

Staff Summary for October 8-9, 2025

14. Recreational Take of Striped Bass**Today's Item****Information** ☐**Action** ☒

Consider adopting proposed amendments to recreational striped bass harvest size limits and consider taking final action under the California Environmental Quality Act.

Summary of Previous/Future Actions

- | | |
|--|--------------------------|
| • Granted petition 2020-005 AM 1 | December 2020 |
| • Granted petition 2022-12 | December 2022 |
| • Wildlife Resources Committee (WRC) vetting | Various 2023-2024; WRC |
| • Notice hearing | June 11-12, 2025 |
| • Discussion hearing | August 13-14, 2025 |
| • Today's adoption hearing | October 8-9, 2025 |

Background

At its June 2025 meeting, the Commission authorized publication of its intent to amend regulations related to recreational striped bass harvest size limits. The notice appeared in the California Regulatory Notice Register on August 1, 2025. The proposed regulations – initiated by two different public petitions for regulation change granted for consideration by the Commission in 2020 and 2022 – are intended to complement the existing 18-inch minimum size limit with a 30-inch maximum size limit, which would result in a slot limit of 18 to 30 inches for harvesting striped bass in anadromous waters and marine waters north of Point Conception. Further detail and background on the proposed regulatory action noticed by the Commission can be found in the August 2025 meeting staff summary (Exhibit 1), the initial statement of reasons (Exhibit 2), and the proposed regulatory language (Exhibit 3).

Staff Analysis

The Commission has shown a strong commitment to California's fish and wildlife while also supporting public opportunities for hunting and fishing, as enumerated through its policy and regulatory decisions over time. Recent examples include approving a conservation plan for western Joshua tree, adopting emergency regulations to increase fishing opportunities for recreational groundfish, reducing the recreational barred sand bass limit, and increasing the northern pintail bag limit.

Over the last three years, the Commission and its Wildlife Resources Committee have weighed a number of factors related to the proposed slot limit for recreational take of striped bass, as evidenced through public statements and discussions with stakeholders during meetings. Some of the factors include the goals of the proposal, effectiveness in achieving the stated goals, the proposal's necessity, the level of impact on other species in the ecosystem, public support or opposition, consistency with Commission policies, and more. Taken together, these factors embody a high level of uncertainty with which the Commission must grapple.

In an effort to address the uncertainty, the ongoing dialogue has been informed in numerous ways, including a Department analysis and report on the proposed slot limit, reviews of

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relevant scientific literature, an angler preference survey, public comment, Department presentations and responses to questions, historical data, an economic and fiscal impact analysis, and an environmental analysis pursuant to CEQA. The culmination of this very public discussion, including multiple Wildlife Resources Committee vetting sessions and, importantly, robust dialogue throughout the rulemaking's public notice period, as required by the California Administrative Procedure Act, has led to today's decision point. The Commission is being asked to balance the uncertainty associated with the proposed regulation and the interests of anglers, striped bass biology and populations, and the needs of other species in the ecosystems.

California Environmental Quality Act (CEQA)

The Department prepared a draft negative declaration for the Commission's consideration; Commission staff reviewed and evaluated the draft, determining that it reflects the Commission's independent judgment (Exhibit 5; SCH #2025090234). Staff submitted the draft negative declaration to the State Clearinghouse, along with a notice of completion, consistent with CEQA and Section 15205(e), Title 14, on September 5, 2025. The period for public review and comment ended on October 6, 2025. The documents are available at [CEQAnet](#).

Significant Public Comments

1. Several commenters support the proposal for various reasons, including the current lack of a robust trophy fishery, possible development of sport fishing opportunities, the long history of striped bass fishing in California, and population benefits (Exhibit 9).
2. A commenter opposes the proposal on the grounds that striped bass are a non-native species that is detrimental to other native fish species that are experiencing environmental and population difficulties (Exhibit 10).
3. Several commenters oppose the proposal for multiple reasons, including lack of sufficient data to indicate a crisis for striped bass, potential negative effects on other fish species if striped bass populations increase, and striped bass's status as a non-native species (Exhibit 11).
4. A form email campaign (20 received), opposes the proposal on the grounds that striped bass are not a native fish, striped bass predate on native fish species like salmon and steelhead, and the Department's angler survey is unrepresentative of fishers statewide (Exhibit 12).
5. Fish On opposes the proposal as detrimental to native fisheries and urges the Commission to prioritize the needs of native species while rejecting the proposal (Exhibit 13).
6. Westlands Water District opposes the proposal as unnecessary, underdeveloped in its analysis of potential environmental impacts, and inconsistent with Commission policies. The district also believes that the draft negative declaration prepared pursuant to CEQA is inadequate and that a full environmental impact report must be prepared instead. (Exhibit 14)

Recommendation

Department: The Department supports either no change to the current regulation or approval of a slot limit as proposed by the Commission.

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Exhibits

1. [Staff summary for Agenda Item 13, August 2025 Commission meeting \(for background purposes only\)](#)
2. [Initial statement of reasons](#)
3. [Proposed regulatory language](#)
4. [Economic and fiscal impact analysis \(STD. 399\)](#)
5. [Draft initial study and negative declaration](#)
6. [Notice of completion and environmental document transmittal form and State Clearinghouse summary form](#)
7. [Department memo transmitting pre-adoption statement of reasons, received September 24, 2025](#)
8. [Pre-adoption statement of reasons, including summary of and recommended responses to public comments received through August 13, 2025, received September 24, 2025.](#)
9. [Emails from Tristin Nguyen; James Smith, owner and operator of California Dawn Sportfishing and Vice President of Golden Gate Fisherman's Association; Ken Baccetti, President, California Striped Bass Association Isleton Delta Chapter; Cynthia M. LeDoux-Bloom; Mitchell Gauthier; and Dan Simms; representative of 26 total emails received between August 10, 2025 and September 25, 2025.](#)
10. [Letter from James Lambert, received August 13, 2025](#)
11. [Emails from Michael Pipkins; Pasha Foroudi; Kevin Lentz; Josh Zhou; and Ray Hiemstra; received between August 15, 2025 and September 25, 2025.](#)
12. [Email from Dylan Sohngen, representative of 20 substantially similar emails received between September 11, 2025 and September 25, 2025](#)
13. [Email from Anupa Asokan, Executive Director, Fish On, received September 24, 2025](#)
14. [Email from Allison Febbo, General Manager, Westlands Water District, received September 25, 2025](#)

Motion

Moved by _____ and seconded by _____ that the Commission finds that the negative declaration reflects the independent judgment of the Commission, certifies the negative declaration, approves the proposed project pursuant to the California Environmental Quality Act, and **adopts** the proposed amendments to sections 5.75 and 27.85 related to slot limits for recreational harvest of striped bass.

OR

Moved by _____ and seconded by _____ that the Commission **not proceed** with the proposed amendments to sections 5.75 and 27.85 related to slot limits for recreational harvest of striped bass.

**Staff Summary for June 11-12, 2025
For Background Purposes Only**

25. Striped Bass

Today's Item

Information ☐

Action ☒

Consider authorizing publication of notice of intent to amend regulations regarding recreational striped bass harvest size limits.

