021 averages around 22 inches. Unfortunately, neither inland nor ocean surveys have historically collected size data on fish that are reported as released, thus it is possible that the size of fish released in the fishery has declined over time. Additionally, creel surveys do not monitor the nighttime Striped Bass fishery, so it is possible that there may be a difference in the size of Striped Bass harvested during the day when compared to what is harvested at night. Currently the Department does not have data to address these questions.

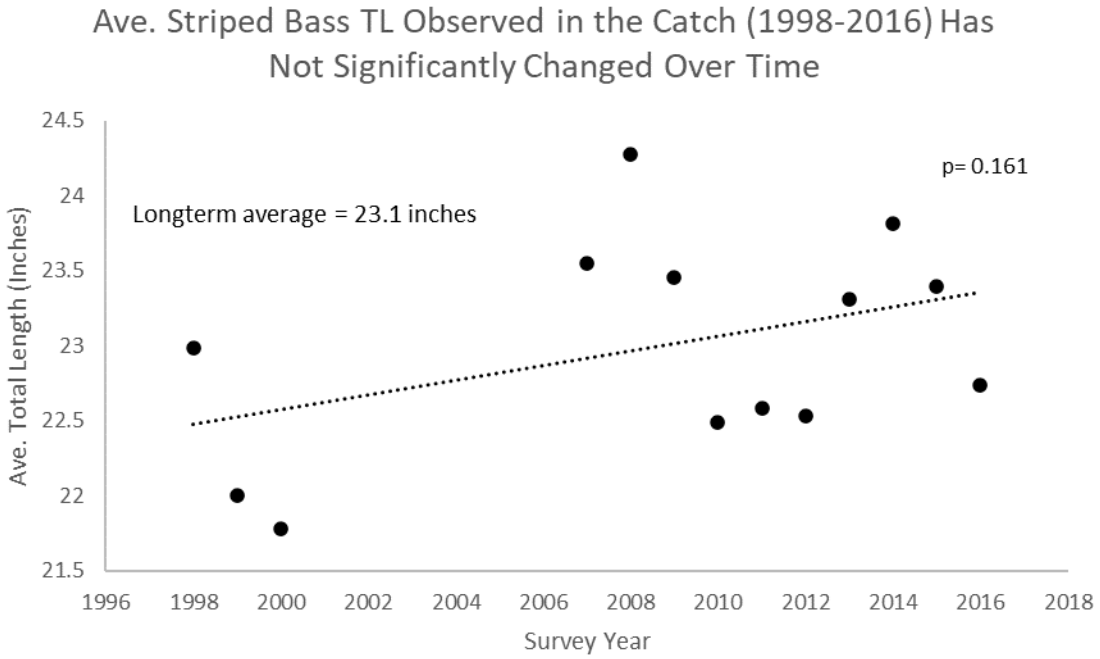


Figure 5. The average size of Striped Bass observed in angler catch by the Survey. The slope of the trend line is not significantly different than 0 (p = 0.161) over the sampling period 1998–2016. Data source: CVAS.

Changes to Striped Bass fishing regulations may have unintended consequences, such as decreased harvest opportunity. For example, an increase to the minimum size for retention may decrease harvest opportunities for all anglers and may disproportionately impact disadvantaged communities that rely on recreational harvest for food security. In a survey commissioned by the California Department of Water Resources (DWR) (Ag. Innovations 2021), 90% of disadvantaged community (DAC) respondents indicated that they or their families consume fish from the Delta four to five times per week. Striped Bass comprised 33% of the catch that DAC anglers reportedly harvested. Currently, Striped Bass harvested in the < 20–inch category represents ~20% of the inland harvest (as reported by CVAS), and ~9% of the ocean/bay harvest (as reported by CRFS). This indicates that Striped Bass anglers are willing to keep smaller fish and may already struggle to catch legal–sized Striped Bass (Figures 6 and 7).

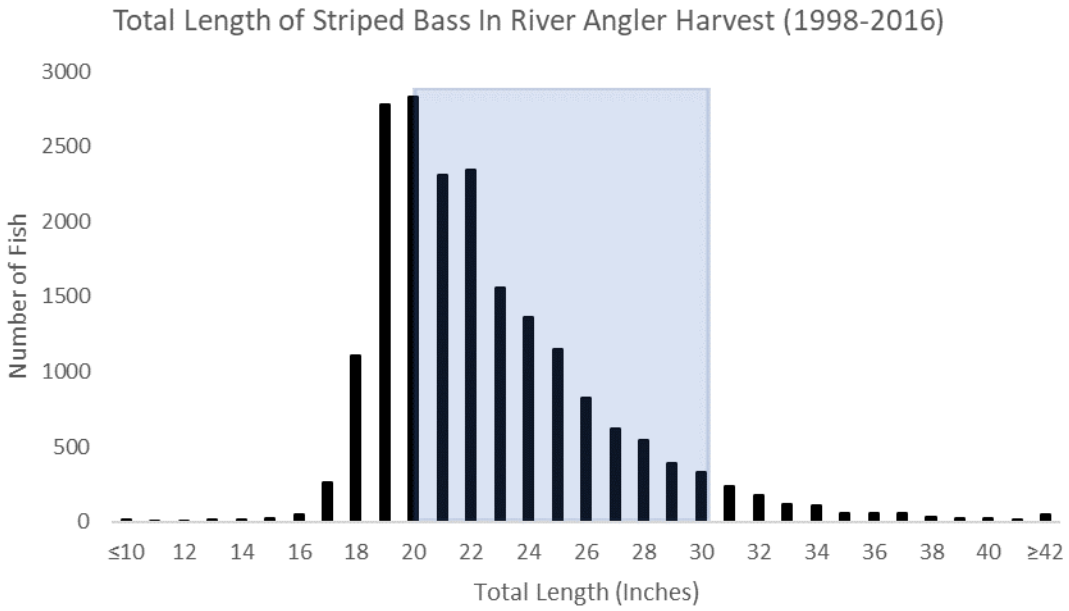


Figure 6. Length–frequency distribution of Striped Bass observed in angler harvest for Central Valley during 1998–2016. Proposed NCGASA slot limit highlighted in blue (74% of reported harvest falls within this range). Data Source: CVAS.

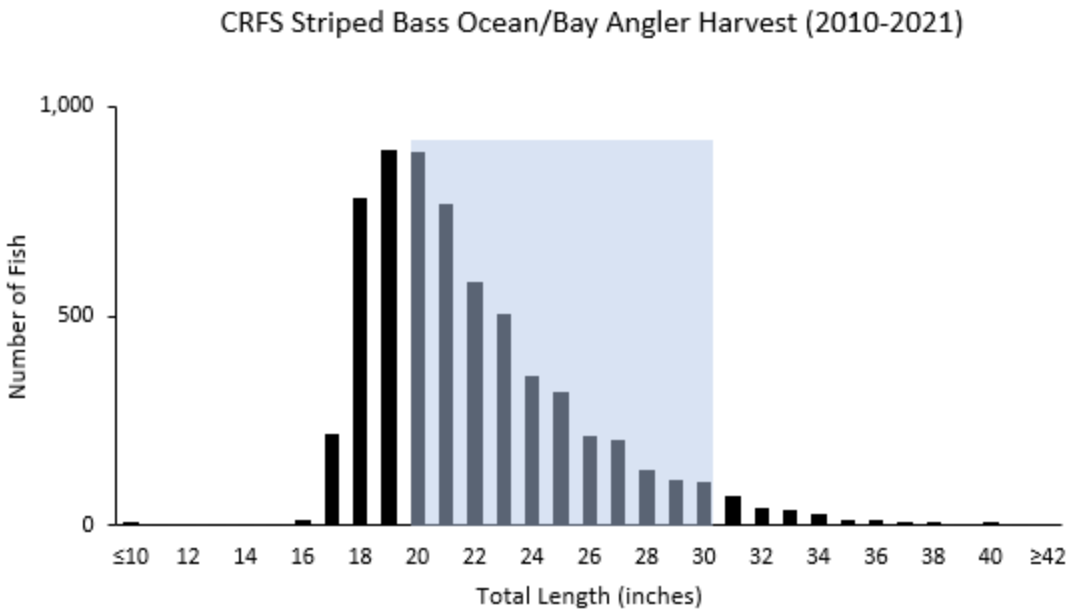


Figure 7. Length–frequency distribution of Striped Bass observed in angler harvest for Ocean/Bay during 2010–2021. Proposed NCGASA slot limit highlighted in blue (87% of reported harvest falls within this range). Data source: RecFIN (CRFS).

Juvenile Abundance Indices

Juvenile abundance for Striped Bass inhabiting the Sacramento–San Joaquin Delta have been indexed using data collected during the Summer Townet Survey (STN, since 1959) and the Fall Midwater Trawl Survey (FMWT, since 1967). These surveys sample the pelagic, open–water habitats of the Delta through San Pablo Bay and target primarily age–0 fish. Age–0 Striped Bass abundance has also been indexed from the San Francisco Bay Study otter and midwater trawls (since 1980), which sample benthic and pelagic open–water habitats from the confluence of the Sacramento–San Joaquin Rivers to South San Francisco Bay. Finally, the UC Davis Suisun Marsh Fish Study (since 1980) also provides a long–term metric of juvenile abundance for Striped Bass inhabiting the sloughs of Suisun Marsh (data available upon request to UC Davis).

All the above–mentioned surveys have documented some level of decline in catch of age–0 or young Striped Bass over their operating history (Figures 8 and 9). These declines are most drastic in the open water surveys (STN, FMWT, SF Bay Study), while the Suisun Marsh Fish Study does not show as steep of a decline (Figure 9). The scale of the decline in the open water surveys may be partially explained by a lateral shift in distribution away from channel habitats to shoal

habitats, which are generally not as well surveyed by the STN, FMWT, and San Francisco Bay Study (Sommer et al. 2011). Regardless, the decline in abundance amongst all surveys to some degree indicates reduced spawning success and recruitment to age–0.

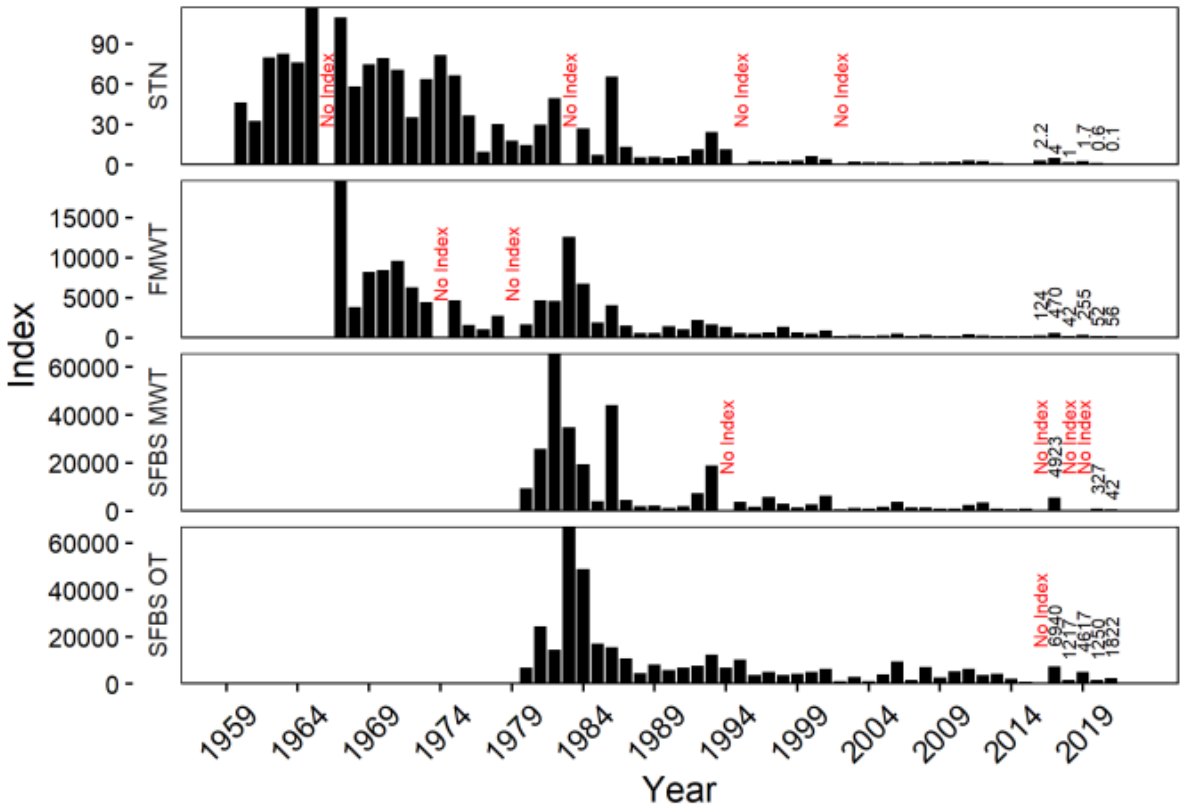


Figure 8. Figure 13 in Malinich et al. 2022. Index values for age–0+ (STN, FMWT) and age–0 Striped Bass (SFBS MWT, SFBS OT) from the Summer Townet Survey (STN), Fall Midwater Trawl (FMWT) and San Francisco Bay Study (SFBS) midwater trawl (MWT) and otter trawl (OT). See Malinich et al. (2022) for description of index values.

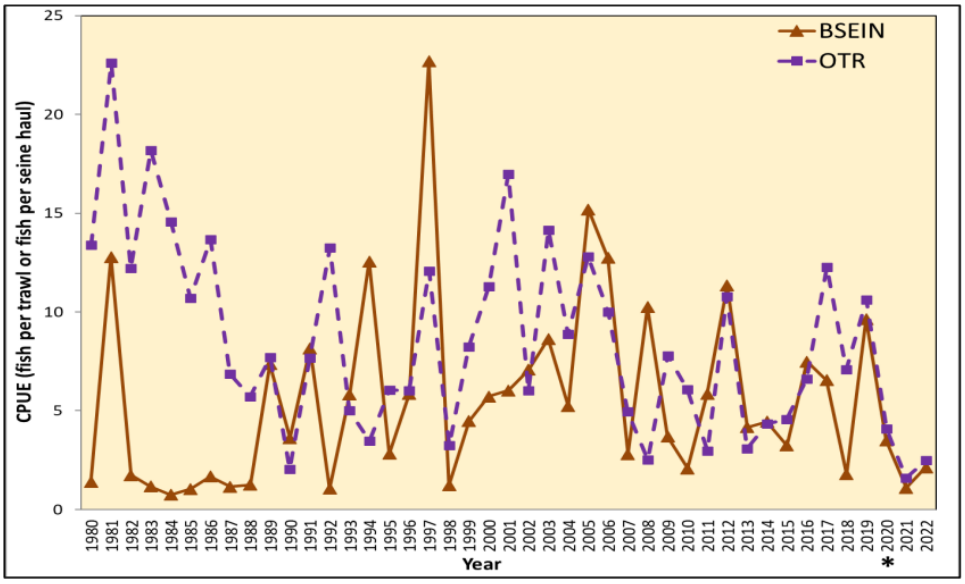


Figure 9. Figure 22 from O'Rear et al. (2022). Catch per unit effort (CPUE) of Striped Bass from the Suisun Marsh Fish Study beach seine (BSEIN) and otter trawl (OTR) surveys. See O'Rear et al. (2022) for description of CPUE calculations.

Adult Population Monitoring

Adult abundance was first estimated in 1969 and continued through the early 2000s. These estimates relied on tagging and subsequent recapture of tagged individuals to generate Lincoln–Petersen population estimates. Estimates show a decline from 1.5–2 million adults in the 1960s and 1970s to fewer than 1 million adults by the late 1990s (Figure 10a). Similarly, age–3 Striped Bass declined from over 600,000 to approximately 100,000 during the same time period (Figure 10b). Harvest rates have also been generated as a product of the adult mark–recapture program. Using high–reward tags and angler tag returns, harvest rates can be calculated from 2011 to 2022. During this time period, harvest rates averaged 12%, with a low of approximately 4% in 2015 and a high of 29% in 2017 (Figure 11). Decreased funding and an associated reduction in the number of tags released and recovered resulted in the inability to reliably calculate abundance estimates using mark–recapture methods after the early 2000s. However, recent abundance estimates calculated using the combined inland and marine harvest estimated from CVAS and CRFS creel surveys, as well as harvest rate from tag returns, resulted in an average of 1,157,275 legal–sized (> 18–inches TL) Striped Bass estimated from 2011–2016. Abundance estimates during this period ranged from 604,695 legal–sized Striped Bass in 2013 to 2,252,748 in 2015. Abundance estimates using harvest and harvest rate are

restricted to this time period due to year–round sampling limitations by CVAS. Additionally, these estimates do not account for harvest in the night fishery or from those fish harvested outside of the CVAS survey area and are therefore biased low.

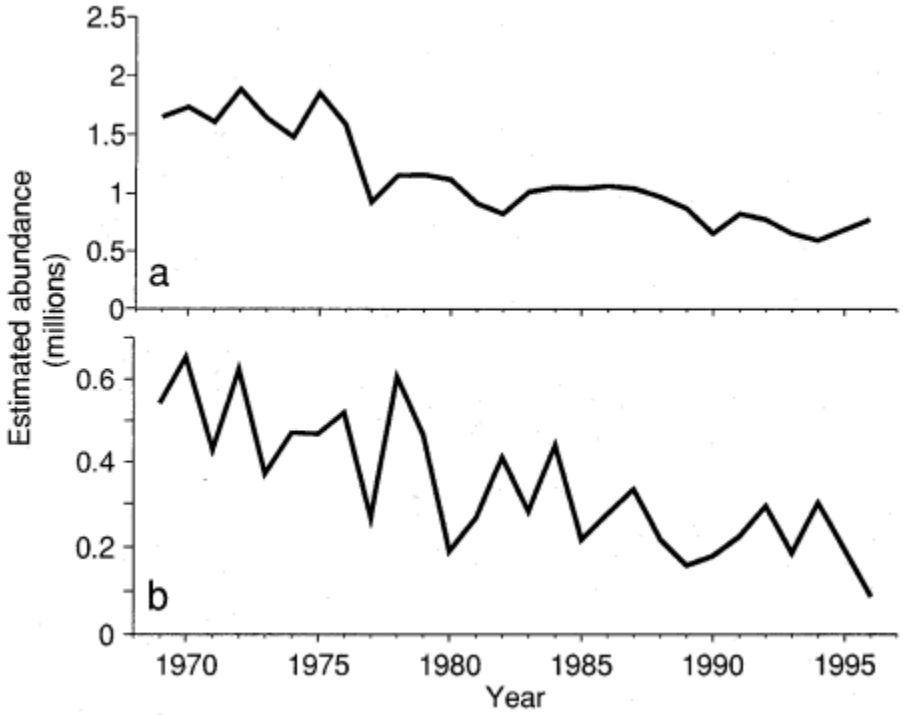


Figure 10. Estimated abundance of a) legal sized Striped Bass (≥ 18inches total length) and b) age–3 Striped Bass in the Sacramento–San Joaquin Watershed from 1969–1996. Figure from Kohlhorst (1999).

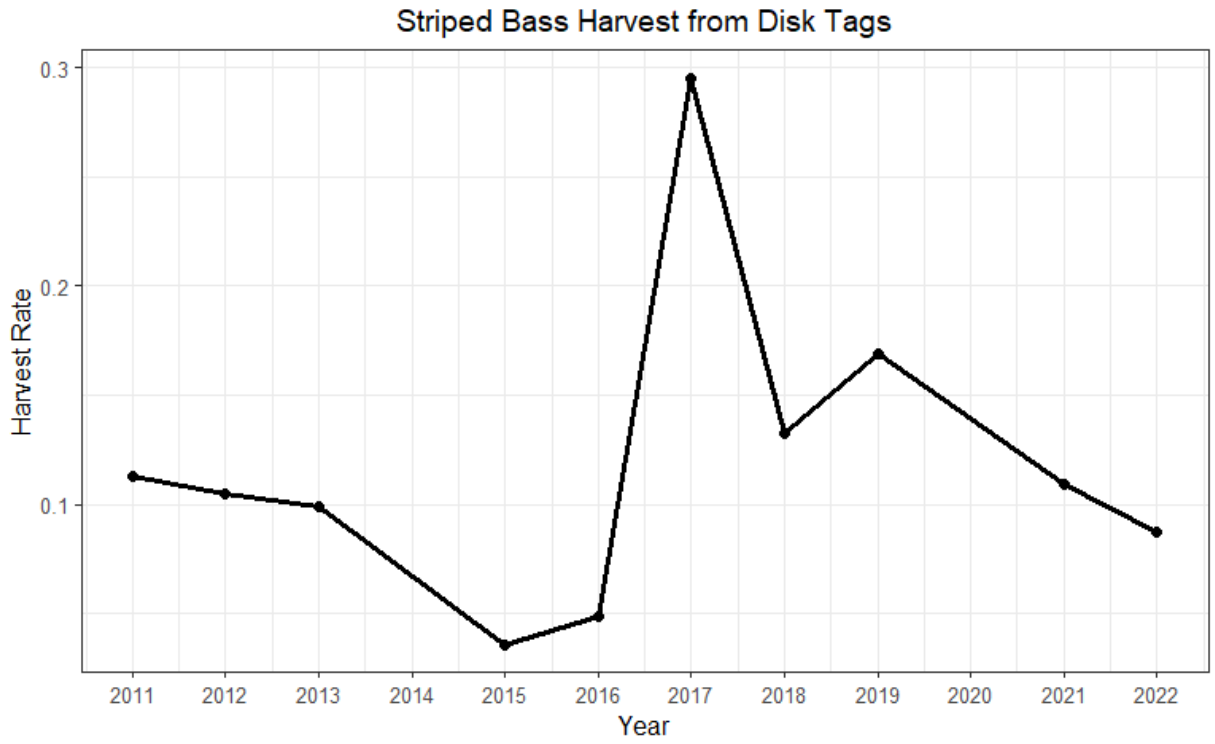


Figure 11. Estimated harvest rate of Striped Bass in the Sacramento–San Joaquin Watershed from 2011–2022.

Population Model

Model overview

To understand potential fishery tradeoffs resulting from proposed regulatory changes to the Striped Bass (*Morone saxatilis*) recreational fishery, we developed a sex–specific age and size–structured population model. The model predicts the sex–specific abundance of growth–type groups for each age at equilibrium as a function of density–dependent recruitment, natural mortality, harvest mortality, and discard mortality. The model accounts for differences in the impact of length–based harvest on females and males by modelling their abundance independently with different average growth rates and contributions to the total fecundity of the stock. Multiple growth–type groups were modelled for each sex to account for inherent variation in fish growth and the cumulative effects of size–selective harvest on the size structure of the stock. We applied the model to evaluate the relative performance of a range of length–based harvest restrictions with a focus on the current MLL and a recently

proposed harvest–slot limit (HSL) at meeting fisheries and conservation management objectives. To account for uncertainty in life history, recruitment, and fishery inputs, we simulated the distribution of plausible model outcomes using a Monte Carlo simulation approach. With this approach we evaluated four management priorities, including stock conservation, total harvest, catch of trophy–sized fish, and total catch.

Methods

Model Formulation

We model the number of fish of each sex and growth–type–group recruiting to age–1 at equilibrium ($R_{g,s}$) with a Botsford–modified Beverton–Holt stock–recruitment function (Beverton and Holt 1957, Botsford and Wickham 1979, Botsford 1981a, Botsford 1981b) as,

Equation (Eq.) 1

$$R_{g,s} = \dot{p}_s p_g R_0 \left(\frac{CR - \phi_0/\phi_f}{CR - 1} \right),$$

where CR is the Goodyear recruitment compensation ratio (Goodyear 1977, 1980) that describes the maximum relative increase in juvenile survival as the total fecundity is reduced from the unfished biomass to near zero (Walter and Martell 2004). The parameters ϕ_0 and ϕ_f are the per–recruit fecundity of the unexploited stock and the exploited stock, respectively. The parameter R_0 is the average number of juvenile fish recruiting to age–1 in the unfished stock, which is analogous to the carrying capacity of the stock. The parameter p_g is a vector of fixed proportions that apportion the number of recruits each year to each growth–type–group (g). By apportioning recruits in fixed proportions, the assumption that variation in growth is a non–heritable trait is made explicit. The parameter $\dot{p}_s$ is a fixed sex ratio of recruits.

The fecundity per recruit of the stock in the fished (ϕ_f) and unfished (ϕ_0) condition was calculated as,

Eq. 2

$$\phi = \sum_a \sum_g p_{g,s=f} S_{a,g,s=f} f_{a,g,s=f} \left(1 - e^{-\theta * p_{male}}\right),$$

where $S_{a,g,s=f}$ is finite survival rate for females, and $f_{a,g,s=f}$ is the reproductive biomass of females at age a in growth–type–group g. The term $(1 - e^{-\theta * p_{male}})$ modifies the fecundity based on the ratio of reproductive males to females –per Heppel et al. (2006), where the parameter p_{male} represents the per–recruit proportion of mature males in the fished condition and θ represents the relative contribution of male to female reproductive biomass in the reproductive process. This modification to the per–recruit fecundity calculation formalizes the assumption that females are the primary contributors to the annual fecundity of the stock while accounting for the influence of altered sex ratios due to differential effects of size–selective harvest on the male and female components of the stock. The reproductive biomass $f_{a,g,s}$ for both sexes was approximated as the difference between the weight and weight–at–maturation for each age, growth–type–group, and sex.

For each sex and growth–type–group, survivorship S to age a was calculated recursively as,

Eq. 3

$$S_{a,g,s} = S_{a-1,g,s} e^{-M_{a-1,g,s}} \left(1 - \dot{V}_{a-1,g,s} V_{a-1,g,s} U\right)\left(1 - \left(\dot{V}_{a-1,g,s} \dot{U} - \dot{V}_{a-1,g,s} V_{a-1,g,s} U\right) D\right),$$

where $S_{a-1,g,s}$ is the finite annual natural survival rate (i.e., $S_{a,g,s} = e^{-M_{a,g,s}}$) that models the proportion of fish surviving from deaths due to natural causes. The parameter $M_{a,g,s}$ is the instantaneous annual natural mortality rate, and the terms $\dot{V}_{a,g,s}$ and $V_{a,g,s}$ are the length–based vulnerabilities of fish to capture and harvest (respectively). The parameter D models discard mortality rate, which represents the proportion of caught and released fish that die due to the capture and handling process, and $\dot{U}$ and U represent capture and harvest rate, respectively.

We modeled the instantaneous annual natural mortality rate $M_{a,g,s}$ as inversely proportional to fish length per Lorenzen (2000) as,

Eq. 4

$$M_{a,g,s} = M_{ref} \left(\frac{L_{ref}}{L_{a,g,s}}\right),$$

where L_{ref} is a reference length where the natural mortality rate is known to be a given value (i.e., M_{ref}). This formulation describes natural mortality as higher for

smaller, younger fish and lower for larger, older fish, which is a pattern that is consistent across fish species (Lorenzen 2000) and is important when determining length–based harvest regulations (Ahrens et al. 2020).

The vulnerability of each sex, age and growth–type–group to capture ($\dot{V}_{a,g,s}$ in Eq. 3) was described as a dome shape with a double logistic model to describe reduced vulnerability of smaller and larger fish relative to moderate sizes as,

Eq. 5

$$\dot{V}_{a,g,s} = \left(\frac{1}{1 + e^{-\left(\frac{L_{a,g,s} - L_{low}}{\sigma * L_{a,g,s}}\right)}} - \frac{1}{1 + e^{-\left(\frac{L_{a,g,s} - L_{high}}{\sigma * L_{a,g,s}}\right)}} \right),$$

where $L_{a,g,s}$ is the length of fish at age a in growth–type–group g for sex s; L_{low} is the lower total length at which fish are 50% vulnerable to capture; L_{high} is the upper total length at 50% vulnerability to capture; and σ approximates the standard deviation of the logistic distribution. The left terms in Eq. 5 model increasing vulnerability to angling with length, and the right terms models declining vulnerability to angling with length. Values of σ specify the steepness of each side of the dome–shaped vulnerability curve.

The vulnerability of each sex, age and growth–type–group to harvest was modeled as Boolean variables where a value of 1 indicated that fish of age a in growth–type–group g were of size legal to harvest (i.e., within range given the MLL or HSL evaluated) and a value of 0 indicated that they were not. Thus, we specified vulnerability to harvest with a logical test as,

Eq. 6

$$V_{a,g,s} = 1, \text{when } L_{min} < L_{a,g,s} < L_{max}$$

$$V_{a,g,s} = 0, \text{when } L_{min} > L_{a,g,s} \text{ or } L_{max} < L_{a,g,s}$$

Where specified values of L_{min} and L_{max} represent the length–based harvest regulation, with L_{min} as the lower and L_{max} as the upper legal length for harvest.

We modelled the growth of males and female fish in each growth–type–group independently with a standard Bertalanffy (1938) growth model as,

Eq. 7

$$L_{a,g,s} = L_{\infty,g,s}\left(1 - e^{-k(a-t_0)}\right),$$

where $L_{\infty,g,s}$ is the asymptotic (maximum) size of growth–type–group g for sex s, k is the metabolic parameter that determines the rate that $L_{\infty,g,s}$ is attained, and t_0 is the theoretical age at length equal to zero. We simulated variability in growth by assigning each growth–type–group a unique $L_{\infty,g,s}$ based on a range between ± 20% of an average annual asymptotic length $\bar{L}_{\infty,s}$ (Walters and Martell 2004). The weight of fish was calculated with a standard weight/length relationship as:

Eq. 8

$$w_{a,g,s} = aL_{a,g,s}{}^{b},$$

where a is the scaling parameter and b is the allometric parameter that modifies the relationship between length and weight.

Simulation Process

We ran our model as a Monte Carlo simulation in three main steps by, 1) defining a set of MLL and HSL regulations to be evaluated, 2) generating a random sample of input parameter values, and 3) running the model iteratively for the full combination of regulations and inputs to produce a sample of predicted outcomes for each regulation. We defined a set of length–based regulations as the combination of a range of minimum (L_{min}) and maximum (L_{max}) legal–size limits. We achieved this by creating vectors for L_{min} and L_{max} in 1 cm increments from 30 cm to a maximum legal length L_{max}(set at 182 cm, i.e., + 20% the maximum value of $\overline{L}_{\infty}$). The vector for L_{max} ranged from the minimum value of the L_{min} vector +1 (i.e., 31 cm) to 182 cm. All regulations with $L_{max} = 182$ cm and $L_{min} < 182$ cm represent MLL regulations while all regulations with $L_{min} < L_{max} < 182$ cm represent HSL regulations. All regulations with $L_{min} > L_{max}$ were excluded from the process.

All additional input parameters were either fixed values or drawn randomly from sampling distributions to account for fishery and biological uncertainty. Distributions for randomly drawn inputs were specified such that the central tendency and variation in parameter values were plausible based on multiple

data sources, published values, and life–history theory. The uncertainty associated with key life history and stock recruitment inputs including the density–dependent compensation ratio CR, the average asymptotic length $\overline{L}_{\infty}$, the metabolic growth parameter k, the instantaneous natural mortality rate M_{ref}, and the length at maturation L_{mat} were obtained using the R package *Fishlife* (Thorson et al. 2017, Thorson 2019, Thorson 2022). The R package *Fishlife* was created to provide life history and stock recruitment parameters with measures of uncertainty important for determining sustainable regulations for data–limited fisheries. The package utilizes data from over 10,000 fish populations contained in the Fishbase database (Froese and Pauly 2017) in a hierarchical multivariate generalized linear mixed model to predict mean parameter values and a covariance matrix based on taxonomic relationships. To further inform the estimation process, we used parameter values available in the literature with the model updating feature provided in the package to produce the covariance matrix used for generating these input parameters (e.g., Rudd et al. 2019). All input parameters of the model, mean values, and sampling distributions are defined in Tables 3 and 4, and fully justified in Appendix 2.

Table 3. Average life history and biological parameter input values used for population simulations of Striped Bass.

Parameter	Description	Male Value	Female Value	Sampling Distribution
R_0[2]	Beverton-Holt Stock Recruitment: Average annual unfished recruitment	1	1	Fixed
CR [2]	Beverton-Holt Stock Recruitment: Compensation ratio	11.6	11.6	$CR \sim \mathrm{MvN}(\mu, \Sigma)$
θ [2]	Sex ratio: Fertility function parameter	-	50.4	$\theta \sim \mathrm{U}(a = 20, b = 8($
$L_{\infty,min}$ [3]	Growth: Minimum asymptotic length (cm)	96.8	106.3	Derived
$L_{\infty,max}$ [3]	Growth: Maximum asymptotic length (cm)	145.2	159.5	Derived
$\overline{L}_{\infty}$ [4]	Growth: Average asymptotic length (cm)	121	132.9	$\overline{L}_{\infty} \sim \mathrm{MvN}(\mu, \Sigma)$
k [4]	Growth: Von Bertalanffy growth coefficient (yr^{-1})	0.1	0.1	$k \sim \mathrm{MvN}(\mu, \Sigma)$
t_0 [4]	Growth: Theoretical age at length 0 (years)	-1.4	-1.4	Fixed
L_{mat} [4]	Maturation: Length (cm) at maturation (years)	35.1	58	$L_{mat} \sim \mathrm{MvN}(\mu, \Sigma)$
A_{max}	Mortality: Maximum age (years)	30	30	Fixed
M_{ref} [5]	Mortality: Natural mortality rate at L_{ref} (yr^{-1})	0.15	0.15	$M_{ref} \sim \mathrm{MvN}(\mu, \Sigma)$
L_{ref} [5]	Mortality: Reference length where $M = M_{ref}$ (cm)	90	90	Fixed
a [6]	Length-weight: scaling parameter	$4.8*10^{-5}$	$2.7*10^{-5}$	Fixed
b [6]	Length-weight: allometric parameter	2.7	2.8	Fixed

[2] Appendix 2.2.5

[3] Appendix 2.2.1

[4] Appendix 2.2.3

[5] Appendix 2.2.4

[6] Appendix 2.2.2

Table 4. Average fishery parameter input values used for population simulations of Striped Bass.

Parameter	Description	Mean Value	Sampling Distribution
L_{troph}	Minimum TL of trophy-size fish (cm)	76	Fixed
D [7]	Discard Mortality rate	0.29	$D \sim B(\alpha = 3.75, \beta = 9.25)$
U [8]	Harvest rate	0.14	$U \sim B(\alpha = 5\,, \beta = 30)$
$\dot{U}$ [8]	Catch rate	0.35	$U/(1 - r_{rate}\,)$
δ [8]	Release rate	0.58	$\delta \sim B(\alpha = 70\,, \beta = 50)$
L_{low} [9]	Lower bound of length that is 50% vulnerable to capture (cm)	48	$N(\mu = 60, \sigma = 3)$
L_{high} [9]	Upper bound of length that is 50% vulnerable to capture (cm)	79	L_{low} + Δ, $\Delta \sim logN(\mu = \ln(5)\,, \sigma = 1)$

Model Outputs

We defined a set of model outputs as management performance metrics relevant to four primary objectives for the Striped Bass fishery. These objectives include three fisheries objectives to 1) maximize harvest, 2) maximize total catch, and 3) maximize catch of trophy–sized fish, and the objective to 4) provide stock conservation. Because the true value of the average number of fish recruiting to age–1 in the unfished condition is unknown, we specified management performance metrics for the fisheries objectives relative to the predicted values for the current MLL. These metrics included the percent change in harvest, total catch, and catch of trophy–sized fish between the

[7] Appendix 2.1.2
[8] Appendix 2.1.1
[9] Appendix 2.1.3

evaluated regulation and the current MLL. We calculated harvest, total catch, and catch of trophy–sized fish as,

Eq. 9

$$H = U \sum_{a} \sum_{g} \sum_{s} N_{a,g,s} \dot{V}_{a,g,s} V_{a,g,s}$$

Eq. 10

$$C = \dot{U} \sum_{a} \sum_{g} \sum_{s} N_{a,g,s} \dot{V}_{a,g,s}$$

Eq. 11

$$T = \dot{U} \sum_{a} \sum_{g} \sum_{s} N_{a,g,s} t_{a,g,s} \dot{V}_{a,g,s}$$

where $N_{a,g,s}$ is the predicted abundance of fish for each age, growth–type–group and sex. The parameter $t_{a,g,s}$ in Eq. 11 is a Boolean variable that takes the value of one when $L_{a,g,s}$ (Eq. 7) is greater than or equal to trophy size (L_{troph}, Table 4). The abundance of each sex at age for each growth–type–group was calculated as,

Eq. 12

$$N_{a,g,s} = R_{g,s} S_{a,g,s}$$

where $R_{g,s}$ is the number of fish recruiting to age–1 for each growth–type–group and sex (Eq. 1) and $S_{a,g,s}$ is their survival to each age (Eq. 3).

We used three performance metrics to evaluate the ability of regulations to conserve important components of the reproductive process as measures of stock conservation, which included,1) spawning stock biomass, 2) mature stock sex ratio, and 3) reproduction by older female fish. The conservation of spawning stock biomass was represented as the probability of each regulation resulting in a spawning potential ratio (SPR) ≥ 0.35. The spawning potential ratio is defined as the ratio of fished to unfished stock fecundity and is commonly used to indicate the risk of recruitment overfishing (i.e., exploitation at a rate beyond stock replacement; Goodyear 1990, Mace and Sissenwine 1993). Minimum values of SPR required for stock persistence vary in the literature from values of

0.3 to 0.5 (Walters and Martelle 2004). We adopted the value of SPR ≥ 0.35 from the 2022 Albemarle Sound–Roanoke River Striped Bass stock assessment (Lee et al., 2022) as an indication of spawning stock biomass conservation and calculated the probability of each regulation meeting this criterion as,

Eq. 13

$$SPR_{prob} = \sum_{I} \left(\frac{R\phi_f}{R_0\phi_0} \geq 0.35 \right) / I_{total},$$

where R is recruitment at equilibrium in the fished condition (Eq. 1), ϕ_0 and ϕ_f is the per–recruit fecundity of the unexploited and exploited stock (respectively, Eq. 2), R_0 is the average number of juvenile fish recruiting to age–1 in the unexploited stock (Table 3), I indicates each model iteration, and I_{total} is the total number of model iterations.

We chose the percent change in mature male sex ratio (r_{male}) between the current and evaluated harvest regulations to account for potential influence of the interaction between variable growth and maturation rates of male and female Striped Bass and length–based vulnerabilities to capture and harvest that may alter the sex ratio (McCleave and Jellyman 2004). In the case of Striped Bass, where females grow and mature at faster rates than males, increased harvest pressure on larger fish may impact the reproductive capacity of the population if exploitation results in disproportionate removal of females. Furthermore, population resilience to exploitation or unfavorable environmental conditions may increase with higher fecundity contribution from larger females. While it is assumed that fecundity scales linearly with body size in individual fishes (i.e. isometric relationship; Walters and Martell, 2004), many marine species demonstrate disproportionately higher reproductive output with body size (i.e. hyperallometric relationship; Barneche et al. 2018). Larger female Striped Bass have been reported to produce larger eggs, larger newly hatched larvae (Monteleone and Houde 1990) and may have higher hatching success than younger females (Zastrow et al. 1990). To capture the impact of regulations on age–specific reproductive output, we used the percent change in the fecundity contribution of females aged ≥ 10 years to the total fecundity of the population between the current and evaluated harvest regulations, calculated as,

Eq. 14

$$\gamma = \frac{\sum_{a\geq 10}\sum_{g} N_{a,g,s=f} f_{a,g,s=f}}{\sum_{a}\sum_{g} N_{a,g,s=f} f_{a,g,s=f}},$$

where $N_{a,g,s=f}$ is the is the predicted abundance (Eq. 12) and $f_{a,g,s=f}$ is the reproductive biomass for females within each age and growth–type–group.

We compared the following three alternative regulations to the results of the current (a) 46–cm TL MLL regulation: (b) 51–76–cm TL HSL, (c) 46–76–cm TL HSL and (d) 70–90–cm TL (Table 5). Regulations (b) and (c) serve as two candidate regulations under consideration as alternatives to the current MLL: (b) was proposed by NCGASA with the goal of increasing opportunities for mature females to spawn before entering the fishery (by increasing the minimum harvest length), and providing protection for older, more fecund females that escape the fishery (see *Introduction* for more details). Additionally, this regulation has the added benefit of creating a trophy fishery by limiting the maximum harvest size to 76–cm TL. Regulation (c) represents an alternative to regulation (b) to allow for continued harvest at the current MLL while establishing a trophy fishery by limiting the maximum harvest size to 76–cm TL. Lastly, we measure the outcome of the current 46–cm TL MLL against (d) East Coast Striped Bass regulations to compare results to a conservation–focused management strategy that is currently implemented for Atlantic stocks (Table 5).

Table 5. Current regulations and proposed and alternate slot limit ranges in consideration for the Striped Bass (*Morone saxatilis*, Moronidae) fishery in California.

Regulation	Description
(a) 46 cm (~18 inches) TL MLL	Current Striped Bass regulation in California
(b) 51-76 cm (~20-30 inches) TL HSL	Slot limit proposed by NCGASA
(c) 46 - 76 cm (~18-30 inches) TL HSL	Current MLL with upper HSL proposed by NCGASA
(d) 70-90 cm (~28- 35 inches) TL HSL	East coast regulations (for comparison)

Model Results

Conditions that affect overfishing.

The probability that length–based harvest regulations resulted in overfishing for Striped Bass varied across several fishery and population conditions (Figure 12). The probability of the model resulting in an SPR < 0.35 (i.e., overfishing) increased as harvest rate (U), catch rate ($\dot{U}$), and discard mortality (D) increased (Figure 12a–f). The probability of overfishing was more variable at high discard mortality rates, likely because (1) these scenarios occurred less frequently in the simulation and (2) high discard mortality conditions that resulted in low probabilities of overfishing included below average values for catch rate (13%) and harvest rate (5%). The probability of overfished conditions occurring declined as the ratio of fecundity contribution of females age ≥10 years (γ) increased (Figure 12i–j), suggesting a relationship between fecundity contribution from larger females and population sustainability. Overfishing was also less likely to occur as release rate (δ) increased (Figure 12g–h), but values never reached zero due to some level of discard mortality present.