Summary of Previous/Future Actions

- | | |
|--|--------------------------|
| • Granted petition 2020-005 AM 1 in concept | December 9-10, 2020 |
| • Granted petition 2022-12 | December 14-15, 2022 |
| • Wildlife Resources Committee (WRC) vetting | Various 2023 - 2024; WRC |
| • Today's notice hearing | June 11-12, 2025 |
| • Discussion hearing | August 13-14, 2025 |
| • Adoption hearing | October 8-9, 2025 |

Background

At its December 2020 meeting, the Commission granted petition 2020-005 AM 1 to potentially establish an inland waters slot limit for the harvest of striped bass. At its December 2022 meeting, the Commission granted a similar petition to establish a slot limit for the harvest of striped bass in marine waters, consistent with the inland slot limit request. The Department evaluated both petitions and presented its findings to WRC over the course of several meetings in 2023 and 2024 (see Exhibit 8). At its September 2024 meeting, WRC recommended that the Commission support a future rulemaking regarding striped bass slot limits from 18 to 30 inches (exhibits 1 and 2).

Consistent with the WRC recommendation, the Department requests that the Commission authorize a notice for proposed amendments to the striped bass regulations; the Department transmitted draft regulatory documents. The draft initial statement of reasons (ISOR; Exhibit 4) includes a detailed breakdown of the history of the striped bass fishery in California, the Department's public outreach efforts regarding striped bass regulations, its evaluation of the petitions for regulation change, and the rationale for its striped bass slot limit recommendation.

Existing regulations already establish – with a few exceptions – an 18-inch minimum size for harvest of striped bass in both inland and marine environments, as well as a bag and possession limit of two fish.

Draft Proposed Regulations

The draft proposed regulations, as detailed in exhibits 4 and 5, would amend sections 5.75 and 27.85 to add a maximum harvest size for striped bass of 30 inches, effectively creating a slot limit of 18 to 30 inches for the harvest of striped bass in both inland and marine environments. Striped bass regulations in non-anadromous waters, however, would not change. The recommendation aims to benefit both fishers and striped bass populations by creating a more robust trophy fishery, reducing recruitment overfishing, and allowing increased spawning by

**Staff Summary for June 11-12, 2025
For Background Purposes Only**

larger mature fish. The proposal also makes minor clarifying amendments to striped bass regulations.

Overall, the proposal is to amend striped bass regulations to:

- Add a maximum harvest size limit of 30 inches for striped bass in both inland and marine waters;
- add a reference to the definition of anadromous waters in inland striped bass regulations;
- replace all references to a “minimum size limit” with a “harvest size limit;” and
- add language specifying that striped bass regulations in non-anadromous waters will remain at an 18-inch harvest size minimum and a bag and possession limit of two fish

Today the Department will present an overview of the draft proposed regulations (Exhibit 7).

Significant Public Comments (N/A)

Recommendation

Commission staff: Authorize publication of a notice of intent to amend regulations related to striped bass slot limits, as recommended by the Department and WRC.

Committee: Support the Department request for regulation amendments related to striped bass slot limits.

Department: Authorize publication of a notice of intent to amend regulations as detailed in the draft ISOR and draft proposed regulatory language.

Exhibits

1. Staff Summary for Agenda Item 2, September 12, 2024 WRC meeting (*for background purposes only*)
2. Department presentation from September 12, 2024 WRC
3. Department memo transmitting draft ISOR, received May 16, 2025
4. Draft ISOR
5. Draft proposed regulatory language
6. Draft economic and fiscal impact statement
7. Department presentation
8. *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

Motion

Moved by _____ and seconded by _____ that the Commission authorizes publication of a notice of its intent to amend sections 5.85 and 27.85 related to slot limits for harvesting striped bass.

State of California
Fish and Game Commission
Initial Statement of Reasons for Regulatory Action

Amend Sections 5.75(c) and (d), and 27.85(c)
Title 14, California Code of Regulations
Re: Striped Bass Harvest Size Limits

I. Date of Initial Statement of Reasons: March 27, 2025

II. Dates and Locations of Scheduled Hearings

(a) Notice Hearing

Date: June 11, 2025

Location: Sacramento, CA

(b) Discussion Hearing

Date: August 13, 2025

Location: Sacramento, CA

(c) Adoption Hearing

Date: October 8, 2025

Location: Sacramento area

III. Description of Regulatory Action

(a) Statement of Specific Purpose of Regulatory Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary

Unless otherwise specified, all section references in this document are to Title 14 of the California Code of Regulations (CCR). “Commission” refers to the California Fish and Game Commission unless otherwise specified. “Department” or CDFW refers to the California Department of Fish and Wildlife unless otherwise specified.

The Department sets management actions and regulations for the striped bass (*Morone saxatilis*) fishery in California. Currently, any striped bass 18 inches or greater may be harvested within anadromous and marine waters north of Point Conception with a daily bag limit of two fish. The proposed regulation change would impose a “slot limit” within these waters whereby only striped bass from 18 to 30 inches total length would be available for harvest in the sport fishery, with no proposed change to the bag limit or season. A slot limit is a management tool that is designed to allow fish within the size range “slot” to be legally harvested while protecting fish outside that slot.

Striped bass are native to the East and Gulf Coasts of North America and were introduced to San Francisco Bay in 1879. A commercial fishery was established in the San Francisco Bay area by the late 1880s (Scofield 1930). 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 Striped Bass Management Plan 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 (Title 14 CCR 5.75, Title 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 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 (Commission, 2020).

The Nor-Cal Guides and Sportsmen's Association (NCGASA) submitted a regulation change proposal to the Commission on August 1, 2022 (Tracking number [TN] 2022-12). The proposal was to change the MLL from 18 inches to 20 inches and impose a maximum size of 30 inches. The stated goals were:

- To protect the species by increasing the minimum length to allow more fish to mature and successfully spawn prior to harvest, and
- To protect the larger fish that tend to be the most prolific spawners and are becoming increasingly rare in the fishery

At its December 2022 meeting, the Commission granted the petition, 2022-12, for consideration in a future rulemaking, along with previously-granted Petition 2020-005 requesting a freshwater striped bass slot limit. The Commission directed staff to align specific proposed regulations with those developed for Petition 2020-005. Initial discussions took place at the January 2023 Wildlife Resources Committee meeting.

The Department examined the necessity of the proposed changes and developed a report, *California Department of Fish and Wildlife Evaluation of Nor-Cal Guides and Sportsmen's Association (NCGASA) Proposed 20-30 Inch Harvest Slot Limit (HSL) for Striped Bass*. On September 12, 2024, the Department provided the Wildlife Resources Committee with a presentation of the report's findings. The Department recommendation is as follows:

"The Department does not recommend a 20-30-inch Harvest Slot Limit (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% of 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."

At the September 12, 2024, Commission's Wildlife Resources Committee meeting, the Department presented its support of an 18-30-inch HSL rather than a 20-30 inch HSL. The data show it would benefit anglers by creating a trophy fishery and increasing total catch. Additionally,

modeling indicates it would decrease risk of recruitment overfishing, and increase egg contribution from older fish to total fecundity.

The Department does not support increasing the MLL from 18-20 inches because it would likely not produce the biological or fisheries responses described in the petition. The Department has determined that increasing the current MLL from 18- 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. Additionally, increasing the MLL to 20 inches is not supported by the angling public contacted through an electronic questionnaire distributed by the Department (n = 18,751). The Striped Bass Angler Preference Questionnaire indicated that 71% supported the current 18-inch MLL. The Department is proposing changes to the following regulations in Title 14, CCR:

- Amend Section 5.75 Striped Bass, subsection (c)
 - Add the maximum harvest size limit of 30 inches.
 - Add reference to the section defining anadromous waters.
 - Amend text to replace references of “minimum size limit” to “harvest size limit”.
 - These changes are necessary to address the petition’s request to provide a 30-inch upper limit which could result in decreased risk of recruitment overfishing (and thus stock conservation benefits) and increased catch and trophy fishing opportunity.
- Add Section 5.75 Striped Bass, subsection (d)(2)
 - Add subsection that specifies that in non-anadromous waters not mentioned in 5.75(d)(1), a minimum size of 18 inches total length and a harvest bag limit of 2 applies.
 - This change is necessary to clarify that the proposed regulation change only applies to anadromous waters and that non-anadromous water regulations for striped bass will not change.
- Amend Section 27.85 Striped Bass, subsection (c)
 - Add the maximum harvest size limit of 30 inches.
 - Amend text to replace references of “minimum size limit” to “harvest size limit”.
 - This change is necessary to address the petition’s request to provide a 30-inch upper limit which could result in decreased risk of recruitment overfishing (and thus stock conservation benefits) and increased catch and trophy fishing opportunity.

(b) Goals and Benefits of the Regulation

As stated in Fish and Game Code Section 1700, Conservation of Aquatic Resources, it is the policy of this state to encourage the conservation, maintenance, and utilization of the living resources of the ocean and other waters under the jurisdiction and influence of the state for the

benefit of all the citizens of the state and to promote the development of local fisheries and distant water fisheries based in California in harmony with international law, respecting fishing and the conservation of the living resources of the ocean and other waters under the jurisdiction and influence of the state. The objectives of this policy include, but are not limited to, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence, and the maintenance of a sufficient resource to support a reasonable sport use. Adoption of scientifically based harvest size limits, and bag and possession limits provide for the maintenance of sufficient sport fish populations to ensure their continued existence.

The benefits of the proposed regulations are consistent with the sustainable management of California's sport fisheries, general health and welfare of California residents, and promotion of businesses that rely on sport fishing throughout California.

(c) Authority and Reference Sections from Fish and Game Code for Regulation

Authority: Section(s) 200, 205, 265, 270, and 275, Fish and Game Code

Reference: Section(s) 110, 200, 205 and 265, Fish and Game Code

(d) Specific Technology or Equipment Required by Regulatory Change

None.

(e) Identification of Reports or Documents Supporting Regulation Change

Commission Petition 2020-005: Striped Bass Slot Limit

Commission Petition 2022-12: Striped Bass Slot Limit (inland & marine)

California Department of Fish and Wildlife, 2024. Evaluation of Regulation Change Petition 2022-12: Proposed 20 – 30-inch harvest slot limit for Striped Bass (*Marone saxatalis*).

California Department of Fish and Wildlife, 2024. Evaluation of Nor-Cal Guides and Sportsmen's Association (NCGASA) Proposed 20 – 30-inch harvest slot limit for Striped Bass (Appendices) (*Marone saxatalis*).

Kohlhorst, D. W. 1999. Status of striped bass in the Sacramento–San Joaquin Estuary. California Fish and Game 85(1):31–36.

Scofield, E.C. 1930. The Striped Bass of California (*Roccus lineatus*). Division of Fish and Game of California Fish Bulletin No. 29. 84 pp.

Stevens, D.E. and D.W. Kohlhorst. 2001. California's Marine Living Resources: A Status Report. California Department of Fish and Game. pp 460–464. Available at <https://wildlife.ca.gov/Conservation/Marine/Status/2001#28129681-frontmatter-introduction-background>.

(f) Public Discussions of Proposed Regulations Prior to Notice Publication

The rulemaking was proposed by stakeholders at the public Striped Bass Town Hall meeting on August 24, 2022. CDFW also sent out an Angler Preference Survey to ~1 million anglers in summer-fall 2022.

Proposed regulations were discussed at the January 11, 2023, September 12, 2024 and January 15, 2025 Fish and Game Commissions Wildlife Resources Committee meetings.

IV. Description of Reasonable Alternatives to Regulatory Action

(a) Alternatives to Regulation Change

The petitioners requested the implementation of a 20-30 inch harvest slot limit. In its evaluation, the Department found that this slot limit would reduce recreational fishing opportunities while not producing sufficiently improved biological or fisheries responses beyond the proposed 18-30 inch harvest slot limit recommendation. Upon consultation, NCGASA endorsed the 18-30 inch harvest slot limit. No other alternative regulation was identified by or brought forward to the Department that would result in the same desired regulatory effect.

(b) No Change Alternative

The no change alternative would leave the current regulations in place.

(c) Description of Reasonable Alternatives that Would Lessen Adverse Impact on Small Business

None.

V. Mitigation Measures Required by Regulatory Action

The proposed regulatory action will have no significant adverse effect on the environment, and therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made:

(a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States

The Commission does not anticipate any statewide adverse economic impacts that would directly affect businesses within the state or would affect their ability to compete with businesses in other states. The proposed changes provide clarification of existing regulations regarding the size limits for taking striped bass that are necessary for the continued preservation of the resource without changing fishing opportunities via changes to take limits and thus, the prevention of adverse economic impacts.

(b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment

The Commission is not aware of any impacts from the proposed action that would affect the creation or elimination of jobs, creation or elimination of existing businesses, the expansion of businesses doing business within California, or any benefits to the health and welfare of California residents or to worker safety. The proposed action is not anticipated to change the

level of fishing activity enough to affect the demand for goods and services related to striped bass sportfishing enough to impact the demand for labor, nor induce the creation of new businesses, nor eliminate or induce the expansion of businesses in California. The adoption of scientifically based harvest size limits and bag and possession limits provide for the maintenance of sufficient sport fish populations to ensure their continued existence. The Commission believes Californians will benefit generally from stable populations of striped bass in California's waters and the associated recreational outdoor opportunities and responsible management of environmental resources.

(c) Cost Impacts on a Representative Private Person or Business

The Commission is not aware of any private sector cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action. The proposed changes do not change any fees or create new penalties to be fined and are not anticipated to change the level of fishing activity enough to affect the demand for goods and services related to the recreational sport fishing industry.

(d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State

The Commission does not anticipate any costs or savings to state agencies as a result of the proposed regulations, nor does it anticipate costs or savings in Federal Funding to the State.

(e) Nondiscretionary Costs/Savings to Local Agencies

None.

(f) Programs Mandated on Local Agencies or School Districts

None.

(g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code

None.

(h) Effect on Housing Costs

None.

VII. Economic Impact Assessment

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State

The Commission is not aware of any impacts from the proposed action that would affect the creation or elimination of jobs within the state, as the proposed action is not anticipated to change the level of fishing activity enough to affect the demand for goods and services related to striped bass sportfishing enough to impact the demand for labor.

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State

The Commission is not aware of any impacts from the proposed action that would affect the creation of new businesses or the elimination of existing businesses, as they are not

anticipated to change the level of fishing activity enough to affect the demand for goods and services related to striped bass sportfishing in a way that would induce the creation of new businesses or eliminate any existing businesses in California.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State

The Commission is not aware of any impacts from the proposed action that would affect the expansion of businesses doing business within California, as they are not anticipated to change the level of fishing activity enough to affect the demand for goods and services related to striped bass sportfishing enough to induce the expansion of businesses currently doing business within California.

(d) Benefits of the Regulation to the Health and Welfare of California Residents

None.

(e) Benefits of the Regulation to Worker Safety

None.

(f) Benefits of the Regulation to the State's Environment

The adoption of scientifically based harvest size limits and bag and possession limits provide for the maintenance of sufficient sport fish populations to ensure their continued existence.