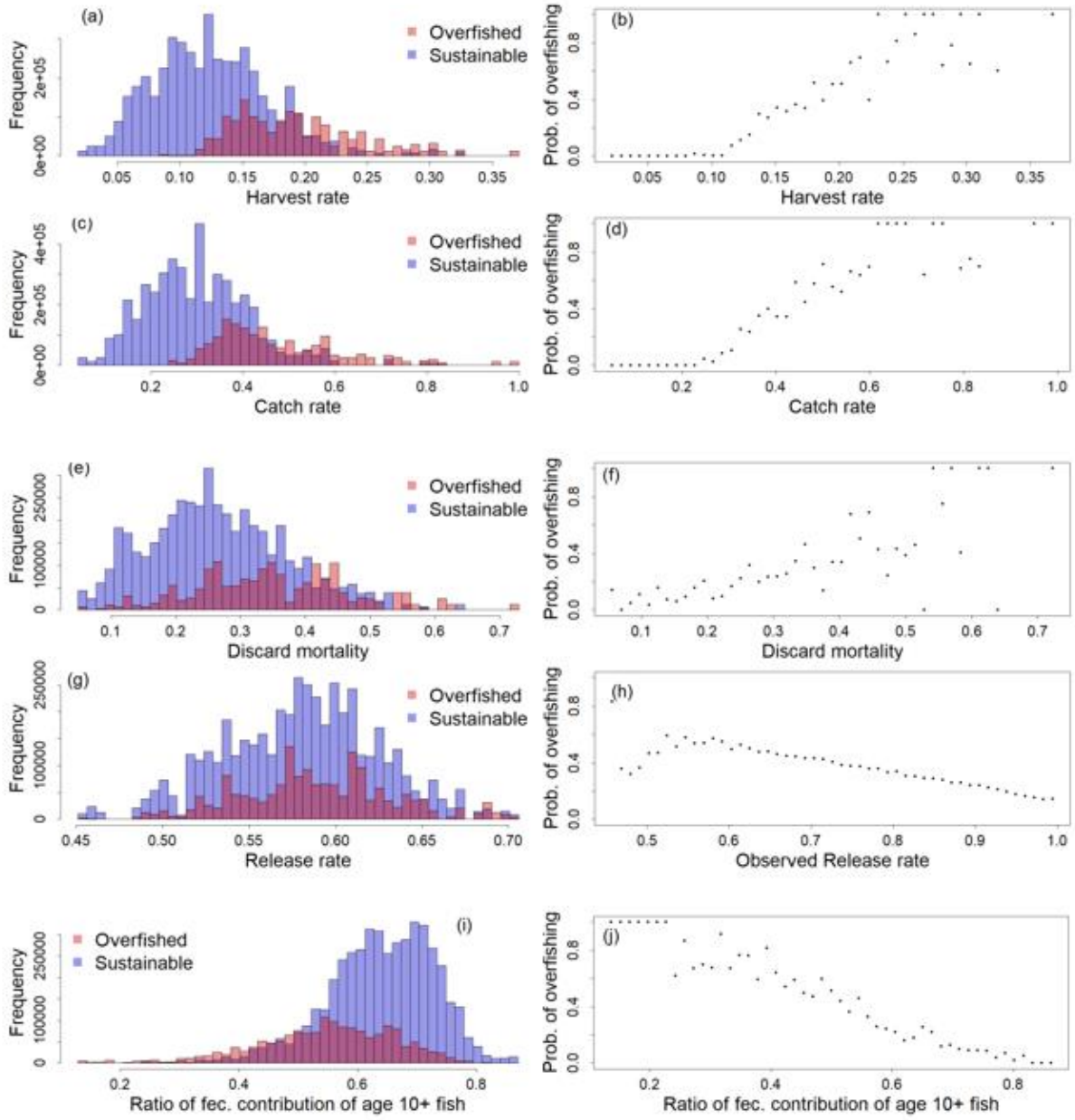


Figure 12. Histograms (left) and scatter plots (right) of simulated values for harvest rate (U, a–b), catch rate ($\dot{U}$, c–d), discard mortality (D, e–f), release rate (δ, g–h), and outputs for fecundity contribution of older (age 10+) fish (γ, i–j) that result in SPR values representing overfished (SPR < 0.35) and sustainable (SPR ≥ 0.35) conditions.

Performance of MLLs and HSLs for fishery objectives

Except for harvest, candidate HSLs outperformed the current MLL for all fishery objectives. The probability of meeting conservation thresholds (SPR ≥ 0.35) under the current 46–cm TL MLL regulation was 47%, compared to 61% and 66% for a HSL with the current MLL 46–76–cm TL and the NCGASA–proposed 51–76–cm TL HSL, respectively. This probability increased to 79% under East Coast regulations (70–90–cm TL HSL) (Figure 13a). The fecundity contribution of older (≥ age 10) fish was higher under HSLs relative to the current MLL, but no differences resulted between the HSLs of interest (Figure 13b). Fecundity contribution of older fish was 6.5% higher than the current MLL under the East Coast HSL, and 8.1% higher under both candidate HSLs (46–76–cm and 51–76–cm) (Figure 13b). Differences in the estimated proportion of mature males in the population between the current and evaluated regulations were minimal, ranging from 1.5–4.5% lower than the current MLL (Figure 13c).

Compared to the three evaluated HSLs (Table 5), the current MLL resulted in the highest harvest per–recruit estimates (Figure 13d). However, the 46–76–cm HSL performed similarly, with harvest only 7.7% lower than that under the current MLL. Harvest estimates decreased by 21.1% under the candidate 51–76–cm HSL and were 73% lower than the current MLL under the East Coast HSL (70–90 cm) (Figure 13d). However, the East Coast HSL resulted in the largest percent increase in catch compared to the current MLL (30.3%), followed by the two candidate HSLs (Figure 13e). Evaluated HSLs performed similarly to each other, resulting in an estimated 8.5% and 13.1% increase in catch per–recruit under the 46–76–cm and 51–76–cm HSL, respectively. Relative to the current MLL, estimates of trophy catch per–recruit was 19% and 24.2% higher under the 46–76– cm and 51–76–cm HSLs (respectively) and 54.6% higher under the East Coast regulation (Figure 13f).

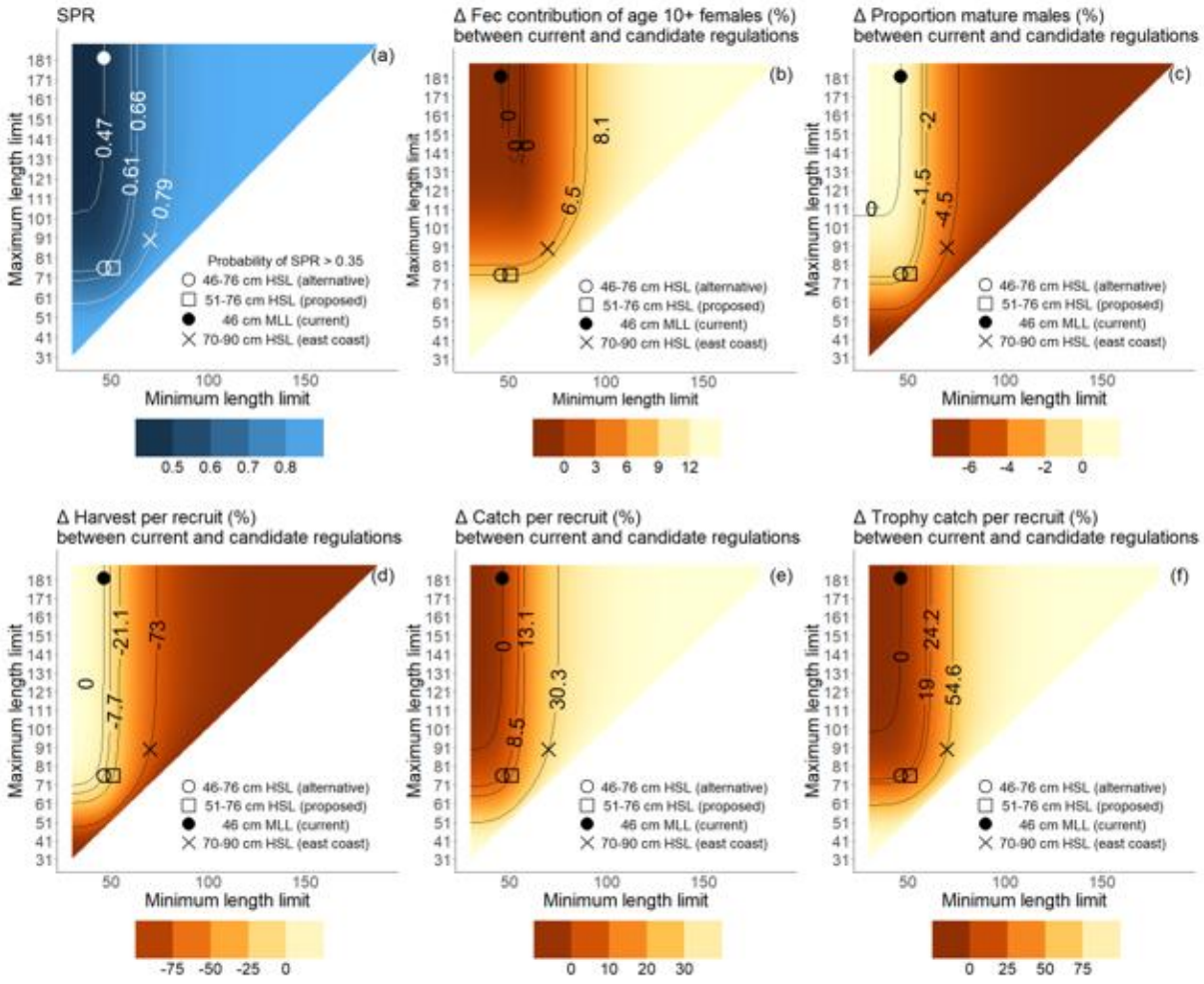


Figure 13. Model results describing (a) the probability of regulations resulting in an SPR ≥ 0.35 and the percent difference in (b) the ratio of fecundity contribution of age 10+ females, (c) the proportion of mature males in the population, (d) harvest per recruit, (e) total catch per recruit, and (f) catch of trophy–sized fish per recruit between current regulations (46–cm MLL) and a continuous range of MLLs and HSLs. The four evaluated regulations (Table 5) are denoted by symbols.

Model Discussion

Our simulation procedure produced more favorable outcomes for nearly all management priorities under HSLs compared to the currently enforced 46–cm MLL. The evaluated HSL regulations produced the greatest improvements to the catch of trophy fish and SPR but represented a trade off in harvest numbers.

HSLs produced more modest improvements to the total catch, the sex ratio and fecundity contribution of older females. These improvements were similar between the two evaluated HSL regulations; however, the harvest tradeoff was greatest for 51–76–cm HSL compared to 46–76–cm HSL.

These results corroborate a growing body of literature that indicate HSLs as an effective alternative to more common MLLs for promoting stock conservation while maintaining catch and harvest opportunities. For example, Gwinn et al. (2015) demonstrated that protecting both immature and large fish from harvest results in a better compromise among management objectives including harvest, trophy–catch, and stock conservation for both short and long–lived species. Ahrens et al. (2020) advanced this work by accounting for the impacts of density and size–dependent growth, mortality, and fecundity on optimal harvest schedules, finding that harvest slots typically outperformed minimum length limits for harvest and catch–related objectives. This work also highlighted the importance of low discard mortality rates for the benefits of HSLs to be realized. Similarly, the benefits for HSLs have been predicted for individual fisheries such as Murray Cod (*Maccullochella peelii*, Koehn and Tood 2012), Northern Pike (*Esox lucius*, Arlinghaus et al., 2010), Gulf of Mexico Red Snapper (Bohaboy et al., 2022), Gag Grouper (Tetzlaf et al., 2013), as well as East Coast Striped Bass (Carr–Harris and Steinback 2020). This body of literature, including this study, suggests that in the recreational fisheries context, HSLs can provide a better outcome for meeting diverse fisheries objectives.

The efficacy of each HSL of interest ultimately depends on the Department's management plan for Striped Bass, which is currently defined by broad goals for the fishery as opposed to quantitative measures. A management goal primarily focused on conservation of the species may consider HSLs closer to East Coast regulations (70–90–cm HSL) to ensure harvest policies result in > 75% probability of population sustainability (Figure 13a). However, these more restrictive regulations conflict with The Department's (CDFW) responsibility to preserve recreational opportunities in the form of harvest, which would decrease by 73% relative to current levels (Figure 13d). Prioritizing harvest numbers above other fishery objectives is best supported by the current MLL, or a wide harvest slot that encompasses most sizes that are vulnerable to catch modeled for the recreational fishery (~46 –100 cm). If the management objective is to enhance recreational fishing opportunities in the form of catch numbers, HSLs better achieve this goal compared to the current MLL. Possibly the most realized benefit of HSLs in terms of catch comes in the form of catch size, as the evaluated HSLs produced substantially higher (19–54%, Figure 13f) numbers of

trophy–sized catch compared to the current MLL. Thus, HSLs provide multiple benefits to the angler experience, including higher catch rates and improved quality of catch (as defined by fish size).

Pursuant to section 703 of the California Fish and Game Code, it is the policy of the Fish and Game Commission that the Department takes actions to promote a self–sustaining Striped Bass population in support of a robust recreational fishery while considering the potential impacts of Striped Bass population growth on native species (FGC 2020). Therefore, regulations that balance stock persistence and recreational catch and harvest opportunities are of primary interest to the Department. Based on model results, the current 46 cm MLL may not be sufficient to ensure the long–term sustainability of the population. Model simulations resulted in a 53% probability of recruitment overfishing (SPR < 0.35) under this regulation, versus a 34–39% probability under the evaluated HSLs (51–76–cm and 46–76–cm HSL, respectively) (Figure 13a). While the probability of meeting a SPR target of ≥ 0.35 relative to the current MLL is marginally higher (5%) under a 51–76–cm HSL, this small improvement comes at the cost of harvest opportunities. Harvest was estimated to decrease by about 21% relative to current levels under a 51–76–cm HSL compared to only a ~8% decrease under a 46–76–cm HSL (Figure 13d). These results align with data collected by creel surveys, which show that Striped Bass harvested in the <20–inch category represent ~20% of the inland harvest (CVAS) and ~9% of the ocean/bay harvest (CRFS) (Figures 6 and 7). Thus, when compared to the proposed 51–76–cm HSL, the 46–76–cm HSL results in a more optimal balance between population sustainability and harvest opportunities.

Evaluated HSLs resulted in higher total catch relative to the current MLL, however, improvements were moderate (8.5% and 13.1% increase under 46–76 and 51–76–cm HSL, respectively) and only reached a maximum of ~40% higher under the most restrictive harvest regulations (Figure 13e). This is most likely due to constraints placed on catch by the highly dome–shaped length selectivity curve used in the model (Figure 2.3). This curve was informed by length selectivity estimated for Atlantic Striped Bass caught in the recreational fishery (Carr–Harris and Steinback 2020) and is supported by the strong dome–shaped selectivity of other large–bodied recreational fish species reported in the literature (see Appendix 2.1.3). The modeled selectivity curve renders larger fish less vulnerable to catch, thus decreasing the risk of fishery mortality from harvest or discard. The dome–shaped vulnerability curve may also moderate the results of trophy catch (Figure 13f) under the candidate HSLs, as a more asymptotic length selectivity curve would have yielded in higher differences in these

outcomes relative to the current MLL. While trophy catch (relative to the current MLL) is 5.2% higher under a 51–76–cm HSL compared to a 46–76–cm HSL (Figure 13f), this gain may not be worth the ~13% loss in harvest opportunities that results from increasing the lower HSL from 46 to 51 cm (Figure 13d). Furthermore, higher abundance of trophy–sized fish resulting from the 51–76–cm HSL compared to the 46–76–cm HSL may not be enough to produce differences in the proportion of fecundity contribution from older (age 10+) females (γ) between the two regulations (Figure 13b). In other words, increasing the lower HSL from 46 to 51 cm does not translate into an increase in the proportion of total fecundity that is contributed by older fish.

While modest (8.1%), candidate HSLs improved γ relative to the current MLL (Figure 13b), which may have positive implications on recruitment success and stock conservation for Striped Bass. Lim et al. (2014) found positive correlations between maternal size and offspring size and number within species across a range of taxa, suggesting that energy investment into individual offspring changes with female size. This can have substantial impacts on recruitment, as larger offspring are less vulnerable to size–dependent mortality and therefore typically experience higher survival rates (Conover and Schultz 1997). The importance of preserving large females by way of HSLs is evident in Le Bris et al. (2015), who demonstrated that population resilience to and recovery from perturbations (i.e. exploitation) was most impacted by the relationship between female size and fecundity. They found that preservation of large fish that possessed non–linear mass–fecundity relationships, as suggested for Striped Bass (Zastrow et al. 1990, Cowan and Rose 1991), increased the ability of the population to withstand and recover from high fishing pressure. Therefore, using HSLs to increase the proportion of total fecundity contributed by larger females may help buffer Striped Bass populations against fluctuations resulting from high exploitation rates and environmental stochasticity.

Our results suggest that the performance of the length–based regulations evaluated are highly sensitive to the catch, harvest, and discard mortality rates of the fishery. This finding is consistent with the literature for both MLLs (Coggins et al. 2007) and HSLs (Gwinn et al. 2015, Ahrens et al. 2020). For HSLs to be effective at preventing overfishing and improving trophy fisheries, the cumulative mortality from discards and harvest must be low enough to allow a proportion of legal fish to grow out of the slot and into larger protected size classes. Higher rates of these sources of mortality will require narrower harvest slots to achieve fishery benefits. This highlights the importance of understanding these rates when designing HSL regulations. Considering data limitations on

discard mortality for the CA Striped Bass fishery, we ran our simulations with a broad range of values. This uncertainty results in lower resolution for predicting differences in the outcomes among competing regulations. A more refined understanding of this parameter for this fishery would increase the ability to distinguish among regulation performances.

Predation Considerations

With the potential to increase Striped Bass population abundance from regulation changes (which requires California Environmental Quality Act [CEQA] permitting), we must consider the impact these changes may have on California Endangered Species Act (CESA) and Federal Endangered Species Act (ESA)–listed prey species the Department is also tasked with managing.

While Striped Bass are known opportunistic predators on salmonid and smelt species, their diets have been found to primarily consist of macroinvertebrates, crayfish, lamprey, and other non–native predator and prey species in aquatic and estuarine habitats (Raney 1952, Callahan et al. 1989, Grossman 2016, Michel et al. 2018, Stompe et al. 2020, Young et al. 2022). Fish become a more important prey item for Striped Bass in the spring and summer (Nobriga and Feyrer 2007, Zeug et al. 2017, Young et al. 2022), which coincides with the seaward migration of salmonids from freshwater habitats.

Observations of salmonids in Striped Bass stomachs vary by life stage and season, but overall remains relatively low (Stevens 1966, Michel et al. 2018, Stompe et al. 2020, Peterson et al. 2020, Brandl et al. 2021). While predation on listed species does occur, there is not enough evidence to support the assertion that Striped Bass predation is the primary contributor to declining salmonid and smelt populations based on available piscivorous predation data in California. Instead, Striped Bass predation impacts should be considered within the broader context of environmental stressors on native fishes, and not necessarily singled out as a significant contributor to salmonid declines.

Striped Bass consume a wide variety of prey species and do not tend to specialize on certain prey items (Zeug et al. 2017, Brandl et al. 2021); however, predation of salmonids and smelt species may be more prevalent in specific size classes of the Striped Bass population based on abundance and spatial/temporal distribution. The profitable prey size for Striped Bass is related to the prey–to–predator size ratio (PPR), where capture success decreases as the

PPR ratio increases (Hartman 2000). Fish are unimportant in the diets of YOY Striped Bass, as diet during this life stage is primarily driven by plankton abundance (Heubach 1963). In a diet composition study of large Atlantic Striped Bass, Walter and Austin (2003) found significant relationships between Striped Bass total length and prey length ($p < 0.05$), indicating that larger and older Striped Bass ate larger prey. Poor regression fit ($r2 = 0.26$) indicated that large fish also consumed small prey, supporting the argument that larger Striped Bass consume a greater size range of prey. Smaller Striped Bass in this study (458–710 mm [~ 18–28 inches]) consumed prey that approached 40% of their total length; however, most prey consumed by all sizes of Striped Bass were smaller, young–of–the–year fishes. This finding is corroborated by Overton (2002), who predicted an optimal prey size to be 21% of the Striped Bass length.

If similar predator–prey dynamics hold true for Striped Bass in California, smolts (ranging from 70–140 mm), as classified by Sturrock et al. (2019) may represent optimal prey size for smaller Striped Bass (13–27 inches). CDFW Fyke trap data show that Striped Bass entering the Sacramento River in the spring are generally < 28 inches (Figure 14), and therefore may exhibit similar feeding patterns to the 'small' Striped Bass in Walter and Austin (2003). Furthermore, Loboshefsky et al. (2012) found that while individual consumption of adult Striped Bass was higher than sub–adults, population total consumption of sub–adults was similar to adults due to greater abundance of sub–adults in the system. A harvest slot may shift the population structure to increase the abundance of older, large fish, yet this still may not have a noticeable impact on salmonid predation due to (1) PPR, (2) high variation in the size of prey consumed, and (3) little evidence of prey specialization. Increasing the minimum length limit from 18–20 inches may have a more noticeable impact on salmonid consumption, however, as this protects a size class of Striped Bass more likely to encounter and consume smolt–sized fishes due to (1) potentially higher delta and freshwater residency of smaller Striped Bass compared to larger, more migratory fish (Dorazio et al. 1994) and (2) more optimal PPR between this size class and smolts.

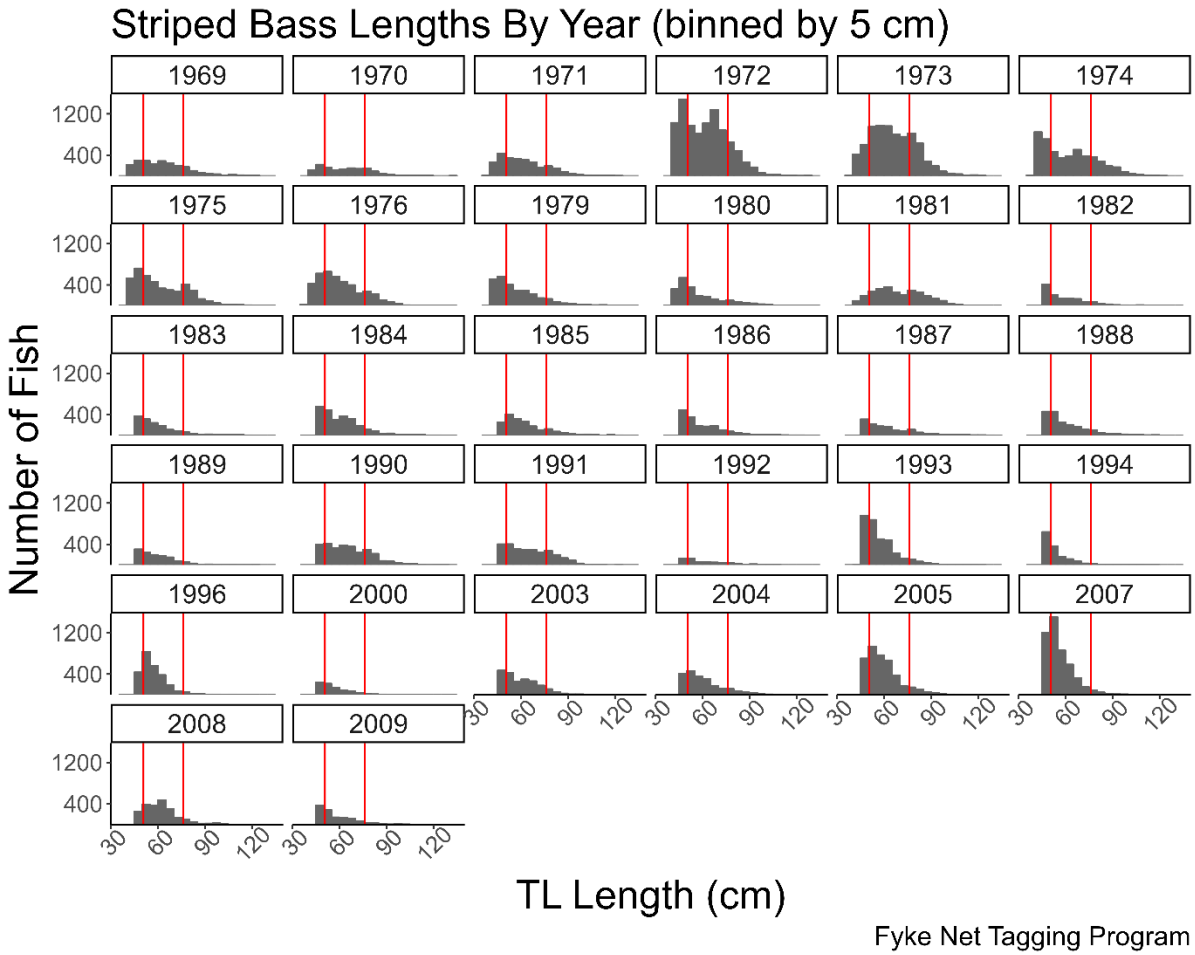


Figure 14. Length–frequency histograms for Striped Bass sampled from fyke nets. Parallel vertical red lines indicate the NCGASA–proposed 20–30 inch total length (51 – 76 cm) slot limit. Note that effort is not accounted for in catch. Data Source: Adult Striped Bass Population Study.

Despite these considerations, most of the literature reviewed suggests that Striped Bass consumption of salmonids and smelts is relatively low compared to other prey items. That said, Striped Bass are widespread, highly opportunistic, generalist predators that display aggregatory feeding behavior, particularly near manmade structures and habitat pinch–points (Tucker et al. 1998; Sabal et al. 2016). Thus, temporal overlap between Striped Bass and salmonids is an important factor to consider. Decreased precipitation and associated warming water temperatures could elicit earlier Striped Bass spawning migrations, increasing temporal overlap between Striped Bass and out–migrating juvenile salmonids in the Sacramento River system (Goertler et al. 2021). Climate change and the environmental conditions of an increasingly degraded Delta may

continue to increase contact between Striped Bass and listed species, and it is difficult to predict the role that protective harvest regulations will play on the predatory impact of Striped Bass in this context. The completed CDFW Predation Literature Review document can be found in Appendix 3.

Informing Broader Management Strategies from East Coast Regulations

When designing fishing regulations, management objectives are generally set as the target. The Department's management goals are guided by the California Fish and Game Commission's Striped Bass Policy (FGC 2020), which states that the Department shall "...emphasize programs that ensure, enhance, and prevent the loss of sport fishing opportunities" and "…strive to maintain a healthy, self–sustaining Striped Bass population in support of a robust recreational fishery." The intended goal of the NCGASA–proposed 20–30–inch harvest slot limit is to increase abundance of Striped Bass as well as protect larger Striped Bass in the population. This desire is consistent with the California Fish and Game Commission's policy, as the policy also supports actions to increase Striped Bass abundance if the actions are consistent with the Department's long–term mission and public trust responsibilities.

For the purposes of this regulation change petition (TN 2022–12) evaluation, the Department evaluated four regulation options for comparison of the NCGASA proposed 20–30–inch slot limit (Table 5). Because the petition requested only one specific HSL and did not include alternative HSL options or other considerations such as changes to season, bag limit, geographic range, the Department's evaluation specifically focused on the proposed 20–30–inch HSL. If the Department had independently determined that the status and trends observed in the Striped Bass fishery warranted regulatory changes to preserve and improve the fishery, multiple regulatory strategies beyond a pre–defined HSL would have been evaluated to determine which strategy, or combination of strategies, would be the most effective to determine or maintain biological and management objectives.

Within Striped Bass native ranges, Atlantic states have adopted various regulatory practices to meet their management goals (Figure 15, ASMFC 2022). In many states, freshwater (rivers) and marine environments have different regulations to protect migratory and spawning Striped Bass while also providing

fishing opportunity. The majority of the Atlantic states' coastlines, as well as the ocean, have a 28–35–inch HSL. However, several areas (particularly in producer areas) enforce slot limits or smaller minimum sizes that allow the harvest of smaller Striped Bass, starting at 18–20 inches depending on the state. There are no regions that include a 20–30–inch slot limit comparable to the NCGASA proposal (K. Drew, ASMFC, personal communication, January 23, 2023).

Atlantic States management (regulations) are based on female spawning stock biomass and fishing mortality targets for the migratory stock complex, which represent the best available scientific information. There are a number of different combinations of size limits and harvest levels that would allow them to achieve the desired spawning stock biomass target and management objectives, and stakeholder needs are considered when they set the size limits and other regulations (ASMFC 2019). The coastal/ocean minimum size limit of 28 inches represents the size at full maturity for Atlantic coast Striped Bass, and therefore fisheries with lower size limits are harvesting immature fish. Those fisheries occur in the producer areas where mature Striped Bass are only available during the spawning season. The Atlantic States Marine Fisheries Commission (ASMFC 2022) allows harvest of those smaller fish and forgoes yield of larger fish in order to create more equitable access to the resource between stakeholders in the ocean region and stakeholders in the producer areas, based on historical fishing patterns (K. Drew, ASMFC, personal communication, January 23, 2023).

In response to the 2015 mandate by the ASMFC to decrease harvest, many coastal and Chesapeake Bay states decreased the recreational bag limit from two to one fish, ≥ 28 inches TL (ASMFC 2014). While these changes successfully hit coast–wide harvest reductions goals, they failed to translate into improvements in the female spawning stock biomass (ASMFC 2016b, ASMFC 2017, NEFSC 2019).

To understand the immediate economic and biological trade–offs resulting from harvest restrictions that favor larger Striped Bass, Carr–Harris and Steinback (2020) evaluated the effect of 36 alternative recreational Striped Bass fishing policies (Table 6 *in* Carr–Harris and Steinback 2020) on (1) expected angler welfare (measured as the level of compensation required to hold anglers' expected utility constant after a policy–induced change in fishing trip quality), (2) total recreational removals, and (3) mature female recreational removals relative to the simulated outcome of the actual 2015 policy of one fish, ≥ 28–inches TL. Simulations revealed that policies that decreased the baseline minimum from 28 to 20 or 24 inches (thus directing harvest toward frequently

encountered yet lower–valued smaller Striped Bass) while constraining harvest of rarely encountered yet higher–valued large Striped Bass resulted in increases of recreational harvest that were incommensurate with concurrent welfare gains (Carr–Harris and Steinback 2020. The one fish 28–36–inches TL HSL regulation was the sole policy analyzed that resulted in a non–trivial reduction in recreational removals relative to the actual 2015 MLL policy (one fish ≥ 28–inches TL). This policy resulted in only a slight reduction in angler welfare due to the relatively low frequency at which Striped Bass ≥ 36 inches are encountered in the fishery (Carr–Harris and Steinback 2020.

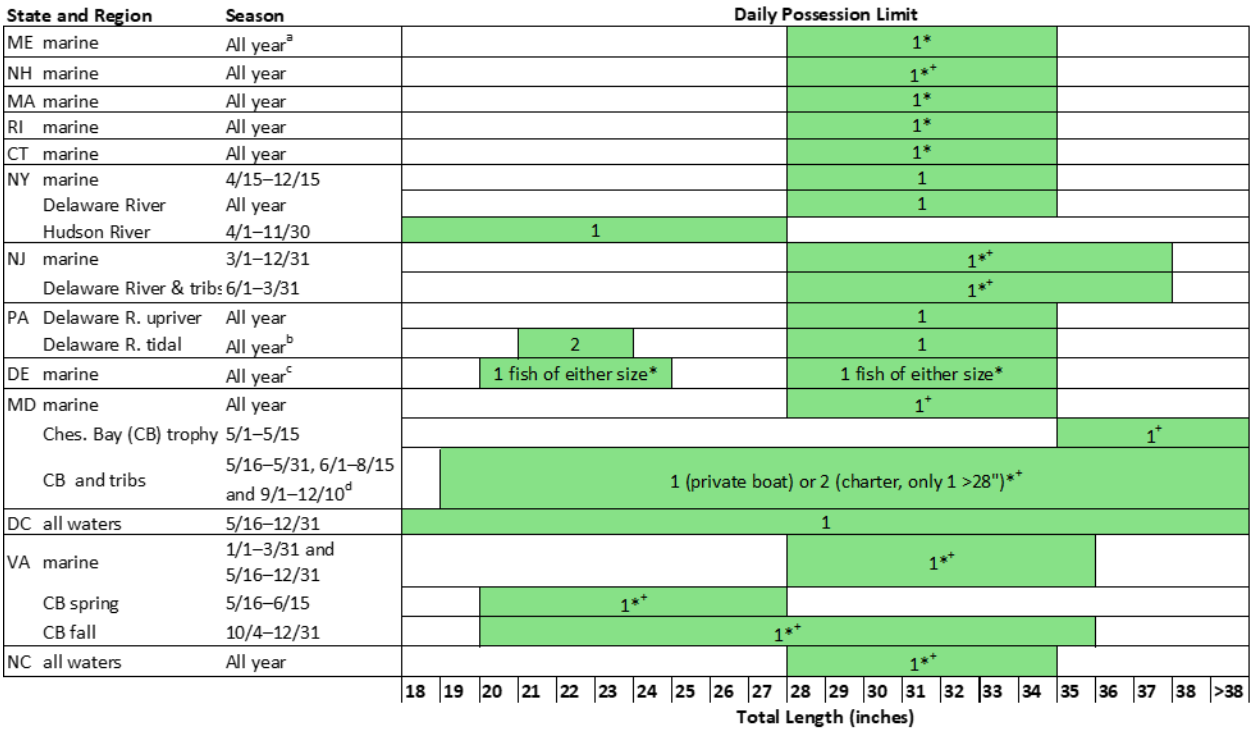
While the effect of length–based regulation changes on angler welfare was not incorporated into the Striped Bass population model presented here, we interpret angler harvest opportunity as a proxy for angler satisfaction. Results from the Striped Bass Angler Preference Questionnaire indicate that 51% of respondents fish for Striped Bass to catch and eat (Question 10, Appendix 1). Furthermore, an Environmental Justice Community Survey conducted for the California Department of Water Resources showed that the overwhelming majority (90%) of the self–identified disadvantaged community (DAC) members surveyed eat fish from the Delta four or more times per week (Ag. Innovations 2021). Aside from those that chose 'other or not specified' (35%), the majority of DAC respondents (51%) indicated that they catch Striped Bass (Ag. Innovations 2021). These results suggest that Striped Bass is an important food source for California anglers, and that failing to maintain harvest opportunities may present an issue for the communities that depend on this resource as a part of their diet.

Compared to the proposed 20–30–inch HSL, our model of the California Striped Bass population estimated that an 18–30–inch HSL would result in a smaller decrease in total harvest relative to current regulations while maintaining the same fecundity contribution of older females in the population (see Population Model section). As with the 'most efficient' regulation of one 28–36–inch fish identified in Carr–Harris and Steinback (2020), an 18–30–inch HSL maintains the lower length limit at the status quo while only excluding harvest opportunity for size classes infrequently encountered in the fishery (see Figure 6 and Figure 7). Thus, we can infer that this regulation may have a similarly low impact on angler welfare as estimated in Carr–Harris and Steinback (2020).

As observed on the East Coast, there are several combinations of harvest size and bag limits that, in concept, could be implemented in California to be more protective of the female spawning biomass and may contribute to increased spawning success compared to the current regulations. However, increasing

Striped Bass abundance and size of fish may not be possible through changes to angling regulations alone due to environmental constraints, carrying capacity, and/or other factors. Examples of management strategies observed on the East Coast (Figure 15) that could be applied to the California Striped Bass fishery (if deemed appropriate) include, but are not limited to:

- Harvest slot limits (as evaluated in this petition)
- Lower or higher minimum size limits
- Split slot limit(s)
- Seasonal closures / Seasonal regulation changes
- Geographic closures (seasonal and/or permanent)
- Increased or decreased bag limits
- Gear Restrictions
- Regulations specific to marine and/or freshwater locations
- Regulations specific to charter boats and private boats
- Combination of more than one option



* Non-offset circle hooks required when fishing bait

+ Spearfishing permitted, all other size and take limits apply

[a] Spawning areas closed 12/1–4/30 and C&R only 5/1–6/30

[b] The 21-24" slot is only open 4/1–5/31

[c] Spawning areas C&R only 4/1–5/31. 20-25" slot is only open 7/1–8/31 in Delaware River, Bay, and tribs

[d] C&R only 1/1–3/31, 12/11–12/31, additional area closures apply

Figure 15. Overview of 2022 recreational Striped Bass fishing regulations in Atlantic coast states. Additional geographic and gear restrictions apply in many of the fisheries. Figure adapted from Table 6 in ASMFC 2022.

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California Department of Fish and Wildlife
Regulation Change Petition Evaluation

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE EVALUATION OF NOR-CAL GUIDES AND SPORTSMEN'S ASSOCIATION (NCGASA) PROPOSED 20-30 INCH HARVEST SLOT LIMIT FOR STRIPED BASS APPENDICES

APPENDIX 1: 2022 STRIPED BASS ANGLER PREFERENCE QUESTIONNAIRE RESULTS SUMMARY

APPENDIX 2: STRIPED BASS POPULATION MODEL PARAMETER INPUT JUSTIFICATIONS

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APPENDIX 1: 2022 STRIPED BASS ANGLER PREFERENCE QUESTIONNAIRE RESULTS SUMMARY

1.1 Questionnaire Purpose

In the Fall of 2020, the Nor-Cal Guides and Sportsman's Association (NCGASA) submitted a regulation change petition to the Fish and Game Commission. The proposed regulation change would restrict the harvest of Striped Bass to a "slot limit" between 20 and 30 inches for inland anadromous waters. In the summer of 2022, the NCGASA submitted a second petition which would apply the 20-to-30-inch harvest slot limit to Striped Bass caught in marine (ocean and bay) waters as well. The NCGASA petition stated that the regulation change would protect the earliest spawners as well as the largest most fecund individuals, which would then eventually increase the population size of Striped Bass. The NCGASA also stated that they had polled their membership and that there was overwhelming support for a 20-to-30-inch slot limit.

The California Department of Fish and Wildlife (CDFW) is in the process of evaluating the proposals to determine how this proposed change may affect the Striped Bass fishery, including harvest opportunities and biological processes. The Striped Bass fishery is one of the largest fisheries in California. This is because Striped Bass have a wide-spread distribution, fishing methods to target and catch Striped Bass are diverse, and anglers can fish for and catch Striped Bass year-round. Because of the popularity of the fishery, any changes to Striped Bass fishing regulations would impact many thousands of California anglers.

Part of the evaluation process included understanding and documenting anglers' general satisfaction with the Striped Bass fishery, as well as gaging angler interest in changing Striped Bass fishing regulations. To reach California's Striped Bass anglers, the CDFW developed and conducted Striped Bass Angler Preference Questionnaires (APQ) first through opportunistic in-person interviews, and then through expanded electronic questionnaires. Altogether, CDFW contacted more than 960,000 licensed anglers and assessed the data from approximately 26,000 respondents. This summary describes the data collection process and results.

1.2 In-person Striped Bass Angler Preference Questionnaire

Initial in-person interviews began in November 2021 and occurred during randomly scheduled Central Valley Angler Survey (CVAS) surveys. Willing participants in the questionnaire were told that CDFW was soliciting angler input on the current Striped Bass fishery. They were not informed of the Nor-Cal Guides and Sportsman's Association (NCGASA) petition as not to bias the responses. Respondent questions were answered after the questionnaire was completed unless it was for clarification. Questionnaires consisted of nine questions, listed below. The in-person questionnaire took place between November 2021 and July 2022. A total of 211 anglers were interviewed and the results in questions 2-9 reflect the responses of 204 self-identified Striped Bass anglers.

1.2.1 In-person Striped Bass APQ questions and results.

1. Do you fish for Striped Bass?
    - Yes
    - No
2. Do you support the current minimum size and bag limit?
    - Yes
    - No
3. Would you like to see the minimum size limit lower?
    - Yes
    - No
4. Would you like to see the minimum size limit higher?
    - Yes
    - No
5. Would you like to see a maximum size limit applied?
    - Yes
    - No
6. Do you support a catch and release fishery for trophy Striped Bass?
    - Yes
    - No

7. Are you associated with any professional fishing associations?
    - Yes
    - No
8. Are you associated with any state natural resource agency?
    - Yes
    - No
9. What method do you use to catch Striped Bass?
    - Any
    - Bait
    - Lure
    - Fly
    - Spear

1.3 In-person Striped Bass Angler Preference Questionnaire Results by Question

1.3.1 Question 1. Do you fish for Striped Bass?

Yes (%)	No (%)	Number of Responses
97	3	211

Anglers contacted (i.e., respondents) overwhelmingly answered that they fished for Striped Bass. If an angler answered "no" to Question 1, the questionnaire ended. If an angler answered "yes", they moved on to Question 2. Seven respondents ended the questionnaire at Question 1.

1.3.2 Question 2. Do you support the current minimum size and bag limit?

Yes (%)	No (%)	Number of Responses
64	36	204

The majority of respondents answered that they support the current minimum size limit of 18 inches and bag limit of two fish per day (64%).

1.3.3 Question 3. Would you like to see the minimum size limit lower?

Yes (%)	No (%)	Number of Responses
30	70	204

The majority of respondents answered that they would not want to lower the minimum size limit for harvestable Striped Bass (70%).

1.3.4 Question 4. Would you like to see the minimum size limit higher?

Yes (%)	No (%)	Number of Responses
19	81	204

Most respondents answered that they would not want to raise the minimum size limit for harvestable Striped Bass (81%).

1.3.5 Question 5. Would you like to see a maximum size limit applied?

Yes (%)	No (%)	Number of Responses
51	49	204

Respondents were almost evenly split on whether they would want to see an upper size limit applied to the Striped Bass fishery.

1.3.6 Question 6. Do you support a catch and release fishery for trophy Striped Bass?

Yes (%)	No (%)	Number of Responses
60	40	204

However, respondents were generally in-favor of a catch-and-release trophy Striped Bass fishery even though that meant a maximum size limit would need to be applied.

1.3.7 Question 7. Are you a member of any professional fishing association?

Yes (%)	No (%)	Number of Responses
10	90	204

1.3.8 Question 8. Are you associated with any state natural resource agency?

Yes (%)	No (%)	Number of Responses
3	97	204

To evaluate whether the questionnaire was reaching a broad fishing community, and not just those anglers represented by professional fishing associations or natural resource agencies, anglers were asked Questions 7 and 8. In both cases, 10% or less of respondents represented the aforementioned groups, demonstrating that the questionnaire was successful in reaching a broad fishing community.