(g) Other Benefits of the Regulation

None.

Informative Digest/Policy Statement Overview

Currently, any striped bass 18 inches or greater may be harvested within anadromous and marine waters north of Point Conception with a daily bag limit of two fish. The proposed regulation change would impose a slot limit within these waters whereby only striped bass from 18 to 30 inches total length would be available for harvest in the sport fishery, with no proposed change to the bag limit or season.

Striped bass are native to the East and Gulf Coasts of North America, and were introduced to San Francisco Bay in 1879. A commercial fishery was established in the San Francisco Bay area by the late 1880s but 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. In response to declines in legal-size striped bass in the 1970's and at the request of anglers, the California legislature established a 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, which remain in effect today. The Striped Bass Management Plan was ended in 2004 due to increases in the striped bass population and concern over the impact of striped bass predation on native fish species. In 2020, the Fish and Game Commission committed to sustain striped bass populations in support of a recreational fishery.

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 proposal was to change the MLL from 18 inches to 20 inches and impose a maximum size of 30 inches. The stated goals were:

- To protect the species by increasing the minimum length to allow more fish to mature and successfully spawn prior to harvest and
- To protect the larger fish that tend to be the best spawners and are becoming increasingly rare in the fishery

The Department developed a report, California Department of Fish and Wildlife Evaluation of Nor-Cal Guides and Sportsmen's Association (NCGASA) Proposed 20-30 Inch Harvest Slot Limit (HSL) for Striped Bass. On September 12, 2024, the Department provided the Wildlife Resources Committee with a presentation of the report's findings. The Department supported an 18-30-inch HSL because it would benefit anglers by creating a trophy fishery and increasing total catch.

The Department is proposing changes to the following regulations in Title 14, CCR:

- Amend Section 5.85 Striped Bass, subsection (c)
 - Add the maximum harvest size limit of 30 inches.
 - Add reference to the section defining anadromous waters.
 - Amend text to replace references to "minimum size limit" with "harvest size limit".
- Add Section 5.85 Striped Bass, subsection (d)(2)
 - Add section that specifies that in non anadromous waters not mentioned in 5.75(d)(1), a minimum size of 18 inches total length and a harvest bag limit of 2 applies.
- Amend Section 27.85 Striped Bass, subsection (c)

- Add the maximum harvest size limit of 30 inches.

Amend text to replace references to “minimum size limit” with “harvest size limit”.

Benefits of the Regulations:

As stated in Fish and Game Code Section 1700, Conservation of Aquatic Resources, it is the policy of this state to encourage the conservation, maintenance, and utilization of the living resources of the ocean and other waters under the jurisdiction and influence of the state for the benefit of all the citizens of the state and to promote the development of local fisheries and distant water fisheries based in California in harmony with international law, respecting fishing and the conservation of the living resources of the ocean and other waters under the jurisdiction and influence of the state. The objectives of this policy include, but are not limited to, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence, and the maintenance of a sufficient resource to support a reasonable sport use. Adoption of scientifically based harvest size limits, and bag and possession limits provide for the maintenance of sufficient sport fish populations to ensure their continued existence.

The benefits of the proposed regulations are consistent with the sustainable management of California’s sport fisheries, general health and welfare of California residents, and promotion of businesses that rely on sport fishing throughout California.

Consistency and Compatibility with Existing Regulations:

Article IV, Section 20 of the State Constitution specifies that the Legislature may delegate to the Commission such powers related to the protection and propagation of fish and game as the Legislature sees fit. The Legislature has delegated authority to the Commission to promulgate recreational fishing regulations (Fish and Game Code sections 200 and 205). Commission staff has searched the California Code of Regulations and has found no other state regulations that address the recreational take of striped bass. The Commission has reviewed its own regulations and finds that the proposed regulations are consistent with other recreational fishing regulations in Title 14, CCR, and therefore finds that the proposed regulations are neither inconsistent nor incompatible with existing state regulation.

Proposed Regulatory Language

Subsection (c) and (d) of Section 5.75, Title 14, CCR, is amended to read:

§ 5.75. Striped Bass.

(a) Open season: All year except for closures listed in special regulations.

(b) Limit: Two, except in waters listed in (d) below.

(c) ~~Minimum-Harvest size limit: No fish less than 18 inches or greater than 30 inches total length may be taken or possessed in anadromous waters as defined in Section 1.04, Title 14, CCR, and inland waters as defined in Section 1.53, Title 14, CCR except in waters listed in (d) below.~~

(d) Exceptions:

(1) In the Colorado River District, the Southern District, and New Hogan, San Antonio and Santa Margarita lakes.

(A) Limit: Ten.

(B) Minimum size: No size limit.

(2) All other non-anadromous waters, lakes and/or reservoirs not mentioned in Section 5.75(d)(1)

(A) Limit: Two

(B) Minimum size: 18 inches total length

(e) For the purpose of these regulations, any striped bass hybrid with white bass is considered to be striped bass.

NOTE: Authority cited: Sections 200, 205, 265 and 270, Fish and Game Code.

Reference: Sections 110, 200, 205 and 265, Fish and Game Code.

Subsection (c) of Section 27.85, Title 14, CCR, is amended to read:

§ 27.85. Striped Bass.

(a) Open season: All year.

(b) Limit: Two.

(c) ~~Minimum~~ Harvest size limits:

(1) North of Pt. Conception, ~~18 inches total length.~~ no fish less than 18 inches total length or greater than 30 inches total length may be taken or possessed.

(2) South of Pt. Conception, no ~~minimum~~ harvest-size limit.

(d) Methods of take: No striped bass may be taken while using a sinker weighing over four pounds, or while using any power driven gurdy or winch. Striped bass may only be taken by angling as defined in Section 1.05, Title 14, CCR, spearfishing pursuant to Section 1.76, and bow and arrow fishing tackle; snagging is an illegal method of take.

NOTE: Authority cited: Sections 200, 205, 265 and 275, Fish and Game Code.

Reference: Sections 110, 200 and 205, Fish and Game Code.

ECONOMIC AND FISCAL IMPACT STATEMENT (REGULATIONS AND ORDERS)

STD. 399 (Rev. 10/2019)

ECONOMIC IMPACT STATEMENT

DEPARTMENT NAME California Fish and Game Commission	CONTACT PERSON Dixie Van Allen	EMAIL ADDRESS fgc@fgc.ca.gov	TELEPHONE NUMBER 916 902-9291
DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400 Amend Sections 5.75(c) and (d), and 27.85(c), T.14 CCR re: Striped Bass Harvest Size Limits			NOTICE FILE NUMBER Z

A. ESTIMATED PRIVATE SECTOR COST IMPACTS *Include calculations and assumptions in the rulemaking record.*

1. Check the appropriate box(es) below to indicate whether this regulation:

- | | |
|--|---|
| <input type="checkbox"/> a. Impacts business and/or employees | <input type="checkbox"/> e. Imposes reporting requirements |
| <input type="checkbox"/> b. Impacts small businesses | <input type="checkbox"/> f. Imposes prescriptive instead of performance |
| <input type="checkbox"/> c. Impacts jobs or occupations | <input type="checkbox"/> g. Impacts individuals |
| <input type="checkbox"/> d. Impacts California competitiveness | <input checked="" type="checkbox"/> h. None of the above (Explain below): |

No new private sector costs are incurred, only affects size limits with no change to take limits.

***If any box in Items 1 a through g is checked, complete this Economic Impact Statement.
If box in Item 1.h. is checked, complete the Fiscal Impact Statement as appropriate.***

2. The _____ (Agency/Department) estimates that the economic impact of this regulation (which includes the fiscal impact) is:

- ☐ Below \$10 million
- ☐ Between \$10 and \$25 million
- ☐ Between \$25 and \$50 million
- ☐ Over \$50 million *[If the economic impact is over \$50 million, agencies are required to submit a [Standardized Regulatory Impact Assessment](#) as specified in Government Code Section 11346.3(c)]*

3. Enter the total number of businesses impacted: _____

Describe the types of businesses (Include nonprofits): _____

Enter the number or percentage of total businesses impacted that are small businesses: _____

4. Enter the number of businesses that will be created: _____ eliminated: _____

Explain: _____

5. Indicate the geographic extent of impacts: ☐ Statewide
☐ Local or regional (List areas): _____

6. Enter the number of jobs created: _____ and eliminated: _____

Describe the types of jobs or occupations impacted: _____

7. Will the regulation affect the ability of California businesses to compete with other states by making it more costly to produce goods or services here? ☐ YES ☐ NO

If YES, explain briefly: _____

ECONOMIC AND FISCAL IMPACT STATEMENT (REGULATIONS AND ORDERS)

STD. 399 (Rev. 10/2019)

ECONOMIC IMPACT STATEMENT (CONTINUED)

B. ESTIMATED COSTS *Include calculations and assumptions in the rulemaking record.*

1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime? \$ _____

a. Initial costs for a small business: \$ _____ Annual ongoing costs: \$ _____ Years: _____

b. Initial costs for a typical business: \$ _____ Annual ongoing costs: \$ _____ Years: _____

c. Initial costs for an individual: \$ _____ Annual ongoing costs: \$ _____ Years: _____

d. Describe other economic costs that may occur: _____

2. If multiple industries are impacted, enter the share of total costs for each industry: _____

3. If the regulation imposes reporting requirements, enter the annual costs a typical business may incur to comply with these requirements.
Include the dollar costs to do programming, record keeping, reporting, and other paperwork, whether or not the paperwork must be submitted. \$ _____

4. Will this regulation directly impact housing costs? ☐ YES ☐ NO

If YES, enter the annual dollar cost per housing unit: \$ _____

Number of units: _____

5. Are there comparable Federal regulations? ☐ YES ☐ NO

Explain the need for State regulation given the existence or absence of Federal regulations: _____

Enter any additional costs to businesses and/or individuals that may be due to State - Federal differences: \$ _____

C. ESTIMATED BENEFITS *Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. Briefly summarize the benefits of the regulation, which may include among others, the health and welfare of California residents, worker safety and the State's environment: _____

2. Are the benefits the result of: ☐ specific statutory requirements, or ☐ goals developed by the agency based on broad statutory authority?

Explain: _____

3. What are the total statewide benefits from this regulation over its lifetime? \$ _____

4. Briefly describe any expansion of businesses currently doing business within the State of California that would result from this regulation: _____

D. ALTERNATIVES TO THE REGULATION *Include calculations and assumptions in the rulemaking record. Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. List alternatives considered and describe them below. If no alternatives were considered, explain why not: _____

ECONOMIC AND FISCAL IMPACT STATEMENT (REGULATIONS AND ORDERS)

STD. 399 (Rev. 10/2019)

ECONOMIC IMPACT STATEMENT (CONTINUED)

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered:

Regulation: Benefit: \$ _____ Cost: \$ _____

Alternative 1: Benefit: \$ _____ Cost: \$ _____

Alternative 2: Benefit: \$ _____ Cost: \$ _____

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives: _____

4. Rulemaking law requires agencies to consider performance standards as an alternative, if a regulation mandates the use of specific technologies or equipment, or prescribes specific actions or procedures. Were performance standards considered to lower compliance costs? ☐ YES ☐ NO

Explain: _____

E. MAJOR REGULATIONS *Include calculations and assumptions in the rulemaking record.*

California Environmental Protection Agency (Cal/EPA) boards, offices and departments are required to submit the following (per Health and Safety Code section 57005). Otherwise, skip to E4.

1. Will the estimated costs of this regulation to California business enterprises **exceed \$10 million**? ☐ YES ☐ NO

If YES, complete E2. and E3

If NO, skip to E4

2. Briefly describe each alternative, or combination of alternatives, for which a cost-effectiveness analysis was performed:

Alternative 1: _____

Alternative 2: _____

(Attach additional pages for other alternatives)

3. For the regulation, and each alternative just described, enter the estimated total cost and overall cost-effectiveness ratio:

Regulation: Total Cost \$ _____ Cost-effectiveness ratio: \$ _____

Alternative 1: Total Cost \$ _____ Cost-effectiveness ratio: \$ _____

Alternative 2: Total Cost \$ _____ Cost-effectiveness ratio: \$ _____

4. Will the regulation subject to OAL review have an estimated economic impact to business enterprises and individuals located in or doing business in California exceeding \$50 million in any 12-month period between the date the major regulation is estimated to be filed with the Secretary of State through 12 months after the major regulation is estimated to be fully implemented?

☐ YES ☒ NO

If YES, agencies are required to submit a [Standardized Regulatory Impact Assessment \(SRIA\)](#) as specified in Government Code Section 11346.3(c) and to include the SRIA in the Initial Statement of Reasons.

5. Briefly describe the following:

The increase or decrease of investment in the State: _____

The incentive for innovation in products, materials or processes: _____

The benefits of the regulations, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, and the state's environment and quality of life, among any other benefits identified by the agency: _____

ECONOMIC AND FISCAL IMPACT STATEMENT (REGULATIONS AND ORDERS)

STD. 399 (Rev. 10/2019)

FISCAL IMPACT STATEMENT

A. FISCAL EFFECT ON LOCAL GOVERNMENT *Indicate appropriate boxes 1 through 6 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

- ☐ 1. Additional expenditures in the current State Fiscal Year which are reimbursable by the State. (Approximate)
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

\$ _____

- ☐ a. Funding provided in _____

Budget Act of _____ or Chapter _____, Statutes of _____

- ☐ b. Funding will be requested in the Governor's Budget Act of _____

Fiscal Year: _____

- ☐ 2. Additional expenditures in the current State Fiscal Year which are NOT reimbursable by the State. (Approximate)
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

\$ _____

Check reason(s) this regulation is not reimbursable and provide the appropriate information:

- ☐ a. Implements the Federal mandate contained in _____

- ☐ b. Implements the court mandate set forth by the _____ Court.

Case of: _____ vs. _____

- ☐ c. Implements a mandate of the people of this State expressed in their approval of Proposition No. _____

Date of Election: _____

- ☐ d. Issued only in response to a specific request from affected local entity(s).

Local entity(s) affected: _____

- ☐ e. Will be fully financed from the fees, revenue, etc. from: _____

Authorized by Section: _____ of the _____ Code;

- ☐ f. Provides for savings to each affected unit of local government which will, at a minimum, offset any additional costs to each;

- ☐ g. Creates, eliminates, or changes the penalty for a new crime or infraction contained in _____

- ☐ 3. Annual Savings. (approximate)

\$ _____

- ☐ 4. No additional costs or savings. This regulation makes only technical, non-substantive or clarifying changes to current law regulations.

- ☒ 5. No fiscal impact exists. This regulation does not affect any local entity or program.