1.3.9 Question 9. What method do you use to catch Striped Bass?

Artificial lure (%)	Bait (%)	Fly (%)	Spear (%)	Other (%)	Total Responses
32	64	1	2	1	204

Respondents were asked their primary preferred method for catching Striped Bass. They were not able to answer more than one method though it was clear that anglers often used more than one method and that this question needed to be edited. Respondents reported artificial lures as the most preferred method followed by bait, and less often fly and spear.

Results of the questionnaire indicated that the Striped Bass anglers that were interviewed by CVAS staff generally supported the current minimum size limit of 18 inches total length and did not support changing the minimum size either lower or higher than 18 inches (Questions 2-4, Section1.2.1). Anglers were neutral on whether they wanted to see a maximum size, with respondents split nearly 50-50 on their responses (Question 5, Section 1.2.1). However, when asked if they would support a catch and release fishery for trophy sized Striped Bass, anglers were generally in favor (60% yes, Question 6, Section 1.2.1).

Comments received from anglers were recorded in a notes section of the datasheet. Comments ranged from anglers wanting smaller or larger bag limits, smaller minimum sizes, the desire for the implementation of a slot limit, and the desire to see regulations removed from Striped Bass because they are an introduced species. Additionally, many anglers reported already practicing catch-and-release fishing on large Striped Bass that they perceived as female. Lastly, despite being in favor of a catch-and-release trophy fishery, some respondents expressed concern about additional restrictions imposed with a maximum size limit. Instead, they desired other anglers to self-regulate the size of Striped Bass harvested instead of CDFW imposing a maximum size limit. This may

explain the discrepancies in the responses between questions 5 and 6 (Section 1.2.1). To reach a larger number of anglers, an electronic version of the APQ was developed.

1.4 Electronic Striped Bass Angler Preference Questionnaire

An electronic questionnaire was developed using the existing in-person APQ questions as a template. The questions were reviewed by managers in Fisheries Branch, human dimensions experts in Wildlife Branch (to assess for bias), and with staff from the Office of Communication and Outreach (OCEO). Because the questionnaire was going to be reaching a larger angling constituent, the original questions were slightly changed and expanded in scope. The available platform for CDFW electronic questionnaires was Survey Monkey and could only be distributed in English because of the distribution timing. Translation services contracts were in-flux due to proximity to the new fiscal year (June-July 2022).

Electronic Striped Bass APQ questions with response choices.

The electronic Striped Bass APQ was distributed through direct email, social media post, CDFW website, a press release, and through the Angler Update email newsletter.

1. Do you fish for Striped Bass?
    - Yes
    - No
2. Do you support the current minimum size?
    - Yes
    - No
3. Do you support the current bag limit?
    - Yes
    - No
4. a. Would you like to see the minimum size limit for harvest of Striped Bass:
        - <18 inches
        - >18 inches

- No change
- No minimum size

b. Preferred minimum size (if not 18 inches)?

- Fill in the blank

5. What length Striped Bass do you consider a trophy (in inches)?
   - Fill in the blank
6. Would you support a catch and release fishery for trophy sized Striped Bass? This would require setting a maximum size/slot limit on Striped Bass that can be harvested.
   - Yes
   - No
7. Are you a member of any professional fishing associations?
   - Yes
   - No
8. Are you associated with any state natural resource agency?
   - Yes
   - No
9. What method do you use to catch Striped Bass? (select all that apply)
   - Artificial lure
   - Bait
   - Fly
   - Spear
   - Other (please specify)
10. Why do you fish for Striped Bass? (select all that apply)
    - Catch and eat
    - Catch and release
    - Fishing Guide
    - Other (please specify)

The questionnaire was distributed to approximately 960,000 licensed anglers through emails stored on the CDFW Automated License Data System (ALDS) database. Licensed anglers received an electronic APQ email if they had both 1) provided an email when they purchased their fishing license, and 2) if they had purchased a fishing license in the last three years (to cut down on the volume of emails). Additionally, the updated APQ was distributed through social media, a news release, posted to the CDFW Striped Bass webpage, and through the CDFW Angler Update email newsletter. For a timeline of important APQ details, see Table 1.1.

Initially the electronic APQ was only distributed in English because the distribution timing aligned with the change of the State of California fiscal year (July 1) and new translation services contracts were in-flux. Since then, the contract has been renewed and the questionnaire was redistributed (through email and social media posts) in non-English languages which include Spanish, Tagalog, Vietnamese, Russian, Simplified Chinese, and Traditional Chinese.

Table 1.1. Electronic Striped Bass Angler Preference Questionnaire details. Includes how the questionnaire was distributed and when, as well as when the questionnaire was translated, and the closing date.

Electronic Striped Bass APQ Detail	Date
Links to the APQ are posted to the CDFW Striped Bass webpages	7/25/2022
Electronic APQ is emailed and successfully delivered to 914,784 anglers	7/26/2022
Social media, press release, and Angler Update newsletter are posted and sent via email	7/28/2022
The StripedBass@wildlife.ca.gov mailbox was created to answer questions; webpages updated with email contact information	8/11/2022
Striped Bass town hall meeting held at Fisheries Branch headquarters	8/24/2022
Language interpretive/translation services contract renewed, and questionnaire gets translated into 6 non-English languages (Spanish, Tagalog, Vietnamese, Russian, Simplified Chinese, and Traditional Chinese)	8/2022-9/2022
Links to the APQ are reposted to the CDFW Striped Bass webpages –	9/21/2022
non-English questionnaires are added	
Social media posts are reposted with links to non-English questionnaires	9/22/2022
Updated electronic APQ is emailed and successfully delivered to 945,550 anglers (added 2 additional years of emails from ALDS)	9/27/2022
Questionnaire closed and links were deactivated/ removed from websites	11/1/2022

1.5 Electronic Striped Bass Angler Preference Questionnaire Results by Question

1.5.1 Question 1. Do you fish for Striped Bass?

Yes (%)	No (%)	Number of Responses
71	29	26,410

Anglers contacted (i.e. respondents) overwhelmingly answered that they fished for Striped Bass. If an angler answered "no" to Question 1, the questionnaire ended. If an angler answered "yes", they moved on to Question 2. Approximately 10,000 respondents ended the questionnaire at Question 1.

1.5.2 Question 2. Do you support the current minimum size limit?

Yes (%)	No (%)	Number of Responses
71	29	16,875

The majority of respondents answered that they support the current minimum size limit of 18 inches (71%).

1.5.3 Question 3. Do you support the current bag limit?

Yes (%)	No (%)	Number of Responses
68	32	16,808

The majority of respondents answered that they support the current bag limit of 2 fish per day (68%).

1.5.4 Question 4. Would you like to see the minimum size limit for harvest of Striped Bass?

No change (%)	No minimum size (%)	Lower than 18 inches (%)	Higher than 18 inches (%)	Number of Responses
54	8	20	18	16,621

Approximately half of anglers contacted preferred the current minimum size limit of 18 inches (54%). Most of the remaining respondents were split on whether they supported lowering the minimum size limit below 18 inches (20%) vs. increasing it above 18 inches (18%). A small fraction of respondents (8%) supported no minimum size limit. Anglers had the option to write in a preferred minimum size if not 18 inches. This portion of Question 4 received 5,527 fill-in-the-blank responses summarized in Figure 1.1. Of the anglers that wrote in preferred minimum size limits, 58% of anglers would prefer a smaller than 18-inch minimum size limit (Fig. 1.1).

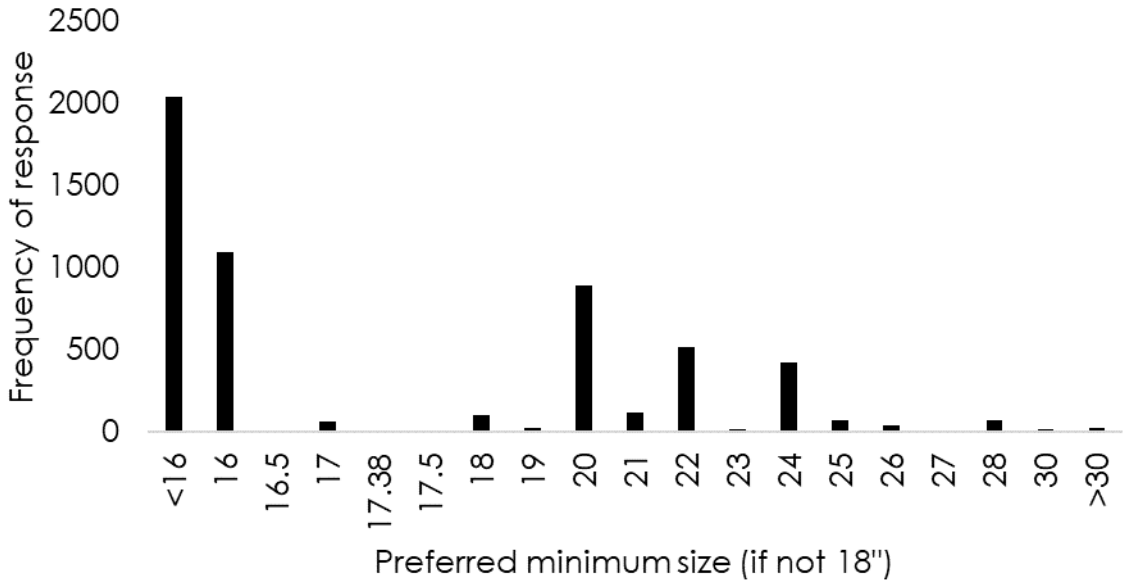

Figure 1.1. There were 5,527 written responses for preferred minimum sizes other than the current 18-inch minimum size (although some respondents entered 18 inches as their preference).

1.5.5 Question 5. What length Striped Bass do you consider a trophy?

This question was a fill-in-the-blank question. The responses are summarized in Figure 1.2. There were 13,887 responses to Question 5.

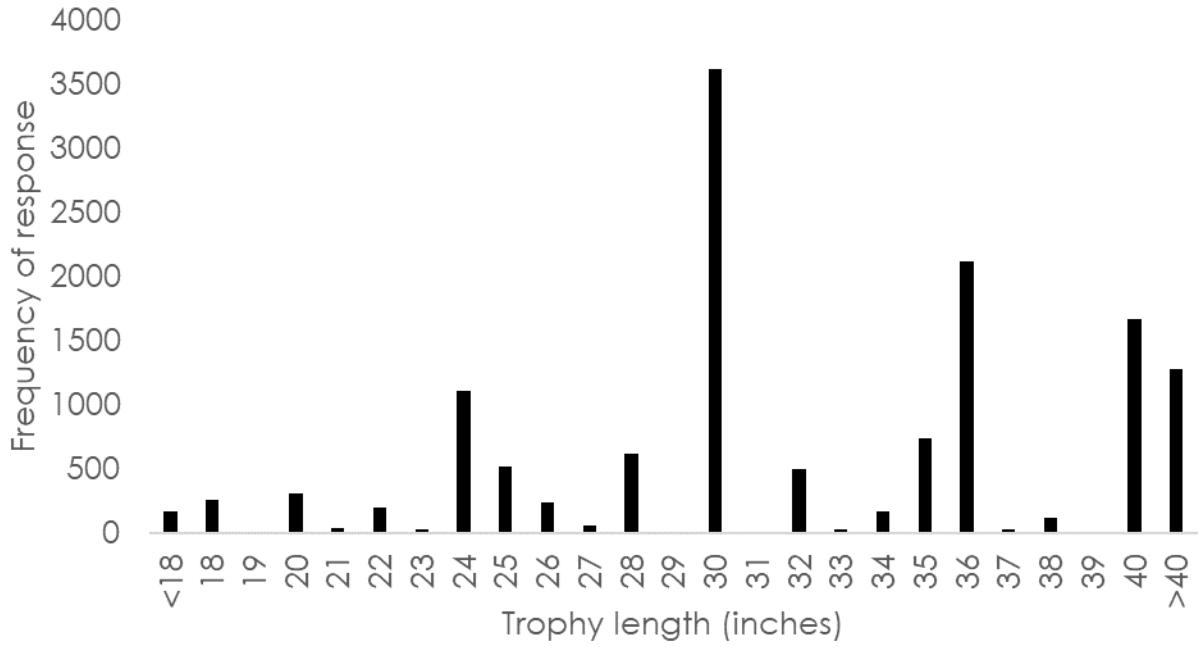

Figure 1.2. Fill-in-the-blank responses to what size Striped Bass anglers considered a trophy.

Responses show that anglers consider a wide range of sizes to be trophies, with 30 inches (26%), 36 inches (15%), and 40 inches or greater (21%) as the most frequent responses.

1.5.6 Question 6. Would you support a catch and release fishery for trophy sized Striped Bass? This would require setting a maximum size/slot limit on Striped Bass that can be harvested.

Yes (%)	No (%)	Number of Responses
64	36	16,797

Anglers overwhelmingly supported the implementation of a maximum size limit on harvestable Striped Bass (64%).

1.5.7 Question 7. Are you a member of any professional fishing association?

Yes (%)	No (%)	Number of Responses
9	91	16,873

1.5.8 Question 8. Are you associated with any state natural resource agency?

Yes (%)	No (%)	Number of Responses
4	96	16,836

To evaluate whether the questionnaire was reaching a broad fishing community, and not just those anglers represented by professional fishing associations or natural resource agencies, anglers were asked Questions 7 and 8. In both cases, less than 10% of respondents represented the aforementioned groups, demonstrating that the questionnaire was successful in reaching a broad fishing community.

1.5.9 Question 9. What method do you use to catch Striped Bass?

Artificial lure (%)	Bait (%)	Fly (%)	Spear (%)	Other (%)	Total Responses
47	42	10	<1	<1	28,524

This question was asked to understand the general methodologies that anglers use to catch Striped Bass and to identify potential methodologies that may be affected by regulation changes (i.e., slot limits). Anglers could choose more than one option (select all that apply), which is why the total number of responses is higher than in previous questions. Artificial lures (47%) and bait (42%) are the most common methods used to catch Striped Bass.

1.5.10 Question 10. Why do you fish for Striped Bass?

Catch and Eat (%)	Catch and Release (%)	Fishing Guide (%)	Other (%)	Total Responses
51	42	1	6	23,812

This question was asked to understand how and why anglers utilize the Striped Bass fishery. Anglers could choose more than one option (select all that apply), which is why the total number of responses is higher than in previous questions. Responses to Question 10 indicate that anglers primarily utilize the Striped Bass fishery for a food resource (51%, catch and eat), followed by for sport (42%, catch and release). Less common responses to this question included: occupation, time in nature, family bonding, and species protection/predator control. Combined, these responses accounted for less than 8% of total responses.

1.6 Striped Bass Angler Preference Questionnaire Summary

Despite being an introduced species and an opportunistic predator, Striped Bass represent one of the largest fisheries in California. Angler Preference Questionnaires were used to quantitatively describe anglers' sentiment towards the fishery. The questionnaire was distributed to over 900,000 licensed California anglers, and more through social media posts, resulting in an unprecedented 26,000 responses and more than 16,000 completed questionnaires.

In general, Striped Bass anglers that took either the in-person APQ and/or the electronic APQ (there is most likely overlap), were supportive of the current Striped Bass fishing regulations (Table 1.1, Questions 2-4; Table 1.2, Questions 2-4). However, given the opportunity for change, anglers' preferences for the Striped Bass fishery varied widely.

Though 54% of anglers would prefer to see no changes made to the minimum size of harvestable Striped Bass, 20% of anglers would like to see the minimum size lowered (Table 1.2, Question 4). Written responses for "preferred minimum size if not 18 inches" showed that a minimum size of 16 inches or less was preferred for 57% of respondents (Figure 1.1).

There was also general support for a catch-and-release trophy Striped Bass fishery (Table 1.1, Question 6; Table 1.2, Question 6), even though that would mean setting a maximum size limit on harvestable Striped Bass (implementing a slot limit). This response indicates that anglers would support restricting the maximum size of harvestable Striped Bass to achieve protection for larger Striped Bass. In fact, written comments from respondents indicate that many anglers already practice catch-and-release fishing on "large" Striped Bass. The implementation of a maximum size limit would ensure that all anglers followed this practice. When asked what size defined a trophy Striped Bass, responses ranged widely (Figure 1.2), with 30, 36, and >40 inches reported most frequently.

Though opinions varied on how anglers would change the Striped Bass fishery, what was clear was that anglers value the fishery for both food and sport (Table 1.2, Question 10), and any changes to Striped Bass fishing regulations will impact thousands of anglers.

Information obtained from Striped Bass Angler Preference Questionnaires will be incorporated into the regulation change petition evaluation completed by CDFW. The evaluation will include a biological assessment of the fishery, potential impacts that the regulation change may have on the fishery and California anglers, as well as anglers' perspectives on the Striped Bass fishery. Together these components will shape CDFW's assessment of the regulation change petition which is expected in summer 2024.

APPENDIX 2. STRIPED BASS POPULALATION MODEL PARAMETER INPUT JUSTIFICATIONS

2.1 Fishery Inputs

2.1.1 Harvest (U) and capture rate ($\dot{U}$) of fish vulnerable to angling

There are no recent published estimates of harvest rates (U) of Striped Bass on the west coast of the U.S.A. Thus, we chose a range of U to represent lower plausible bounds of exploitation and upper plausible bounds that are likely to lead to overfishing. We represented the uncertainty in U with a beta distribution parameterized with an $\alpha = 5$ and $\beta = 30$. This resulted in a mean U of 0.14 and 95% probability between 0.05 and 0.27 (Fig. 2.1). This distribution included the range of historic published estimates of U on the west coast of 0.12-0.19 for 1965 to 1978 (Sommani 1972, Miller 1974), unpublished estimates from CDFW's adult Striped Bass mark-recapture study of 0.04-0.29 (2011-2022), as well as estimates from the Atlantic coast stock assessment from 2011 to 2021 of 0.13-0.32 (2022 ASMFC). It results in a 0.35 and 0.24 probability of U greater than the Atlantic coast management target and threshold of 0.16 and 0.18, respectively (2022 ASMFC).

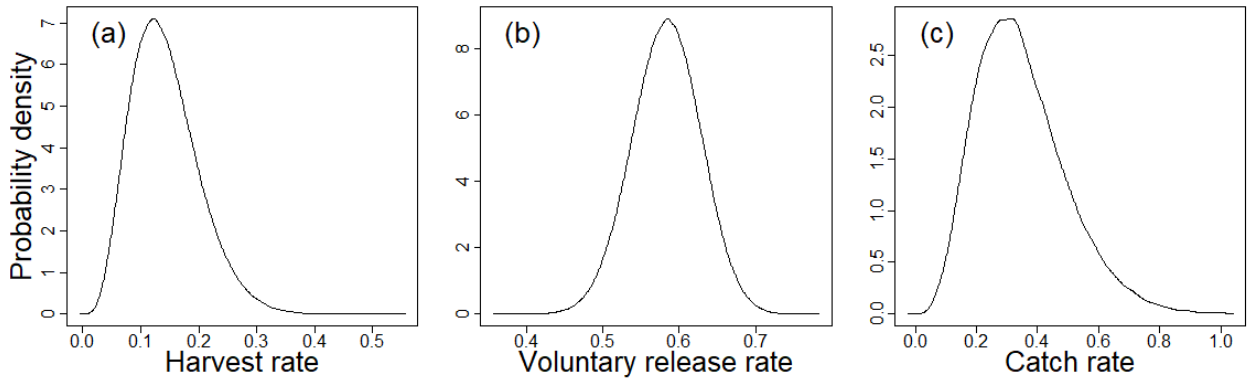

Figure 2.1. Probability distributions of parameter values for (a) harvest, (b) voluntary release rate, and (c) catch rates used to inform $U, \delta, \dot{U}$ (respectively) in the model.

We informed the capture rate $\dot{U}$ indirectly with estimates of voluntary release rates of Striped Bass (δ) as $\dot{U} = U/(1-\delta)$ because δ is easier to inform than $\dot{U}$. We represented δ with a beta distribution with an $\alpha = 70$ and $\beta = 50$, resulting in a mean voluntary release rate of 0.58 with 95% probability between 0.49 and 0.67 (Fig. 2.1). This range represents current patterns of voluntary catch and release practices by recreational anglers in the Sacramento-San Joaquin Delta and tributaries reported by CVAS ($\dot{U}$ = 0.74-0.90), is consistent with the total release rates between 0.43 and 0.75 for Striped Bass reported through the California Recreation Fisheries Survey (CRFS, sourced from Recreational Fisheries Information Center [RecFIN]), and through commercial passenger fishing vessels (CPFV) guide logbook records for the Pacific Oceans and San Francisco Estuary ($\dot{U} = 0.14$-0.58) (Table 2.1). Furthermore, δ results in model outputs of total release (i.e., the sum of voluntary and legally mandated release) that approximate patterns among δ, U, and $\dot{U}$ reported for Atlantic Striped Bass stocks (2022 ASMFC). The distribution of angler capture rates that resulted from the specified U and δ parameters had mean of 0.35 with 95% probability between 0.12 and 0.69 (Fig. 2.1).

Table 2.1. Estimated harvest rates and literature sources for Striped Bass recreational fisheries.

Source	Harvest rates
Miller (1974)	12-19%
Sommani (1972)	9.6-17.6%
2022 ASMFC	13-32%
CDFW Adult Tagging Program (2011-2022; unpublished)	4-29%

2.1.2 Discard mortality rate

Published mortality rates of captured and released Striped Bass by anglers range between <1% to 67% and can depend on fishing practices (Table 2.2). Because actual angling practices occur in less controlled environments than discard mortality studies, it is likely that this range underrepresents the true levels of discard mortality (e.g., Tenningen et al., 2021). Thus, we specified discard mortality rates with a beta distribution parameterized with an $\alpha = 3.75$ and $\beta = 9.25$ (Fig 2.2). This specification resulted in a mean discard mortality rate of 0.29 and 95% probability range between 0.09 and 0.55, encompassing discard rates

in the literature (Table 2.3), those applied in 2022 ASMFC (i.e., 37%), and representing common discard mortality rates applied in stock assessments of a variety of large-bodied marine fisheries (z et al., 2014).

Table 2.2. Estimated voluntary release rates and data/literature sources for Striped Bass recreational fisheries.

Data	Source	Release rates
CRFS 2005-2022	RecFIN (https://www.recfin.org)	43-75%
CPFV logbook records 1995-2020	CDFW Marine Logs System	14-58%
CVAS 1991-2016	Wixom et al. 1995; CDFW 2021	74-90%

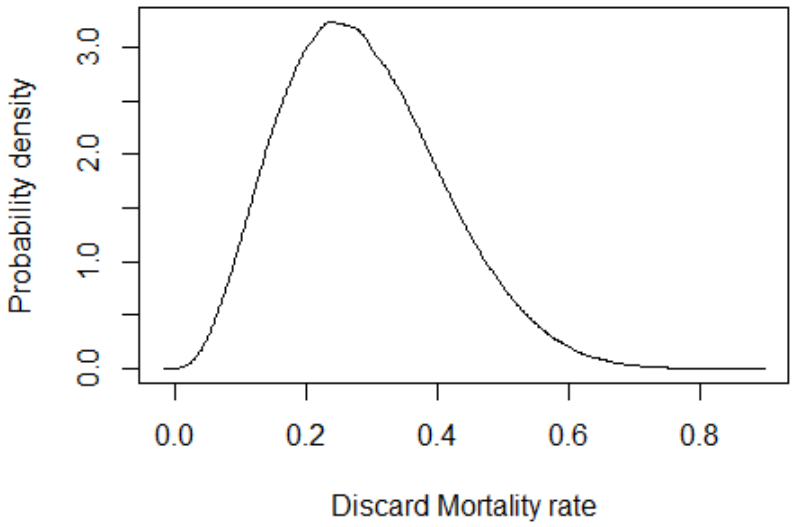

Figure 2.2. Probability distribution of parameter values for discard mortality rate used to inform D in the model.

Table 2.3. Estimated discard mortality rates and literature sources for Striped Bass recreational fisheries.

Source	Release mortality rates
Harrell (1988)	15.6-30.7%
Hysmith et al. (1993)	38%
Diodati and Richards (1996)	3-26%
Nelson (1998)	6-27%
Bettoli and Osborne (1998)	14-67%
Lukacovic and Uphoff (2002)	0.8-9%
Millard et al. (2003)	8-18%
May (1990)	26-30%
Childress 1989a,b	22-27%
Millard et al. (2005)	9-23%

2.1.3 Length-based vulnerability to capture.

Variation in length-based vulnerability to capture can result from complex interactions among fishery and fish characteristics (O'Boyle et al. 2016, Patterson et al. 2012, Garner et al. 2014, Micah et al. 2021). Selectivity patterns of Striped Bass are likely governed by variation in fishing practices targeting harvest versus trophy catch as well as the relative spatial and temporal distribution of angling effort relative to ontogenetic shift in the spatial distribution of fish and temporal migration patterns. Carr-Harris and Steinback (2020) estimated a single strongly dome-shaped selectivity curve for Chesapeake Bay and Atlantic coast Striped Bass fisheries that closely aligns with the strong dome shaped selectivity's of other large-bodied recreational fish species, including red snapper, grey trigger fish and Murray cod (2010 SEFSC, Patterson et al. 2012, Garner et al. 2014, Garner et al. 2017, Gwinn et al. 2019, Micah et al. 2021). Thus, we specified a strongly dome shaped selectivity pattern similar to Carr-Harris and Steinback (2020) with greater uncertainty in the vulnerability of larger fish to capture. We represented the selectivity pattern with a double logistic model with lower lengths at 50% vulnerability to capture (L_{low}) drawn from a normal distribution

with $\mu = 60$ and $\sigma = 3$. This resulted in a 95% probability between 54 cm and 66 cm (Fig. 2.3a). The upper length at 50% vulnerability to capture (L_{high}) was modeled as $L_{high} = L_{low} + \Delta$, where Δ was drawn from a log-Normal distributions with $\mu = \log(5)$ and $\sigma = 1$. This resulted in L_{high} with a mean of 68 cm and 95% probability between 57 cm and 96 cm (Fig. 2.3b). We specified the standard deviation of the double logistic model as the product of a coefficient of variation of 0.15 and the length of the fish (i.e., $\sigma_{\text{logit}} = cv * L$). To ensure that the maximum capture probability did not fall below a value of 1, we scaled the vulnerability curve by dividing the outputs by the maximum probability in each growth-type-group. This resulted in a mean L_{low} of 48 and L_{high} of 79 (Fig. 2.3c).

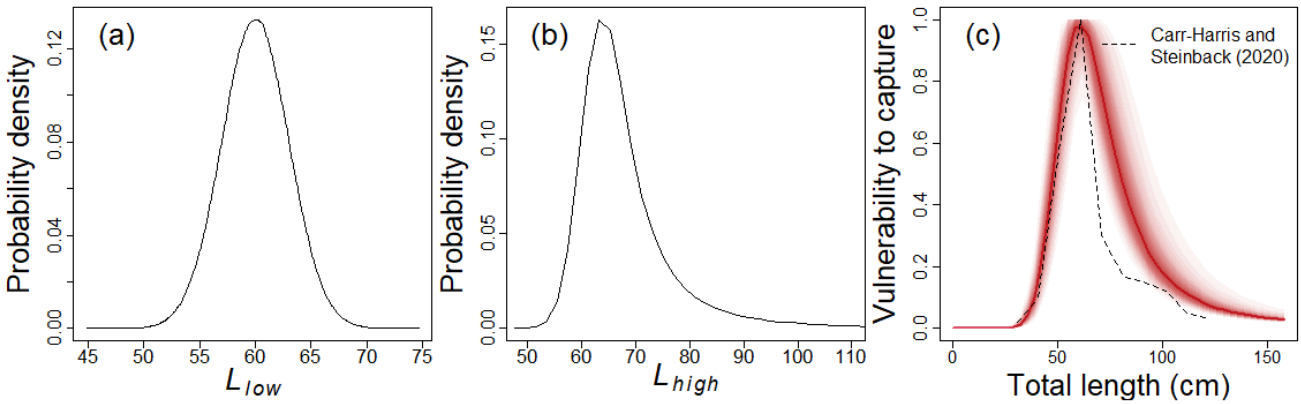

Figure 2.3. Probability distributions of parameter values for (a) lower length at 50% vulnerability to capture and (b) upper length at 50% vulnerability to capture used to inform the vulnerability of fish of length L to capture (c). The bold red line in panel (c) represents the length-based capture probability used in the model compared to capture probabilities modeled for Atlantic Striped Bass (dashed line; Carr-Harris and Steinback 2020). Light red lines represent the standard deviation of the capture probability for Pacific Striped Bass, indicating greater uncertainty in the vulnerability of larger fish to capture.

2.2 Life History Inputs

2.2.1 Length at age

A total of 21 growth-type-groups were simulated, following procedures in Gwinn et al. (2015). In brief, asymptotic length for each growth-type-group g for each sex s ($L_{\infty,g,s}$) was assigned at evenly spaced intervals between $L_{\infty,min}$ and $L_{\infty,max}$ (Table 2.4) for a total equal to the number of growth-type-groups. Values for $L_{\infty,min}$ and $L_{\infty,max}$ were set as $\pm$ 20% of the mean asymptotic length $\overline{L}_{\infty}$ (Table 2.4), which approximates the 95% probability range of a normal distribution with a means of $\overline{L}_{\infty}$ and a standard deviation of 10% of the mean. The proportion of fish recruiting to each growth-type-group g for each sex s ($p_{g,s}$) was specified as the normal probability density of $L_{\infty,g,s}$, with a mean of $\overline{L}_{\infty}$ and a standard deviation 10% of $\overline{L}_{\infty}$ (Gwinn et al. 2015; Walters and Martell 2004).

Table 2.4. Mean and 95% probability of minimum and maximum asymptotic lengths for growth-type-group assignments.

Parameter	Average length (cm)	*95% probability at 2.5%*	95% probability at *97.5%*
$L_{\infty,min}^{female}$	106.3	93.4	121.3
$L_{\infty,max}^{female}$	159.5	140.1	181.9
$L_{\infty,min}^{male}$	96.8	85.2	109.8
$L_{\infty,max}^{male}$	145.2	127.9	165

2.2.2 Length-weight relationship.

Length-weight parameters were estimated with a standard length-weight regression fit to data collected during creel surveys (Wixom et al. 1995; CDFW 2021) conducted from 1991-2016 in the San Francisco estuary and Sacramento-San Joaquin Delta. Length-weight parameters were estimated as $\alpha = 4.8 * 10^{-5}$ and $\beta = 2.7$ for males and $\alpha = 2.7 * 10^{-5}$ and $\beta = 2.8$ for females.

2.2.3 Von Bertalanffy growth parameters and Length-at-maturation

Growth and maturation rates of Striped Bass are known to be sex specific, with females growing to larger sizes and maturing at larger sizes and ages then males (Robinson 1960, Mansueti 1961, Turner and Kelley 1966). To account for these differences, we estimated von Bertalanffy growth parameters (Bertalanffy 1938) using an existing long-term fishery-independent length and age data set collected between 1969 and 2009 (total sample size of 250,125). Data were collected with fyke nets and experimental gill nets in the Sacramento-San Joaquin River Delta and tributaries, providing representation of a broad range of sizes and ages (Danos et al. 2020). The growth model was specified with common t_0 and k parameters and a sex-specific L_∞ parameters, and fit with a Normal likelihood via maximum likelihood methods. This analysis resulted in maximum likelihood estimates of $t_0 = -1.4$, $k = 0.1$ (95% probability between 0.08 and 0.13), $L_\infty^{male} = 121$ cm (95% probability between 106.6 cm and 137.5 cm) , and $L_\infty^{female} = 132.9$ cm (95% probability between 116.8 cm and 151.6 cm) . The mean length at maturation (L_{mat}) was set to 35.1 cm for males (95% probability between 30.5 cm and 40.5 cm) and 58 cm for females (95% probability between 50.5 cm and 67 cm), which approximates maturation at 2 years for males and 4-5 years for females (Coutant 1986, Scofield 1930, Calhoun et al. 1948).

2.2.4 Natural mortality

Natural mortality M is difficult to measure directly (Vetter 1988), and there are no known estimates of age-specific M for Striped Bass on the west coast. Thus, we modeled natural mortality as size-dependent following Lorenzen (2000):

$$M_{a,g,s} = M_{ref}\left(\frac{L_{ref}}{L_{a,g,s}}\right),$$

where L_{ref} is a reference length where the natural mortality rate is known to be a given value (i.e. M_{ref}). We inform L_{ref} using the natural mortality schedule given for Atlantic Striped Bass in recent stock assessments by adjusting L_{ref} to mirror the Lorenzen mortality curve at $M_{ref} = 0.15$ (2022 ASMFC). This resulted in $L_{ref} = 90$ cm for males and females, with a mean M of 0.15 and a 95% probability between 0.10 and 0.22 (Fig. 2.4).

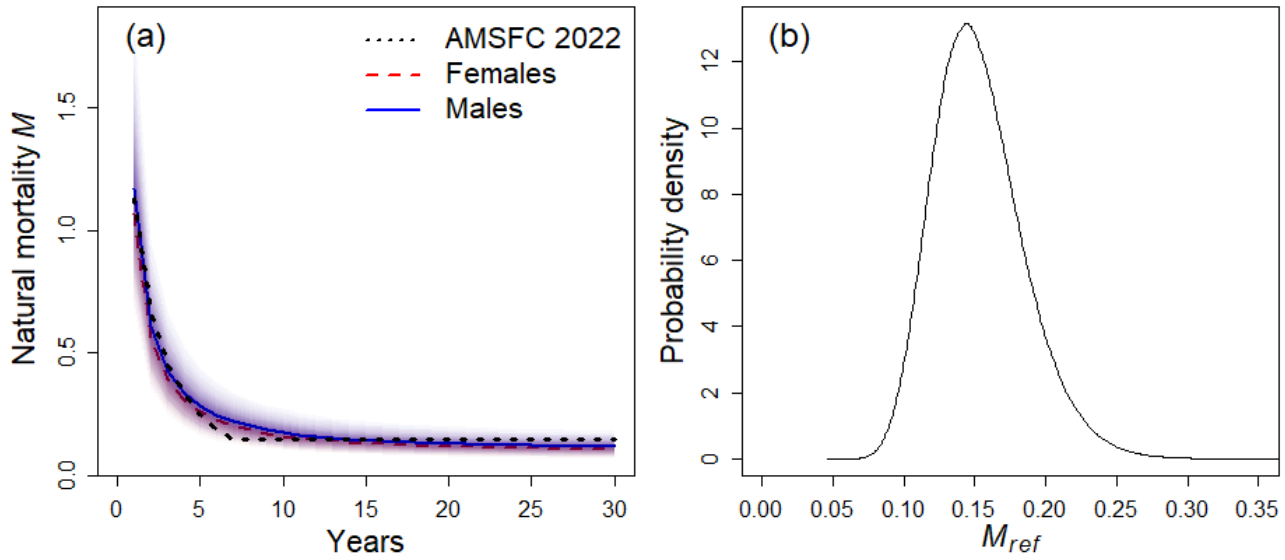

Figure 2.4. Sex-specific natural mortality-at-age estimates for Pacific Striped Bass (bold blue line and dashed red line) compared to natural mortality reported for Atlantic Striped Bass (dotted line; 2022 ASMFC) (a). Panel (b) describes the probability distribution of parameter values for M_{ref} used to inform natural mortality M.

2.3 Reproduction and Recruitment Inputs

2.3.1 Compensation Ratio (CR), scaling parameter (R_0), and fertility function (θ)

The parameter CR is the Goodyear compensation ratio (Goodyear 1977, 1980) that describes the maximum relative increase in juvenile survival as the total fecundity is reduced from the unfished biomass (φ_0) to near zero. There are no available estimates of CR for pacific Striped Bass; however, Meyers et al. (1999) reports a value of $CR = 18.2$ for the species and the recent stock assessment of Atlantic stocks estimated and applies a value of $CR = 6$ (2022 ASMFC). We applied a mean value of $CR = 11.6$ in our Monty Carlo process based on the Fishlife analysis updated with the estimates of Myers et al. (1999) and 2022 ASMFC. This resulted in a 95% probability of CR between 4.4 and 25.8. Because R_0 is a scaling parameter that does not influence the comparison of alternative regulations, we set it to $R_0 = 1$ to present results on a 'per-recruit' scale.

The term θ (Eq. 2) was used investigate the interaction of fertility and sex ratio at various levels, ranging from $\theta = 20$ (representing a "low fertility" function) to $\theta = 80$ (representing a "high fertility" function) (Heppell et al. 2006; Fig. 2.5). Values for θ were drawn from a random uniform distribution, which resulted in a mean of 50.4 and 95% probability between 22 and 78.

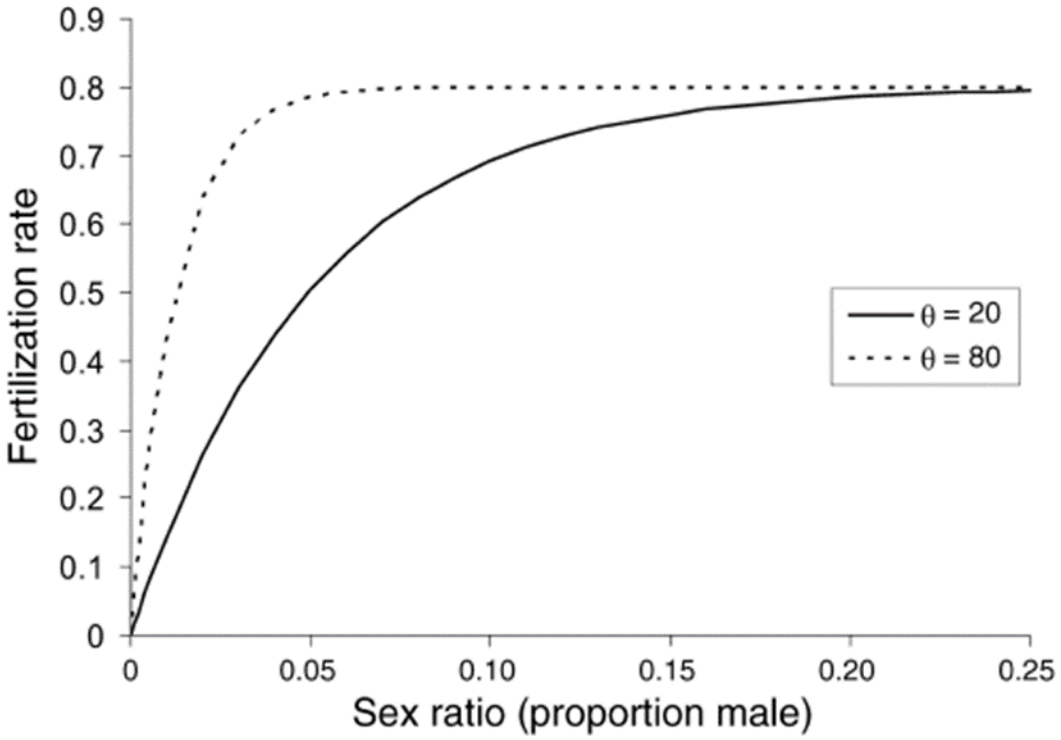

Figure 2.5 Model relationship between fertilization rate and sex ratio (proportion of males) based on two different levels of fertility function, θ (Fig.3 from Heppell et al. 2006).

APPENDIX 3: CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE'S STRIPED BASS DIET, FORAGING BEHAVIOR, AND PREDATION LITERATURE REVIEW

3.1 Literature Review Purpose

In the Fall of 2020, the Nor-Cal Guides and Sportsman's Association (NCGASA) submitted a regulation change petition to the Fish and Game Commission. The proposed regulation change would restrict the harvest of Striped Bass to a "slot limit" between 20 and 30 inches for inland anadromous waters. In the summer of 2022, the NCGASA submitted a second petition which would apply the 20-to-30-inch harvest slot limit to Striped Bass caught in marine (ocean and bay) waters as well. The NCGASA petition stated that the regulation change would protect the earliest spawners as well as the largest most fecund individuals, which would then over time, increase the population size of Striped Bass. The NCGASA also stated that they had polled their membership and that there was overwhelming support for a 20-to-30-inch slot limit. In response to the petition filing, the California Department of Fish and Wildlife (CDFW) began compiling and reviewing the available science to evaluate the efficacy of the science presented in the proposal. The goal of this literature review is to understand trends in the Striped Bass population, trends in inland and marine fisheries, and impacts that the proposed slot limit may have on listed species (if any) through predation.

During the evaluation process, several questions arose which necessitated a literature review which specifically focused on Striped Bass diet, foraging behavior, and predation. The review was needed to better understand how diet and feeding behavior of Striped Bass could vary temporally, spatially, by life-stage, and sex. The review also included pertinent literature that discussed factors that may influence feeding behaviors including environmental conditions, Striped Bass migration and distribution, and predator-prey abundance, among others.

The information included in the literature review included: study funding source (if listed and/or easily discernable), study period, geographic range, predator and prey assemblages evaluated/detected by the study, key findings from the study, and an overall take away from the paper. Information listed in the "key findings" and "overall" sections of the review include text taken directly from the

document that was reviewed as well as text that reflects the opinions of the reviewer. Final impressions and findings from this literature review will inform and be presented in the CDFW evaluation of the NCGASA slot limit proposal document. This review is a living document and will be updated as new research is conducted and literature published.

3.2 General Striped Bass diet and foraging behavior

Loboschefsky et al. 2012

Loboschefsky, E., G. Benigno, T. Sommer, K. Rose, T. Ginn, A. Massoudieh, and F. Loge. 2012. Individual-level and Population-level Historical Prey Demand of San Francisco Estuary Striped Bass Using a Bioenergetics Model. San Francisco Estuary and Watershed Science 10(1).

Funding Source. DWR and IEP.

Study Period. Dates ranging between 1969-2004 were selected because it was a composite study to create a model and not a study to collect data.

Geographic Range. San Francisco Estuary.

Predator assemblage evaluated. Sub-adult (age 1 and 2) and adult (age 3+) Striped Bass.

Prey species detected. Diet analysis was compiled from many sources and over different time scales. Prey item categories included: fish, decapod/isopods, mysids, and "other".

Key Findings.

- Quantified the individual and population-level consumption by Striped Bass.
- Mean length at age, and subsequent calculated mean weight began to decrease in the early 1990s for fish older than age 4.
- Adult Striped Bass diet consisted primarily of prey fish during all time-periods analyzed and was not observed to change significantly over time.

- Sub-adult Striped Bass became more piscivorous during the study period beginning in 1990, with a commensurate decline in the proportion of mysids in their diet. Prey fish increased from 2.5% to 12.2% in the diet of age one and from 78.5% to 82.1% in the diet of age two between 1980 and 1990, and mysids in the diets decreased from 95.9% to 58.5% and from 18.4% to 8.4%.