- ☐ 6. Other. Explain _____

**ECONOMIC AND FISCAL IMPACT STATEMENT
(REGULATIONS AND ORDERS)**

STD. 399 (Rev. 10/2019)

FISCAL IMPACT STATEMENT (CONTINUED)

B. FISCAL EFFECT ON STATE GOVERNMENT *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

\$ _____

It is anticipated that State agencies will:

☐ a. Absorb these additional costs within their existing budgets and resources.

☐ b. Increase the currently authorized budget level for the _____ Fiscal Year

☐ 2. Savings in the current State Fiscal Year. (Approximate)

\$ _____

☒ 3. No fiscal impact exists. This regulation does not affect any State agency or program.

☐ 4. Other. Explain _____

C. FISCAL EFFECT ON FEDERAL FUNDING OF STATE PROGRAMS *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

\$ _____

☐ 2. Savings in the current State Fiscal Year. (Approximate)

\$ _____

☒ 3. No fiscal impact exists. This regulation does not affect any federally funded State agency or program.

☐ 4. Other. Explain _____

FISCAL OFFICER SIGNATURE
DocuSigned by:


6558B761E2D347D...

DATE
7/17/2025

The signature attests that the agency has completed the STD. 399 according to the instructions in SAM sections 6601-6616, and understands the impacts of the proposed rulemaking. State boards, offices, or departments not under an Agency Secretary must have the form signed by the highest ranking official in the organization.

AGENCY SECRETARY

 Bryan Cash

7/21/2025

DATE
07/15/2025

Finance approval and signature is required when SAM sections 6601-6616 require completion of Fiscal Impact Statement in the STD. 399.

DEPARTMENT OF FINANCE PROGRAM BUDGET MANAGER



DATE

STD. 399 Addendum

Amend Sections 5.75(c) and (d), and 27.85(c) of Title 14, California Code of Regulations, Regarding Striped Bass Harvest Size Limits

Background

Currently, any striped bass 18 inches or greater may be harvested within anadromous and marine waters north of Point Conception with a daily bag limit of two fish. The proposed regulation change would impose a slot limit within these waters whereby only striped bass from 18 to 30 inches total length would be allowable for harvest in the sport fishery, with no proposed change to the bag limit.

Striped bass are native to the East and Gulf coasts of North America and were introduced to San Francisco Bay in 1879. A commercial fishery was established in the San Francisco Bay area by the late 1880s but 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. In response to declines in legal-size striped bass in the 1970's 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, which remain in effect today.

The Striped Bass Management Plan ended in 2004 due to increases in the striped bass population and concern over the impact of striped bass predation on native fish species. In 2020, the California Fish and Game Commission (Commission) committed to sustain striped bass populations in support of a recreational fishery.

The Nor-Cal Guides and Sportsmen's Association (NCGASA) submitted a regulation change proposal to the Commission on August 1, 2022 (Tracking number 2022-12). The proposal was to change the MLL from 18 inches to 20 inches and impose a maximum size of 30 inches. The stated goals were to:

- Protect the species by increasing the minimum length to allow more fish to mature and successfully spawn prior to harvest, and
- protect the larger fish that tend to be the best spawners and are becoming increasingly rare in the fishery.

The California Department of Fish and Wildlife (Department) examined the necessity of the proposed changes and developed a report, "California Department of Fish and Wildlife Evaluation of NCGASA Proposed 20-30 Inch Harvest Slot Limit (HSL) for Striped Bass." On September 12, 2024, the Department provided the Commission's Wildlife Resources Committee with a presentation of the report's findings. The Department supported an 18-30-inch HSL because it would benefit anglers by creating a trophy fishery and increasing total catch.

The Department is proposing changes to the following regulations in Title 14, CCR:

- Amend Section 5.85 Striped Bass, subsection (c).
 - Add the maximum size limit of 30 inches.
 - Add reference to the section defining anadromous waters.
 - Amend text to replace references to “minimum size limit” to “harvest size limit”.
- Add Section 5.85 Striped Bass, subsection (d)2 ,
 - Add section that specifies that in non-anadromous waters not mentioned in 5.75(d)1, a minimum size of 18 inches total length and a harvest bag limit of 2 applies.
- Amend Section 27.85 Striped Bass, subsection (c) ,
 - Add the maximum size limit of 30 inches.
 - Amend text to replace references to “minimum size limit” to “harvest size limit”.

Economic Impact Statement

A. Estimated Private Sector Costs Impacts

Answer 1: h. None of the above (Explain below):

The Commission is not aware of any private sector cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action. The proposed changes to existing regulations regarding the size limits for taking striped bass have the goal of expansion of the resource – without changing fishing opportunities via changes to take limits – and therefore are not anticipated to have economic impacts. These changes are also not anticipated to change the level of fishing activity enough to affect the demand for goods and services related to striped bass sport fishing or to impact the demand for labor, nor induce the creation of new businesses, nor eliminate or induce the expansion of businesses in California.

Fiscal Impact Statement

A. Fiscal Effect on Local Government

Answer 5. No fiscal impact exists. This regulation does not affect any local entity or program. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution.

B. Fiscal Effect on State Government

Answer 3. No fiscal impact exists. This regulation does not affect any State agency or program. The Department program implementation and enforcement are projected to remain the same with a stable volume of fishing activity.

C. Fiscal Effect on Federal Funding of State Programs

Answer 3. No fiscal impact exists. This regulation does not affect any federally funded State agency or program.

**DRAFT Negative Declaration for
Proposed Amendments to
Recreational Striped Bass Harvest Size Limits
Title 14, California Code of Regulations**

Lead Agency:
California Fish and Game Commission

Prepared by:
California Department of Fish and Wildlife Fisheries Branch

August 2025 Draft

This Report Has Been Prepared Pursuant to the
California Environmental Quality Act of 1970

State Clearinghouse #

Project Summary and Findings

Project

Unless otherwise specified, all section references in this document are to Title 14 of the California Code of Regulations (CCR).

The California Fish and Game Commission (Commission) proposes to amend Sections 5.75(c) and (d), and 27.85(c) related to striped bass harvest limits for sport fishing for the 2026 season and onward. Currently, any striped bass 18 inches or greater may be harvested within anadromous and marine waters north of Point Conception with a daily bag limit of two fish. The proposed regulation change would impose a “slot limit” within these waters whereby only striped bass from 18 to 30 inches total length would be available for harvest in the sport fishery, with no proposed change to the bag limit or season. A slot limit is a management tool that is designed to allow fish within the size range “slot” to be legally harvested while protecting fish outside that slot.

These proposed changes were requested through the public petition for regulation change process. The Department developed a report to analyze the proposed regulatory changes, and 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. Additionally, modeling indicates a slot limit would increase egg contribution from older fish to total fecundity.

The Department has evaluated the proposed amendments and presented its findings to the Commission for consideration.

Findings

The initial study and the Commission’s review of the project showed that the project will not have any significant or potentially significant effects on the environment, and therefore no alternatives or mitigation measures are proposed to avoid or reduce any significant effects on the environment. The project will not have a significant effect on aesthetics, agriculture and forestry resources, air quality, biological resources, cultural resources, energy, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation, tribal cultural resources, utilities and service systems, and wildfire.

Basis of the Findings

Based on the initial study, implementing the project will not have any significant or potentially significant effects on the environment. Therefore, the Commission is filing this negative declaration pursuant to the California Environmental Quality Act, Public Resources Code Section 21080, subdivision (c).