- Sub-adult population total consumption was variable from year to year and was statistically correlated to the sub-adult abundance estimates for age one.

- Adult population total consumption was statistically correlated to Striped Bass abundance estimates.

- From 1990 through 2001, piscivorous predation rates increased coincident with higher population numbers of adult Striped Bass and sub-adults.

Overall. This study found that individual consumption by adult females was higher than adult males at comparable age–classes. This may be because of the larger sizes and growth rates of females than of males, and the higher energetic cost of spawning in females than in males. One of the key findings of this paper is that population total consumption by sub-adult Striped Bass was similar to the population total consumption by adult Striped Bass. While the individual total consumption by adults was greater than that of the sub-adults, the larger sub-adult population abundance resulted in very similar total consumption (e.g., mean = 18.1× 106 kg prey for sub-adults versus 17.9 × 106 kg prey for adults). Prey located outside of the estuary represents an unknown percentage of the estimated total prey consumed by adults. By contrast, since sub-adults primarily reside in the estuary, and since the simulations showed that this demographic frequently consumes more than adults, sub-adults have a particularly large consumption demand within the estuary. Sub-adult Striped Bass can be highly abundant in shallow-water habitat (Nobriga and Feyrer 2007). A high percentage of prey consumed by sub-adult Striped Bass may originate inshore rather than in pelagic habitat.

Nobriga and Feyrer 2008

Nobriga, M., and F. Feyrer. 2008. Diet composition in San Francisco Estuary Striped Bass: does trophic adaptability have its limits? Environmental Biology of Fishes. DOI 10.1007/s10641-008-9376-0.Funding Source.

Funding Source. DWR and the CALFED Science Program.

Study Period. Used data collected from Stevens 1966 (1963-1964) and Nobriga and Freyrer 2007 (2001-2003), excluding winter samples from Stevens to make data sets temporally comparable.

Geographic Range. Sacramento San Joaquin Delta (16 sites).

Predator assemblage evaluated. Striped Bass diets.

Prey species detected. Variable, but focused on Inland Silverside, Threadfin Shad, and decapod shrimp.

Key Findings.

- This study examined trophic adaptability, as changes in diet over time shifted with prey availability.
- Results indicate that Striped Bass could effectively incorporate new prey into their diet at an intermediate time scale between one to two years. This was observed by Stevens 1966 after Threadfin Shad established populations in the San Francisco Estuary and were identified as a new prey source in the early 1960s.
- Threadfin Shad was a close second in importance to cannibalized Striped Bass as a prey fish and remained at similar frequencies in Striped Bass stomachs 40 years later.
- Logistic regression models for the three prey taxa tested showed their presence–absence in Striped Bass stomachs was significantly affected by both prey density and predator length. Larger Striped Bass (>400 mm FL) were less likely to consume smaller prey fishes such as Inland Silverside, and more likely to consume Threadfin Shad and decapod shrimp.
- Striped Bass and Mysid shrimp often form a predator–prey association in estuaries, and there is evidence to suggest that San Francisco

Estuary (SFE) Striped Bass productivity has declined in part because Mysid shrimp productivity has declined.

Overall. SFE Striped Bass exhibited, and continue to exhibit, considerable trophic adaptability. Striped Bass have adapted by incorporating certain prey into their diet as prey were introduced and rose to prominence in the estuary's faunal assemblage. They speculate that as continued species introductions push the SFE food web further away from a pre-existing state, it is increasingly unlikely that Striped Bass will find a suite of invading 'alternate prey' that can fully replace their established historical prey which may lead to declines in Striped Bass productivity.

Stevens 1966

Stevens, D.E. 1966. Food habits of Striped Bass, *Roccus saxatilis*, in the Sacramento–San Joaquin Delta. California Department of Fish Game Fish Bulletin 136:68–96.

Funding Source. Delta Fish and Wildlife Protection Study through DWR and the California Water Bond Act.

Study Period. September 1963 through August 1964.

Geographic Range. Sacramento-San Joaquin Delta.

Predator assemblage evaluated. Striped Bass food habits (n= 8,628 stomachs).

Prey species detected. Various aquatic macroinvertebrate and fish species (see key findings below). Percentages reported below represent average % by volume across seasons (see Tables 5, 6, 7, and 8 in document)

Key Findings.

- Data were analyzed by frequency of occurrence in the stomachs and percent of diet by volume.
- Young bass between 5-12 cm (September 1963) and 12-23 cm (August 1964) consumed crustaceans (56%), insects (trace), mollusks (1%), Threadfin Shad (36%), and small Striped Bass (12%).

- Juvenile bass between 13-25 cm (September 1963) and 24-35 cm (August 1964) consumed crustaceans (14%), Threadfin Shad (31%), Striped Bass (18%), American Shad (3%), Delta Smelt (listed as pond smelt in document, 5%), King Salmon (spring and summer)(2%), insects (trace), and mollusks (trace).

- Sub-adult bass between 26-37 cm (September 1963) and 36-47 cm (August 1964) consumed Threadfin Shad (43%), Striped Bass (35%), unidentified fishes (10%), American Shad (1%), King Salmon (spring and summer) (3%), and crustaceans (4%).

- Adult bass longer than 38 cm (September 1963) and longer than 48 cm (August 1964) were considered at least three years old. Their diet included Striped Bass (45%), unidentified fishes (6%), Threadfin Shad (26%), American Shad (4%), Delta Smelt (trace), King Salmon (spring)(1%), and crustaceans (trace).

- King Salmon were observed in the diets of sub-adult (fall and spring) and adult Striped Bass (spring) in the lower San Joaquin River, but not in the middle or upper San Joaquin River.

- Diets of Striped Bass caught in the south delta were dominated by crustacean species for young through sub-adult Striped Bass. Adult diets were dominated by fishes, primarily other Striped Bass and Threadfin Shad.

Overall. Five items frequently occurred in the diets of Striped Bass of any age, including Mysid shrimp, amphipods, small Striped Bass, Threadfin Shad, and discarded or stolen sardine and anchovy bait. Young Striped Bass were one of the important foods of adult and sub-adult bass. In the fall, they were discovered in two-fifths of sampled sub-adults and adults' stomachs. In the winter and spring, as the young bass became less abundant and larger, they were eaten less frequently. In the summer, when the new year-class of young bass became available, there was a sharp increase in the percentage of the sub-adults and adults that had eaten small bass. These new young-of-the-year bass were also of importance as a food of juvenile bass.

Thomas 1967

Thomas, J.L. 1967. The Diet of Juvenile and Adult Striped Bass Roccus Saxatilis, in the Sacramento-San Joaquin River System. Cal Fish and Game 53(1):49-62.

Funding Source. Federal Aid to Fish Restoration Funds (Dingell-Johnson Project California).

Study Period. Incidental collection took place between 1957-1960. In 1961, the Young of Year (YOY) were collected monthly. In 1962, both juveniles and adults were collected monthly.

Geographic Range. (i) San Francisco Bay (SFB), (ii) San Pablo Bay, (iii) Sacramento River and bays from Crockett to Pittsburg, (iv) Delta, (v) Lower Sacramento River, and (vi) Upper Sacramento River.

Predator assemblage evaluated. Striped Bass only.

Prey species detected. Both vertebrates and invertebrates were collected (see Table 2 in Thomas 1967). Prey detected included Chinook Salmon.

Key Findings. Results are presented by season, location, and size class, and are reported as frequency of occurrence and percentage volume. Below is a summary of detected prey species size classes with volume reported.

- Adults (> 16 inches).
    - Spring diet largely consisted of Shiner Perch (50%) and anchovies (34%). Individuals were found in the SFB.
    - Summer diet largely consisted of Northern Anchovies and Shiner Perch. Individuals were found in the SFB.
    - Fall diet largely consisted of Northern Anchovies and Shiner Perch (>50% by volume combined), Pacific Tomcod and herring (22% by volume combined). Young Striped Bass also appeared in the diet. Individuals were found in the Delta.
- Juveniles (size group not stated, assuming < 16 inches).
    - Spring diet largely consisted of King Salmon (65%). Individuals were found in the Upper Sacramento River.

- Summer diet largely consisted of King Salmon and carp (73% combined). Individuals were found in the Upper Sacramento River.

- Summer diet largely consisted of Mysid shrimp (80%). Individuals were found in the Delta.

Overall. The study did not differentiate diet by fish size for all locations and times of the year. Therefore, results where diet composition across size classes differentiated were summarized. Generally, adults in San Francisco Bay contained larger volumes of Shiner Perch and anchovies in stomachs, while juveniles in the Upper Sacramento River and Delta contained more King Salmon, carp, and Mysid shrimp.

Young et al. 2022

Young, M.J., Feyrer, F., Smith, C.D., and D.A. Valentine. 2022. Habitat-specific foraging by Striped Bass (*Morone saxatilis*) in the San Francisco Estuary, California: implications for tidal restoration. San Francisco Estuary & Watershed Science 20 (3).

Funding Source. U.S. Bureau of Reclamation (Interagency Agreement).

Study Period. Spring (March 26-April 5) 2018 and Summer (July 9-18) 2018.

Geographic Range. Ryer Island in the north-central delta was targeted for this study. Three habitat types were sampled: marsh, shoal, and channel. These habitats were sampled both day and night using gill nets and trawls to minimize time of day and gear type bias.

Predator assemblage evaluated. Striped Bass were evaluated at a size range of 63 to 671 mm standard length, and an age range spanning 1-5 years.

Prey species detected. Stomach contents revealed 9,989 prey items representing 46 prey taxa.

Key Findings.

- Tested for differences in fish size and stomach fullness across season and habitat types using ANOVA.

- Collected 269 Striped Bass of which 34 had empty stomachs (n = 235 individuals).
- Diets were dominated by invertebrates.
- Diets only differed by Stiped Bass size in the spring.
- There were significant diet differences across habitats in both spring and summer. Striped Bass collected in marsh habitat had significantly different stomach contents than Striped Bass collected in channel or shoal habitat. The channel and shoal habitat stomach contents were not significantly different from each other.

Overall. The prey variability observed in this study, coupled with shifts in dominant prey types over time in the estuary, indicate that Striped Bass are an adaptable and opportunistic predator able to adjust to changing environmental conditions and prey availability. In this study, total invertebrate consumption was generally consistent across seasons, and variability was instead associated with specific invertebrate categories. Fish were only the most important diet item for large Striped Bass in the marsh in spring, and not any other habitat/season combination, consistent with Zeug et al. (2017). The dominant fish diet items were littoral or benthic fish species of least concern, with few pelagic or special status-fishes observed in diets.

Zeug et al. 2017

Zeug, S.C., Feyrer. F.V., Brodsky, A., and J. Melgo. 2017. Piscivore diet response to a collapse in pelagic prey populations. Environmental Biology of Fishes 100: 947-958.

Funding Source. U.S. Bureau of Reclamation.

Study Period. November and December 2010 and 2011.

Geographic Range. Study was located at the San Francisco Estuary and centered on Suisun Bay and San Pablo Bay using multimesh gill nets.

Predator assemblage evaluated. Striped Bass, Sacramento Pikeminnow, Largemouth Bass.

Prey species detected. Generalized into 16 prey categories (see Table 1 in Zeug et al. 2017).

Key Findings.

- Across the study duration, 348 total stomachs were examined. Out of this total, 25% of stomachs had no identifiable contents.
- Striped Bass comprised the majority of piscivores collected (89%) followed by Sacramento Pikeminnow (10%). Two Largemouth Bass were collected (0.6% of total) but were excluded from comparisons among species due to the low sample size.
- Benthic prey accounted for 80% of all prey by weight and pelagic prey accounted for 7%. The remaining 13% consisted of other sources such as terrestrial or could not be identified (excessive digestion).
- Prey items in the stomachs of Striped Bass were gravimetrically dominated by *Crangon* spp. (26%), "other Osteichthyes" (17%), and Isopoda (16%; see Figure 4 in Zeug et al. 2017). No other prey item made up more than 10% of the diet by gravimetric proportion.
- In both years the category "other Osteichthyes" occurred in the greatest density near the confluence of the Sacramento and San Joaquin rivers.
- No special status species were detected in any piscivore stomach examined. However, small sample sizes, and time of year could have contributed to this.

Overall. The results indicate there has been a significant reduction in the contribution of pelagic prey resources to Striped Bass diets when compared to earlier studies (e.g., Johnson and Calhoun 1952; Thomas 1967) concomitant with the pelagic organism decline. Striped Bass responded to the pelagic organism decline by consuming greater proportions of benthic fish and invertebrates whereas Sacramento Pikeminnow diets were more specialized and consisted primarily of benthic fish in both years. If there has been a decline in SFE Striped Bass abundance, it could be linked to reduction in preferred prey resources.

3.3 Predation focused Striped Bass diet and foraging behavior studies

Michel et al. 2018

Michel, C.J., Smith, J.M., Demetras, N.J., Huff, D.D., and S.A. Hayes. 2018. Non-native fish predator density and molecular-based diet estimates suggest differing effects of predator species on juvenile salmon in the San Joaquin River, California. San Francisco Estuary and Watershed Science 16(4).

Funding Source. DWR.

Study Period. Sampling took place from early May 2014 through April 2015 using electrofishing boats. Sampling was scheduled to occur during historical peak out-migration of sub-yearling fall-run Chinook Salmon.

Geographic Range. Three sites near Old River in the Lower San Joaquin River.

Predator assemblage evaluated. Largemouth Bass (LMB), Channel Catfish (CHC), White Catfish (WHC), and Striped Bass (STB).

Prey species detected. The diet analysis focused on 12 selected prey species and is not considered a full comprehensive diet analysis. Largemouth bass, Striped Bass, Mississippi Silverside, Chinook, Sacramento Splittail, Threadfin Shad (TFS), Rainbow Trout/steelhead, Green Sturgeon, Delta Smelt, Longfin Smelt, Sacramento Pikeminnow, and White Sturgeon were all identified as prey through DNA assays.

Key Findings.

- Largemouth Bass (42%) and Striped Bass (40%) were by far the most captured predators in the study reaches, followed by White Catfish, Channel Catfish, and other Centrarchid species.
- The catch composition between these two habitats also varied; Largemouth Bass dominated the littoral habitat, and Striped Bass dominated the channel habitat. This could be a sampling (electrofishing) bias. Striped Bass were patchily distributed between sampling reaches.

- A total of 582 predator diets were collected, comprising 253 LMB diets, 186 STB diets, 107 WHC diets, and 36 CHC diets.

- CHC had the widest variety of prey species in their diets. The least frequent prey items found in CHC diets was STG, LFS, SPM, and STW.

- LMB was found in the highest proportion of diets for all species, followed by STB, MSS, CHK, and SPT, in approximately that order for all predators. DSM, RBT, and TFS were found in low frequencies in all four predator species.

- Contribution of salmonids to predator diets (2014 and 2015 combined): 27.7% of CHC diets tested positive for Chinook Salmon, followed by 4.8% of STB diets, 4.7% of WHC diets, and 2.8% of LMB diets. For Steelhead, 5.5% of CHC diets and 2.2% of STB diets had Steelhead; no WHC or LMB diets tested positive for Steelhead. Combined, salmonids were present in 33.3% of CHC diets, followed by 7.0% of STB diets, 4.7% of WHC diets, and 2.8% of LMB diets.

- Non-native predator (Largemouth Bass, Channel and White Catfish, and Striped Bass) diets were mostly comprised of other non-native predator species. Salmonid prey were found in only 7% of STB diets.

Overall. Michel et al. 2018 found that Striped Bass in these size-classes are mostly found in roving aggregations, and whether they are found in a study reach during the time of a survey is highly variable. This is consistent with the understanding that Striped Bass are highly mobile, migratory, and aggregating fish as sub-adults or small adults. This study also found that although all tested predator species ate salmonids, the predators tested positive more frequently for non-native piscivorous species. They also tested positive for many non-native prey species at higher frequencies. Other studies throughout the Delta have found similarly low frequencies of salmonids in predator diets, with typically less than 5% of Striped Bass diets containing salmonids, even during peak out-migration and in regions with higher densities of salmonids (Stevens 1966; Thomas 1967; Nobriga 2007). Only in the rare exception of when a migratory corridor becomes spatially constricted do salmonids become a major component of Striped Bass diets in the Delta (such as with fish ladders; Sabal et al. 2016).

Nobriga and Feyrer 2007

Nobriga, M., and F. Feyrer. 2007. Shallow-water piscivore-prey dynamics in California's Sacramento–San Joaquin Delta. San Francisco Estuary & Watershed Science 5(2).

Funding Source. IEP.

Study Period. March-October 2001 and March-October 2003 using beach seines and gill nets for nearshore sampling.

Geographic Range. The study was located within the Sacramento-San Joaquin Delta. Central sampling locations were found on Liberty, Decker, and Sherman islands. Southern sites included Medford and Mildred islands.

Predator assemblage evaluated. Striped Bass, Largemouth Bass, and Sacramento Pikeminnow.

Prey species detected. See Table 1 *in* Nobriga and Freyrer (2007).

Key Findings.

- Striped Bass had the broadest spatio-temporal distribution. Largemouth Bass had the narrowest spatio-temporal distribution.
- All three piscivores had diverse diet compositions comprised of numerous invertebrate and fish taxa.
- Field observations of changes in piscivore stomach contents through time have indicated that piscivorous fishes exhibit prey switching behavior. Striped Bass are opportunistic feeders that shift in prey items as the fish get larger/older (Stevens 1966).
- There were noticeable seasonal shifts in prey fish consumed by all three piscivores. Collectively, most native fish use occurred during spring (March-May) and the highest prey species richness occurred during summer (June-August).
- Largemouth Bass preyed on a greater number of native fish than the other two piscivores and consumed native fish farther into the season (July) than the other two piscivores (May).

- Striped Bass piscivory was significantly affected by season (chi-square = 24.6; *P*= 0.00002), but not fork length (chi square = 7.37; *P* =0.06).

- Striped Bass typically only exceeded the 50% piscivory threshold during summer and fall regardless of size.

Overall. This study indicates that all three predators frequently occur in Delta shallow-water habitats. However, they acknowledge that having only five sampling sites limited the ability to generalize about piscivore distributions across the entire Delta. This study found that piscivore prey choices are functions of encounter and capture probabilities. Both encounter and capture probabilities are probably affected by prey relative abundance. Encounter probabilities also are influenced by environmental factors such as turbidity and vegetation density.

Peterson et al. 2020

Peterson, M., J. Guignard, T. Pilger, and A. Fuller. 2020. Stanislaus Native Fish Plan: Field Summary Report for 2019 Activities. Technical Report to Oakdale Irrigation District and South San Joaquin Irrigation District. *Draft in Review.*

Peterson et al. 2023

Peterson, M., T. Pilger, J. Guignard, A. Fuller, and D. Demko. Diets of Native and Non-native Piscivores in the Stanislaus River, California, Under Contrasting Hydrologic Conditions. San Francisco Estuary & Watershed Science 2: 1-22.

Funding Source. Oakdale and South San Joaquin Irrigation Districts.

Study Period. Spanned four months from March 1, 2019, through June 30, 2019.

Geographic Range. Lower Stanislaus River from Oakdale Recreation Area 66.9 river kilometer (rkm) to the confluence with the San Joaquin River.

Predator assemblage evaluated. While 17 predator species were targeted, black bass, stiped bass, hardhead, Sacramento Pikeminnow, sunfish, and catfish were most evaluated.

Prey species detected. A variety of invertebrates fishes, and crustaceans.

Key Findings.

- Predator composition included black bass (51%), Striped Bass (13%), sunfish (13%), Hardhead (12%), and Sacramento Pikeminnow (8%).

- Habitat types assessed in the study included rip-rap, submerged vegetation, overhanging vegetation, woody debris, open water, and unknown. Flows during the study period were between 3,000 and 4,000 cfs, and the dominant habitat types at these flows were submerged and overhanging vegetation.

- Black bass were ubiquitous throughout the study area and observed in all habitat types, but submerged vegetation was the most common. Striped Bass were concentrated in the middle and lower reaches and most often observed in overhanging and submerged vegetation, but also found in open water and woody debris.

- Invertebrates (insects, crustaceans, and annelids) dominated predator diets. Ninety percent of all identified prey items were invertebrates. Fish made up only seven percent of the total identified diet and were primarily consumed by black bass and Striped Bass.

- The two most observed consumed fish were Chinook Salmon and lamprey. Chinook salmon made up 8.5% of Striped Bass diet by number, and lamprey made up 6.7%.

    - Twenty four percent of Striped Bass caught were observed to have consumed at least one Chinook Salmon. Black bass were observed to consume Chinook Salmon at a lower rate of 9.2%.

    - Black bass that consumed salmon were 175-300 mm fork length (FL).

    - Striped Bass that consumed salmon were between 240-660 mm FL.

    - Striped Bass consumed Chinook Salmon and lamprey at a rate that increased gradually in March and April, peaked in May, and decreased slightly in June.

- Fork length (FL) of Striped Bass that consumed salmon significantly decreased over the study period, while FL of black bass that

consumed salmon increased slightly. However, mean FL of black bass did not change over sampling period, suggesting smaller black bass that ate salmon early in the season may not have been able to consume salmon later in the season with increases in prey sized. Striped Bass appeared to consume salmon independent of prey size.

- Total estimated monthly consumption was highest for Striped Bass across the study period (March- June). Striped bass holds the highest estimated population-level impact on Chinook Salmon based on rotary screw trap estimates of salmon migration into the study reach.

- The total number of juvenile Chinook Salmon entering the study area occurred at the same time of diet collections. Mismatch in temporal scales would most likely overestimate the predation impact on Chinook Salmon.

Overall. Overall fish consumption was low (7% of total predator diets), and most often observed in black bass and Striped Bass. Fish species consumed by Striped Bass primarily consisted of Chinook Salmon (8.5%) and lamprey (6.7%), but also included non-natives such as bluegill (0.6%), carp (3%), green sunfish (0.6%), loach (0.6%), and Striped Bass (0.6%). Chinook Salmon occurrence was observed in Striped Bass 240-660 mm FL (9-25 inches). Consumption of Chinook Salmon appeared to be dependent on prey size for black bass, but independent for Striped Bass. Striped Bass were estimated to have the largest impact on salmon populations in the study area compared to other predators. Consumption estimates rely on assumptions that may or may not have been violated.

Stompe et al. 2020

Stompe, D.K., Roberts, J.D., Estrada, C.A., Keller, D.M., Balfour, N.M., and A.I. Banet. 2020. Sacramento River predator diet analysis: a comparative study. San Francisco Estuary & Watershed Science 18(1).

Funding Source. Northern California Water Association and CDFW.

Study Period. Hook and line sampling occurred between March 2017-November 2017. Sampling occurred over three habitat types. riprap, natural, and manmade.

Geographic Range. Sacramento River (middle) near Chico, and Ord Bend in the Glenn-Colusa Irrigation District.

Predator assemblage evaluated. Striped Bass between 22.5 cm and 47 cm and Sacramento Pikeminnow were evaluated. The study analyzed predator size, distribution, and diet. Predator Catch Per Unit Effort (CPUE) was used as a measure of abundance.

Prey species detected. Prey species were determined through visual ID and PCR primers. Major prey categories included macroinvertebrates, crayfish, and fishes (see table for index of relative importance IRI%).

Key Findings.

- Out of the 155 target species that were captured, 68 were Sacramento Pikeminnow and 87 were Striped Bass. Of these individuals, Sacramento Pikeminnow (n=30) and Striped Bass (n=47) contained stomach contents that were identifiable.
- Sampled Striped Bass and Sacramento Pikeminnow were evenly distributed across all habitat types.
- Temporal distribution showed that Striped Bass CPUE was higher in summer than in fall.
- Of the individuals that contained stomach contents, piscivory was observed in 71% of Sacramento Pikeminnow and 84% of Striped Bass.
- The two most important prey items for both predator species, as enumerated by %IRI, were macroinvertebrates (excluding crayfish) and Chinook Salmon (Sacramento Pikeminnow: 77% and 15%, respectively; Striped Bass: 78% and 17%, respectively; Table 3.1 below).
- %IRI and PERMANOVA modeling indicate no difference in diets between Sacramento Pikeminnow and Striped Bass.
- Prey frequency of occurrence showed no relationship with species or habitat type but was significantly influenced by water temperature.

Table 3.1. *In* Stompe et al. 2020 (Table 3). Table represents %IRI values for Sacramento Pikeminnow and Striped Bass captured via hook and line sampling near Chico, Ca.

Prey Species	Sacramento Pikeminnow	Striped Bass
American Shad	0.08	0.64
Chinook	14.57	17.03
Crayfish	2.56	0.17
Green Sturgeon	0.00	0.08
Hardhead	0.48	2.75
Macroinvertebrate spp.	76.90	78.09
Pacific Lamprey	0.90	0.11
Sculpin spp.	4.51	1.03
Tule Perch	0.00	0.10

Overall. %IRI and PERMANOVA modeling indicated no difference in diets between Sacramento Pikeminnow and Striped Bass. While there are obvious life-history differences between these two species, on a per capita basis, neither appears to have a higher impact on observed prey, including Chinook Salmon, than the other. Both Sacramento Pikeminnow and Striped Bass are opportunistically feeding on seasonally available prey populations. Results support the notion that Sacramento Pikeminnow and Striped Bass exhibit prey-switching behavior, both spatially and temporally. This likely occurs in the presence of high densities of certain prey, such as during in-river releases of hatchery Chinook Salmon. The observed proportion of Chinook Salmon in predator diets within the Sacramento River was lower than was seen by Thomas (1967). Overall predator diets in the Sacramento River were substantially different than those observed within the Delta (Stevens 1966; Nobriga and Feyrer 2007). This could indicate that predation pressure or likelihood of being predated upon is different during the river migratory phase versus in the more open-water habitat of the delta. PERMANOVA modeling showed that water temperature was the only variable measured that significantly affected

predator diets. Because of the association between water temperature and seasonality, this may indicate a temporal association of predator diets, which would support the conclusion that both Sacramento Pikeminnow and Striped Bass are opportunistically feeding on seasonally available prey populations.

3.4 Size specific Striped Bass diet and foraging behavior

Heubach et al. 1963

Heubach, W., Toth, R.J., and A.M., McCready. 1963. Food of young-of-the-year Striped Bass (*Roccus saxatilis*) in the Sacramento-San Joaquin River System. California Fish and Game 49 (4): 224-239.

Funding Source. Dingell-Johnson Project California F-9-R, and Federal Aid to Fish Restoration.

Study Period. Opportunistically collected in conjunction with other field activities from June-November 1956-1961.

Geographic Range. Lower Sacramento-San Joaquin River system (tow net and seining stations).

Predator assemblage evaluated. Juvenile Striped Bass (YOY).

Prey species detected. Planktonic species.

Key Findings.

- This study took place prior to the California Water Plan establishing baseline diets for YOY Striped Bass in the delta.
- The percentage frequency of copepod occurrence was greater in small bass than large ones. Larger plankton, *Neomysis* and *Corophium,* occurred more frequently in larger YOY Striped Bass.
- Salinity affected prey distribution/availability and therefore diets. The occurrence of plankton species in YOY stomachs generally coincided with the distribution of plankton in the environment.

- In this study, several major groups comprising over 20 species of small animals were eaten by young-of-the-year Striped Bass. Many of these organisms were also reported in previous food habits studies (cited within Heubach et al. 1963).

- Fish were unimportant in the diet of YOY Striped Bass.

Overall. Fish were unimportant in the diet of young-of-the-year Striped Bass. The occurrence of organisms in the stomachs generally agreed with the distribution of plankton organisms in the environment. Thus, food habits in any area were largely controlled by the factors controlling plankton distribution. Salinity and water flow were the most important of these factors.

Walter and Austin 2003

Walter, J.F., and H.M. Austin. 2003. Diet composition of large Striped Bass (*Morone saxatilis*) in Chesapeake Bay. Fishery Bulletin 101: 414-423.

Study Period. March 1997 through May 1998.

Geographic Range. Chesapeake Bay, tributaries, and Chesapeake Bay mouth.

Predator assemblage evaluated. Striped Bass.

Prey species detected. Through diet analysis, 34 different species of fish and 18 species of invertebrates were detected (see Table 2 *in* Walter and Austin 2003).

Key Findings.

- Two size classes of Striped Bass were analyzed. Striped Bass between 458-710 mm were classified as resident and migratory fish. Striped Bass between 711-1255 mm were classified as a coastal migrant fish.

- Out of the 1225 fish analyzed, 56% contained items in stomach (these results are similar to Brandl et al. 2021)

- Clupeid fishes dominated the diet, particularly Atlantic Menhaden. Menhaden accounted for 44% of the weight and occurred in 18% of all stomachs.

- Menhaden ranged in length from 103 to 360 mm total length, and scored higher on the index of relative important compared to any other species as calculated in the equation below.
    - $IRI = (\%N + \%W) \times \%FO$
    - Where %N = the percentage of a prey species by number, %W = the percentage of a prey species by weight, and %FO = the percent frequency of occurrence of a prey species.
- Size appeared to indicate potential differences in Striped Bass diets. Smaller Striped Bass consumed Bay Anchovy, juvenile Spotted Hake, whereas larger Striped Bass consumed anadromous herrings.
- There was a significant relationship between Striped Bass total length and prey length ($P<0.05$, $r2=0.26$), indicating that larger and older Striped Bass ate larger prey. The regression fit was poor, indicating that large fish also consumed small prey (Figure 3.1). In other words, larger Striped Bass consumed a greater size range of prey than smaller Striped Bass.

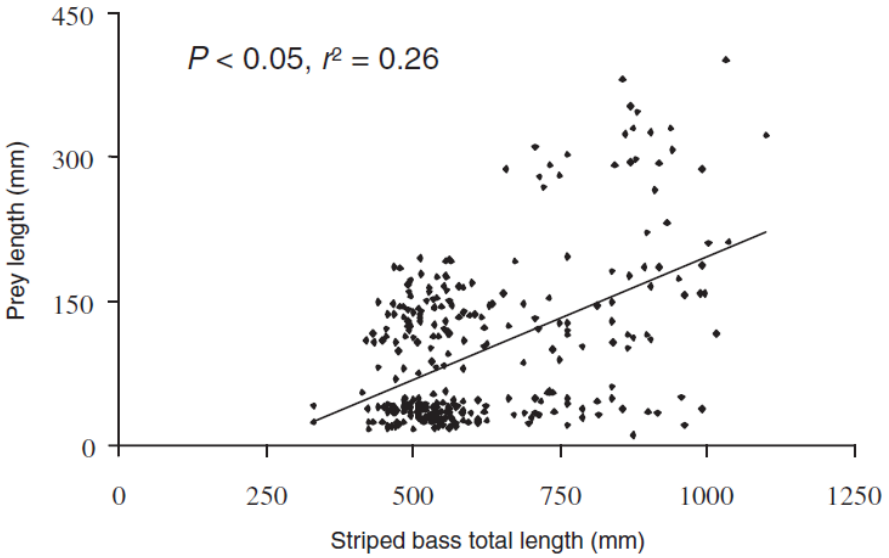

Figure 3.1. *In* Walter and Austin 2003 (Figure 4). Plot of prey total length against total length for Striped Bass.

- Smaller Striped Bass consumed prey that approached 40% of their total length. However, most prey consumed by all sizes of Striped Bass were smaller, young-of-the-year fishes. This is corroborated by Overton 2002 who predicted an optimal prey size to be 21% of the Striped Bass length.

- Spring feeding on anadromous fishes like Gizzard Shad, anadromous herring, and White Perch indicated a seasonal trend which corresponded to spawning migrations of Striped Bass.

Overall. Smaller Striped Bass (18-28 inches) consumed up to 40% body length, but mostly ate smaller, YOY fishes (corroborated by Overton 2002), whereas larger Striped Bass (> 28 inches) consumed both small and large prey. This study further supports the idea that Striped Bass interact with out-migrating anadromous fishes during their spawning migrations, and so the temporal overlap of these interactions are important when thinking about out-migrating salmonids in CA. Fyke data show that most Striped Bass entering the Sac River in the spring are in this < 28 inch range (see Figure 3.2 below), and therefore may exhibit feeding patterns of the 'smaller' Striped Bass in this study. Goertler et al. 2021 suggests that climate change, particularly warming ocean temperatures and decreased precipitation could increase migration timing of Striped Bass, thus potentially resulting in more temporal overlap with out-migrating juvenile salmonids.

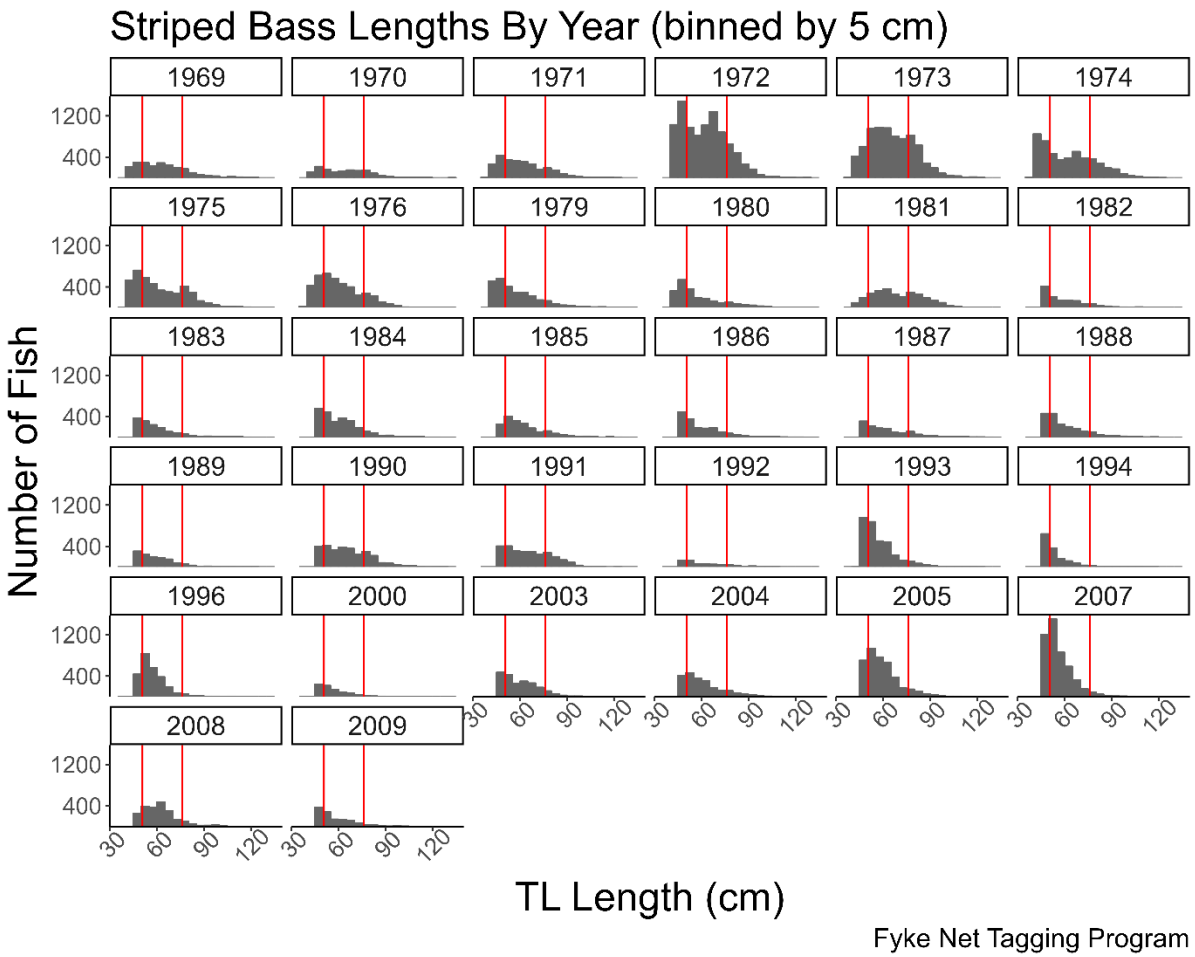

Figure 3.2. Length-frequency histograms for Striped Bass sampled from fyke nets. Parallel vertical red lines indicate the proposed 20-30 inch slot limit. Data Source: Striped Bass Tagging Program.

3.5 Striped Bass migration timing in relation to environmental conditions

Calhoun 1952

Calhoun, A.J., 1952. Annual migration of California Striped Bass. California Fish and Game 38(3): 391–403.

Funding Source. Unknown, CDFG funded most likely.

Study Period. Tagging took place January and November 1947**,** Spring 1950 and 1951. Tag recoveries took place November through April soon after tagging.

Geographic Range. Sacramento-San Joaquin Delta.

Predator assemblage evaluated. Adult Striped Bass (>20 ") caught in gill nets (n = 4,136) and marked with Disc tags.

Prey species detected. NA.

Key Findings.

- Seasonal movement of adult Striped Bass.
    - During winter-early spring, Striped Bass were recaptured close to tagging locations. (Antioch and Franks Tract) within the Delta, no signs of large migrations.
    - During spring (April), Striped Bass spread out throughout the delta and up into rivers to spawn.
    - During late spring-early summer, Striped Bass are post spawn. Striped Bass are still spread widely across the delta but in greater concentrations in the delta central indicating that they are moving back into the delta.
    - During summer, Striped Bass recaptures indicate that they are moving toward salt water. Recaptures are further downstream in San Pablo Bay.

- During fall, Striped Bass recaptures are once again higher up in the delta near tagging locations but widespread (not in tributaries though), mostly sloughs in the delta.
- During winter, Striped Bass showed the same pattern as previous year. Clumping near tagging locations, more concentrated than in the fall.

Overall. The results of tagging studies conducted in 1947, 1950, and 1951 indicate that in the summer months, adult bass are distributed mainly in San Francisco Bay and the ocean. In the fall and winter most of them move upstream to San Pablo Bay, Suisun Bay, and the Delta. In the spring the spawning population moves farther upstream where they spawn, mostly during May and June, in fresh water of 15°C or higher. After spawning, most large fish return to the lower bays and the ocean.

Goertler et al. 2021

Goertler, P., Mahardja, B., and T. Sommer. 2021. Striped Bass (*Morone saxatilis*) migration timing driven by estuary outflow and sea surface temperature in the San Francisco Bay-Delta, California. Scientific Reports 11: 1510. DOI 10.1038/s41598-020-80517-5.

Funding Source. Interagency Ecological Program and CDWR.

Study Period. 1969-present.

Geographic Range. San Francisco Estuary, Sacramento-San Joaquin Delta, and tributaries.

Predator assemblage evaluated. NA.

Prey species detected. NA.

Key Findings.

- Median migration timing varied from the third week of May to the fourth week of June.
- Striped Bass migrated later in years when Delta outflow was greater and sea surface temperature was cooler.
- Results suggest increased sea surface temperature congruent with decreased precipitation could shift Striped Bass migration earlier in spring.
- Findings are consistent with Striped Bass movement in their native range in the Chesapeake Bay, where warmer spring water temperature is linked with earlier spawning migration.
- Early migration has implications for predation risk on seaward migrating juvenile Chinook Salmon. There may be more temporal overlap if Striped Bass migrate earlier, as most juvenile salmon exited rivers by late June.
- Estuary outflow was positively related to median date, indicating that Striped Bass migration was delayed when estuary outflow was high.

- Results may indicate increased residence time in the estuary in response to food web and habitat benefits.

Overall. Warming temps and decreased precipitation could increase migration timing of Striped Bass, which has the potential to create more temporal overlap with out-migrating Chinook Salmon.

Le Doux-Bloom 2012

Le Doux-Bloom, C. M. 2012. Distribution, habitat use, and movement patterns of sub-adult Striped Bass *Morone saxatilis* in the San Francisco Estuary Watershed, California. University of California, Davis ProQuest Dissertations Publishing.

Funding Source. DWR and IEP.

Study Period. Summer 2010- summer 2011.

Geographic Range. Regions include Central Bay, South Bay, San Pablo Bay, Carquinez Strait, San Joaquin River, Central Delta, East Delta, South Delta, Sacramento River, Cache Complex, American River, and Feather River.

Predator assemblage evaluated. Striped Bass (n = 99) with a length range of 9-17 inches.

Prey species detected. NA.

Key Findings.

- *Chapter 2: Distribution and Habitat Use of Sub-adult Striped Bass (Morone saxatilis) in the San Francisco Estuary Watershed*
    - During fall, Striped Bass occupied Central Bay, Cache Complex, Central Delta, Sacramento River, and Carquinez Strait. Over winter, fish shifted toward the ocean, generally staying around Carquinez Strait, Central Bay, and the lower Sacramento River. Some study fish may have emigrated to the ocean, evidenced by low detections in the bays and delta. Striped Bass dispersed in the spring, expanding from nearshore Pacific Ocean and 65 river kilometers (rkm) to Coyote Creek in the South Bay, near San Jose to the upper Sacramento River near Colusa and 264 rkm upstream on the

Feather River. This could be related to increased temperatures in the San Francisco Estuary Watershed, and timing of upstream migration may be temperature-dependent, as this occurred when temps went from cold to cool.

- In 2010, an average flow year, most fish were observed between Carquinez Straight and Sacramento River (rkm 192). During a high flow year (2011) more fish aggregated toward the ocean.

- Temperature appeared to influence habitat use in winter and spring. Fish shifted to higher salinity habitat when temperature decreased, and only revisited upstream locations when temperature increased above 10°C.

- Results indicate Striped Bass inhabited shoal habitat across all seasons, with channel and shoal habitat used equally over winter.

- *Chapter 3: Movement Patterns of Sub-adult Striped Bass in the San Francisco Estuary Watershed:*

    - There were N = 43 individual fish detected.

    - The study found three movement patterns for Striped Bass: River residents, estuarine residents (freshwater to mesohaline habitats) and bay residents (predominantly polyhaline to euhaline habitats).

    - Summer movement patterns were segregated by salinity, while movements increased in all resident groups during late fall and spring. Riverine fish moved from higher in the watershed to lower freshwater habitats which may reflect a preference for warmer water to over-winter in. While receivers recorded movement into the south delta, their actual whereabouts over the winter could not be detected due to comparatively fewer receivers there. As temperatures increased in late spring, riverine fish returned to upstream habitats.

- The water temperature of both river and ocean may trigger sub-adult movement by bay and riverine groups.
- There was some evidence of spawning migration, where individuals moved upstream in the spring, and returned a few weeks later to higher salinity habitat.

Overall. There were three distinct movement patterns detected from tagged Striped Bass that appeared to be related to salinity. There is also a strong correlation between temperature preference and salinity. Fish shifted to higher salinity habitat when temperatures decreased, and revisited upstream locations when temperatures increased above 10°C. Striped Bass in this study tended to utilize both channel and shoal habitat ubiquitously throughout the seasons (Figure 3.3).

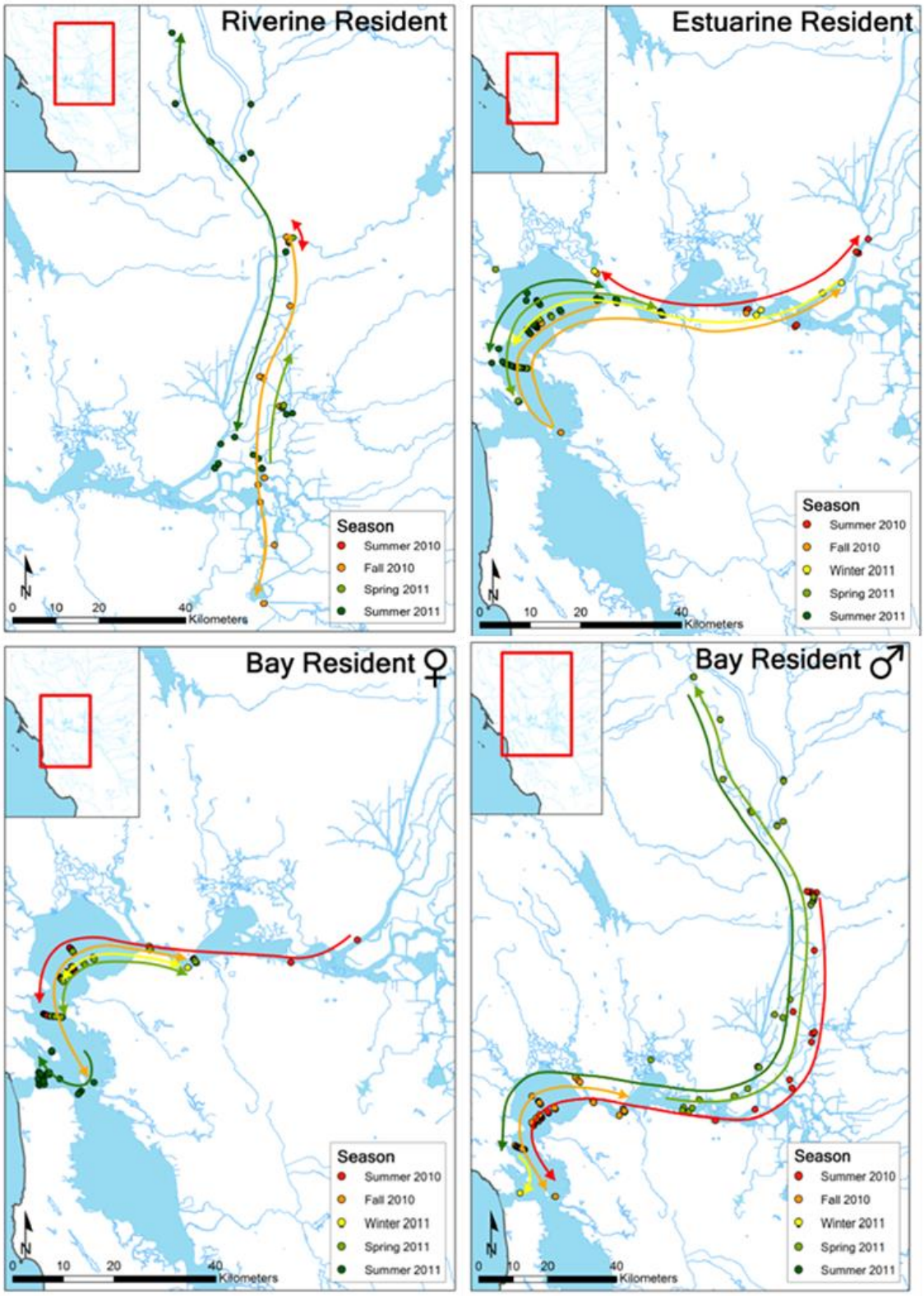

Figure 3.3. *In* Le Doux-Bloom 2012. Figures depict seasonal movement patterns of male and female Striped Bass in the summer of 2010 and 2011.

3.6 Habitat alteration and predation

Michel et al. 2020

Michel, C.J., M.J. Henderson, C.M. Loomis, J.M. Smith, N.J. Demetras, I.S. Iglesias, B.M. Lehman, and D.D. Huff. 2020. Fish predation on a landscape scale. Ecosphere 11(6): e03168. DOI 10.1002/ecs2.3168.

Funding Source. CDFW Research Regarding Predation on Threatened and/or Endangered Species in the Delta, Sacramento and San Joaquin Watersheds Proposal Solicitation Package

Study Period. April 3- May 13, 2017.

Geographic Range. A Generalized Random Tessellation Stratified algorithm was used to select twenty sites in the South Delta and San Joaquin Basin.

Predator assemblage evaluated. This study did not target anything specific, and no predator species was identified.

Prey species detected. Predation Event Recorders (PERS) were employed using tethered, drifting hatchery Chinook Salmon.

Key Findings.

- Percent of preyed-upon PERs varied through time and between sites, ranging from 0% to 37%. In total, they deployed 1,670 PERs during the spring of 2017, of which 15.7% (~262) were preyed upon.
- Predation risk for salmonids and other similar prey species in the South Delta were strongly influenced by water temperature, time of day, predator density, and bottom roughness.
- The upper limit of temperatures measured during sampling in the spring of 2017 (20°C) is approximately the lower end of the thermal preference of Striped Bass. Predation rates may have changed under other different thermal conditions that favored Striped Bass presence in the study area.

- This study found a strong influence of predator densities on predation risk, indicating that predation risk is not solely mediated through habitat and environmental conditions.

Overall. This study identified areas of predation hotspots and environmental covariates associated with increased predation. However, they used tethered prey so results likely represent higher predation rates, don't represent how prey can evade predators, or how prey naturally interact with their environments. Juvenile salmonid distribution, health, and overall vulnerability to predation were not considered.

Sabal et al. 2016

Sabal, M., Hayes, S., Merz, J., and J. Setka. 2016. Habitat alterations and nonnative predator, Striped Bass, increase native Chinook Salmon mortality in the Central Valley, California. North American Journal of Fisheries Management 36: 309-320.

Funding Source. NOAA/ NMFS.

Study Period. April 23-May 24, 2013. Each site (n=30) was sampled 3 times.

Geographic Range. Mokelumne River at Woodbridge Irrigation District Dam (WIID).

Predator assemblage evaluated. Striped Bass.

Prey species detected. Chinook Salmon smolts (hatchery).

Key Findings.

- Combined Striped Bass relative abundance surveys with diet analysis to compare rates of salmon predation across different habitat types.
- A total of 10 sites were sampled using electrofishing. Each site was assigned to one of 3 habitat types (WIDD, other altered, and natural).
- A before-after control impact design using predator removal was paired with Chinook Salmon releases (n= 2,000 total Chinook Salmon, over 2 release groups).

- The Striped Bass removal–salmon survival experiment showed a 10.2% increase in survival of juvenile Chinook Salmon after 11 Striped Bass were removed.
- Diet energetic analysis demonstrated that 7.9–13.1% of the emigrating juvenile Chinook Salmon were consumed.
- A local predation hot spot (WIDD) was associated with increased per capita consumption (PCC) of juvenile Chinook Salmon by Striped Bass and attracted larger numbers of Striped Bass, thus decreasing the survival of emigrating juvenile salmon by 8–29%
- According to this study, a single Striped Bass could consume between 0.71–1.20% of the released juvenile Chinook Salmon population (n=2000).

Overall. Striped Bass aggregated at WIDD, exhibiting an eightfold increase in CPUE compared with that at other altered locations and a 60-fold increase in CPUE compared with that at natural locations. Diets of Striped Bass collected at WIDD consisted primarily of juvenile Chinook Salmon, and the per capita impact of Striped Bass on juvenile salmon was higher at WIDD than at other altered locations. However, 2,000 Chinook Salmon smolts were released for this study so diets should primarily consist of the most abundant prey item, especially when passing through a pinch point such as the WIDD. This study indicated that Striped Bass could have a major population level impact on released hatchery Chinook Salmon smolts but extrapolation to wild smolts is challenging.

3.7 Predation impacts on listed species

Boughton and Ohms 2020

Boughton, D.A., and H.A. Ohms. 2020. Carmel River Steelhead Fishery Report - 2018. 56 p. Santa Cruz (CA): Prepared by National Marine Fisheries Service for the California-American Water Company in fulfillment of the Memorandum of Agreement SWC-156.

Funding Source. California-American Water Company.

Study Period. Juvenile and adult Striped Bass diet sampling occurred from June to January in 2010 and 2011 and was conducted by CDFW. Carmel River Steelhead Association (CRSA) used eDNA methods in June and July of 2017 to identify contents of Striped Bass diet.

Geographic range. Carmel River.

Predator assemblage evaluated. 525 Striped Bass (SB) diets analyzed over the two year period (2010-2011). Twenty two SB diets (sizes ranging from 16-31 inches) were analyzed using eDNA in 2017.

Prey species detected. Crustaceans and fishes.

Key Findings.

- In both years, the majority of SB stomachs were empty (61% and 74%, 2010 and 2011, respectively). Unknown as to whether this reflects quick digestion of prey items or the inability of SB to find and consume prey items.
- Of the contents that could be identified, prey items included Crustaceans (mysids, amphipods, and isopods) and fish (steelhead/ Rainbow Trout, sculpin, Three-spine Stickleback, lamprey, and goby). Crustaceans and fishes were found in roughly equal numbers.
- eDNA analysis from 22 SB diets indicated that 59% (n=13) contained steelhead DNA, and 27% (n= 6) contained other fish contents in their stomachs or upper intestines.

Overall. The results of this study indicate that SB consumed all known fish species in the Carmel River; however, fish species consumption was found in roughly equal proportions as crustaceans. The potential effects of SB on steelhead in Carmel River is still unknown, there isn't data available to determine whether SB predation is contributing to the decline of steelhead in this location. Future approaches to address this question included: stable isotope analysis of SB muscle tissue, bioenergetics modeling, environmental data collection, and life-cycle modeling.

Brandl et al. 2021

Brandl, S., Schreier, B., Conrad, L.J., May, B., and M. Baerwald. 2021. Enumerating predation on Chinook Salmon, Delta Smelt, and other San Francisco estuary fishes using genomics. North American Journal of Fisheries Management 41: 1053-1065.

Funding Source. CDFW's Ecological Restoration Program.

Study Period. The months of December, April, and June from Dec 2012-June 2014 were chosen to encompass critical periods of native fish migration. However, analysis was confined to April 2014 to avoid confounding factors associated with seasonal effects, extreme catch variability among our sampling months, and other factors. Catch of Striped Bass was variable, and 63% of all Striped Bass catch occurred in April 2014. The native prey abundance was statically correlated with samples from April 2014.

Geographic range. Northern Delta:

- Steamboat slough (Chinook Salmon outmigration corridor).
- Miner/Sutter slough (Chinook Salmon outmigration corridor).
- Sacramento River (Chinook Salmon outmigration corridor).
- Liberty Island (rearing area for Delta Smelt and other native species).
- Sac Deep Water Shipping Channel (rearing area for Delta Smelt and other native species).

Predator assemblage evaluated. Striped Bass was the primary target. The following predators were also sampled opportunistically; Largemouth Bass, Smallmouth Bass, White Catfish, Channel Catfish, and Sacramento Pikeminnow.

Prey species detected. 13 prey taxa.

- **Non-native.** Striped Bass (17%) and Mississippi Silverside (9%)-most frequently detected in all predators.
- **Native.** Sacramento Pikeminnow (16%) and Chinook Salmon (13%) Delta Smelt (4%) and Longfin Smelt (6%). White Sturgeon,

Green Sturgeon, and steelhead were all ~ 0% (only 0-3 total detections for each species). Results focus on Striped Bass predation of Chinook Salmon, as very few Delta Smelt were detected in gut analysis.

Key Findings.

- Results of this study reflected the proportions of prey items detected in fish that had contents in their stomachs. Proportions of empty stomachs varied (Channel catfish 65%, Largemouth Bass 81%, Sacramento Pikeminnow 47%, Smallmouth Bass 74%, Striped Bass 74%, White Catfish 50%).

- A wide range of prey taxa were detected in Striped Bass, indicating that they are not highly selective in prey choice.

- For Striped Bass with prey in gut, 60% of detections were native species (Sacramento Pikeminnow (n = 32), Chinook Salmon (n = 29), and Splittail (n =18)). This corresponds to native species in 15% of Striped Bass sampled.

- Detection of Striped Bass predation on Chinook Salmon was higher in habitats with relatively higher temperature and lower conductivity (Brandl et al. 2021, Table 5).

- Predatory fish made up a relatively high proportion of diets of other predatory fish. Striped Bass consumed other predatory fish at similar rates as more traditional prey items like Chinook or Threadfin Shad

- Longfin Smelt were detected in gut contents of 20% of Sacramento Pikeminnows (*n* = 13). Approximately 1% of Striped Bass contained Delta Smelt. Because of the low detections of Delta Smelt, this species wasn't included in further analyses.

- Chinook Salmon were detected in 27% of Smallmouth Bass guts, and 18% of Striped Bass guts. Chinook Salmon were not found in Largemouth bass, White Catfish, Channel Catfish, or Sacramento Pikeminnow guts.

Overall. This study found high prevalence of empty guts in Striped Bass (74%), but those that contained prey had a significant level of native species detected (60%). Predatory species were also frequently detected

in Striped Bass, noting that Chinook Salmon presence occurred in similar quantities as other predatory species. Striped Bass predation on Chinook was correlated with higher temps and lower conductivity.

Grossman et al. 2013

Grossman, G., Essington, T., Johnson, B., Miller, J., Monsen, N., and T. Pearsons. 2013. Effects of fish predation on salmonids in the Sacramento River–San Joaquin Delta and associated ecosystems. Panel final report. 71 p. Sacramento (CA): California Department Fish Wildlife, Delta Stewardship Council, and National Marine Fisheries Service.

Funding Source. CDFW, Delta Stewardship Council, and NMFS workshop proceedings.

Study Period. Panel review of predation literature and presentations from the 2013 Fish Predation Workshop.

Geographic Range. Sacramento-San Joaquin Delta.

Predator assemblage evaluated. Varied by study evaluated.

Prey species detected. Salmonids.

Key Findings.

- In the case of juvenile salmonid prey in the Delta, predators may display positive selectivity for these species because they are energy-rich, are easily handled (i.e., soft-rayed, and fusiform) and potentially naive to invasive predators.
- Fish predation on salmonids in the Delta is specific to the smolt life stage. This and the context dependency of these predator-prey relationships, given the variable Delta environment, undoubtedly will make the population-level effects of fish predation on salmonid survivorship/adult returns challenging to detect.
- Population data show conflicting results, and some studies show adult Striped Bass (age-3+) declining in abundance whereas other studies show a long-term decline in age-0 fish, but a relatively stable adult population (see section 2A in document, pg. 21).

- The causal factors driving divergent trends in age-0 and adult Striped Bass abundance are unclear. In part, they may be due to a shift towards shallower habitats by age-0 fish, thereby reducing catches in the midwater trawl survey which has used permanent sampling stations.

Overall. There is little information on the spatial distribution and size/age structures of fish predator populations, or how these characteristics vary over time. This greatly limited the Panel's ability to make quantitative inferences regarding the effects of fish predation on salmonids at the population level. Populations of some fish predators (e.g., Striped Bass) have declined over time, but this decline has not coincided with concomitant increases in salmonid populations and there is uncertainty regarding variation in the abundance of sub-adult Striped Bass (Loboschefsky et al. 2012). Juvenile salmon are clearly consumed by fish predators and several studies indicate that the population of predators is large enough to effectively consume all juvenile salmon production. However, given extensive flow modification, altered habitat conditions, native and non-native fish and avian predators, temperature and dissolved oxygen limitations, and overall reduction in historical salmon population size, it is not clear what proportion of juvenile mortality can be directly attributed to fish predation.

Grossman 2016

Grossman, G.D. 2016. Predation on fishes in the Sacramento-San Joaquin Delta: current knowledge and future directions. San Francisco Estuary & Watershed Science 14(2).

Funding Source. Delta Stewardship Council.

Study Period. This is a Review Study using gray literature, presentations from the 2013 Fish Predation Workshop, and 2015 IEP Workshop.

Geographic Range. Sacramento-San Joaquin Delta.

Predator assemblage evaluated. Literature was searched and researchers actively working on dietary or predator–prey studies on Delta fishes were contacted. Out of the resulting data, a matrix of predator species and their piscine prey was compiled.

Prey species detected. Prey varied by study reviewed.

Key Findings.

- Many factors induced variation into predator–prey relationships including: (1) the presence and type of shelter (e.g., submerged aquatic vegetation (SAV) or woody debris), (2) the ratio of prey size to predator size, (3) seasonal changes in abundance of the prey array, (4) defensive morphological (e.g., spines) or behavioral adaptations, and (5) seasonal changes in habitat quality for prey, such as those produced by influxes of contaminants during winter–spring high flows or high water temperatures during summer and fall.

- The act of predation may be broken into several component rates, including search and encounter, pursuit and attack, capture and handling, and consumption. These components are affected by a variety of changes that have occurred in the Delta. In unmodified environments, these components are affected by factors such as prey abundance and availability, spatial and temporal overlap of predator and prey, habitat complexity, turbidity, behavior, physiology, and morphological adaptations that facilitate (predator) or inhibit (prey) the predation process.

- The effects of both contaminants and invasive species may be magnified by environmental changes that have occurred in the Delta over the last 100 years. Those changes include: (1) species invasions that alter physical habitat structure, (2) alterations of hydrologic regimes, temperature regimes and turbidity levels, (3) wetland loss, and (4) anthropogenic changes in physical structure (levees, canals, and abstraction facilities). Additionally, those factors are coupled with changes in climate, as well as (6) eco-system effects of invasives (e.g. shifts in food webs, changes in structural complexity of littoral habitats by invasive plants, etc.).

- The data indicated that most predators were only occasional consumers of individual prey species. See Table 2 in Grossman 2016 for ranked predator-prey interactions by species.

- Moderate consumption was observed in Sacramento Pikeminnow consuming Longfin Smelt, Striped Bass consuming Sacramento Splittail, and Largemouth Bass consuming Prickly Sculpin.

- Common consumption was observed in Striped Bass consuming Chinook Salmon, Largemouth Bass consuming Sacramento Pikeminnow, and Channel Catfish consuming Largemouth Bass.

Overall. Some invasive predators have been established in the Delta for over 100 years (e.g., Striped Bass) and it is possible that prey species have had sufficient time to develop behavioral adaptations to these predators. This analysis yielded few generalizations regarding predator–prey interactions for Delta fishes other than the observation that most predators were unspecialized and consumed a wide variety of both native and invasive fishes. Most predators fed primarily on invasive species. Given the generalist nature of vertebrate predators, this likely represents consumption of prey in proportion to their abundance.

Lindley and Mohr 2003

Lindley, S.T., and M.S. Mohr. 2003. Modeling the effect of Striped Bass (*Morone saxatilis*) on the population viability of Sacramento River winter-run Chinook Salmon (*Oncorhynchus tshawytscha*). Fishery Bulletin 101(2): 321-331.

Funding Source. National Center for Ecological Analysis and Synthesis which is funded by an NSF grant, UC Santa Barbara, and the State of California.

Study Period. NA.

Geographic Range. NA.

Predator assemblage evaluated. Striped Bass through adult mark-recapture data between 1968-1995 (Kohlhorst 1999).

Prey species detected. Winter-run Chinook Salmon adult spawning estimates from Red Bluff Diversion Dam (RBDD)1967-1996 (Myers et al. 1998).

Key Findings.

- The current Striped Bass population of roughly 1×10^6 adults consume about 9% of winter-run Chinook Salmon outmigrants. By comparison, based on prey consumption rates and predator and prey abundances, Jager et al. (1997), using a spatially explicit individual

based model, estimated that between 13% and 57% of fall-run chinook fry were consumed by piscivorous fish in the Tuolumne River, California.

- The model predicts that if the Striped Bass population declines to 512,000 adults as expected in the absence of stocking, winter-run Chinook Salmon will have about a 28% chance of quasi-extinction (defined as three consecutive spawning runs of fewer than 200 adults) within 50 years. If stocking stabilizes the Striped Bass population at 700,000 adults, the predicted quasi-extinction probability is 30%. A more ambitious stocking program that maintains a population of 3 million adult Striped Bass would increase the predicted quasi-extinction probability to 55%.

Overall. Striped Bass predation at the current population level may be a nontrivial source of mortality for winter-run Chinook Salmon. Striped Bass may have declined along with winter-run Chinook Salmon, so predicted predation impacts may have changed. A significant increase in Striped Bass abundance could substantially increase the risk of winter-run Chinook Salmon extinction and reduce the likelihood of recovery. What constitutes a "significant increase" is not defined.

Nobriga et al. 2021

Nobriga, M.L., Michel, C.J., Johnson, R.C., and J.D. Wikert. 2021. Coldwater fish in a warm water world: Implications for predation of salmon smolts during estuary transit. Ecology and Evolution, 11:10381–10395. DOI 10.1002/ece3.7840

Funding Source. USFWS and NMFS.

Study Period. 2012-2019.

Geographic Range. Sacramento River Basin.

Predator assemblage evaluated. Striped Bass and Largemouth bass (LMB).

Prey species detected. Predation Event Recorders (PERS) were employed using tethered, drifting hatchery Fall-run Chinook Salmon.

Key Findings.

- Neither distance from shore nor water temperature was observed to influence the willingness of Striped Bass to attack PERs, which supports the assertation that Striped Bass are temperate pelagic predators. Largemouth Bass attacked PERS most frequently in warmer water, near shorelines. Thus, as temperatures warm, Chinook Salmon face higher near shore predation risk.

- PERS data suggests the combined effect of Striped Bass and LMB appears additive, Striped Bass predation rates remained the same as LMB predation increased with warmer temperatures.

- Modeled Striped Bass prey consumption was 17 g/day and was consistent across water temperatures, while Largemouth Bass prey consumption increased with increasing temperatures. The per capita quantitative impact of LMB on Chinook Salmon was about half that of Striped Bass.

Overall. Chinook Salmon survival is generally water temperature dependent. Striped Bass predation does not seem to depend on temperature, while LMB feeding does. Simulation models predict LMB predation impacts to be comparatively lower than Striped Bass. Hypotheses for future research are listed below:

- If Striped Bass adults resume foraging quickly after spawning, this would coincide with smolt outmigration. At warmer temps, this would predict lower smolt survival as a function of water temperature. To test this, a study investigating post-spawn resumed foraging times for Striped Bass is recommended.

- LMB have an undocumented but substantial impact on Chinook Salmon. Increase in submerged aquatic vegetation (SAV) increases water clarity and allowed LMB to proliferate and enabled large increases in LMB in the past three decades. Population estimates of LMB would be useful in better understanding impacts on Chinook Salmon.

- Disease could be playing a more substantial role in survival than previously thought. Salmon typically survive in 20°C temps in hatchery conditions, so temperature alone shouldn't impact survival. Higher disease at these temperatures in the wild could impact swimming speeds, which would leave salmon more vulnerable to predation.

From: michael carney <[redacted]>
Sent: Tuesday, November 5, 2024 3:21 PM
To: FGC <FGC@fgc.ca.gov>
Subject: 30 inch striped bass slot (needed)

> You don't often get email from [redacted] Learn why this is important

Hello,

I just wanted to say that I believe a slot limit would greatly improve the striped bass fishery. I've been fishing for them a few times per week for 3 years now. I've caught and released 100's of stripers and out of all of those catches the largest fish were a 31, 30, 26.5 and a 24 (inches). Everything else has been shakers up to 23 inches many of them being around 18-21 inches. I mainly fish for them in the carquinez straits during spring, summer and fall. I'm quite shocked that after all of this time fishing for them I never hooked up on anything larger than 31 inches. In my opinion, way too many anglers tend to keep the large fish and since it takes about 7 years for a striped bass to reach 30 inches it makes sense that most of the fish in the system are small as they never really get a chance to grow big due to everyone keeping everything that is legal.

Having a greater number of trophy bass to catch would be a lot more fun than catching a bunch of 18 inch fish.

From what I understand, numbers are down with many fish such as halibut, sturgeon, salmon and striped bass. I hope something can be done to help improve these fisheries. A slot limit to protect large fish would be a step in the right direction.

-Michael

California Department of Fish and Wildlife

Inland Sport Fishing Special Waters, Bait, Gear, and Boundary Adjustments

Supplemental Proposed Changes to the Inland Sport Fishing Regulations Updates 2026 (Effective January 1, 2026)

January 15, 2025 WRC

Changes added after September WRC

1. **Statewide:** Low Flow Website
    - This change will reorganize the information in 8.00 but will not make any new changes. Low flow phone lines were removed last year, but the section was still organized around the phones lines. By re-organizing, it will be easier for the public to find the waterbody they are interested in.
2. **Region 1:** 7.40 (40) a1-2, Eel River
    - change boundary line resulting in a slight shift downstream, ~.5 miles
        - More recognizable features for boundary
        - Only changes gear restrictions in .5 miles of stream, not thought to be controversial
3. **Statewide:** Section 5.65 (regulations relating to American Shad)
    - Include spearfishing as a method of take allowable in the Valley District. This will make 5.65 consistent with Section 2.30, which was updated in the 2025 to allow spearfishing as a method of take for American Shad in the Valley District.
4. **Region 1**: Name change in 7.50(b)(145)
    - The name of Squaw Valley Creek was changed by federal legislation through the Department of Interior's Order 3404 on 9/8/2022 to Yét Atwam Creek. This update will make the regulation text consistent with this change.

Changes Presented at the September WRC

1. **Region 1:** Black Bass Size Restriction (Lassen and Modoc Co.)

- remove black bass minimum size requirement from all waters, except for Mountain Meadows Reservoir.
    - Bass have had slow growth rates and stunted sizes. This will improve population size structures.

2. **Region 1**: Susan River (Lassen Co.) Regulation Simplification Clean Up

    - Revert fishing regulations to the historic traditional trout opener (Last Saturday in April through Nov. 15).
    - Update language to include a special open season for youths participating in the Youth Fishing Derby.
        - This change will increase angler opportunity by lengthening the season in the spring and shortening the winter season.

3. **Region 1:** Bait Fish Use in the Sacramento River (Shasta and Tehama Co.)

    - move the upper limit of the Sacramento River upstream from Highway 32 Bridge to Deschutes Bridge.
        - Allowing live fin fish to be used further up the Sacramento River will increase fishing opportunities on striped bass and other non-native fishes that are currently limited to lures and other methods.

4. **Region 1**: Sierra District Anadromous Regulations Clean Up

    - Increase fishing opportunity by allowing the use of bait during summer months within anadromous streams (when anadromous fish are not present).
    - Add new special regulation sections for Clear Creek, Cow Creek, Cotton Creek, and Paynes Creek.
    - Change Antelope Creek boundary to make angling more protective for Central valley steelhead on this section.

5. **Statewide:** Trout General Statewide Regulations Clean Up

    - add 7.00 (which lists general regulations in each District) to the list of sections excepted from general statewide trout regulations in 5.85(a)(2) for clarity for enforcement.

6. **Region 4:** Arroyo Seco River (Monterey Co.) Rainbow Trout Restriction

    - change the trout Bag Limit from 5 trout to 5 Brown Trout and 0 Rainbow Trout. Add a gear restriction of "only artificial lures with barbless hooks may be used".
        - These measures would protect the native Coastal Rainbow Trout threatened by drought and degraded habitat conditions and as a result, would support steelhead population viability in the Salinas River watershed.

PROPOSED AMENDMENTS TO CALIFORNIA FALCONRY REGULATIONS

California Code of Regulations, title 14, sections 670 and 703

PRESENTATION TO THE WILDLIFE RESOURCES COMMITTEE

January 15, 2025 | David Kiene

Office of the General Counsel

Proposed Amendments to Sections 670 & 703

1. Delete a provision in subsection 670(e)(2)(D), disfavored by the 9th Circuit, in which licensees sign a certification stating that they understand their facilities, equipment or raptors are subject to unannounced inspections.
2. Delete a provision in subsection 670(h)(13)(A) that restricts the purposes for which falconry birds can be exhibited and limits compensation for exhibiting, to be consistent with a court order prohibiting enforcement of this provision.

Proposed Amendments to §§ 670 & 703 (continued)

3. Add subsection 670(j)(1)(F) to generally prohibit placement of raptor housing facilities inside dwellings to reduce the likelihood of future litigation.

4. Delete subsection 670(e)(3)(A)1, which allows falconers to take out of state examinations in certain circumstances, for consistency with Federal regulations.

Proposed Amendments to §§ 670 & 703 (continued)

5. Update applications for licenses to reflect the deletion of the certification and make several minor changes, and Subsections 703(b)(1)(B) and (C) to update the incorporations of the revised applications.

Questions | Contact

David Kiene

Attorney IV

Office of the General Counsel,
David.Kiene@wildlife.ca.gov

§ 670. Practice of Falconry.

(a) General Provisions.

(1) Any person who wants to engage in falconry activities shall first apply for and be issued an annual falconry license from the department.

(2) Except as provided in Section 12300, Fish and Game Code, it shall be unlawful for any person to engage in falconry in California unless they have in their immediate possession a valid original falconry license, a valid original hunting license, and any required stamps.

(3) Falconry activities shall be as provided by the Fish and Game Code and regulations provided herein.

(4) Applicable regulations adopted by the U.S. Secretary of the Interior pursuant to the Migratory Bird Treaty Act (MBTA) and published in Title 50, Code of Federal Regulations, Part 21 (Revised 07/02/2015), hereinafter referred to as 50 CFR 21, are hereby incorporated and made a part of these regulations.

(5) Falconry applications and records as required by this section shall be kept on forms provided by the department and submitted to the department's License and Revenue Branch,1740 N. Market Blvd., Sacramento, CA 95834; or, submitted to the department's online reporting system website at wildlife.ca.gov.

(b) Definitions. For purposes of this section, the following definitions apply:

(1) “Abatement” is the use of trained raptors to reduce human/wildlife conflicts.

(2) “Captive-bred raptor” means the progeny of a mating of raptors in captivity, or progeny produced through artificial insemination.

(3) “Capture” means to trap or capture or attempt to trap or capture a raptor from the wild.

(4) “Eagles” includes golden eagle (*Aquila chrysaetos*), bald eagle (*Haliaeetus leucocephalus*), white-tailed eagle (*Haliaeetus albicilla*), and Steller's sea-eagle (*Haliaeetus pelagicus*).

(5) “Exotic raptor” is a raptor that has no subspecies occurring naturally in the wild in the United States and is not covered under the MBTA.

(6) “Eyas raptor” or “nestling” is a young raptor not yet capable of flight.

(7) “Falconry” means the possession, housing, trapping, transport, and use of raptors for the purpose of hunting or training.

(8) “Hacking” is the temporary or permanent release of a raptor held for falconry to the wild so that it may gain experience and conditioning.

(9) “Hybrid raptor” means offspring of raptors of two or more distinct species listed in Title 50, CFR, Section 10.13.

(10) “Imping” is to cut a broken or damaged feather and replace or repair it with another feather.

(11) “Imprint” means a raptor that is hand-raised in isolation from the sight of other raptors from two weeks of age until it has fledged. An imprinted raptor is considered to be so for its entire lifetime.

(12) “License year” is the 12-month period starting July 1 and ending the following June 30, and is the same as the term “regulatory year” for determining possession and take of raptors for falconry as defined in 50 CFR 21.

(13) “Non-native raptor” is any raptor that does not naturally occur in the state of California

(14) “Passage raptor” is a juvenile raptor less than one year old that is capable of flight.

(15) “Raptor” means any bird of the Order Falconiformes, Accipitriformes or Strigiformes, or a hybrid thereof.

(16) “Wild raptor” means a raptor removed from the wild for falconry. It is considered a wild captured raptor, no matter its time in captivity or whether it is transferred to other licensees or permit types.

(c) Take of Game Species or Nongame Birds or Mammals. Every person using falconry raptors to hunt or take resident small game including upland game species, migratory game birds, or nongame birds or mammals in California shall abide by the laws and regulations authorizing hunting of such species, including, but not limited to, licenses, seasons, bag limits, and hunting hours.

(1) A licensee shall ensure, to the extent possible, that falconry activities do not result in unauthorized take of wildlife.

(A) If an animal is injured as a result of unauthorized take, the licensee shall remove the animal from the raptor and transport the injured animal to the nearest wildlife rehabilitation center.

(B) If an animal is killed as a result of an unauthorized take, the licensee may allow a falconry bird to feed on the kill but the licensee shall not possess the animal and shall leave the kill at the site where taken.

(2) The take shall be reported to the department, with the band or tag number of the species taken (if any), as set forth in subsection (f).

(d) Take of State or Federal Threatened or Endangered Species. This license does not authorize take of state or federally listed threatened, endangered, or candidate wildlife, or wildlife designated as fully protected within the State of California. Any take shall be reported by the licensee to the nearest U.S. Fish and Wildlife Service (USFWS) Ecological Services Field Office and the department's License and Revenue Branch within 10 calendar days of the kill. The licensee shall report his or her name, falconry license number, date, species and sex (if known) of the animal taken, and exact location of the kill as provided in 50 CFR 21.

(e) Licensing.

(1) Falconry Licenses: A falconry license is issued in one of three falconry classes listed in subsection (e)(6) and may be issued to a:

(A) California resident, nonresident, or non-US citizen, who is applying for a new license;

(B) California licensee who is applying to renew a license that has not been expired for more than 5 years;

(C) California licensee who is applying to renew a license that has not expired; and,

(D) Nonresident or non-U.S. citizen falconer who has a valid falconry license issued from another state or country.

(2) Application for License.

(A) The applicant for a new license shall submit a completed New Falconry License Application with the nonrefundable fee, as specified in Section 703, to the address listed on the application.

(B) The applicant for renewal of a license that has not been expired for more than 5 years shall submit a completed Falconry License Renewal Application with the nonrefundable fee, as specified in Section 703, to the address listed on the application.

(C) The department may issue new licenses and renew licenses with the conditions it determines are necessary to protect native wildlife, agriculture interests, animal welfare, and/or human health and safety.

(D) Signed Certification. Each application shall contain a certification worded as follows: “I certify that I have read and am familiar with both the California and U.S. Fish and Wildlife Service falconry regulation, CFR 50, Sections 21.29 through 21.30, and that the information I am submitting is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to cancellation of the application, suspension or revocation of a license, and/or administrative, civil, or criminal penalties. ~~I understand that my facilities, equipment, or raptors are subject to unannounced inspection pursuant to subsection 670(j), Title 14, of the California Code of Regulations.~~ I certify that I have read, understand, and agree to abide by, all conditions of this license, the applicable provisions of the Fish and Game Code, and the regulations promulgated thereto. I certify that there are no pending or previous legal or administrative proceedings that could disqualify me from obtaining this license.” The application shall be submitted with the applicant's original signature.

(E) Experience. The department shall consider an applicant's falconry experience acquired in California, as well as another state or country when reviewing an application for any class of license. The department shall determine which class of falconry license is appropriate, consistent with the class requirements herein and the documentation submitted with the application demonstrating prior falconry experience.

(3) Examination Requirement. An applicant not possessing a valid falconry license, or required to apply for a new falconry license in California shall pass the falconry examination to demonstrate proficiency in falconry and raptor-related subject areas before being issued a license. An applicant shall correctly answer at least 80 percent of the questions to pass the examination. An applicant who fails to pass the examination may take another examination no earlier than the next business day following the day of the failed examination. An applicant shall submit the nonrefundable falconry examination fee specified in Section 703 each time the applicant takes an examination.

(A) An applicant who meets one of the following criteria shall be exempt from taking the California falconry examination:

1. ~~An applicant who provides documentation of successfully passing a federally approved examination in a state that has had its falconry regulations certified as specified in 50 CFR 21 will not be required to take the examination in California if the applicant took the examination less than five years prior to submitting an application for a California falconry license.~~

~~2.~~ The applicant is a nonresident or non-U.S. citizen falconer who has a valid falconry license issued from another state or country.

~~3.~~ 2. The applicant is a member of a federally recognized tribe and has a valid falconry license issued from that member's tribe.

(B) After successfully passing the falconry examination, the raptor housing facility, if any, of a new applicant shall pass an inspection and be certified by the department, pursuant to subsection (j), before a license may be issued.

(4) Expired License. A license for the practice of falconry expires and is not valid unless renewed annually with the required application form and payment of fees as specified in Section 703.

(A) It shall be unlawful for any person to practice falconry, including possession of falconry raptors, without a valid license in their possession.

(B) If a license has not been renewed for a period less than 5 years from the expiration date on the license, the license may be renewed at the class held previously if the applicant provides proof of licensure at that class.

(C) If a license has not been renewed for a period of more than 5 years from the expiration date on the license, it shall not be renewed. The applicant shall apply for a new falconry license and successfully complete the examination as set forth in subsection (e)(3). Upon passing the examination and the payment of the annual license application fee, a license may be issued at the class previously held if the applicant provides proof of prior licensure at that class.

(5) Nonresidents of California and Non-US Citizens.

(A) A person who is a member of a federally recognized tribe and has a valid falconry license from that member's tribe shall be considered a nonresident licensed falconer for purposes of subsection (e)(5).

(B) A nonresident licensed falconer or non-U.S. citizen licensed falconer may temporarily practice falconry in California for up to 120 calendar days without being required to obtain a California falconry license.

1. A nonresident licensed falconer or non-U.S. citizen licensed falconer may practice falconry with raptors from a licensed California falconer, provided that signed and dated written authorization is given to the nonresident or non-U.S. citizen by the licensee. The original written authorization must be carried with the licensee while in possession of the raptor.

2. A nonresident licensed falconer or non-U.S. citizen licensed falconer shall provide and thereafter maintain facilities and equipment for raptors in the licensee's possession while temporarily practicing falconry in California. Temporary facilities shall meet the standards in these regulations, including, but not limited to, provisions described in subsection (j), and pursuant to 50 CFR 21.

3. A nonresident licensed falconer or non-U.S. citizen licensed falconer may house raptors in the licensee's possession at another licensed falconer's facilities while temporarily practicing falconry in California.

(C) A nonresident licensed falconer or non-U.S. citizen licensed falconer applying for a falconry license in California shall submit proof of a valid falconry license held from the licensee's tribe, state or country, along with the completed New Falconry License Application and fee, and pass a facility inspection pursuant to subsection (j).

(D) A nonresident or non-US citizen applicant applying for a falconry license in California but not possessing a valid original falconry license from the applicant's tribe, state, or country of origin shall submit the completed New Falconry License Application and fee, and pass both the examination and a facility inspection pursuant to subsection (e)(3) herein.

(6) Falconry Classes. There are three classes of licensed falconers in California: Apprentice falconer, General falconer, and Master falconer. The department at its sole discretion may issue a falconry license in one of these classes to an applicant who meets the requirements and qualifications for the class as described in these regulations.

(A) Apprentice Falconer.

1. Age. An applicant for an Apprentice falconer license shall be at least 12 years of age at the date of application. If an applicant is less than 18 years of age, a parent or legal guardian shall co-sign the application and shall be legally responsible for activities of the Apprentice falconer.

2. Sponsorship. A sponsor is required for at least the first two years in which an Apprentice falconry license is held, regardless of the age of the Apprentice falconer. A sponsor shall be a Master falconer or a General falconer who has at least two years of experience at the General Falconer class. A sponsor shall certify in writing to the department that the sponsor will assist the Apprentice falconer, as necessary, in learning the husbandry and training of raptors held for falconry; learning the relevant wildlife laws and regulations; and determining what species of raptor is appropriate for the Apprentice falconer to possess; and will notify the department's License and Revenue Branch immediately if sponsorship terminates.

3. Termination of Sponsorship. If sponsorship is terminated, an Apprentice falconer and the Apprentice's sponsor shall immediately notify the department's License and Revenue Branch in writing. The license shall be valid only if the Apprentice falconer acquires a new sponsor within 30 calendar days from the date sponsorship is terminated, and provides written notification, along with the new sponsor's certification, to the department once a new sponsor is secured. Failure to comply with sponsorship requirements shall result in loss of qualifying time from the date sponsorship was terminated to the date of securing a new sponsor, and no subsequent license shall be issued until the required two years of sponsorship have been fulfilled.

4. Possession of Raptors. An Apprentice falconer may possess for falconry purposes no more than one wild or captive-bred red-tailed hawk (*Buteo jamaicensis*) or American kestrel (*Falco sparverius*) at any one time, regardless of the number of state, tribal, or territorial falconry licenses in possession and only as long as the raptor in possession is trained in the pursuit of game and used in hunting. An Apprentice falconer may only capture from the wild or possess a passage red-tailed hawk or an American kestrel. The Apprentice may take raptors less than 1 year old, except nestlings. Apprentice falconers are not required to capture a wild raptor

themselves; the raptor can be transferred to the Apprentice by another licensee. An Apprentice falconer may not capture from the wild or possess an eyas raptor or a raptor that is imprinted on humans. An Apprentice falconer must maintain written proof of legal acquisition.

5. Inspection of Facilities. After successfully passing the falconry examination, the facility of an Apprentice applicant shall pass an inspection and be certified by the department, pursuant to subsection (j), before a license may be issued.

6. Advancement From Apprentice Class. An Apprentice falconer shall submit a completed Apprentice Falconer's Annual Progress Report, as specified in Section 703, to the address listed on the report. The report shall demonstrate that the Apprentice falconer has practiced falconry with a raptor at the Apprentice class for at least two years, including maintaining, training, flying, and hunting with the raptor for at least four months in each license year, and a summary of the species the Apprentice possessed, how long each was possessed, how often each was flown, and methods of capture and release. Within the report, the sponsor shall certify in writing to the department that the Apprentice falconer has met the requirements of these regulations. No falconry school program or education shall be substituted for the minimum period of two years of experience as an Apprentice falconer.

(B) General Falconer.

1. Age. General falconers shall be at least 16 years of age. If an applicant is less than 18 years of age, a parent or legal guardian shall co-sign the application and shall be legally responsible for activities of the General falconer.

2. Possession of Raptors. A General falconer may possess for falconry purposes any wild raptor species listed in subsection (g)(6), any captive-bred or hybrid of any species of Order Falconiformes, Accipitriformes, or Strigiformes, or any legally acquired raptor from another state or country. A General falconer must maintain written proof of legal acquisition. A General falconer shall possess no more than three raptors for use in falconry at any one time, regardless of the number of state, tribal, or territorial falconry licenses in possession; and only two of these raptors may be wild-caught. Only eyas or passage raptors may be wild-caught; except American kestrel (*Falco sparverius*) or great horned owl (*Bubo virginianus*) may be captured at any age.

3. Advancement From General Class. A General falconer shall have practiced falconry with a raptor, including maintaining, training, flying, and hunting with the raptor, at the General class for at least five years before advancing to Master falconer. No falconry school program or education shall be substituted for the minimum period of five years of experience as a General falconer.

(C) Master Falconer.

1. Possession of Raptors. A Master falconer may possess for falconry purposes any wild raptor species listed in subsection (g)(6), any captive-bred or hybrid of any species of Order Falconiformes, Accipitriformes, or Strigiformes, or any legally acquired raptor from another state or country. A Master falconer must maintain written proof of legal acquisition. A Master falconer may possess any number of raptors except the licensee shall possess no more than five wild-caught raptors for use in falconry at any one time, regardless of the number of state, tribal, or territorial falconry licenses in possession. Only eyas or passage raptors may be wild-caught; except American kestrel (*Falco sparverius*) or great horned owl (*Bubo virginianus*) may be captured at any age.

2. Possession of Eagles. A Master falconer may possess up to three eagles with proof of legal acquisition at any one time, except no bald eagle shall be possessed.

i. Eagles shall not be captured from the wild in California.

ii. Eagles may only be obtained from a permitted source.

iii. Eagles originating in California from a licensed California rehabilitation facility may be temporarily transferred to a Master Falconer for the purpose of rehabilitation in accordance with 50 CFR 21, and with subsection (h)(3) herein.

iv. The department shall authorize in writing which species of eagles a Master falconer may possess pursuant to 50 CFR 21. The Master falconer shall submit a written request for this authorization and include a resume of the licensee's experience in handling large raptors such as eagles, and two letters of recommendation to the department's License and Revenue Branch. The resume documenting experience shall include information about the type of large raptor species handled, such as eagles or large hawks, the type and duration of the activity in which experience was gained, and contact information for references who can verify the experience. The two letters of recommendation shall be from persons with experience handling and/or flying large raptors. Each letter shall be dated, signed in ink with an original signature and shall describe the author's experience with large raptors, including, but not limited to, handling of raptors held by zoos, rehabilitating large raptors, or scientific studies involving large raptors. Each letter shall also assess the licensee's ability to care for eagles and fly them in falconry. The department may deny a request for a Master falconer to possess an eagle if the applicant has less than the equivalent of two years of experience handling large raptors or, at the department's discretion, the department determines that based on a letter of recommendation the applicant is not capable of caring for the eagle or flying it in falconry.

(7) Fees. The base fee for a falconry license is specified in Fish and Game Code Section 396. Falconry-related fees are specified in Section 703 of these regulations for the following:

(A) Application. An applicant shall submit a nonrefundable falconry license application fee when applying for a new license or renewing a license.

(B) Examination. An applicant shall submit a nonrefundable falconry examination fee each time the applicant takes an examination.

(C) Inspection. An applicant or licensee shall submit a nonrefundable inspection fee prior to the department inspecting the licensee's facilities, raptors, if present, and equipment. The inspection fee provides for inspections of up to five enclosures.

1. If a facility has more than five enclosures, an additional inspection fee is required for every additional enclosure over five.

2. If the applicant or licensee is sharing an existing raptor facility with another licensed falconer, and possesses proof of a passed inspection, there is no requirement for an additional inspection.

(D) Re-inspection. An applicant shall submit an additional nonrefundable re-inspection fee when his or her facility has failed to pass a previous inspection.

(E) Administrative Processing. An applicant shall submit a nonrefundable administrative processing fee for each Resident Falconer Raptor Capture, Recapture and Release Report submitted to the department's License and Revenue Branch when not using the department's online reporting system.

(8) Denial. The department may deny the issuance of a new license or a renewal of an existing or expired license if:

(A) The applicant or licensee has failed to comply with regulations adopted pursuant to the Fish and Game Code related to raptors, Fish and Game Code Section 1054, or Penal Code Section 597; or

(B) The applicant or licensee has failed to comply with any provision of any statute, regulation, rule or ordinance existing in any other state or in any city, county, or other local governing entity in any other state, that is related to the care and licensing of raptors, so long as the failure to comply would constitute a violation of the Fish and Game Code, regulations related to raptors in Title 14, or Penal Code Section 597;

(C) The applicant or licensee has failed to comply with any provision of any federal statute, regulation, or rule that is related to the care and licensing of raptors, including, but not limited to, 50 CFR 21.

(D) The department shall deny the issuance of a license or renewal of an existing license if the applicant or licensee fails to submit all required items or perform any task necessary to obtain a license. Before denying an application for this reason, the department shall notify the applicant in writing that the application is deficient. The applicant may supplement an application by providing the missing required information or materials. If sent by U.S. mail or other carrier, these materials shall be postmarked no later than 30 calendar days after the date of the proof of service accompanying the department's notification. If the 30 calendar day deadline falls on a weekend or holiday the submission of additional information or materials will be accepted until the close of business on the first state business day following the deadline to submit additional information or materials. The department may extend this deadline for good cause. If denied, the applicant or licensee may submit a new application at any time.

(9) Suspension and Revocation. Any license issued pursuant to these regulations may be suspended or revoked at any time by the department for failure to comply with the Fish and Game Code or regulations adopted pursuant to the Fish and Game Code related to raptors, Fish and Game Code Section 1054, or Penal Code Section 597. If the licensee has been convicted in a court of competent jurisdiction of violating one of these provisions, the suspension or revocation shall take effect immediately if the violation pertains to conduct that threatens native wildlife, agricultural interests of this state, the welfare of the birds, or the safety of the public, or if the licensee has been previously convicted of violating the provisions described above or has had his or her license previously suspended or revoked. If the licensee has not been convicted, the suspension or revocation shall take effect when the time to request an appeal as described herein has expired. A timely request for an appeal will stay the department's suspension or revocation if the licensee was not convicted as described above.

(10) Proof of Service. All notices sent from the department to a falconry applicant or licensee as described herein shall include a proof of service that consists of a declaration of mailing, under

penalty of perjury, indicating the date of mailing the department's notification, denial, or other correspondence.

(11) Appeal. Any applicant or licensee who is denied a license, an amendment to an existing license or has a license suspended or revoked by the department pursuant to these regulations may appeal that denial, amendment, suspension, or revocation by filing a written request for an appeal with the commission. If sent by U.S. mail or other carrier, a request for an appeal shall be postmarked no later than 30 calendar days after the date of the proof of service accompanying the department's notice of denial, suspension, or revocation. If submitted electronically or by facsimile, it shall be received no later than 30 calendar days after the date of the proof of service. The commission shall not accept a request for an appeal that is submitted after the 30 calendar day deadline to request an appeal. If the 30 calendar day deadline falls on a weekend or holiday the request for appeal will be accepted until the close of business on the first state business day following the 30 calendar day deadline to submit a request for appeal.

(12) Record Keeping. A licensee shall retain copies of all falconry-related records (hard copy or electronic) including, but not limited to, the applicant's falconry license, raptor transfer records, capture and release and disposition records, import or export documentation, sponsorship information, annual reports submitted to the department, and all health records of raptors possessed pursuant to the falconry license (Falconry Records) for at least five years.

(13) Name or Address Change. The licensee shall notify the department's License and Revenue Branch, in writing, of any change of name or mailing address within 30 calendar days of the change. Facility address changes must be reported within five business days of the change.

(f) Reporting Requirements.

(1) Licensees are required to report all raptor acquisition and disposition information using the Resident Falconer Raptor Capture, Recapture and Release Report within 10 calendar days to the department's online reporting system.

(A) For raptors acquired from the wild or released back to the wild, submission shall include information about the county of capture/release, date of capture/release, a description of the capture/release site, a description of the capture method, species information, and Latitude/Longitude coordinates of capture/release site.

(B) If a licensee is unable to use the department's online reporting system, the licensee may submit relevant forms by mail, fax, or email to the department's License and Revenue Branch, or the licensee may report over the telephone to the License and Revenue Branch. The information will be entered into the department's online reporting system by department staff, and the department shall charge a nonrefundable administrative processing fee, as specified in Section 703, for each form entered.

(2) Upon applying for license renewal or within 10 calendar days after expiration of the license, whichever comes first, a licensee shall submit to the department an annual report using the Falconry Hunting Take Report, as specified in Section 703, summarizing the number and type of prey species taken while hunting, counties hunted, and birds used in hunting during the most recent license year, as well as any inadvertent take of non-target wildlife.

(3) Upon applying for license renewal or within 10 calendar days after expiration of the license, whichever comes first, an Apprentice falconer shall submit to the department's License and

Revenue Branch an annual report using the Apprentice Falconer's Annual Progress Report, as specified in Section 703. The report shall be signed and dated by both the Apprentice falconer and sponsor. The report will be used by the department to determine qualifying experience for future licenses.

(g) Capturing Raptors From the Wild.

(1) A resident licensed falconer may not capture more than two raptors from the wild during the license year and only as authorized for each falconry class license.

(2) A nonresident licensed falconer may request to capture within California one wild raptor of the species specified in subsection (g)(8), excluding species with capture quotas, and shall submit to the department's License and Revenue Branch a complete Nonresident Falconer Application for Raptor Capture Permit , as specified in Section 703. The permit issued shall be valid beginning on July 1 and ending on June 30 of the following year, or if issued after the beginning of the permit year, for the remainder of that permit year. Whether successful or unsuccessful in capturing a raptor, the nonresident licensed falconer shall submit a complete Nonresident Falconer Raptor Capture Permit and Report, as specified in Section 703. Nonresidents shall only capture raptors from the wild in accordance with the conditions of the permit. Nonresidents that request to capture species with capture quotas must submit an application for the random drawing, as specified in subsection (g)(9).

(3) Non-U.S. citizens are not eligible to capture any California wild raptor.

(4) Raptors may be captured by trap or net methods that do not injure them. The licensee shall identify all set traps with the name and address of the licensee and shall check such traps at least once every 12 hours, except that all snare type traps shall be attended at all times when they are deployed.

(5) A licensee shall be present during the capture of a raptor from the wild; however another General or Master licensed falconer may capture the raptor for the licensee. A licensee's presence during capture includes attendance of snare traps, or attendance while checking non-snare traps at least once every 12 hours. If a licensee has a long-term or permanent physical impairment that prevents the licensee from attending the capture of a raptor for use in falconry, then another licensee may capture a bird for the licensee without the licensee being present. The licensee is responsible for reporting the capture. The raptor will count as one of the two raptors the licensee is allowed to capture in that license year.

(6) The following raptor species may be captured from the wild in California: Northern goshawk (*Accipiter gentilis*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), red-tailed hawk *(Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), merlin (*Falco columbarius*), American kestrel (*Falco sparverius)*, prairie falcon (*Falco mexicanus*), barred owl (*Strix varia*), and great horned owl (*Bubo virginianus*).

(7) No more than two nestlings of the species allowed for capture from the wild may be captured by the same General or Master licensee during the license year. In no case may all nestlings be captured and removed from any nest. At least one nestling shall be left in a nest at all times.

(8) The following restrictions apply to the total, cumulative capture of wild raptors among all licensees. These restrictions are in addition to the limitation of two wild raptors per licensee during the license year.

(A) Northern Goshawk.

No more than one northern goshawk may be captured within the Lake Tahoe Basin during the license year. There are no restrictions on the cumulative number or location of Northern goshawk captured in the balance of the state during the license year.

1. The Lake Tahoe Basin area is defined as those portions of Placer, El Dorado, and Alpine counties within a line: beginning at the north end of Lake Tahoe, at the California-Nevada state line approximately four miles north of Stateline Point in the near vicinity of Mt. Baldy; westerly along the Tahoe Divide between the Lake Tahoe and Truckee River drainages to the intersection of the north line of Section 36, T17N, R17E, MDM; west along said north section line to the section corner common to section 25, 26, 35, and 36, T17N, R17E, MDM; south approximately one mile along the common section line; southwesterly to the intersection of the Tahoe Divide and Highway 267 in the near vicinity of Brockway Summit; southwesterly in the near vicinity of the Tahoe Divide to Mt. Pluto; south to Mt. Watson; westerly approximately two miles to Painted Rock; southerly approximately two miles along the Tahoe Divide to the intersection of Highway 89; southwesterly along the Tahoe Divide to Ward Peak; southerly approximately 30 miles along the Tahoe Divide to a point on the Echo Lakes Road; southeasterly along said road to Old Highway 50; southeasterly along Old Highway 50 to the intersection of the Echo Summit Tract Road; southerly along said road to Highway 50; easterly along Highway 50 to the intersection of the South Echo Summit Tract Road; southerly along said road to the Tahoe Divide; southerly along the Tahoe Divide past the Alpine county line to Red Lake Peak; northerly along the Tahoe Divide past Monument Peak to the California-Nevada state line; north on the state line to the point of beginning. NOTE: the area described above includes the entire basin of Lake Tahoe within California.

(B) Cooper's Hawk. No restrictions on cumulative number or location of Cooper's hawks captured statewide during the license year.

(C) Sharp-shinned Hawk. No restrictions on cumulative number or location of sharp-shinned hawks captured statewide during the license year.

(D) Red-tailed Hawk. No restrictions on cumulative number or location of red-tailed hawks captured statewide during the license year.

(E) Red-shouldered Hawk. No restrictions on cumulative number or location of red-shouldered hawks captured statewide during the license year.

(F) Merlin. No restrictions on cumulative number or location of merlins captured statewide during the license year. Merlins may be captured only from August 15 through February 28 every year.

(G) American Kestrel. No restrictions on cumulative number or location of American kestrels captured statewide during the license year.

(H) Prairie Falcon. No more than 14 prairie falcons may be captured per license year.

(I) Barred Owl. No restrictions on cumulative number or location of barred owls captured statewide during the license year.

(J) Great Horned Owl. No restrictions on cumulative number or location of great horned owls captured statewide during the license year.

(9) Special Raptor Capture Permit Drawing. A random drawing shall be held by the department to distribute Special Raptor Capture Permits to capture species with quotas, which include one Northern goshawk in the Tahoe Basin and prairie falcons from the wild, as specified in subsection (g)(8). An applicant may be a resident and/or nonresident and must possess a valid General or Master falconry license at the time of application to enter the drawing. Non-U.S. citizens are not eligible to enter the drawing.

(A) A resident applicant shall not submit more than two drawing applications each license year.

(B) A nonresident applicant shall not submit more than one drawing application each license year.

(C) Licensees may apply through the department's Automated License Data System at license agents, department license sales offices, or on the department's website, using a Special Raptor Capture Drawing Application. Each application submitted must specify the species the applicant is applying for to capture from the wild. The applicant shall submit a nonrefundable Special Raptor Capture Drawing Application fee, as specified in Section 703 for each drawing application submitted.

(D) Applications must be received by 11:59pm, Pacific Standard Time, on May 15 each year.

(E) Permits are awarded according to an applicant's choice and computer-generated random number (lowest to highest) drawing. Successful applicants and a list of alternates for each species and/or area shall be determined by random drawing within 10 business days following the application deadline date. If the drawing is delayed due to circumstances beyond the department's control, the department shall conduct the drawing at the earliest date possible.

(F) Successful and alternate applicants will be notified. Unsuccessful applicants shall not be notified. The successful applicant shall submit the Special Raptor Capture Permit fee, as specified in Section 703, to the department's License and Revenue Branch by 5:00 p.m. on June 30 each year to claim the permit. If the deadline to submit the fee falls on a weekend or holiday, payment will be accepted until 5:00 p.m. on the first state business day following the deadline to submit payment. Unclaimed permits shall be awarded to alternates for that species and/or area on an individual basis, in the order drawn.

(G) A Special Raptor Capture Permit shall only be issued to a successful applicant who holds a General or Master falconry license that is valid for the same license year that the permit is valid. Only the permit holder is entitled to capture a raptor, and the permit shall be in immediate possession of the permit holder during the capture. Permits are not transferable and are valid only for the species, area and period as specified on the permit.

(H) A permit holder who successfully captures a Northern goshawk or prairie falcon shall immediately complete the capture portion of the permit and shall return the permit to the department's License and Revenue Branch or enter it on the department's online reporting system within 10 calendar days of the capture. The submission shall include information about the county of capture, date of capture, a description of the capture site, a description of the capture method, species information, and Latitude/Longitude coordinates of capture site.

(I) A permit holder who is unsuccessful in capturing a Northern goshawk or prairie falcon shall indicate “unsuccessful” on the report card portion of the permit and shall return the permit to the

department's License and Revenue Branch within 10 calendar days of the expiration of the permit.

(J) The permit holder shall surrender the permit to an employee of the department for any act by the permit holder that violates any raptor related provision of the Fish and Game Code, or any regulation of the commission adopted pursuant thereto, and any act on the part of the permit holder that endangers the person or property of others. The decision of the department shall be final.

(10) Banded or Marked Raptors. If a licensee captures a raptor that has a band, research marker, or transmitter attached to it, the licensee shall promptly report the band number and all other relevant information to the Federal Bird Banding Laboratory at 1-800-327-2263.

(A) If the raptor has a transmitter attached to it, the licensee may possess the raptor for up to 30 calendar days, during which time the licensee shall make a reasonable attempt to contact the owner of the transmitter. If the owner wants to replace the transmitter or its batteries, or have the transmitter removed and the bird released, the owner or the owner's designee may make such change or allow the licensee to do so before the raptor is released. Temporary possession of the raptor will not count against the licensee's possession limit for falconry raptors. If the owner cannot be contacted or does not want the transmitter to remain on the raptor, the licensee may keep the raptor if it was lawfully captured.

(B) If the raptor belongs to a falconer, subsection (h)(12) shall apply.

(11) Injury Due to Trapping. If a raptor is injured due to trapping, the raptor may be put on the licensee's falconry license and it will count as part of the possession limit. If the licensee adds the raptor on the falconry license, the licensee shall report the capture to the department's online reporting system within 10 calendar days after capture, and shall have the raptor immediately treated by a veterinarian or a permitted California wildlife rehabilitator. Alternately, the injured raptor may be immediately given directly to a veterinarian or a permitted California wildlife rehabilitator. In either case, the licensee is responsible for the costs of care and rehabilitation of the raptor.

(12) Unintentional Capture. A licensee shall immediately release any bird unintentionally captured that the licensee is not authorized to possess.

(13) Public and Private Lands. A licensee is not authorized to capture raptors or practice falconry on public lands where it is prohibited, on private property without written permission from the landowner or tenant, or on tribal government lands without written permission. The licensee shall carry the original signed written permission while practicing falconry.

(h) Possession, Transfer, and Disposition of Raptors.

(1) Permanent Transfer of Raptor. A licensee may acquire a raptor through a transfer and shall report the transfer by entering the required information on the department's online reporting system within 10 calendar days of the transfer. The number of raptors acquired through a transfer is not restricted, as long as the licensee abides by the requirements of the licensee's class, and does not exceed the licensee's possession limit.

(A) If a licensee transfers a raptor removed from the wild to another licensee in the same year in which it is captured, the raptor will count as one of the raptors the licensee is allowed to capture from the wild that year. It will not count as a capture by the recipient.

(B) A surviving spouse, executor, administrator, or other legal representative of a deceased licensee may transfer any bird held by the licensee to another authorized licensee within 90 calendar days of the death of the licensee. After 90 calendar days, disposition of a raptor held under the license shall be at the discretion of the department.

(2) Temporary Transfer or Care of Raptor. Any licensee who temporarily transfers possession of the licensee's raptor to another licensee, or allows an unlicensed person to temporarily care for a raptor, shall provide written notification of such transfer to the department's License and Revenue Branch within 10 calendar days after the bird is transferred. The notification shall include contact information including name, address, phone number, and email address of the temporary caregiver.

(A) Temporary possession of a raptor by a licensee shall not exceed 120 calendar days. Temporary possession may exceed 120 calendar days only if a request is made to the department's License and Revenue Branch and written authorization is given. Temporary care of a raptor by an unlicensed person shall not exceed 45 calendar days. A raptor cared for by an unlicensed person shall remain housed at the licensee's facility. The unlicensed person is not authorized to fly the raptor. A licensed falconer in temporary possession of a raptor may fly the raptor if the falconer possesses the appropriate class license.

(3) Assisting In Raptor Rehabilitation. A General or Master falconer may assist a permitted California wildlife rehabilitator to condition a raptor for its release back into the wild. A rehabilitation raptor in the care of the licensee for this purpose shall not be added to the licensee's falconry license, but shall remain under the permit of the rehabilitator.

(A) The rehabilitator shall provide the licensee with a letter of temporary transfer that identifies the raptor and explains that the falconer is assisting in its rehabilitation. The terms of the temporary transfer are at the discretion of the rehabilitator to assure the necessary care of the raptor. The licensee shall have in possession the letter or legible copies while assisting in the rehabilitation of the raptor.

(B) The licensee shall return any such raptor that cannot be released to the wild to the rehabilitator within 180 calendar days unless otherwise authorized by the department's License and Revenue Branch. The department's Wildlife Branch will make the possession determination.

(4) Importation of Raptors by Nonresidents or Non-U.S. Citizens. A nonresident or non-U.S. citizen may temporarily import lawfully possessed raptors into California for up to 120 calendar days. The department's License and Revenue Branch shall be notified within 10 calendar days prior to importing the raptor. A nonresident or non-U.S. citizen shall submit to the department's License and Revenue Branch official written authority to export raptors from the originating state or country, along with a health certificate for the raptor, prior to importing a raptor. A non-U.S. citizen may import a falconry raptor that the licensee possesses legally, provided that importation of that species into the United States is not prohibited, and the licensee has met all permitting requirements of the licensee's country of residence. Import of raptors, including exotic

raptors, may be subject to other state and federal laws and may require additional federal permits.

(5) Release of Raptors. A licensee may release a native, wild caught raptor to the wild in California only to a location near the site that raptor was originally captured, and in appropriate habitat for that species of raptor. If the licensee cannot access the site of original capture, then licensee shall release it in appropriate habitat for that species of raptor.

(A) Prior to release, the licensee shall ensure the immediate area around the release site is free from other raptors.

(B) The licensee shall remove any falconry band on the raptor being released; however seamless metal bands shall remain attached.

(C) A licensee may not intentionally and permanently release a non-native raptor, hybrid, or native captive-bred raptor to the wild in California.

(D) A licensee shall not release any barred owl to the wild in California. A licensee shall contact the department's License and Revenue Branch to determine disposition of a barred owl in possession. The department's Wildlife Branch will determine disposition.

(6) Hacking. A wild raptor may be hacked for conditioning or as a method for release back into the wild. Any hybrid, captive-bred, or exotic raptor a licensee has in possession may be hacked for conditioning, and shall have two attached functioning radio transmitters during hacking except native captive bred raptors shall have a minimum of one functioning transmitter. A licensee may not hack any raptor near a known nesting area of a state or federally threatened or endangered, or fully protected animal species or in any other location where a raptor may take or harm a state or federally listed threatened or endangered, or fully protected animal species. Only a General or Master falconer may hack falconry raptors.

(7) Death, Escape or Theft. A licensee whose raptor dies, escapes, or is stolen shall report the loss of the raptor by entering the required information on the department's online reporting system within 10 calendar days of the loss. A licensee may attempt to recover a raptor lost to the wild for up to 30 calendar days before reporting the loss. The licensee shall also report a theft of a raptor to an appropriate local law enforcement agency within 10 calendar days of the loss.

(8) Disposition of Raptor Carcass. If a raptor dies and was banded or had an implanted microchip, the band or microchip shall be left in place. If a licensee keeps the carcass or parts thereof, the licensee shall retain all records of the raptor. A licensee must send the entire body of a golden eagle carcass held for falconry, including all feathers, talons, and other parts, to the National Eagle Repository. Within 10 calendar days the carcass of any other raptor species shall be either:

(A) Delivered to the department if the licensee obtains authorization from the department's License and Revenue Branch prior to delivery. The department's Wildlife Branch will make the determination where the carcass will go. A carcass may only be delivered to the department if the carcass is frozen; or

(B) Donated to any person authorized to possess the raptor or parts thereof; or

(C) Kept by the licensee for use in imping; or

(D) Burned, buried, or otherwise destroyed; or

(E) Delivered to a taxidermist for mounting and possession by the licensed falconer only.

1. Within 30 days of the expiration of a license, the licensee shall return the mounted raptor to the department.

2. Within 30 days of the death of the licensee, the estate shall return the mounted raptor to the department.

3. In either event, the licensee or the estate shall contact the department's License and Revenue Branch. The department's Wildlife Branch will determine the disposition of the mounted raptor.

(9) Recapture. A licensee may recapture a raptor wearing falconry equipment or a captive-bred or exotic raptor at any time, whether or not the licensee is authorized to possess the species. A recaptured raptor will not count against the possession limit of the licensee, nor will its capture from the wild count against the licensee's limit on number of raptors captured from the wild. The licensee shall report recaptured raptors by submitting a complete Resident Falconer Raptor Capture, Recapture and Release Report to the department's online reporting system within five calendar days.

(A) A recaptured falconry raptor shall be returned to the person who lawfully possessed it. If that person cannot possess the raptor or does not wish to possess it, the licensee who recaptured the raptor may keep it if that species is allowed under the licensee's existing license. If kept, the raptor will count towards the licensee's possession limit.

1. A licensee who retains a recaptured raptor shall report the acquisition to the department's online reporting system within five calendar days.

2. If neither party wishes to keep the raptor, disposition of the raptor will be at the discretion of the department. The licensee in possession shall contact the department's License and Revenue Branch. The department's Wildlife Branch will determine the disposition of the recaptured raptor.

(10) Use of Feathers. A licensee may possess feathers of each species of raptor authorized to be possessed for as long as the licensee has a valid falconry license. For eagle feathers, a licensee must follow federal standards as noted in 50 CFR 21. A licensee may receive raptor feathers from another person in the United States as long as that person is authorized to possess the feathers. Feathers from a falconry raptor may be donated to any person with a valid permit to possess them, or to anyone exempt from a permit requirement for feather possession. Any feathers of falconry raptors possessed by a falconer whose license has expired or been suspended or revoked shall be donated to any person exempt from the permit requirement or authorized by permit to acquire and possess the feathers within 30 calendar days of the license expiration, suspension or revocation. If the feathers are not donated, they shall be burned, buried, or otherwise destroyed.

(11) Purchase, Buy, Sell, Trade, or Barter. No person shall purchase, buy, sell, trade or barter wild raptors or any parts thereof including, but not limited to, feathers. A licensee may purchase, buy, sell, trade or barter captive-bred, hybrid or exotic raptors marked with seamless metal bands to other persons or entities who are authorized to possess them.

(12) Use of Hybrid, Non-native, and Exotic Raptors. When flown free, hybrid, non-native, or exotic raptors shall have attached at least two functioning radio transmitters to allow the raptor to be located.

(13) Other Uses of Falconry Raptors. A licensee may use falconry raptors for education, exhibiting, propagation, or abatement. A licensee may transfer a wild-caught raptor to a raptor propagation permit, but the raptor shall have been used in falconry for at least two years, or at least one year for a sharp-shinned hawk, merlin, Cooper's hawk or American kestrel. A wild caught raptor may be transferred to another permit type other than falconry only if it has been injured and can no longer be used in falconry. In this case, the licensee shall provide a copy of a certification from a veterinarian to the department's License and Revenue Branch stating that the raptor is not useable in falconry.

(A) Education and Exhibiting. A licensee may use raptors in his or her possession for training purposes, education, field meets, and media (filming, photography, advertisements, etc.), as noted in 50 CFR 21, if the licensee possesses the appropriate valid federal permits~~, as long as the raptor is primarily used for falconry and the activity is related to the practice of falconry or biology, ecology or conservation of raptors and other migratory birds. Any fees charged, compensation, or pay received during the use of falconry raptors for these purposes may not exceed the amount required to recover costs~~. An Apprentice falconer may use the licensee's falconry raptor for education purposes only under the supervision of a General or Master falconer.

(B) Propagation. A licensee may conduct propagation activities with raptors possessed under a falconry permit if the licensee possesses a valid federal Raptor Propagation Permit and the person overseeing propagation has any other necessary state and federal authorization or permits. The raptor shall be transferred from a falconry license to a federal Raptor Propagation Permit if it is used in captive propagation for eight months or more in a license year. The transfer shall be reported by submitting a complete Resident Falconer Raptor Capture, Recapture and Release Report to the department's online reporting system. Transfer of a raptor from a falconry license to a federal Raptor Propagation Permit is not required if the raptor is used for propagation purposes fewer than eight months in a license year.

(C) Abatement. A Master falconer may conduct abatement activities with raptors possessed under a falconry license and receive payment if the licensee possesses a valid federal Special Purpose Abatement Permit. A General falconer may conduct abatement activities only as a sub-permittee of the holder of a valid federal Special Purpose Abatement Permit.

(i) Banding and Tagging.

(1) A goshawk captured from the wild or acquired from another licensee shall be banded with a permanent, nonreusable, numbered USFWS leg band if the raptor is not already banded. A peregrine, gyrfalcon or Harris's hawk legally acquired from another state, or from another licensee, shall be banded with a permanent, nonreusable, numbered USFWS leg band if the raptor is not already banded.

(A) A licensee shall obtain a permanent, nonreusable, numbered USFWS leg band from the department's License and Revenue Branch. The License and Revenue Branch shall report banding data to the USFWS.

(B) A licensee may purchase and implant an ISO (International Organization for Standardization)-compliant (134.2 kHz) microchip in addition to the band. The licensee shall report the band number or the microchip information to the department's online reporting system when reporting acquisition of the bird.

(2) Captive bred raptors that are listed under the MBTA shall be banded with seamless metal bands.

(3) If a band is lost or must be removed from a raptor in a licensee's possession, the licensee shall report the loss of the band to the department's online reporting system within five (5) days, and the licensee shall request a replacement permanent, nonreusable, numbered USFWS leg band from the department's License and Revenue Branch.

(4) After receiving a replacement band from the department's License and Revenue Branch, the licensee shall reband a raptor if the original band is lost or removed. The License and Revenue Branch shall report rebanding data to the USFWS.

(5) The alteration, counterfeiting or defacing of a band is prohibited except that licensees may remove the rear tab or may smooth any imperfect surface provided the integrity of the band and numbering are not affected.

(6) The department may approve an exemption from the banding requirement if a licensee provides documentation that health or injury problems to a raptor are caused by a band. If an exemption is approved, the licensee shall keep the written exemption and shall carry a copy when transporting or flying the raptor. If a wild Northern goshawk is exempted from the banding requirement, an ISO-compliant microchip supplied by the USFWS shall be used instead.

(j) Facilities, Equipment, and Inspections.

(1) Housing Standards and Specifications. Raptor housing facilities shall meet the standards in 50 CFR 21 at all times. Raptor housing facilities shall be inspected and certified by the department prior to issuance of a falconry license. Thereafter, a licensee shall maintain approved permanent facilities for housing raptors.

(A) Raptor housing facilities shall protect raptors housed in them from predators, the environment, domestic animals, and escape, and shall provide a healthy, clean, and safe environment.

(B) Indoor (“mews”) or outdoor (“weathering area”) raptor facilities may be used to house raptors.

(C) Falconry raptors may be kept outside in the open at any location when in the presence of a licensed falconer and may be temporarily under watch by a person 12 years or older designated by the licensee.

(D) Permanent falconry facilities may be either on property owned by a licensee, on property owned by another person where a licensee resides, or elsewhere with property owner approval.

(E) A licensee shall report to the department's License and Revenue Branch, in writing within five calendar days if the licensee moves the licensee's permanent falconry facilities to another location. The department will conduct a facility inspection, as specified in Section 703, and the licensee shall pay the inspection fees.

(F) It shall be unlawful for a person to locate a permanent raptor housing facility inside a dwelling, except that a licensee in possession of a raptor in an apartment or condominium complex on (*effective date of the revised regulation*) may house that raptor in a permanent raptor housing facility inside a dwelling for the remainder of its life if the licensee notifies the Department in writing no later than 30 days after (*effective date of the revised regulation*) of their intent to house that raptor in a permanent raptor housing facility inside a dwelling. A licensee shall send such notification to (*Dept. mailing address and email address*). Such notification shall include the following information: name of the licensee; species of the raptor that will be possessed inside a dwelling; band number (if available); microchip number (if available); sex (if known); age; whether the raptor was wild caught; date the raptor was acquired; the name of the apartment or condominium complex; and a photo of the outside of the apartment or condominium unit where the bird will be housed. A raptor that is lawfully housed in a permanent raptor housing facility inside a dwelling pursuant to this subsection that is transferred shall thereafter be housed in a permanent raptor housing facility located outside a dwelling.

(2) Equipment. A licensee shall have jesses or other materials and equipment to make them, leash, swivel, bath container, and appropriate scales or balances for weighing raptors the licensee possess.

(3) Inspections. Inspections of indoor or outdoor facilities, equipment, and raptors shall be conducted by the department. Inspections are required for a new license applicant, applicants renewing a license which has been expired more than 5 years, and licensees that move facility housing to a new address. Applicants and licensees shall initiate the inspection by submitting a complete Raptor Facilities and Falconry Equipment Inspection Report and fees, as specified in Section 703. Equipment and facilities that meet the federal standards shall be certified by the department using the Raptor Facilities and Falconry Equipment Inspection Report. Equipment and facilities that do not meet the minimum standards and specifications shall not be certified by the department.

(A) The department may conduct unannounced visits to inspect facilities, equipment, or raptors possessed by the licensee, and may enter the facilities of any licensee when the licensee is present during a reasonable time of the day and on any day of the week. The department may also inspect, audit, or copy any permit, license, book, or other record required to be kept by the licensee under these regulations at any time. The department may deny the issuance of, or immediately suspend, the license of a licensee who refuses to be available to participate in a facility inspection or who refuses to allow inspection of a facility, license, book, or other record required to be kept by the licensee. A refusal to allow inspection may be inferred if, after reasonable attempts by the department, the licensee is unavailable for inspection. The department may reinstate a license suspended pursuant to this subsection if the licensee allows the department to inspect the facility, license, book, or other record, and no violations of these regulations or any license conditions are observed during that inspection.

(B) If a licensee's facilities are not on property owned by the licensee, the licensee shall submit to the department's License and Revenue Branch a signed and dated statement with original signature from the property owner indicating the property owner agrees that the falconry facilities and raptors may be inspected by the department without advance notice.

Credits

Note: Authority cited: Sections 200, 203, 265, 355, 356, 395, 396, 398, 710.5, 710.7, 713, 1050, 1054, 1530, 1583, 1802, 3007, 3031, 3039, 3503, 3503.5, 3511, 3513, 3800, 3801.6, 3950, 4150 and 10500, Fish and Game Code. Reference: Sections 395, 396, 713, 1050, 3007, 3031, 3503, 3503.5, 3511, 3513 and 3801.6, Fish and Game Code; Section 597, Penal Code; and Title 50, Code of Federal Regulations, Parts 21.29 and 21.30.

UNITED STATES DISTRICT COURT

EASTERN DISTRICT OF CALIFORNIA

PETER STAVRIANOUDAKIS; et al., Plaintiffs, v. UNITED STATES FISH & WILDLIFE SERVICE; et al., Defendants.	No. 1:18-cv-01505-JLT-BAM **STIPULATED JUDGMENT AND ORDER**

The Court, having reviewed the parties' Stipulation for Compromise Settlement and Release of Claims, and upon the agreement of all parties to this action, therefore, the Court enters the following judgment and order:

1. Defendant U.S. Fish and Wildlife Service has delegated enforcement of falconry regulations in California, including those contained in 50 C.F.R. § 21.82, to the California Department of Fish and Wildlife.

2. Regarding the claims in Plaintiffs' Second Amended Complaint (ECF 64) asserted under the First Amendment of the Constitution, neither the Federal Defendants nor the State Defendant admit that such claims have any merit. This Court has held that Plaintiffs do not

have standing to assert their First Amendment claims against the Federal Defendants, and that Plaintiffs are likely to succeed on the merits of their First Amendment claims against the State Defendant (ECF 95). Accordingly, the State Defendant consents to the Court's Judgment and Order enjoining the State Defendant his officers, agents, servants, employees, and all persons in active concert or participation with him from enforcing the regulations listed below regarding the regulation of falconry, unless and until such time as the State Defendant may amend or revise any of such regulations in a manner consistent with the Court's January 14, 2022, Order:

A. This Court has held that the provisions of 50 C.F.R. § 21.82(f)(9)(i), 14 C.C.R. § 670(a)(4), and (h)(13)(A) challenged here likely violate the First Amendment to the United States Constitution. The State Defendant is enjoined from relying on those regulations to prohibit licensed falconers from photographing or filming their birds for "movies, commercials, or in other commercial ventures that are not related to falconry."

B. This Court has held that the provisions of 50 C.F.R. § 21.82(f)(9)(ii) and 14 C.C.R. § 670(a)(4) and (h)(13)(A) challenged here likely violate the First Amendment to the United States Constitution. The State Defendant is enjoined from relying on those regulations to prohibit licensed falconers from photographing or filming their birds for "commercial entertainment; for advertisements; as a representation of any business, company, corporation, or other organization; or for promotion or endorsement of any products, merchandise, goods, services, meetings, or fairs."

C. This Court has held that the provisions of 50 C.F.R. § 21.82(f)(8)(v) and 14 C.C.R. § 670(a)(4) and (h)(13)(A) challenged here likely violate the First Amendment to the United States Constitution. The State Defendant is enjoined from relying on those regulations to require licensed falconers to discuss "information about the biology, ecological roles, and conservation needs of raptors and other migratory birds" when conducting conservation education activities or otherwise dictating the content of these presentations.

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D. This Court has held that the provisions of 50 C.F.R. § 21.82(f)(8)(iv) and 14 C.C.R. § 670(a)(4) and (h)(13)(A) challenged here likely violate the First Amendment to the United States Constitution. The State Defendant is enjoined from relying on those regulations to prohibit licensed falconers from being paid to speak with their birds.

3. The California Department of Fish and Wildlife will provide notice to the public on the Department's website of what regulations will no longer be enforced and shall note that such changes are required by this judgment and will amend any instruction or compliance forms the Department issues to falconers to reflect the terms of this judgment. The Department shall maintain said notice on its website until the regulatory provisions not to be enforced are either repealed or amended, by the State Defendants, after which time the Department may remove the notice from its website.

4. This stipulated judgment addresses the Plaintiffs' First Amendment challenges to the regulations referenced in paragraph 2 without adjudicating the constitutionality under the First Amendment to the United States Constitution of those specific regulations challenged in Plaintiffs' Second Amended Complaint and does not address or impact the constitutionality of any other statute or regulation.

5. This Court's previous Order, (ECF 95) dismissed without leave to amend Counts I–III of the Second Amended Complaint against all Defendants; Counts IV–VII as to the Federal Defendants; Count IX as to the State Defendant; and Count IX as to the Federal Defendants with respect to the unannounced inspection provisions of the challenged regulations, but not the challenged speech regulations.

6. Count IX against the Federal Defendants and Counts IV–VIII against the State Defendant are resolved by this stipulated judgment and order. Count VIII was based on California state regulations and was not asserted against the Federal Defendants. See ECF 64 at 27–28.

7. Count IX against the Federal Defendants is dismissed without prejudice in its entirety.

8. This Order resolves all claims in this case and there is no just reason for delay. The Court directs entry of final judgment pursuant to the terms of this stipulated judgment and order.

IT IS SO ORDERED.

Dated: **November 10, 2022**

UNITED STATES DISTRICT JUDGE

FOR PUBLICATION

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

PETER STAVRIANOUDAKIS; KATHERINE STAVRIANOUDAKIS; SCOTT TIMMONS; ERIC ARIYOSHI; AMERICAN FALCONRY CONSERVANCY, *Plaintiffs-Appellants*, v. UNITED STATES FISH AND WILDLIFE SERVICE; CHARLTON H. BONHAM, in his official capacity as Director of California Department of Fish and Wildlife; JIM KURTH, in his official capacity as Deputy Director Exercising the Authority of the Director of California Department of Fish and Wildlife; MARTHA WILLIAMS, *Defendants-Appellees*.	No. 22-16788 D.C. No. 1:18-cv-01505-JLT-BAM OPINION

Appeal from the United States District Court
for the Eastern District of California
Jennifer L. Thurston, District Judge, Presiding

Argued and Submitted November 13, 2023
San Francisco, California

Filed July 24, 2024

Before: Sidney R. Thomas, Danielle J. Forrest, and Salvador Mendoza, Jr., Circuit Judges.

Opinion by Judge Forrest;
Partial Concurrence and Partial Dissent by Judge S.R. Thomas

SUMMARY*

Article III Standing

In an action brought by individual falconers and the American Falcon Conservancy alleging that state and federal regulations impose unconstitutional conditions on their right to obtain a falconry license and that the unannounced, warrantless inspections that they must consent to violate the Fourth Amendment and the Administrative Procedures Act, the panel: (1) reversed the district court's dismissal for lack of standing of plaintiffs' unconstitutional-conditions claim against the California Department of Fish and Wildlife (CDFW); and (2) affirmed the district court's dismissal for lack of standing of their remaining claims against CDFW and the U.S. Fish and Wildlife Service (FWS).

* This summary constitutes no part of the opinion of the court. It has been prepared by court staff for the convenience of the reader.

The falconers challenged the requirement, included in both the state and federal regulations, that they submit to unannounced, warrantless inspections as a condition of obtaining a falconry license. As to their standing on their claim against the CDFW, the panel noted that under the well-settled doctrine of "unconstitutional conditions," the government may not require a person to give up a constitutional right in exchange for a discretionary benefit. California conditions falconry licenses on applicants' annual certification that they agree to unannounced warrantless inspections. The panel held that simply agreeing to submit to those inspections, in the absence of an actual inspection, amounted to the relinquishment of Fourth Amendment rights. Therefore, the falconers' alleged injury in fact is the forced choice. In addition to injury, the two remaining standing requirements were also satisfied. The panel further held that because the falconers sufficiently alleged an injury in fact, constitutional ripeness was also satisfied. Accordingly, the panel reversed the district court's dismissal of the Falconers' unconstitutional-conditions claim against CDFW for lack of standing.

The panel held that the falconers' unconstitutional-conditions claim asserted against FWS was unripe. Because FWS has delegated falconry licensing authority to California, a lengthy chain of events would have to take place before the falconers could show a remediable impact traceable to FWS. The panel concluded that the connection between the falconers' asserted injury and FWS is too attenuated and hypothetical at this point to support federal question jurisdiction over the falconers' unconstitutional-conditions claim against FWS.

The falconers also contended that the federal and California authorization of unannounced inspections

violates the Fourth Amendment both facially and as-applied because they authorize unreasonable warrantless searches of the falconers' private home, curtilage, and other property. The panel held that the falconers' direct challenge failed because they have not alleged that they were subjected to warrantless inspection under the challenged regulations. Because the falconers sought declaratory and injunctive relief, the panel considered whether they had Article III standing to seek prospective relief. The panel held that the falconers failed to allege any facts about the frequency or volume of unannounced inspections that California regulators undertake, but relied primarily on the existence of the regulation authorizing unannounced inspections. The panel concluded that the falconers had not sufficiently demonstrated injury in fact as to the unannounced-inspection claim. Because the falconers lacked standing to directly challenge the authorization of unannounced inspections, they also lacked standing to challenge this authorization under the Administrative Procedures Act.

The American Falcon Conservancy also asserted an unconstitutional-conditions claim and an unannounced-inspection claim on behalf of their members. Like the individual plaintiffs, the panel concluded that the American Falcon Conservancy met the associational standing requirements for its unconstitutional-conditions claim but not for its unannounced-inspection claim.

Concurring in part and dissenting in part, Judge S.R. Thomas agreed that the district court properly dismissed the falconers' claim that the regulations violated the Fourth Amendment because they had not been subjected to an inspection under the current regulations and could not establish that a future inspection was imminent. He disagreed that the falconers had standing to challenge the

state regulations under the unconstitutional-conditions doctrine, and would affirm the district court's dismissal of all of the falconers' remaining claims.

COUNSEL

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OPINION

FORREST, Circuit Judge:

The question presented is whether individual falconers and the American Falcon Conservancy (AFC) have standing to challenge the constitutionality of the California Department of Fish and Wildlife's (CDFW) and United States Fish and Wildlife Service's (FWS) regulations authorizing unannounced, warrantless inspections of falconers' property and records and requiring falconers to agree to such inspections as a condition of obtaining a falconry license.

Plaintiffs assert that the challenged state and federal regulations impose unconstitutional conditions on their right to obtain a falconry license and that the unannounced, warrantless inspections that they must consent to violate the Fourth Amendment and the Administrative Procedures Act (APA). The district court dismissed Plaintiffs' Fourth Amendment-based claims for lack of Article III standing, concluding that Plaintiffs failed to demonstrate injury in fact because they have not been subjected to a warrantless inspection under the challenged regulations and have not shown that future warrantless inspections are certainly impending. We reverse the district court's dismissal of Plaintiffs' unconstitutional-conditions claims brought against CDFW and affirm as to the dismissal of their remaining claims.

I. BACKGROUND

A. Falconry Regulation

"Falconry is caring for and training raptors for pursuit of wild game, and hunting wild game with raptors." 50 C.F.R.

§ 21.6. Falconry is governed by the federal Migratory Bird Treaty Act and its implementing regulations, which impose a detailed regulatory scheme that governs the possession and trade of certain birds of prey. 16 U.S.C. § 704(a); 50 C.F.R § 10.13 (listing regulated species); 50 C.F.R. § 21.82(a)–(f). Under this scheme, falconers must obtain a permit to lawfully engage in falconry. 50 C.F.R. § 21.82(c).

Two provisions of the federal regulatory scheme are at issue here. The first authorizes regulators to conduct unannounced inspections of "[f]alconry equipment and records . . . in the presence of the permittee during business hours on any day of the week by State, tribal, or territorial officials." *Id.* § 21.82(d)(9). The second requires falconry permit applicants to submit "a signed and dated statement showing that [they] agree that the falconry facilities and raptors may be inspected without advance notice by State, tribal (if applicable), or territorial authorities at any reasonable time of day" so long as the permitee is present. *Id.* § 21.82(d)(2)(ii).

Originally, there were parallel federal and state permitting systems. States could either elect to prohibit falconry or to allow it under regulations that met minimum federal standards. *Id.* § 21.82(b)(1). Once the federal government certified that a state's regulatory scheme satisfied federal standards, it "terminate[d] Federal falconry permitting" in that state. *Id.* § 21.82(b)(3). In 2008, FWS abandoned the parallel permitting system. Recognizing that "[e]very State government except that of Hawaii has now implemented regulations governing falconry," FWS discontinued federal permitting starting in 2014. Migratory Bird Permits, 73 Fed. Reg. 59,448, 59,448 (Oct. 8, 2008). Since 2014, "a State, tribal, or territorial falconry permit" is all that is required to lawfully practice falconry. *Id.*; *see also*

Migratory Bird Permits; Delegating Falconry Permitting Authority to 17 States, 78 Fed. Reg. 72,830, 72,830–33 (Dec. 4, 2013) (delegating falconry permitting to California).

Also at issue in this case are California's falconry regulations. California has adopted a licensing scheme that requires falconers to renew their licenses annually. Cal. Code Regs. tit. 14, § 670(a)(1). Consistent with federal requirements, California authorizes unannounced inspections: CDFW "may conduct unannounced visits to inspect facilities, equipment, or raptors possessed by the licensee, and may enter the facilities of any licensee when the licensee is present during a reasonable time of the day and on any day of the week" and "may also inspect, audit, or copy any permit, license, book, or other record required to be kept by the licensee under these regulations at any time." Cal. Code Regs. tit. 14, § 670(j)(3)(A). To obtain a California falconry license, the applicant must certify in writing:

> I understand that my facilities, equipment, or raptors are subject to unannounced inspection pursuant to subsection 670(j), Title 14, of the California Code of Regulations. I certify that I have read, understand, and agree to abide by, all conditions of this license, the applicable provisions of the Fish and Game Code, and the regulations promulgated thereto.

Id. § 670(e)(2)(D). The California regulations provide that CDFW "shall deny the issuance of a license or renewal of an existing license if the applicant or licensee fails to submit all

required items." *Id.* § 670(e)(8)(D); *see also id.* § 679(e)(8)(B).

B. Plaintiffs' Falconry Activities

Individual Plaintiffs Eric Ariyoshi, Scott Timmons, and Peter Stavrianoudakis (collectively, the Falconers) are California residents who have been licensed falconers for decades. Plaintiff Katherine Stavrianoudakis is not a falconer, but she is married to and lives with Peter Stavrianoudakis.

Ariyoshi's falcon lives in an unrestricted mews[1] 30 feet from his home. Timmons's three birds live in mews and other structures directly adjacent to his home. Peter Stavrianoudakis's falcon lives primarily in his and his wife's bedroom, although the bird occasionally is weathered in a protective enclosure approximately 20 feet from the home. The Falconers all comply with California's falconry regulations and renew their licenses annually.

AFC is an organization "dedicated to protecting and preserving the practice of falconry, and protecting falconers' rights." AFC has approximately 100 members nationwide, all of whom are subject to federal and state falconry regulations. The Falconers are AFC members.

In their joint complaint, the individual Plaintiffs and AFC describe six unannounced inspections that state and federal law enforcement agents have conducted. Timmons alleges that in 1992, when he was in college, CDFW officers approached him at his mother's property in Thousand Oaks, California to ask whether he possessed a particular red-tailed

[1] A "mews" is an "indoor" facility for housing raptors. Cal. Code Regs. tit. 14, § 670(j)(1)(B).

hawk. Timmons told them the hawk had flown away, which the officers already knew because they had the hawk in their possession. Peter Stavrianoudakis alleges that sometime around 1983, his home was searched, and he was arrested, all without a warrant, "by armed members of [CDFW] related to his lawful activities as a non-resident falconer in Nevada."

AFC alleges that armed FWS agents conducted warrantless searches of the homes and property of two of its Washington-state members—Stephen Layman and Lydia Ash (Washington members)—in 2004 and 2009, respectively. AFC also alleges that armed CDFW agents conducted warrantless searches of the homes and property of two of its California members—Fred Seaman and Leonardo Velazquez (California members)—in 2016 and 2017, respectively.

C. District Court Proceedings

Plaintiffs' first amended complaint alleged that federal and state falconry regulations violate the First, Fourth, and Fourteenth Amendments of the United States Constitution, as well as the APA. The district court dismissed with leave to amend the Fourth Amendment claims, and partially dismissed the APA claim, all for lack of standing.

Plaintiffs filed a second amended complaint, asserting four claims based on the Fourth Amendment. Count I alleges that California's requirement that license applicants agree to unannounced inspections is a facial and as-applied violation of the Fourth Amendment (unconstitutional-conditions claim). Count II alleges that California's regulation allowing unannounced inspections is a facial and as-applied violation of the Fourth Amendment because it authorizes warrantless searches of licensees' homes, curtilage, papers, and effects

(unannounced-inspections claim). In Count III, Katherine Stavrianoudakis alleges that the unannounced-inspection regulations violate her Fourth Amendment rights as a co-habitant of a falconer. Finally, Count IX alleges that the federal unannounced-inspection regulations violate the APA.

The district court dismissed all the Fourth Amendment-based claims without leave to amend. The district court concluded that the individual Plaintiffs' alleged injury related to future inspections was too speculative because they "have never been subjected to the unannounced inspections pursuant to the challenged regulations." Likewise, the district court found that AFC lacked associational standing because it did not allege that its members face immediate or threatened injury from unannounced, warrantless inspections. The district court dismissed the Fourth Amendment allegation in the APA claim because, without standing to bring their substantive claims, Plaintiffs lack standing to bring an APA-based challenge to the same regulations. A stipulated judgment was entered as to the remaining claims, and this appeal followed.

II. DISCUSSION

"We review de novo an order granting a motion to dismiss for lack of standing under Federal Rule of Civil Procedure 12(b)(1) and construe all material allegations of fact in the complaint in favor of the plaintiff." *Southcentral Found. v. Alaska Native Tribal Health Consortium*, 983 F.3d 411, 416–17 (9th Cir. 2020). "The party invoking federal jurisdiction bears the burden of establishing" the elements of standing, and "each element must be supported in the same way as any other matter on which the plaintiff bears the

burden of proof, *i.e.*, with the manner and degree of evidence required at the successive stages of the litigation." *Lujan v. Defs. of Wildlife*, 504 U.S. 555, 561 (1992).

A. Unconstitutional-Conditions Claim

The Falconers challenge the requirement, included in both the state and federal regulations, that they submit to unannounced, warrantless inspections as a condition of obtaining a falconry license. They claim that this requirement unconstitutionally conditions falconry licenses on waiver of "their Fourth Amendment rights to be free from unreasonable warrantless searches of their private homes, protected curtilage, and protected effects." The district court dismissed this claim, concluding that the Falconers lack standing and the claim is unripe because the Falconers failed to allege that they had been subjected to or imminently faced an unannounced inspection. We reverse as to the Falconers' claim against CDFW and affirm as to their claim against FWS.

1. CDFW

a. Standing

The Falconers must establish the three "irreducible" elements of Article III standing. *Lujan*, 504 U.S. at 560. First, that they "suffered an injury in fact that is concrete, particularized, and actual or imminent." *TransUnion LLC v. Ramirez*, 594 U.S. 413, 423 (2021). Second, that their "injury was likely caused by the defendant[s]." *Id.* And third, that their "injury would likely be redressed by judicial relief." *Id.*

We begin with injury. "Under the well-settled doctrine of 'unconstitutional conditions,' the government may not require a person to give up a constitutional right . . . in

exchange for a discretionary benefit . . . ." *Dolan v. City of Tigard*, 512 U.S. 374, 385 (1994). As the Supreme Court noted a century ago, the state may condition the benefits it bestows, but "the power of the state in that respect is not unlimited, and one of the limitations is that it may not impose conditions which require the relinquishment of constitutional rights." *Frost v. Railroad Commission*, 271 U.S. 583, 593–94 (1925). This is so because "[i]f the state may compel the surrender of one constitutional right as a condition of its favor, it may, in like manner, compel a surrender of all." *Id.*

We have recognized that the unconstitutional-conditions "doctrine is especially important in the Fourth Amendment context" because, "[u]nder modern Fourth Amendment jurisprudence, whether a search has occurred depends on whether a reasonable expectation of privacy has been violated." *United States v. Scott*, 450 F.3d 863, 867 (9th Cir. 2006) (citing *Katz v. United State*s, 389 U.S. 347, 361 (1967) (Harlan, J., concurring)). "Pervasively imposing an intrusive search regime as the price of [a discretionary government benefit], just like imposing such a regime outright, can contribute to the downward ratchet of privacy expectations." *Id.* Accordingly, the doctrine applies when the government attempts to "exact waivers of rights as a condition of benefits, even when those benefits are fully discretionary." *Id.* at 866–67.[2]

[2] At issue in *Scott* was whether a pretrial detainee can be induced to categorically give up his Fourth Amendment right against unreasonable search and seizure as a condition of release. We answered no. Even if a detainee signs a release agreement conditioned on submitting to warrantless search, the Fourth Amendment is satisfied only if "the search in question (taking the fact of consent into account) was reasonable." *Id.* at 868.

A plaintiff suffers a "constitutionally cognizable injury" whenever the government succeeds in pressuring the plaintiff into forfeiting a constitutional right in exchange for a benefit or the government withholds a benefit based on the plaintiff's refusal to surrender a constitutional right. *Koontz v. St. Johns River Water Mgmt. Dist.*, 570 U.S. 595, 606–07 (2013); *id.* at 607 (holding that the plaintiff suffered a "constitutionally cognizable injury" where he refused to waive his constitutional rights and was therefore denied a discretionary benefit); *cf. Dolan*, 512 U.S. at 379 (reversing lower court's rejection of an unconstitutional-conditions claim where the "government had granted [the] petitioner's permit application subject to conditions" requiring the petitioner to waive her Fifth Amendment rights). That is, "regardless of whether the government ultimately succeeds in pressuring someone into forfeiting a constitutional right, the unconstitutional conditions doctrine forbids burdening the Constitution's enumerated rights by coercively withholding benefits from those who exercise them." *Koontz*, 570 U.S.at 606.

Here, California conditions falconry licenses on applicants' annual certification that they "understand, and agree to abide by, all conditions of this license, the applicable provisions of the Fish and Game Code, and the regulations promulgated thereto," including unannounced, warrantless inspections. Cal. Code Regs. tit. 14, § 670(e)(2)(D); *id.* § 670(e)(4)(A). At face value, having to agree to such inspections of their "facilities, equipment, or raptors"—which include their homes, curtilage, and papers—as a condition of obtaining a falconry license constitutes a surrender of their Fourth Amendment right "to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures." U.S. Const.

amend. IV; *see also Carpenter v. United States*, 585 U.S. 296, 304 (2018) (explaining that, although "[f]or much of our history, Fourth Amendment search doctrine was 'tied to common-law trespass' and focused on whether the Government 'obtains information by physically intruding on a constitutionally protected area,'" it has also been "expanded . . . to protect certain expectations of privacy as well" (citations omitted)).[3]

The question presented here is whether simply agreeing to submit to those inspections, in the absence of an actual inspection—*see* Part II.B—amounts to the relinquishment of Fourth Amendment rights. We conclude that it does. By successfully applying for a falconry license, the Falconers certify that they will forego a claim to Fourth Amendment protections. An inspection may not occur or, if it does, it may not violate the Fourth Amendment because it is reasonable. But the idea that the Falconers surrender nothing unless and until an unlawful inspection occurs—that California extracts a blanket waiver that is, in fact, entirely superfluous—defies logic. Rather, we take the regulation to mean what it says, and agreeing to unannounced, warrantless inspections without any consideration of the reasonableness of such inspections implicates Fourth Amendment rights. *See*

[3] The dissent's citation to Judge Bennett's concurrence in *Hotop v. City of San Jose*, 982 F.3d 710, 723 (9th Cir. 2020), for the proposition that allowing the Falconers' claim to proceed "with no allegation of an actual impending search" will subject the government to "inappropriate judicial scrutiny" is puzzling. Dissent at 36. Judge Bennett's point in *Hotop* was that the conduct at issue—requiring a regulated party to submit information to a government regulator on a required form—was not a search. *Hotop*, 982 F.3d at 720–21. Here, it cannot reasonably be disputed that CDFW entering the Falconers' property to inspect their falconry facilities and records would be a search as traditionally understood. *See United States v. Jones*, 565 U.S. 400, 408 n.5 (2012).

Johnson v. Smith, No. 23-3091, 2024 U.S. App. LEXIS 14019, at *8–33 (10th Cir. June 10, 2024) (outlining Fourth Amendment precedent concerning regulatory inspections).

Therefore, the Falconers' alleged injury in fact is the forced choice: retention of their Fourth Amendment rights or receipt of a falconry license, which is required to lawfully practice falconry. Cal. Code Regs. tit. 14, § 670(a)(1); *see Blackburn v. Snow*, 771 F.3d 556, 568 (1st Cir. 1985) (rejecting prison regulation requiring visitors to choose between submitting to a strip search or forgoing entry because "*it is the very choice to which the [plaintiff] was put* that is constitutionally intolerable—and it was as intolerable the second and third times as the first"). And the Falconers suffer this injury every time they renew their licenses, whether or not they are actually subjected to any unlawful inspections. *Koontz*, 570 U.S. at 606. The separate question of whether an unannounced, warrantless inspection by CDFW would violate the Fourth Amendment is not before us. *See Benjamin v. Stemple*, 915 F.3d 1066, 1068 (6th Cir. 2019) ("[The unconstitutional conditions] argument works, or at least begins to work, only if the required consent surrenders cognizable Fourth Amendment rights."). Although undoubtedly the "government may sometimes condition benefits on waiver of Fourth Amendment rights," whether the conditions imposed in this case offend the Fourth Amendment goes to the merits of the Falconers' claim, not to whether they have sufficiently alleged injury for standing purposes. *Scott*, 450 F.3d at 867.

In addition to injury, the two remaining standing elements are also satisfied, which the parties seemingly concede. CDFW enforces California's falconry-license requirements, Cal. Code Regs. tit. 14, § 670, and the declaratory and injunctive relief that Falconers seek—

preventing enforcement of the challenged condition—would redress their claimed injuries, *see Epona, Ltd. Liab. Co. v. County of Ventura*, 876 F.3d 1214, 1220 (9th Cir. 2017).

b. Ripeness

Article III also requires that a plaintiff's claim be ripe for adjudication. *See Ass'n of Irritated Residents v. EPA*, 10 F.4th 937, 944 (9th Cir. 2021) ("The ripeness doctrine, which aims to avoid premature and potentially unnecessary adjudication, 'is drawn both from Article III limitations on judicial power and from prudential reasons for refusing to exercise jurisdiction.'" (quoting *Nat'l Park Hosp. Ass'n v. Dep't of Interior*, 538 U.S. 803, 808 (2003))). There are two ripeness considerations: constitutional and prudential.

Constitutional ripeness overlaps with the injury-in-fact element of Article III standing, and "therefore the inquiry is largely the same: whether the issues presented are definite and concrete, not hypothetical or abstract." *Id.* (internal quotation marks and citation omitted). Because the Falconers sufficiently allege an injury in fact, constitutional ripeness is satisfied.

Prudential ripeness concerns "the fitness of the issues for judicial decision and the hardship to the parties of withholding court consideration." *Id.* (quoting *Abbott Lab'ys v. Gardner*, 387 U.S. 136, 149 (1967)). "A claim is fit for decision if the issues raised are primarily legal, do not require further factual development, and the challenged action is final." *Stormans, Inc. v. Selecky*, 586 F.3d 1109, 1126 (9th Cir. 2009) (quoting *US W. Commc'ns v. MFS Intelenet, Inc.*, 193 F.3d 1112, 1118 (9th Cir. 1999)). In cases against a government agency, relevant considerations include "whether the administrative action is a definitive statement of an agency's position; whether the action has a

direct and immediate effect on the complaining parties; whether the action has the status of law; and whether the action requires immediate compliance with its terms." *Id.* (quoting *Ass'n of Am. Med. Colls. v. United States*, 217 F.3d 770, 780 (9th Cir. 2000)).

Here, the challenged licensure condition is final and is imposed annually. While the record is "admittedly sparse," as in *Stormans*, the challenged circumstances "are not hypothetical"—when the Falconers apply for a license renewal, they must include the certification that they agree to submit to warrantless, unannounced inspections. *Id.* Whether that condition violates the Fourth Amendment is a "primarily legal" inquiry. *Id.* Accordingly, this issue is fit for judicial review.

As to hardship, "a litigant must show that withholding review would result in direct and immediate hardship and would entail more than possible financial loss." *Id.* (quoting *US W. Commc'ns*, 193 F.3d at 1118). Relevant considerations include "whether the 'regulation requires an immediate and significant change in the plaintiffs' conduct of their affairs with serious penalties attached to noncompliance.'" *Id.* (quoting *Ass'n of Am. Med. Colls.*, 217 F.3d at 783). The Falconers have shown hardship because, "unless [they] prevail in this litigation, they will suffer the very injury they assert"—waiving their Fourth Amendment rights as a condition of lawfully practicing falconry. *Id.*

For all these reasons, we reverse the district court's dismissal of the Falconers' unconstitutional-conditions claims against CDFW for lack of standing.

2. FWS

The Falconers' unconstitutional-conditions claim asserted against FWS is unripe. As just discussed, "[f]or a case to be ripe, it must present issues that are definite and concrete, not hypothetical or abstract." *Clark v. City of Seattle*, 899 F.3d 802, 809 (9th Cir. 2018) (citation omitted); *see also Thomas v. Anchorage Equal Rights Comm'n*, 220 F.3d 1134, 1139 (9th Cir. 2000) (en banc) (explaining that when "measuring whether the litigant has asserted an injury that is real and concrete rather than speculative and hypothetical, the ripeness inquiry merges almost completely with standing" (citation omitted)).

Here, because FWS has delegated falconry licensing authority to California, a lengthy chain of events would have to take place before the Falconers could show a remediable impact traceable to FWS. First, on remand, the district court would have to enjoin the challenged aspects of California's licensing scheme as violative of the Falconers' Fourth Amendment rights. Second, the injunction would have to trigger a federal review and, ultimately, revocation of California's licensing scheme. *See* 50 C.F.R. § 21.82(b)(4)(vi), (5)(i) (authorizing FWS to review an approved State's program to determine whether the laws meet the minimum federal requirements and to "suspend[] the approval of a State . . . falconry program" that it determines "has deficiencies"). Third, FWS would have to reintroduce a federal licensing scheme with the same unconstitutional conditions, notwithstanding the district court's order that such conditions (as embodied in the

California scheme) are unconstitutional.[4] Finally, the Falconers would have to apply for a federal falconry license, at which time they would once again be forced to choose between a license and their Fourth Amendment rights.

The Falconers suggest that because California's challenged licensure requirement is imposed at the direction of a federal regulation, 50 C.F.R. § 21.82(d)(2)(ii), the responsibility for the unconstitutional conditional essentially passes through to FWS. While this reasoning has some intuitive appeal, it fails to account for the fact that FWS ceded its parallel licensing authority and delegated full falconry licensing authority within California to California. *See* Migratory Bird Permits, 73 Fed. Reg. 59,448, 59,448 (Oct. 8, 2008) ("[A] State, tribal, or territorial falconry permit" is all that is required to lawfully practice falconry.); Migratory Bird Permits; Delegating Falconry Permitting

[4] This step is particularly unlikely. Federal regulations provide that if FWS suspends a state's program, it "will honor all falconry permits in that jurisdiction for 2 years from the date of our final notification of suspension of certification." 50 C.F.R. § 21.82(b)(5)(v). After two years, all raptors held under permits from the suspended state must be transferred into "other States or territories, or to Federal raptor propagation or education permittees, institutions exempt from the Federal permit requirements, or permanently released to the wild (if it is allowed by the State, tribe, or territory and by this section), or euthanized." *Id*. It seems unlikely that FWS would deviate from this approach because during the rulemaking process ending parallel permitting, FWS received a comment requesting that FWS take over a suspended state program, rather than follow the process outlined above. In response, FWS said "[t]he elimination of the Federal permit was considered at the request of the States. We cannot afford to support permitting positions just for States that fail in their permitting programs." Migratory Bird Permits, Changes in the Regulations Governing Falconry, 73 Fed. Reg. 59,448, 59,452 (Oct. 8, 2008).

Authority to 17 States, 78 Fed. Reg. 72,830, 72,830–33 (Dec. 4, 2013) (delegating falconry permitting to California).

It may be that if California falls out of full compliance with federal regulations by not requiring license applicants to "agree that the[ir] falconry facilities and raptors may be inspected without advance notice," 50 C.F.R. § 21.82(d)(2)(ii), federal review would be triggered that could lead to revocation of California's licensing authority, 50 C.F.R. § 21.82(b)(4)(vi), (5)(i). But it is not certain this is what would happen in the face of an adverse judicial decision and injunction. FWS may respond differently to a state that simply stops enforcing a federal requirement of its own volition compared to a state that has been enjoined by a federal court from enforcing a regulation as a constitutional matter.[5]

We conclude that the connection between the Falconers' asserted injury and FWS is too attenuated and hypothetical at this point to support federal jurisdiction over Falconers' unconstitutional-conditions claim asserted against FWS.

B. Unannounced-Inspections Claim

The Falconers also directly contend that the federal and California authorization of unannounced-inspections, 50 C.F.R. § 21.82(d)(9); Cal. Code Regs. tit. 14, § 670(j)(3)(A), violate the Fourth Amendment both facially and as-applied

[5] *See generally* Aditya Bamzai, The Path of Administrative Law Remedies, 98 Notre Dame L. Rev. 2037, 2062–64 (2023) (discussing agencies' acquiescence to non-binding court decisions); Nicholas Parillo, The Endgame of Administrative Law and the Judicial Contempt Power, 131 Harv. L. Rev. 685, 691 n.15 (2018) (same); *see also generally* Benjamin M. Barczewski, Cong. Rsch. Serv., R47882, Agency Nonacquiescence: An Overview of Constitutional and Practical Considerations (2023).

because they authorize "unreasonable warrantless searches of Falconers' private homes, protected curtilage, and other property." Again, the Falconers seek declaratory and injunctive relief. The district court also dismissed this claim on the basis that the Falconers failed to show sufficient injury to satisfy Article III standing. We agree.

The Falconers' direct challenge fails because they have not alleged that they were subjected to warrantless inspection under the challenged regulations. *See Hotop v. City of San Jose*, 982 F.3d 710, 716 n.4 (9th Cir. 2020) (concluding that plaintiffs' allegations "support[ed] only a facial challenge to the regulations" because the complaint did not allege that the regulations had been unlawfully applied to the plaintiffs in the past); *cf. Potter v. City of Lacey*, 46 F.4th 787, 801 (9th Cir. 2022) (Bennett, J., dissenting) ("Potter also argues that the RV Parking Ordinance violates the Fourth Amendment. Because police never seized Potter's RV, he can raise only a facial Fourth Amendment challenge to the ordinance."). At best, Timmons and Peter Stavrianoudakis alleged that they were subjected to warrantless inspections decades ago under a different regulatory scheme.[6] Thus, we address only the Falconers' facial challenge. *See City of Los Angeles v. Patel*, 576 U.S.

[6] Timmons and Peter Stavrianoudakis allege that they were unconstitutionally searched by CDFW agents in 1992 and 1983, respectively. Those searches occurred many years before the federal government issued the current regulations, Migratory Bird Permits, Changes in the Regulations Governing Falconry, 73 Fed. Reg. 59,448, 59,448 (Oct. 8, 2008), and delegated falconry permitting to California, Migratory Bird Permits; Delegating Falconry Permitting Authority to 17 States, 78 Fed. Reg. 72,830, 72,830–33 (Dec. 4, 2013). Accordingly, to the extent these Plaintiffs bring an as-applied challenge based on searches that occurred under an outdated regulatory scheme, those searches have no bearing on the standing analysis.

409, 415 (2015) (holding that "facial challenges under the Fourth Amendment are not categorically barred or especially disfavored").

The Falconers rely on *Meland v. Weber*, which held that when a party "is the actual object of the government's regulation, then 'there is ordinarily little question that the action or inaction has caused him injury.'" 2 F.4th 838, 845 (9th Cir. 2021) (quoting *Lujan*, 504 U.S. at 561–62); *see also Illinois v. Krull*, 480 U.S. 340, 354 (1987). They contend that because the unannounced-inspection requirement applies only to licensed falconers, they are the objects of this regulation. But plaintiffs have standing "as the objects of regulation" only when the challenged regulation imposes a "clear burden" on them. *Cal. Sea Urchin Comm'n v. Bean*, 883 F.3d 1173, 1181 (9th Cir. 2018), *as amended* (Apr. 18, 2018). A clear burden is established when, for example, the challenged regulation "is directed at [plaintiffs] in particular" and "requires them to make significant changes in their everyday business practices," *Abbott Lab'ys*, 387 U.S. at 154, or when a law creates a "coercive effect" that "require[s] (or at least encourage[s])" plaintiffs to act in a manner that could amount to unconstitutional discrimination, *Meland*, 2 F.4th at 846–47.

Here, the Falconers failed to identify any comparable, concrete effects—such as self-censorship or any kind of behavioral change—prompted by the unannounced-inspections provisions that would amount to a clear burden. Rather, they essentially claim that they feel threatened by the possibility of a future inspection. No authority establishes that mere discomfort constitutes constitutional injury.

We also are not persuaded that the object-of-regulation analysis is the correct paradigm. Instead, because the

Falconers seek declaratory and injunctive relief, we consider whether they have "Article III standing to seek prospective relief." *Villa v. Maricopa County*, 865 F.3d 1224, 1229 (9th Cir. 2017). In this context, a plaintiff "must allege either continuing, present adverse effects due to . . . exposure to Defendants' past illegal conduct, or a sufficient likelihood that [plaintiff] will again be wronged in a similar way." *Id.* (internal quotation marks and citations omitted). The Falconers' allegations do not address the present-adverse-effect criterion in any way. Standing therefore depends on whether they have alleged a "sufficient likelihood" of a future wrong.

The Falconers acknowledge that they have not been inspected (at least not in several decades), but they contend that the "pattern or practice of unreasonable warrantless searches" authorized by the unannounced-inspection provisions create a likelihood of future individualized injury. This is insufficient to "show that the threat of future injury is 'actual and imminent, not conjectural or hypothetical.'" *Bolden-Hardge v. Off. of the Cal. State Controller*, 63 F.4th 1215, 1220 (9th Cir. 2023) (quoting *Summers v. Earth Island Inst.*, 555 U.S. 488, 493 (2009)).

The Falconers argue that it is impossible for them to identify with any certainty when *unannounced* inspections will occur. That may be, but the Falconers failed to allege *any* facts about the frequency or volume of unannounced inspections that California regulators undertake, which would inform the "likelihood" that the Falconers face a risk of such inspection. *Cf. Susan B. Anthony List v. Driehaus*, 573 U.S. 149, 164–65 (2014) (holding that injury was imminent because plaintiffs demonstrated that enforcement actions took place 20 to 80 times each year and thus "are not a rare occurrence"). Rather, the Falconers rely primarily on

the existence of the regulation authorizing unannounced inspections. While the regulation is of course material, mere speculation that regulators will exercise their inspection authority is insufficient to establish standing for a claim seeking prospective relief. *See, e.g.*, *Cal. Tow Truck Ass'n v. City & County of San Francisco*, 693 F.3d 847, 866 (9th Cir. 2012) ("[T]he mere existence of a statute, which may or may not ever be applied to plaintiffs, is not sufficient to create a case or controversy within the meaning of Article III." (quoting *San Diego County Gun Rights Comm. v. Reno*, 98 F.3d 1121, 1126 (9th Cir. 1996))).

In sum, the Falconers have not sufficiently demonstrated injury in fact as to their unannounced-inspection claim.[7] Based on the allegations presented, "[n]o violation of the laws is on the horizon and no enforcement action or prosecution is either threatened or imminent. . . . [A]t this stage the dispute is purely hypothetical and the injury is speculative. Whether viewed through the lens of standing or ripeness, resolution of the [Fourth] Amendment issues is premature." *Thomas*, 220 F.3d at 1137. Because the Falconers lack standing to directly challenge the authorization of unannounced inspections, they also lack standing to challenge this authorization under the APA.

[7] Katherine Stavrianoudakis is positioned differently than the other individual Plaintiffs because she is not a falconer. She alleges that the unannounced-inspection provisions violate her Fourth Amendment rights because she shares a home with a licensed falconer. The district court dismissed her claim because she did not show that she was subjected to an unannounced inspection. On appeal, the parties did not specifically address her standing arguments. We conclude that Katherine Stavrianoudakis does not have standing for the same reasons that the Falconers do not have standing.

C. AFC's Claims

AFC also asserts an unconstitutional-conditions claim and an unannounced-inspection claim on behalf of its members. AFC alleges that the inspection regulations injure its members, not the organization itself. *See Columbia Basin Apartment Ass'n v. City of Pasco*, 268 F.3d 791, 798 (9th Cir. 2001) ("[A]n organization may have standing to assert the claims of its members even where it has suffered no direct injury from a challenged activity."). To establish associational standing and bring suit on behalf of its members, AFC must establish that: "(a) its members would otherwise have standing to sue in their own right; (b) the interests it seeks to protect are germane to the organization's purpose; and (c) neither the claim asserted nor the relief requested requires the participation of individual members in the lawsuit." *Cent. Sierra Env't Res. Ctr. v. Stanislaus Nat'l Forest*, 30 F.4th 929, 937 (9th Cir. 2022) (quoting *Hunt v. Wash. State Apple Advert. Comm'n*, 432 U.S. 333, 343 (1977)). Like the individual Plaintiffs, we conclude that AFC has met these requirements for its unconstitutional-conditions claim but not for its unannounced-inspection claim.

Regarding the unconstitutional-conditions claim asserted against CDFW, the first requirement is satisfied because the Falconers are AFC members and they have individual standing to bring the unconstitutional-conditions claim. The second requirement is also met because AFC's interest in ensuring that its members are not subject to unconstitutional conditions in obtaining falconry licenses is germane to AFC's purpose of promoting "the broadest liberties possible" for falconers. And the third requirement is fulfilled because AFC requests only declaratory and

injunctive relief, which "do not require individualized proof." *Columbia Basin Apartment Ass'n*, 268 F.3d at 799.

But as with the Falconers' claims, we affirm the district court's dismissal of AFC's unconstitutional-conditions claim as asserted against FWS and its unannounced-inspection claim. For the reasons discussed regarding the Falconers, AFC's unconstitutional-conditions claim against FWS is not ripe. As to AFC's unannounced-inspection claim, the first requirement of organizational standing is not met. The Falconers failed to establish sufficient injury to have standing to bring this claim. AFC points to four of its members who are not parties here and who have experienced unannounced inspections. Specifically, AFC alleges that FWS conducted warrantless inspections of the homes and property of the Washington members in 2004 and 2009, and that CDFW conducted warrantless inspections of the homes and property of the California members in 2016 and 2017. The question is whether these inspections caused an injury that establishes standing for those members and, in turn, AFC. They did not.

Even assuming that the alleged prior warrantless inspections demonstrate that AFC's non-party members suffered injury, such injury supports only a damages claim to remedy a past violation. *Bolden-Hardge*, 63 F.4th at 1221. Because AFC seeks prospective relief—and "at least one member" of an organization must have "standing to present, in his or her own right, *the claim (or the type of claim)* pleaded by the association"—more must be shown as relates to the California and Washington members. *United Food & Com. Workers Union Loc. 751 v. Brown Grp.*, 517 U.S. 544, 555 (1996) (emphasis added).

As previously discussed, "standing to seek prospective relief" exists where plaintiffs are suffering either "continuing, present adverse effects" from the defendants' past illegal conduct or "a sufficient likelihood" that they will be similarly wronged again in the future. *Villa*, 865 F.3d at 1229 (citations omitted). Just like the Falconers, AFC's allegations do not address the first criterion in any way. And as to the second criterion, the operative complaint merely sets out the general allegation that "[w]arrantless searches of American Falconry Conservancy members' private homes and other property by Defendants is widespread and on-going," without any specificity about the likelihood that the Washington and California AFC members will be inspected without a warrant again. It is also worth noting that each AFC member identified was subjected only to one past inspection that occurred several years ago. These allegations do not establish "that the threat of future injury is 'actual and imminent,'" as opposed to "'conjectural or hypothetical.'" *Bolden-Hardge*, 63 F.4th at 1220 (quoting *Summers*, 555 U.S. at 493). AFC therefore lacks standing to bring its unannounced-inspection claim based on its identified Washington and California members because, although "[p]ast wrongs may serve as evidence of a 'real and immediate threat of repeated injury,' . . . they are insufficient on their own to support standing for prospective relief." *Id.* (quoting *City of Los Angeles v. Lyons*, 461 U.S. 95, 102–03 (1983)).

AFFIRMED IN PART; REVERSED IN PART; REMANDED.[8]

[8] Each party shall bear its own costs.

S.R. THOMAS, Circuit Judge, concurring in part and dissenting in part:

The question in this case is whether Plaintiff-Falconers have standing to challenge state and federal falconry regulations as violative of their Fourth Amendment rights. I agree that the district court properly dismissed Falconers' claim that the regulations violate the Fourth Amendment because they have not been subjected to an inspection under the current regulations and cannot establish that a future inspection is imminent. I respectfully disagree that Falconers have standing to challenge the state regulations under the unconstitutional-conditions doctrine instead. Because I would affirm the district court's dismissal of all of Falconers' remaining claims, I respectfully dissent in part.

I

The Fourth Amendment guarantees "the right of the people . . . against unreasonable searches and seizures." U.S. Const. amend. IV. "[R]easonableness" is the "ultimate measure of . . . constitutionality" and is judged by balancing the intrusion on the individual's reasonable expectation of privacy against the "promotion of legitimate government interests." *Vernonia Sch. Dist. 47J v. Acton*, 515 U.S. 646, 652 (1995). In assessing whether a search was "reasonable," the fact that an individual consented to the search, and the conditions under which such consent was obtained, may be relevant. *See United States v. Scott*, 450 F.3d 863, 867–68 (9th Cir. 2006); *Schneckloth v. Bustamonte*, 412 U.S. 218, 228 (1973) ("the Fourth [] Amendment[] require[s] that consent not be coerced"). However, the fact that an individual has consented to a search as a condition of obtaining some benefit "does not by itself make an otherwise unreasonable search reasonable." *Scott*, 450 F.3d at 871.

While most Fourth Amendment challenges concern the reasonableness of a particular search, the Supreme Court has clarified "facial challenges under the Fourth Amendment are not categorically barred." *City of L.A., Calif. v. Patel*, 576 U.S. 409, 415 (2015). To mount a facial challenge, however, a plaintiff must still satisfy the requirements for Article III standing by pleading a concrete injury-in-fact in the same manner required for an as-applied challenge. *See Clapper v. Amnesty Intern. USA*, 568 U.S. 398, 409–14 (2013). Where the plaintiff has already been subjected to a search or seizure, the past intrusion can satisfy the constitutional injury requirement. *See, e.g.*, *Patel*, 576 U.S. at 413–14; *Garcia v. City of L.A.*, 11 F.4th 1113, 1117 (9th Cir. 2021). Where no search or seizure has yet occurred, a plaintiff only has standing if they can establish that one is "certainly impending." *Clapper*, 568 U.S. at 409; *see also Columbia Basin Apartment Ass'n. v. City of Pasco*, 268 F.3d 791, 797 (9th. Cir. 2021).

Like all justiciability doctrines, the injury-in-fact requirement is designed to ensure that we "adjudicate live cases or controversies consistent with the powers granted the judiciary in Article III." *Thomas v. Anchorage Equal Rights Com'n*., 220 F.3d 1134, 1138 (9th Cir. 2000). "By requiring the plaintiff to show an injury in fact, Article III standing screens out plaintiffs who might have only a general legal, moral, ideological, or policy objection to a particular government action." *Food & Drug Admin. v. Alliance for Hippocratic Medicine*, 602 U.S. 367, 381 (2024).

As the majority opinion recounts, Falconers' operative complaint advances two alternative theories of Fourth Amendment injury. First, Falconers allege they are injured by the "ongoing threat" of future unreasonable searches. The majority properly affirmed dismissal of claims based on

this theory because Falconers cannot demonstrate a "sufficient likelihood" that they will be subjected to a future search. *City of L.A.v. Lyons*, 461 U.S. 95, 111 (1983). Alternatively, Falconers allege they are injured by the act of giving consent to future inspection because they are forced to "waive" their the Fourth Amendment rights as a condition of licensure. In my view, this alternative "unconstitutional-conditions" theory fares no better because the act of giving consent, without more, is not a cognizable injury under our precedents.

II

The unconstitutional-conditions doctrine prohibits "the government from coercing people into giving [] up [constitutional rights]" by withholding benefits "from those who exercise them." *Koontz v. Johns Water Mgmt. Dist.*, 570 U.S. 595, 604 (2013). The doctrine originates in the *Lochner* Era, where it was used to strike down restrictions on commercial activity imposed as a "condition" of doing business. *See, e.g. Frost & Frost Trucking Co. v. RR Comm'n*, 271 U.S. 583, 591–92 (1926); *W. Union Telegraph Co. v. State of Kansas ex rel. Coleman*, 216 U.S. 1, 35 (1910); *see also Kathleen M. Sullivan*, Unconstitutional Conditions, 102 Harv. L. Rev. 1413, 1416 (1989). The conflict in those cases arose after the government brought an enforcement against a business entity for failing to abide by the restriction. *Frost*, 271 U.S. at 590; *W. Union Telegraph*, 216 U.S. at 7. Later, the unconstitutional-conditions doctrine was extended to government policies requiring individuals to forgo—or retaliating against individuals for engaging in—protected expression as a condition of receiving some benefit. *See, e.g.*, *Bd. of Cnty. Com'rs, Wabunsee Cnty., Kan. v. Umbehr*, 518 U.S. 668, 674–75 (1996); *Speiser v. Randall*, 357 U.S. 513, 529 (1958). The

plaintiffs in those cases were injured by the government's termination of employment or denial of some benefit based on the plaintiffs' "engaging in [protected] speech." *Speiser*, 357 U.S. at 518; *see also Umbehr*, 518 at 617.

Today, the unconstitutional-conditions doctrine is most often litigated in the in the land use context, where it restricts local governments from "forc[ing]" a landowner to forego "her right under the Fifth Amendment to just compensation" in exchange for a land use permit. *Dolan v. City of Tigard*, 512 U.S. 374, 385–86 (1994). In land use cases, the injury that gives rise to constitutional standing is either the uncompensated appropriation of property rights, *Nollan v. California Coastal Com'n*, 483 U.S. 825, 831 (1987), or the "impermissible denial" of authorization to fully develop the landowner's property. *Koontz*, 570 at 607. These injuries occur at the time of the permitting decision, which effects a concrete change in the scope of the owner's property right.

In the Fourth Amendment context, we have recognized that the unconstitutional-conditions doctrine may be relevant in assessing whether a warrantless search or seizure was "reasonable." In *Scott*, for example, we considered whether defendant Scott's consent to the warrantless search of his home "as a condition to [pre-trial] release" made the state's subsequent search of his home reasonable. 459 F.3d at 865. We explained that the unconstitutional-conditions doctrine prevents the government from making "end-runs" around constitutional protections by "attaching strings" to "conditional benefits." *Id*. at 866. We concluded that "Scott's assent to his release conditions does not by itself make an otherwise unreasonable search reasonable" and affirmed the district court's order granting Scott's motion to suppress the fruits of the search. *Id*. at 871, 875. *Scott* did

not address the validity of Nevada's pretrial release regime under which Scott's consent was obtained in the first place.

The application of the unconstitutional-conditions doctrine to cases like this, where no search has occurred and the only alleged injury is the signing of a form, is far from "settled." Indeed no federal court has held that the act of giving consent itself constitutes injury absent an actual or imminently impending search. The majority's assertion that Falconers are injured "every time they renew their licenses," is unsupported by precedent.

The recognition of this new type of injury has the unfortunate effect of opening a loophole in our standing jurisprudence. By allowing Falconers to mount an "unconstitutional-conditions" challenge to a law that they do not have standing to challenge directly, the majority opinion undercuts the restriction of prospective relief to those cases where the plaintiff "has suffered or is threatened with a concrete and particularized legal harm[.]" *Fellowship of Christian Athletes v. San Jose Unified Sch. Dist. Bd. of Educ.*, 82 F.4th 664, 680 (9th Cir. 2023) (en banc).

III

Even if the imposition of an inspection requirement could by itself violate the unconstitutional-conditions doctrine, Falconers have not demonstrated that CDFW's regime actually burdens a protected right. That is because the Fourth Amendment protects only individual's right to be free from "*unreasonable* searches and seizures"—not the absolute right to deny all access to one's home. U.S. Const. amend. IV (emphasis added). Because Falconers have not pleaded any facts to demonstrate that they will be forced to endure "unreasonable" inspections, they have not

demonstrated that they had to "give up" any constitutional right. *Dolan*, 512 U.S. at 385.

Where the unconstitutional conditions doctrine applies, it bars the forced surrender of rights protected of the Constitution. *Koontz*, 570 U.S. at 606. Neither Falconers nor the majority explain precisely which constitutional protections Falconers have been forced to forgo. Falconers' brief, for example, refers to the "right to demand a warrant," but that is not an accurate description of what the Fourth Amendment protects. *See United States v. Kincade*, 379 F.3d 813, 822–24 (9th Cir. 2004) (discussing exceptions to the warrant requirement). Falconers do not, for instance, have the right to demand a warrant prior to a valid administrative search, or a search justified by non-law enforcement "special needs." *Id*. at 823. Further, our precedent clearly establishes that the act of giving consent does *not* constitute a waiver of an individuals's right to invoke the Fourth Amendment in the future. *See Scott*, 450 F.3d at 868 (discussing and rejecting "the waiver theory" of "Fourth Amendment rights").

The majority asserts that the substance of Fourth Amendment law is not relevant to standing because it goes to "the merits" of Falconers' claim. This statement reflects the familiar principle that "jurisdictional inquiry" is different from "merits inquiry." *Inland Empire Waterkeeper v. Corona Clay Co.*, 17 F.4th 825, 834 (9th Cir. 2021); *see also Rakas v. Illinois*, 439 U.S. 128, 138 (1978) (distinguishing between "standing to invoke the exclusionary rule" and the "substantive question" of whether the exclusionary rule applies.). However, this principle does not render the substance of Fourth Amendment law *irrelevant* to our standing analysis, especially in the context of the an unconstitutional-conditions claim, where the specification of

a burdened right is an essential element Falconer's theory of Article III injury. If the signing of a form without more never amounts to a violation of the Fourth Amendment, that legal conclusion is certainly relevant to the jurisdictional inquiry. We should not credit Falconers' assertion that they "forego a claim to Fourth Amendment protections" by virtue of agreeing to future inspections when our Fourth Amendment case law clearly holds otherwise. *See Scott*, 450 F.3d at 868.

Finally, in addition to the legal infirmities addressed above, there are prudential reasons to doubt Falconers' demand for "robust constitutional scrutiny" of "warrantless search conditions . . . on government benefits, licenses, and privileges." By delinking Article III injury analysis from the substance of Fourth Amendment law, Falconers' unconstitutional conditions theory effectively softens the standing requirements that guard against meritless challenges to manifold reasonable regulations.

The government regularly requires citizens to consent to search and seizure as a condition of receiving some benefit or participating in some activity. We have repeatedly confirmed the reasonableness of various types of routine "suspicionless search[]" under longstanding exceptions to the warrant requirement. *Kincade*, 379 F.3d at 823. Familiar examples of include physical pat-downs conducted by TSA agents as a condition of flying, *see e.g.*, *Gilmore v. Gonzales*, 435 F.3d 1125, 1138 (9th Cir. 2006); *United States v. Marquez*, 410 F.3d 612, 616 (9th Cir. 2005); sobriety tests conducted by police officers as a condition of driving on public roads, *see, e.g.*, *Demarest v. City of Vallejo, Cal.*, 44 F.4th 1209, 1212–20 (9th Cir. 2022)*; Birchfield v. North Dakota*, 579 U.S. 438, 478 (2016); building inspections conducted by city officials as a condition of receiving a

rental or business license, *see, e.g.*, *Killgore v. City of S. El Monte*, 3 F.4th 1186, 1190 (9th Cir. 2021); *Rush v. Obledo*, 756 F.2d 713, 720 (9th Cir. 1985); and searches conducted by probation and parole officers as a condition of supervised release, *see e.g.*, *United States v. Betts*, 511 F.3d 872, 877 (9th Cir. 2007).

Under the majority's logic, a plaintiff would have standing to challenge the laws and regulations authorizing all of these practices at the moment they agree to the condition, either expressly by signing a form, or impliedly by participating in the regulated activity. This expansion in constitutional standing under the Fourth Amendment will lead to dramatic expansion in meritless facial challenges to all kinds of regulations adopted to protect public health, welfare, and safety. Allowing these kinds of Fourth Amendment claims to proceed with no allegation of an actual impending search "will subject government at every level to inappropriate judicial scrutiny of its actions . . . ." *Hotop v. City of San Jose*, 982 F.3d 710, 723 (9th Cir. 2020) (Bennett, J., concurring).

In sum, Falconers' unconstitutional-conditions theory reflects an impermissible attempt to circumvent the Article III injury requirement in the context of the Fourth Amendment. I would affirm the district court dismissal of the Plaintiffs' claims in their entirety. Thus, I respectfully dissent, in part.

Three Sections of California Fish and Game Code Relevant to the Take of Nongame Mammals

Extracted by California Fish and Game Commission staff on January 2, 2024

To help facilitate conversation, this document provides extracts from the California Fish and Game Code related to the take of nongame mammals for ease of reference. Footnotes are added for convenience and are not part of the official statutes, nor are they a complete recapitulation of the law.

Please refer to complete statutory text at https://leginfo.legislature.ca.gov/faces/home.xhtml for a more comprehensive understanding of the particular code section(s).

Section 4152. Taking of Nongame Mammals Found Injuring Crops or Property

(a) Except as provided in Section 4005, nongame mammals and black-tailed jackrabbits, muskrats, subspecies of red fox that are not the native Sierra Nevada red fox (*Vulpes vulpes necator*), and red fox squirrels that are found to be injuring growing crops or other property may be taken at any time or in any manner in accordance with this code and regulations adopted pursuant to this code by the owner or tenant of the premises or employees and agents in immediate possession of written permission from the owner or tenant thereof. They may also be taken by officers or employees of the Department of Food and Agriculture or by federal, county, or city officers or employees when acting in their official capacities pursuant to the Food and Agricultural Code pertaining to pests, or pursuant to Article 6 (commencing with Section 6021) of Chapter 9 of Part 1 of Division 4 of the Food and Agricultural Code. Persons taking mammals in accordance with this section are exempt from Section 30071, except when providing trapping services for a fee. Raw furs, as defined in Section 4005, that are taken under this section, shall not be sold.

(b) Traps used pursuant to this section shall be inspected and all animals in the traps shall be removed at least once daily. The inspection and removal shall be done by the person who sets the trap or the owner of the land where the trap is set or an agent of either.

(c) This section does not apply to bobcats.

Section 4180. Taking of Fur-Bearing Mammals Injuring Property

(a) Except as provided for in Section 4005, fur-bearing mammals that are injuring property may be taken at any time and in any manner in accordance with this code or regulations made pursuant to this code. Raw furs, as defined in Section 4005, that are taken under this section, shall not be sold.

(b) Traps used pursuant to this section shall be inspected and all animals in the traps shall be removed at least once daily. The inspection and removal shall be done by the person who sets the trap or the owner of the land where the trap is set or an agent of either.

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[1] Requires a license or entitlement for the taking of birds or mammals.

Section 4005. Persons Required to Procure Trapping Licenses; Qualifications

(a) Except as otherwise provided in this section, every person who traps fur-bearing mammals or nongame mammals, designated by the commission, shall procure a trapping license. Raw fur of fur-bearing and nongame mammals may not be sold. For purposes of this article, “raw fur” means any fur, pelt, or skin that has not been tanned or cured, except that salt-cured or sun-cured pelts are raw furs.

(b) The department shall develop standards that are necessary to ensure the competence and proficiency of applicants for a trapping license. A person shall not be issued a license until the person has passed a test of their knowledge and skill in this field.

(c) Persons trapping mammals in accordance with Section 4152 or 4180 are not required to procure a trapping license except when providing trapping services for profit.

(d) No raw furs taken by persons providing trapping services for profit may be sold.

(e) The license requirement imposed by this section does not apply to any of the following:

(1) Officers or employees of federal, county, or city agencies or the department, when acting in their official capacities, or officers or employees of the Department of Food and Agriculture when acting pursuant to the Food and Agricultural Code pertaining to pests or pursuant to Article 6 (commencing with Section 6021) of Chapter 9 of Part 1 of Division 4 of the Food and Agricultural Code.

(2) Structural pest control operators licensed pursuant to Chapter 14 (commencing with Section 8500) of Division 3 of the Business and Professions Code, when trapping rats, mice, voles, moles, or gophers.

(3) Persons and businesses licensed or certified by the Department of Pesticide Regulation pursuant to Chapter 4 (commencing with Section 11701) and Chapter 8 (commencing with Section 12201) of Division 6 of, and Chapter 3.6, (commencing with Section 14151) of Division 7 of, the Food and Agricultural Code, when trapping rats, mice, voles, moles, or gophers.

(f) Except for species that are listed pursuant to Chapter 1.5 (commencing with Section 2050)2 of Division 3 or Chapter 8 (commencing with Section 4700)3, nothing in this code or regulations adopted pursuant thereto shall prevent or prohibit a person from trapping any of the following animals:

(1) Gophers.

(2) House mice.

(3) Moles.

(4) Rats.

(5) Voles.

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[2] Refers to the California Endangered Species Act.

[3] Refers to fully protected animals.

Section 472 of Title 14 of the California Code of Regulations, Relevant to the Take of Nongame Mammals

Extracted by California Fish and Game Commission staff on January 2, 2024

To help facilitate conversation, this document provides Section 472 of Title 14 of the California Code of Regulations; Title 14 is where regulations promulgated by the California Fish and Game Commission may be found. Footnotes are added for convenience and are not part of the regulation or referenced statutes, nor are they a complete recapitulation of the law.

Please refer to complete regulatory text (https://govt.westlaw.com/calregs/) or statutory text (https://leginfo.legislature.ca.gov/faces/home.xhtml) for a more comprehensive understanding of the particular section(s).

Section 472. General Provisions.

Except as otherwise provided in Sections 478[1], 485[2], and subsections (a) through (d) below, nongame birds and mammals may not be taken.

(a) The following nongame birds and mammals may be taken at any time of the year and in any number except as prohibited in Chapter 6: English sparrow, starling, domestic pigeon *(Columba livia)* except as prohibited in Fish and Game Code section 3680[3], coyote, weasels, skunks, opossum, moles and rodents (excluding tree and flying squirrels, and those listed as furbearers, endangered or threatened species).

(b) Fallow, sambar, sika, and axis deer, of either sex, may be taken concurrently with the general deer season and on properties where an authorized deer, elk, or pronghorn antelope season is open. There is no bag or possession limit for deer taken pursuant to this subsection.

(1) It shall be unlawful to take any deer pursuant to this subsection without a valid hunting license in possession, but no tag, stamp, or additional endorsement of any kind is required.

(2) It shall be unlawful to detach or remove only the head, hide, or antlers of any deer taken pursuant to this subsection, or to leave through carelessness or neglect any portion of the flesh normally eaten by humans to go to waste.

(c) Aoudad, mouflon, tahr, and feral goats may be taken all year.

(d) American crows (*Corvus brachyrhynchos*)

(1) May be taken only under the provisions of Section 485 and by landowners or tenants, or by persons authorized in writing by such landowners or tenants, when American crows are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. Persons authorized by landowners or tenants to take American crows shall keep such written authorization in their possession

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[1] Prohibitions on take of bobcats.

[2] Regulates the take of crows.

[3] Refers to racing pigeons.

when taking, transporting or possessing American crows. American crows may be taken only on the lands where depredations are occurring or where they constitute a health hazard or nuisance. If required by Federal regulations, landowners or tenants shall obtain a Federal migratory bird depredation permit before taking any American crows or authorizing any other person to take them.

(2) American crows may be taken under the provisions of this subsection only by firearm, bow and arrow, falconry or by toxicants by the Department of Food and Agriculture for the specific purpose of taking depredating crows. Toxicants can be used for taking crows only under the supervision of employees or officers of the Department of Food and Agriculture or federal or county pest control officers or employees acting in their official capacities and possessing a qualified applicator certificate issued pursuant to sections 14151-14155 of the Food and Agriculture Code. Such toxicants must be applied according to their label requirements developed pursuant to sections 6151-6301, Title 3, California Code of Regulations.

(e) Pursuant to Fish and Game Code Section 2003[4], it is unlawful to offer any prize or other inducement as a reward for the taking of nongame mammals in an individual contest, tournament, or derby.

[4] Refers to the offering of prizes or other inducements for the taking of wildlife.

California Fish and Game Commission
Commission Policies Directly Related to the Take of Nongame Mammals

January 2, 2024

Depredation Control

It is the policy of the Fish and Game Commission that:

All wildlife species shall be maintained in harmony with available habitat whenever possible. In the event that some birds or mammals may cause injury or damage to private property, depredation control methods directed toward offending animals may be implemented. Should such depredation be upon wildlife species being intensively managed, the Department may institute appropriate depredation control methods directed towards the offending animals.

Terrestrial Predator Policy

It is the policy of the Fish and Game Commission that:

I. For the purposes of this policy, terrestrial predators are defined as all native wildlife species in the Order Carnivora, except those in the Family Otariidae (seals, sea lions), the Family Phocidae (true seals), and sea otters (Enhydra lutris).

II. Pursuant to the objectives set forth in Section 1801 of Fish and Game Code, the Commission acknowledges that native terrestrial predators are an integral part of California's natural wildlife and possess intrinsic, biological, historical, and cultural value, which benefit society and ecosystems. The Commission shall promote the ecological, scientific, aesthetic, recreational, and educational value of native terrestrial predators in the context of ecosystem-based management, while minimizing adverse impacts on wildlife and reducing conflicts that result in adverse impacts to humans, including health and safety, private property, agriculture, and other public and private economic impacts.

III. The Commission further recognizes that sustainable conservation and management strategies are necessary to encourage the coexistence of humans and wildlife. It is, therefore, the policy and practice of the Fish and Game Commission that:

   A. Existing native terrestrial predator communities and their habitats are monitored, maintained, restored, and/or enhanced using the best available science. The department shall protect and conserve predator populations.

   B. Native terrestrial predator management shall be consistent with the goals and objectives of existing management and conservation plans. Management strategies shall recognize the ecological interactions between predators and other wildlife species and consider all available management tools, best available science, affected habitat, species, and ecosystems and other factors. The department shall provide consumptive and non-consumptive recreational opportunities. The recreational take of native terrestrial predator species shall be managed in a way that ensures sustainable populations of predator and prey are maintained.

C. Human-predator conflict resolution shall rely on management strategies that avoid and reduce conflict that results in adverse impacts to human health and safety, private property, agriculture, and public and private economic impacts. Efforts should be made to minimize habituation of predators especially where it is leading to conflict. Human safety shall be considered a priority. Management decisions regarding human-predator conflicts shall evaluate and consider various forms of lethal and nonlethal controls that are efficacious, humane, feasible and in compliance with all applicable state and federal laws and regulations. A diverse set of tools is necessary to avoid, reduce, and manage conflict. To ensure long-term conservation of predators and co-existence with humans and wildlife, all legal tools shall be considered when managing to address conflicts.

CDFW Awards $17M to Critical Restoration Projects Statewide

November 14, 2024

The California Department of Fish and Wildlife (CDFW) today announced the award of $17 million in grants for 18 restoration and protection projects throughout the state, including projects to benefit disadvantaged communities, salmon and steelhead in the Klamath-Trinity watershed, wetlands and meadows and watersheds impacted by cannabis cultivation. Today's awards continue the ongoing efforts to support critical restoration projects with funding made available in late 2022 through the Nature Based Solutions

(NBS) Initiative and Greenhouse Gas Reduction Funds, funding through CDFW's Cannabis Program, as well as funding dedicated to habitat restoration through Proposition 68.

"Timing is critical to restore and protect California's biodiversity, and we're seizing this moment to support a diverse array of projects that will benefit fish, wildlife, lands and watersheds across the state," said CDFW Director Charlton H. Bonham. "By collaborating with these important conservation partners, advancing Tribally-led restoration, and by staying focused on protecting ecosystems with the greatest need, we'll ensure these funds will help support vulnerable species and communities across California."

Since the beginning of 2023, CDFW has awarded close to $292 million through a single application process for several funding initiatives. This streamlined process allowed CDFW to get funds out to the door faster to critical restoration projects. Visit the Restoration Grants Story Map page to learn more about funded projects.

Background

In late 2022, CDFW announced the availability of $200 million in new funding for restoration, including $100 million in emergency drought funding for protecting salmon against drought and climate change. Funding under the Addressing Climate Impacts and Nature Based Solutions initiatives provides grant funding for projects addressing water and habitat impacted by climate, as well as restoring wetlands and mountain meadows and creating wildlife corridors. Remaining funding for wetland and mountain meadow restoration is available through the Greenhouse Gas Reduction Fund.

In early 2023, CDFW announced increased funding availability through the Cannabis Restoration Grant Program (CRGP). Funding under CRGP facilitates environmental stewardship by providing financial assistance for projects that support watershed-scale restoration, among other priorities.

This funding also supports key initiatives, including conserving 30% of California's lands and coastal waters by 2030 under California's 30x30 initiative, Nature-Based Solutions and increasing the pace and scale of restoration through Cutting the Green Tape.

More information about these funding opportunities, including guidelines and how to apply, general information about CDFW's grant programs, as well as a schedule for upcoming grant solicitations, once available, can be found at www.wildlife.ca.gov/grants.

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Photo by Julia Stephens, Tuolumne River Trust - Cottonwood Meadow Hydrologic Improvement Project

- **Proposition 68 Klamath-Trinity Projects**
  CDFW is awarding $1.6 million in Prop. 68 Klamath-Trinity funding to four restoration projects in the Klamath-Trinity watershed.
- **Cutting the Green Tape for Scott River Watershed Restoration**
  ($127,000 awarded to the Scott River Watershed Council)
  “We are honored to receive support for our project,” said Betsy Stapleton, permitting specialist with the Scott River Watershed Council (SRWC). “The project builds off CDFW and State Water Resource Control Board initiatives to cut green tape and streamline restoration permitting, thereby helping achieve major state initiatives such as conserving 30% of California's lands by 2030. We work closely with state and federal agencies, Tribes, local landowners and other NGOs to scale up restoration in the Scott River Watershed, a critically important Klamath River tributary. This work addresses the impacts of climate change, competing demands for limited water and the need for salmonid recovery. Incorporating SRWC's place-based approach and long-term relationships to reduce the administrative permitting burden, the project will also ensure ongoing environmental protection, allowing limited restoration dollars to deliver more on the ground restoration. Thank you, CDFW.”
- **Scott River Tailings Restoration Phase 2**
  ($219,000 awarded to Scott River Watershed Council) This project will improve in-stream and floodplain conditions along the Scott River Yuba Dredge Tailings, a highly degraded 5-mile reach of the Scott River, for the benefit of anadromous salmonids.
  “Our family has owned this property for 40 years and has implemented various restoration activities over the years,” said landowner Larry Alexander. “We greatly value our collaboration with the Scott River Watershed Council in helping to spearhead some significant restoration activities on this particular reach of the Scott River. We are very gratified by the positive results of moving this reach back toward a more proper functioning condition riparian zone.”
- **Middle Stotenburg Creek Coho Habitat Enhancement Project**
  ($517,000 awarded to the Smith River Alliance)
  "This project is part of a larger effort to restore fish passage and salmonid habitat across the Smith Coastal Plain,” said Monica Scholey, program coordinator with

Smith River Alliance. “The Smith River Plain is a highly productive ecosystem and important feeding ground and migration stop for numerous aquatic species. Restoration of fish passage along the tributaries and slough channels of the Smith River Plain is vital for the management and protection for salmonid populations. Last year we removed several fish passage barriers just downstream from this new project site on Stotenburg Creek, a tributary on the Smith River Plain. Last winter we observed coho and Chinook salmon immediately benefit from this work. We are thankful for the support and opportunity to continue restoring fish passage in Stotenburg Creek.”

- **Marble Peaks Ranch Acquisition**
  ($814,000 to The Nature Conservancy — $799,000 funded by Prop. 68 Klamath-Trinity and $14,000 funded by Prop. 68 Severely Disadvantaged Communities)
  “The Nature Conservancy is grateful for the support of CDFW for the acquisition of this important property in the Scott River Watershed,” said Amy Campbell, project director for The Nature Conservancy. “Projects that lead to the restoration of habitat and permanent protection flows are essential to the recovery of coho salmon, especially in light of the recent dam removals in the Klamath Basin and can assist local communities with adjusting to a future where water security for both people and nature is essential.”
- **Proposition 68 Severely Disadvantaged Communities Projects**
  CDFW is awarding $4.56 million in Prop. 68 funding to five restoration projects to benefit severely disadvantaged communities.
- **Ormond Beach Perkins Road Area Restoration Project**
  ($251,000 awarded to the city of Oxnard)
  "The Perkins Road area of Ormond Beach, though located just half a mile from a severely disadvantaged community and the 200,000-resident population of Oxnard, is seldom visited by families and the general public for recreation or wildlife viewing,” said Eric Humel, grants coordinator with the city of Oxnard. “Receiving this grant funding will help to ensure that residents and youth have knowledge of the ecological significance of the wetland area and are able to learn about and participate in its restoration.”
- **Riparian Buffer Fencing on Iron Gate and Copco 1 Reservoirs**
  ($800,000 awarded to Trout Unlimited, Inc.)
  "This funding is a key investment in making sure the native vegetation planted in the former reservoir has the best chance possible to get established and restores the riparian habitat along the Klamath in the coming years,” said Evan Bulla, Klamath

River project coordinator with Trout Unlimited, Inc. “Healthy, diverse vegetation along the river corridor is important for water quality and critical habitat for the insects, birds and wildlife of the watershed. We're proud to be working with our partners on this piece of restoring the Klamath River following dam removal."

- **Prairie Creek Floodplain Restoration Project**
  ($3.1 million awarded to the Yurok Tribe)
  The project will restore rearing and spawning habitat to alleviate key limiting habitat and life stage factors necessary for recovery of listed salmonids at a strategic location within the Redwood Creek watershed.
- **Wetland and Mountain Meadow Restoration**
  As part of its Nature-Based Solutions Initiative, CDFW is awarding $6.7 million in Wetlands and Mountain Meadows Restoration Funding and Greenhouse Gas Reduction Funds to six projects that will restore and enhance wetlands and meadows throughout the state.
- **Cottonwood Meadow Hydrologic Improvement Project - Phase 1**
  ($244,000 awarded to Tuolumne River Trust)
  "Tuolumne River Trust is incredibly grateful to be awarded this critical funding to implement the first phase of restoration work at Cottonwood Meadow,” said Julia Stephens, River and Meadow Restoration Program director with Tuolumne River Trust. “This project will restore wetland conditions that will benefit over 30 acres of meadow habitat in an area affected by the 2013 Rim Fire and identified by the Stanislaus National Forest as a top priority for restoration for wildlife habitat. Tuolumne River Trust and the Stanislaus National Forest have been working hard towards this milestone for over three years and are ready to hit the ground running next summer."
- **Lower Klamath Refuge Water Deliveries**
  ($2.25 million to the California Waterfowl Association — $1.85 million from Nature Based Solutions-Wetlands and $392,000 from Prop. 68 Severely Disadvantaged Communities)
  “The Lower Klamath National Wildlife Refuge is arguably the most important wetland in California from a waterfowl breeding, molting and staging area for resident and migratory waterfowl, especially for California’s mallard population, which has been in steep decline over the past couple decades and now at record low levels,” said Jake Messerli, CEO of the California Waterfowl Association. “We are thankful for the California Department of Fish and Wildlife’s partnership and

support as we work to restore the Klamath refuges back to the vibrant wetland ecosystem they once used to be."

- **Tunnel Meadow Restoration and California Golden Trout Conservation Project**
  ($813,000 to Trout Unlimited, Inc.)
  "Tunnel Meadow is of critical importance to the persistence of the beloved state fish of California, the Golden Trout," said Jessica Strickland, California Inland Trout Program manager with Trout Unlimited, Inc. "Trout Unlimited, the Inyo National Forest and partners couldn't be more excited to add it to the portfolio of meadow restoration currently underway in the headwaters of the South Fork Kern River."
- **Windler Floodplain Habitat Enhancement**
  ($2 million to the Salmon River Restoration Council)
  This project will enhance salmonid rearing habitat at the Windler River bar, on a reach of the North Fork Salmon River, by lowering the floodplain and increasing connectivity. Riparian revegetation will increase shade and diversity along channels and across the river bar.
- **Design and Permitting for White Mallard Dam Improvements and Butte Creek Flow Enhancements**
  ($740,000 to Ducks Unlimited, Inc.)
  "This project is a win for salmon. Keeping more water in Butte Creek will minimize the chance that salmon stray into canals," said Cliff Feldheim, fish and wildlife biologist with Ducks Unlimited, Inc. "This project sets a precedent of how to manage Butte Creek water for salmon, agriculture and managed wetlands while developing a framework for landowners and biologists to work together to keep salmon in Butte Creek and out of canals."
- **Kuulanapo Wetland Preserve Restoration**
  ($1.1 million awarded to Lake County Land Trust)
  "It is with great appreciation that we accept this grant from CDFW," said Lake County Land Trust Board President Valerie G. M. Nixon. "We look forward to co-managing the Kuulanapo Wetland Preserve with The Big Valley Band of Pomo Indians. As we work together to restore the health of the wetlands, uplands and Clear Lake, we have much to learn from the descendants of the first people to manage this land."
- **Cannabis Restoration Funding**
  CDFW is awarding $4.3 million in Cannabis Program restoration funding to five projects to promote ecosystem restoration and ecological health throughout California.

- **Recovery of Foothill Yellow-Legged Frog in Tuolumne and Merced River Watersheds**

  ($368,000 to the Yosemite Conservancy)

  Since 2013, Yosemite Conservancy donors have contributed more than $2.2 million to protect aquatic species in Yosemite National Park, including targeted efforts to reintroduce once-common, now-endangered Sierra Nevada yellow-legged frogs. That effort has resulted in a measurable increase in yellow-legged frog numbers in Yosemite — one of few examples of a frog population rebounding as amphibians decline worldwide. This latest project involving Yosemite National Park biologists and CDFW will improve habitat in the Tuolumne and Merced River watershed to increase the yellow-legged frog population and benefit native stream-dwelling fish and wildlife species.

  “Protecting vulnerable species like yellow-legged frogs maintains the park’s biodiversity as nature envisioned,” said Yosemite Conservancy President Frank Dean. “By focusing on the stewardship of new areas of habitat, we hope to further increase the yellow-legged frog population and simultaneously improve conditions that also benefit a variety of other wildlife,” This project is a great example of an effective, sustained and collaborative wildlife management program."

  In addition to yellow-legged frog programs, Yosemite Conservancy support has gone to red-legged frogs, Yosemite toads, western pond turtles and several salamander species in Yosemite Valley and other areas of the park.

- **Enhancing Dune Habitat and Ecosystem Function within Northern Monterey County State Parks**

  ($467,000 to the San Jose State University Research Foundation)

  This project will expand local dune restoration efforts to Moss Landing State Beach and Zmudowski State Beach. Restoration efforts include removing invasive species, reestablishing native dune vegetation and encouraging sand deposition using natural materials to enhance habitat quality and increase coastal resilience.

- **Weaver Creek Habitat Restoration Implementation**

  ($1.4 million to the Yurok Tribe)

  This project will address degraded stream channel conditions along a 1-mile section of Weaver Creek, a coho-bearing stream with high intrinsic potential. These rehabilitation efforts will create instream habitat for many special status species, bolster riparian habitat and ensure a single threaded wet channel during summertime baseflow conditions.

- **Los Peñasquitos Watershed Assessment & Invasive Plant Management Plan**
  ($1,073,000 to Los Peñasquitos Lagoon Foundation)
  The project will conduct a comprehensive, multi-jurisdictional watershed assessment to map, evaluate and prioritize areas needing invasive plant treatment on a watershedscale.
- **Fish Passage and Habitat Improvements to Dry Creek Yuba and Nevada Counties**
  ($991,000 to Sierra Streams Institute)
  In conjunction with the U.S.-Air-Force-funded removal of Beale Lake Dam, this project will restore access to 15 miles of historic riverine migratory corridor for fall-run Chinook salmon and the federally threatened Central Valley steelhead and create approximately 3 acres of improved spawning habitat. “Sierra Streams Institute is excited to be able to improve salmonid habitat throughout the entire Dry Creek watershed, from its headwaters, through Beale Air Force Base and our work with them on restoring habitat after removal of the Beale Lake Dam, down to the confluence with the Feather River,” said Sierra Streams Institute Executive Director Jeff Lauder. “Dry Creek historically supported robust populations of Chinook salmon. Through this series of projects partnering with the Army Corps of Engineers, Sutter Buttes Regional Land Trust and CDFW, we can take steps toward restoring an active Chinook population in this vital foothill stream system."

Categories: Grants

Tagged: restoration grants | salmon | steelhead | Klamath-Trinity watershed | wetlands | meadows | Nature Based Solutions

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2022-2024 News Releases

Fall Migration Brings the Return of Avian Influenza in Wild Birds

December 6, 2024

Avian Influenza H5N1 is again circulating in susceptible wild birds in California during fall migration.

California sits at the epicenter of the Pacific Flyway, one of North America's major migratory routes that bring millions of visiting birds through the state each fall and winter.

Preliminary detections of avian influenza have been made in wild birds collected in late October and November from several counties including Contra Costa, Marin, Monterey, Los Angeles, San Benito, San Luis Obispo, and San Diego.

Prior to these detections, the last confirmed detections of avian influenza H5N1 in wild birds in California was in July 2024. Avian influenza in free-ranging wild birds is primarily

a disease of waterfowl and shorebirds, the natural hosts of avian influenza viruses whose wetland and other watery habitat is a significant factor for disease transmission among these species.

Predators and scavengers that feed on infected birds may also be at risk of acquiring infection. The Eurasian strain of Highly Pathogenic Avian Influenza (HPAI) H5N1 was first detected in California in July 2022. During the past two seasons, detections of the virus in wild birds have generally subsided during spring and summer and re-emerged in the fall as waterfowl and other waterbirds undertake fall migration.

Avian influenza spreads through direct bird-to-bird contact and may also spread to birds through contaminated surfaces including hands, shoes, clothing and hunting gear. While the Centers for Disease Control considers the transmission risk of avian influenza to people to be low, residents and waterfowl hunters are advised to take precautions to protect themselves, hunting dogs, falconry birds, poultry and pet birds.

Steps that may help reduce the spread of avian influenza include:

- Report dead wild birds, and other wildlife, to CDFW using the mortality reporting form. While it is not possible to test every wild bird for avian influenza, all mortality reports are important and help disease specialists monitor the outbreak.
- Report sick and dead poultry to the California Department of Food and Agriculture (CDFA) hotline at 1 (866) 922-2473.
- Prevent contact between domestic birds and wild birds, especially waterfowl. Exclude wild birds from accessing chicken or other domestic bird feed and water.
- Do not feed waterfowl or other waterbirds at park ponds as it may increase the congregation of birds and contribute to disease spread.
- Do not bring potentially sick wild birds home or move sick birds to another location.
- Before transporting potentially sick wild birds to wildlife rehabilitation centers, veterinary clinics, or other animal facilities, contact the facility for guidance and to determine if the bird should be collected.
- If recreating outdoors in areas with large concentrations of waterfowl and other waterbirds, wash clothing and disinfect footwear and equipment before traveling to other areas or interacting with domestic birds.
- Where it can be done so safely, dead birds may be disposed of to help reduce exposure to new birds and minimize scavenging by birds and mammals that also may be susceptible to infection. Dead birds may be collected into a plastic bag and placed in the regular trash collection. Guidance on protective equipment is available

from the California Department of Public Health. If assistance or guidance is needed with the disposal of dead birds on private property, contact your county environmental health department or animal services for options available in your area.

Additional safety recommendations for waterfowl hunters:

- Harvest only waterfowl that look and behave healthy. Do not handle or eat sick game. Do not handle wild birds that are obviously sick or found dead.
- Field dress and prepare game outdoors or in a well-ventilated area. Do not dress wild game in the vicinity of poultry or pet birds.
- Wear rubber gloves or other impermeable disposable gloves while handling and cleaning game.
- Remove and discard intestines soon after harvesting and avoid direct contact with intestinal contents. Place waste in a plastic bag and dispose in a garbage container that is protected from scavengers.
- Do not eat, drink, smoke or vape while handling dead game.
- When done handling game, wash hands thoroughly with soap and water (or alcohol-based hand sanitizer if soap and water are unavailable), and clean knives, equipment and surfaces that came in contact with game. Wash hands before and after handling any meat.
- Keep harvested waterfowl cool (either with ice or refrigeration), below 45 degrees Fahrenheit, until processed and then refrigerate or freeze.
- Thoroughly cook all game to an internal temperature of 165 degrees Fahrenheit before consuming.
- Clean and disinfect clothing, footwear and hunting gear before traveling to other areas. As appropriate, footwear and gear may be washed with soap and water, then disinfected in household bleach diluted 1:10 with water for at least 10 minutes.
- Bathe dogs with pet shampoo after hunting outings, and do not feed dogs raw meat, organs or other tissues from harvested waterfowl.
- Falconers should avoid hunting waterfowl, and other waterbirds, during the avian influenza outbreak.

For more information on avian influenza H5N1, check out CDFW's informational flyer addressing frequently asked questions and links to additional resources. The USDA maintains the official list of detections on its website. For guidance on keeping domestic birds healthy, please visit the CDFA and USDA websites.

For guidance on orphaned or injured live wild birds, please contact your nearest wildlife rehabilitation center prior to collecting the animal. Be advised that some wildlife rehabilitation centers may have restrictions on the wildlife species they will admit.

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Categories: Hunting, Species, Waterfowl, Wildlife

Tagged: Highly Pathogenic Avian Influenza | Pacific Flyway | Waterfowl | Duck Hunting | Goose Hunting

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California Fish and Game Commission
Wildlife Resources Committee (WRC) Work Plan
Scheduled Topics and Timeline for Items Referred to WRC

Updated January 6, 2025

Topics	Category	Sep 2024	Jan 2025	May 2025
Periodic and Annual Regulations				
Upland (Resident) Game Birds	Regulatory	X/R		X
Big Game Hunting	Regulatory	X/R	X/R	X
Waterfowl Hunting	Annual Regulatory	X/R		X
Central Valley Sport Fishing	Annual Regulatory	X/R		X
Klamath River Basin Sport Fishing	Annual Regulatory	X/R		X
Inland Sport Fishing (including striped bass)	Regulatory	X/R	X/R	
Department Lands	Regulatory			X
Regulations & Legislative Mandates				
Falconry	Referral for Review		X	X
Restricted Species	Regulatory			
Take of Nongame Mammals	Referral for Review	X	X/R	

KEY: X Discussion scheduled X/R Recommendation potentially developed and moved to FGC

California Fish and Game Commission: Perpetual Timetable for Anticipated Regulatory Actions

January 8, 2025

Subject of Rulemaking	Title 14 Section(s)	WRC Sacramento January 15, 2025	FGC Sacramento February 12, 2025	FGC Sacramento February 13, 2025	MRC Sacramento March 13, 2025	TC Sacramento April 15 2025	FGC Sacramento April 16, 2025	FGC Sacramento April 17, 2025	FGC Teleconference May 14, 2025	WRC Sacramento May 15, 2025	FGC Sacramento June 11, 2025	FGC Sacramento June 12, 2025	MRC Sacramento July 17, 2025	TC Sacramento August 12, 2025	FGC Sacramento August 13, 2025	FGC Sacramento August 14, 2025	WRC Sacramento September 11, 2025	FGC Sacramento October 8, 2025	FGC Sacramento October 9, 2025	MRC Sacramento November 6, 2025	TC Sacramento December 9, 2025	FGC Sacramento December 10, 2025	FGC Sacramento December 11, 2025
Central Valley Sport Fishing (Annual)	7.40(b)(4), (43), (66), (80)		N				D		A				E 7/15										
Klamath River Basin Sport Fishing (Annual)	7.40(b)(50)		N				D		A				E 7/15										
Waterfowl Hunting, 2025-26 (Annual)	502		D				A						E 7/1										
Inland Sport Fish Bag Limits, Gear, and Low-Flow Information	2.30, 5.00, 7.50, 8.00, 703	E 1/1																					
Fisheries Logbook Forms and Fishing Block Charts	120.7, 122, 165, 190, 705.1	E 1/1																					
Commercial California Halibut and White Seabass Set Gill Nets	174.1				**Withdrawn from OAL on 11/25. Re-submittal pending re-notice of modified regulatory language**																		
Possession of Wildlife and Wildlife Rehabilitation	679, 679.1, 679.2, 679.3, 679.4, 679.5, 679.6, 679.7, 679.8, 679.9, 703					E 4/1																	
Federal Groundfish and Associated Species	27.20, 27.40, 27.45, 27.50, 27.65, 28.27, 28.28, 28.29, 28.54, 28.65	E 1/1																					
Emergency Regulations for Mandatory Testing for Chronic Wasting Disease	708.5		**EE 1/22**																				
Recreational Take of Barred Sand Bass	28.30			D				A			E 6/1												
Commercial Red Sea Urchin [2]	120.7			N				A					E 7/1										
White Sturgeon Sport Fishing During CESA Candidacy Emergency	5.78, 27.93				**EE 3/5**																		
White Sturgeon Sport Fishing During CESA Candidacy Emergency (First 90-Day Extension)	5.78, 27.93				E 3/5						**EE 6/3**												
White Sturgeon Sport Fishing During CESA Candidacy Emergency (Second 90-Day Extension)	5.78, 27.93						A				E 6/3						**EE 9/1**						
White Sturgeon Sport Fishing 2084	5.78, 5.79, 5.80, 27.90, 27.92, 27.93		N				D				A						E 9/1						
Importation of Live Aquatic Plants and Animals for Research Purposes	236					E 4/1																	
Inland Sport Fishing Special Waters, Bait, Gear, and Boundary Adjustments	4.20, 5.00, 5.85, 7.00, 7.40, 7.50, 8.10						N				D				A								
Commercial Harvest of Sea Palm; Kelp and Other Aquatic Plants Harvest Reporting	165, 705.1			N				D/A															
Market Squid Fishery Management Plan Amendment	53.00, 53.01, 53.02, 53.03							N				D				A							
Commerical Take of Market Squid	149							N				D				A							
Recreational Crab Fishery Gear and Validations	29.80, 29.85, 190, 195, 701							N				D				A							
Big Game Hunting, 2025-26 Seasons, and Chronic Wasting Disease Testing	360, 362, 363, 364, 364.1, 708.5		D				A						E 7/1										

Future Rulemakings: Schedule to be Determined

Subject of Rulemaking	Title 14 Section(s)	WRC Sacramento January 15, 2025	FGC Sacramento February 12, 2025	FGC Sacramento February 13, 2025	MRC Sacramento March 13, 2025	TC Sacramento April 15 2025	FGC Sacramento April 16, 2025	FGC Sacramento April 17, 2025	FGC Teleconference May 14, 2025	WRC Sacramento May 15, 2025	FGC Sacramento June 11, 2025	FGC Sacramento June 12, 2025	MRC Sacramento July 17, 2025	TC Sacramento August 12, 2025	FGC Sacramento August 13, 2025	FGC Sacramento August 14, 2025	WRC Sacramento September 11, 2025	FGC Sacramento October 8, 2025	FGC Sacramento October 9, 2025	MRC Sacramento November 6, 2025	TC Sacramento December 9, 2025	FGC Sacramento December 10, 2025	FGC Sacramento December 11, 2025
Santa Cruz Harbor Salmon Fishing (CFGC Petition 2016-018)	TBD																						
European Green Crab (CFGC Petition 2017-006)	TBD																						
Possess Game / Process Into Food	TBD																						
American Zoological Association / Zoo and Aquarium Association	671.1																						
Night Hunting in Gray Wolf Range (CFGC Petition 2015-010)	474																						
Donation of Fish to Non-Profit Organizations [1]	TBD																						
Electronic Report Cards	1.74, 5.79, 5.80, 5.81, 5.87, 5.88																						
Shellfish Aquaculture Best Management Practices	TBD																						
Ridgeback Prawn Incidental Take Allowance	120(e)																						

KEY

CFGC = California Fish and Game Commission MRC = CFGC Marine Resources Committee WRC = CFGC Wildlife Resources Committee TC = CFGC Tribal Committee OAL = Office of Administrative Law

EM = Emergency **EE = Emergency Expires** E = Anticipated Effective Date (**RED "X" = expedited OAL review**) EUF = Effective Upon Filing w/ Secretary of State

N = Notice Hearing D = Discussion Hearing A = Adoption Hearing V = Committee Vetting R = Committee Recommendation 1 = Considers CFGC Petition 2023-10 2 = Considers CFGC Petition 2023-04