This proposed negative declaration consists of the following:

- Introduction – Project Description and Background Information
- Initial Study Environmental Checklist Form
- Explanation of the Response to the Initial Study Environmental Checklist Form

Project Description and Background Information For Proposed Amendments to Striped Bass Harvest Size Limits

Introduction

The proposed amendments to the striped bass sport fishing regulations will impose a 30-inch maximum harvest limit in marine and anadromous waters north of Point Conception, which in combination with the current minimum size limit, will result in a harvest “slot limit” of 18 to 30 inches total length. The proposed amendments are considered and evaluated by the Commission during three scheduled public meetings. The Commission makes the final determination on what amendments to the regulations should be adopted at the Commission’s adoption meeting. The Commission received the Department’s recommended amendments to the striped bass recreational fishing regulations at the June 12, 2025 meeting (notice meeting) and will consider adopting the amendments at the October 8-9, 2025 meeting (adoption meeting). The Commission is the lead agency for the purposes of the California Environmental Quality Act (CEQA) for this project. Under California Fish and Game Code Section 200, the Commission has the authority to regulate the taking or possession of fish, including take for the purpose of sport fishing.

Project Goals and Objectives

The goal of this project is to amend the striped bass sport fishing regulations in furtherance of the state’s conservation policy as set forth in Section 1700 of the Fish and Game Code. The conservation policy includes the following objectives:

- (a) The maintenance of sufficient populations of all species;
- (b) The recognition of the importance of recreational uses;
- (c) The maintenance of a sufficient resource to support a reasonable sport use;
- (d) The growth of local commercial fisheries; and
- (e) The management of the fisheries under the state’s jurisdiction.

The goal of this project is to amend the striped bass sport fishing regulations in furtherance of the Commission’s Striped Bass Policy. It is the policy of the Fish and Game Commission that:

1. The Department of Fish and Wildlife shall monitor and manage the striped bass fishery of the Sacramento-San Joaquin Estuary for vitality, consistent with Commission policy that the Department emphasize programs that ensure, enhance, and prevent loss of sport fishing opportunities.
2. The Department shall ensure that actions to increase striped bass abundance are consistent with the Department's long-term mission and public trust responsibilities including those related to threatened and endangered species and other species of greatest conservation need. Recognizing issues associated with potential incidental take of these species, the Department shall strive to maintain a healthy, self-sustaining striped bass population in support of a robust recreational fishery. Consistent with the Commission Policy on Cooperation, the Department shall work with relevant stakeholders, organizations, and the public to develop appropriate objectives to achieve these broad aims.

3. The Department shall work toward these goals through any appropriate means. Such means may include actions to help maintain, restore, and improve habitat beneficial to striped bass, reduce impacts of invasive aquatic vegetation, improve water quality, reduce loss of striped bass from water projects and diversions, and assess the status and population of striped bass in the Delta.

Background

Striped bass are native to the East and Gulf Coasts of North America and were introduced to San Francisco Bay in 1879. A commercial fishery was established in the San Francisco Bay area by the late 1880s (Scofield 1930). 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 striped bass Management Plan 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 (Title 14 CCR 5.75, Title 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 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 (Commission, 2020).

The Nor-Cal Guides and Sportsmen's Association (NCGASA) submitted a regulation change proposal to the Commission on August 1, 2022 (Tracking number [TN] 2022-12). The proposal was to change the MLL from 18 inches to 20 inches and institute a maximum size of 30 inches. The stated goals were:

- To protect the species by increasing the minimum length to allow more fish to mature and successfully spawn prior to harvest, and
- To protect the larger fish that tend to be the most prolific spawners and are becoming increasingly rare in the fishery.

At its December 2022 meeting, the Commission granted the petition, 2022-12, for consideration in a future rulemaking, along with the previously-granted Petition 2020-005 requesting a freshwater striped bass slot limit. The Commission directed staff to align specific proposed regulations with those developed for Petition 2020-005. Initial discussions took place at the January 2023 Wildlife Resources Committee meeting.

The Department examined the potential effects of the proposed changes and developed a report, *California Department of Fish and Wildlife Evaluation of Nor-Cal Guides and Sportsmen's Association (NCGASA) Proposed 20-30 Inch Harvest Slot Limit (HSL) for Striped Bass*. On September 12, 2024, the Department provided the Wildlife Resources Committee

with a presentation of the report's findings. The Department did not recommend changing the minimum size limit, but was supportive of creating an upper size limit. According to the report, "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....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 data show an 18-30-inch HSL could benefit anglers by creating a trophy fishery and increasing total catch. Additionally, modeling indicates it could decrease risk of recruitment overfishing and increase egg contribution from older fish to total fecundity.

This regulation change aims to improve the striped bass fishery. A decline in recruitment of striped bass juveniles has been observed over the past several decades, and by protecting the size class of >30-inch adults, the Department hopes to increase recruitment. However, the limiting factor constraining striped bass recruitment is likely poor environmental conditions, so the expected increase in contribution from spawners >30 inches may not result in positive population growth (CDFW 2024).

The Department's evaluation concludes that instituting an 18-30-inch HSL would have a less than significant impact on salmonid and smelt populations through striped bass predation. Based on available piscivorous predation data in California, there is insufficient evidence to support that striped bass predation is a primary contributor or limiting factor to survival of salmonid and smelt populations. Striped bass are one of many piscivorous predators in the Central Valley rivers and bays that contribute to consumption of salmonids, smelt and other native fishes. Striped bass are opportunistic predators that do not specialize in specific prey species, so an increase in population does not proportionally correlate to increased consumption of salmonids and smelt. Research indicates larger striped bass are less likely to target smaller prey such as smelt and smolt size salmonids. The primary limiting factors for salmonid and smelt survival are environmental conditions including limited spawning and rearing habitat and poor water quality (CDFW 2024).

In summary, the Department concludes that establishing an upper HSL at 30 inches will not likely contribute to population level impacts to salmonid and smelt populations due to (1) sub-optimal predator-prey ratios, (2) high variation in the size of prey consumed, (3) little evidence of prey specialization, and (4) limiting factors impacting recruitment of juvenile striped bass.

Exercising its independent judgment, Commission staff has reviewed and concurs with the Department's analysis and conclusions. The Commission, for good cause, places great weight on the Department's expertise as a State wildlife trustee under the California Environmental Quality Act.

Project Location

The striped bass sport fishing regulation amendments addressed by the initial study/negative declaration occur throughout the anadromous inland and ocean waters of California north of Point Conception.

Schedule

If adopted by the Commission at its October 8 2025, meeting, and approved by the Office of Administrative Law, the proposed regulatory amendments described below are expected to be effective on January 1, 2026.

Environmental Checklist Form

1. Project Title:
Striped Bass Harvest Size Limits Regulations
Title 14, California Code of Regulations
2. Lead Agency Name and Address:
California Fish and Game Commission
715 P Street, 16th Floor
Sacramento, CA 95814
3. Contact Person and Phone Number:
Melissa Miller-Henson, (916) 653-4899
4. Project Location:
Inland and ocean waters of California.
5. Project Sponsor's Name and Address:
California Department of Fish and Wildlife
Fisheries Branch
1010 Riverside Parkway
West Sacramento, CA 95605
6. General Plan designation:
N/A (statewide)
7. Zoning:
N/A (statewide)
8. Description of Project:
The California Fish and Game Commission proposes to amend selected sport fishing regulations for striped bass. The proposed regulation change would impose a "slot limit" within these waters whereby only striped bass from 18 to 30 inches total length would be available for harvest in the sport fishery, with no proposed change to the bag limit or season. A slot limit is a management tool that is designed to allow fish within the size range "slot" to be legally harvested while protecting fish outside that slot. This amendment is necessary to maintain consistency with the Department's mission to manage California's diverse fisheries resources for their ecological value and their use and enjoyment by the public.
9. Surrounding land uses and setting:
N/A
10. Other Public Agencies Whose Approval Is Required:
None.
11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.31?
On March 11, 2025, the Commission mailed a tribal notification to Native American tribes traditionally and culturally affiliated with the project area. No tribes have requested consultation.

Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- | | | |
|--|---|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agriculture and Forestry | <input type="checkbox"/> Air Quality |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Energy |
| <input type="checkbox"/> Geology/Soils | <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards and Hazardous Materials |
| <input type="checkbox"/> Hydrology/Water Quality | <input type="checkbox"/> Land Use/Planning | <input type="checkbox"/> Mineral Resources |
| <input type="checkbox"/> Noise | <input type="checkbox"/> Population/Housing | <input type="checkbox"/> Public Services |
| <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation | <input type="checkbox"/> Tribal Cultural Resources |
| <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Wildfire | <input type="checkbox"/> Mandatory Findings of Significance |

This project will not have a "Potential Significant Impact" on any of the environmental factors listed above; therefore, no boxes are checked.

Determination

On the basis of this initial evaluation:

- ☒ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in

an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

A large gray rectangular box redacting the signature of the Executive Director.

Melissa Miller-Henson, Executive Director

September 5, 2025

Date

Responses to Initial Study Environmental Checklist

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTM)	Less Than Significant Impact	No Impact (NI)
I. Aesthetics. Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
II. Agriculture And Forestry Resources. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
III. Air Quality. Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
d) Result in any other emissions (such as those leading to odors) affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
IV. Biological Resources. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	LTS	<input type="checkbox"/>

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
V. Cultural Resources. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
VI. Energy. Would the project:				

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
VII. Geology and Soils. Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
VIII. Greenhouse Gas Emissions. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
IX. Hazards And Hazardous Materials. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
X. Hydrology and Water Quality. Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
i) result in substantial erosion or siltation on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollution runoff; or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
iv) impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XI. Land Use and Planning. Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XII. Mineral Resources. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XIII. Noise. Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
general plan or noise ordinance, or applicable standards of other agencies?				
b) Generation of excessive ground borne vibration or ground borne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XIV. Population and Housing. Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XV. Public Services. Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XVI. Recreation.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XVII. Transportation. Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XVIII. Tribal Cultural Resources.				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XIX. Utilities and Service Systems. Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Result in a determination by the waste water treatment provider, which serves or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XX. Wildfire. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
XXI. Mandatory Findings Of Significance.				

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation (LTSM)	Less Than Significant Impact	No Impact (NI)
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NI

Explanation of Responses to Initial Study Environmental Checklist

I. Aesthetics

- a) The project will not have an adverse effect on a scenic vista. Such an impact will not occur because the project will not involve any construction, land alteration, or modification of any buildings or structures.
- b) The project will not damage scenic resources such as trees, rock outcroppings, and historic buildings. Such an impact will not occur because the project will not involve any construction, land alteration, or modification of any buildings or structures.
- c) The project will not substantially degrade, in nonurbanized areas, the existing visual character or quality of public views of the site and its surroundings. Such an impact will not occur because the project will not involve any construction, land alteration, or modification of any buildings or structures.
- d) The project will not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

II. Agriculture and Forestry Resources

- a) The project will not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to non-agricultural use. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.
- b) The project will not conflict with existing zoning for agricultural use or a Williamson Act contract. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.
- c) The project will not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timber zoned Timberland Production. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.
- d) There will be no loss of forest land and the project will not result in the conversion of forest land to non-forest use. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.
- e) The project will not involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland to non-agricultural use. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.

III. Air Quality

- a) The project will not conflict with or obstruct implementation of the applicable air quality plan. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.

- b) The project will not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. Such an impact will not occur because the project involves no ongoing sources of air pollution.
- c) The project will not expose sensitive receptors to substantial pollutant concentrations. Such an impact will not occur because the project will not increase pollutant concentrations.
- d) The project will not create objectionable odors affecting a substantial number of people.

IV. Biological Resources

- a) The project will have a Less Than Significant Impact, either directly or through habitat modifications, on certain species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, National Marine Fisheries Service (NMFS), or U.S. Fish and Wildlife Service (USFWS). There is no substantial evidence, in light of the whole record before the agency, that the project will have a significant effect on these biological resources as explained below.

This determination is based largely on the Department report, “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*)” (CDFW 2024). The Department’s evaluation concludes that instituting an 18-30-inch HSL would have a less than significant impact on salmonid and smelt populations through striped bass predation (CDFW 2024). Based on available piscivorous predation data in California, there is insufficient evidence to support that striped bass predation is a primary contributor or limiting factor to survival of salmonid and smelt populations. Striped bass are one of many piscivorous predators in the Central Valley rivers and bays that contribute to consumption of salmonids, smelt and other native fishes. Striped bass are opportunistic predators that do not specialize in specific prey species (Zeug et al. 2017, Brandl et al. 2021), so an increase in population does not proportionally correlate to increased consumption of salmonids and smelt.

Striped bass predation on salmonids (and other native fish) may be more concentrated in some areas and less in others (Stevens 1966, Sabal et al. 2016, Michel et al. 2018), and may be higher at certain times of the year (Thomas 1967, Stompe et al. 2020). However, the specific relationships are complex and there are significant uncertainties in striped bass predation patterns (Grossman et al. 2013).

Studies of striped bass stomach contents generally find relatively small amounts of salmonids or smelt, if at all (Zeug et al. 2017, Michel et al. 2018, Brandl et al. 2021, Young et al. 2022). Research indicates larger striped bass are less likely to target smaller prey such as smelt and smolt size salmonids (Nobriga and Feyrer 2008). Additionally, the limiting factor constraining striped bass recruitment is likely poor environmental conditions, so the expected increase in contribution from spawners >30 inches may not result in positive population growth. The primary limiting factors for salmonid and smelt survival are environmental conditions, including limited spawning and rearing habitat and poor water quality (CDFW 2024).

It should also be noted that striped bass eat a number of non-native species (Peterson et al. 2023), which in turn eat salmonids, smelt, and other native species; a reduction in these species (however modest) from any larger striped bass would be beneficial to those native populations.

In summary, establishing an upper HSL at 30 inches will not likely contribute to population level impacts to salmonid and smelt populations due to (1) sub-optimal predator-prey ratios, (2) high variation in the size of prey consumed, (3) little evidence of prey specialization, and (4) limiting factors impacting recruitment of juvenile striped bass. See CDFW (2024) in Appendix A for a more complete analysis and literature survey supporting these conclusions.

- b) The project will not have an adverse effect on any riparian habitat or other sensitive natural communities identified in local or regional plans, policies and regulations, or by the California Department of Fish and Wildlife or the USFWS. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.
- c) The project will not have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.
- d) The project will not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.
- e) The project will not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. Such an impact will not occur because the project will not result in any construction, land alteration, or land use changes.
- f) The project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.

V. Cultural Resources

- a) The project will not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5. The project does not involve ground disturbing work or work permanently modifying any existing structure or resource and thus has no potential to affect historical resources.
- b) The project will not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5. The project does not involve ground disturbing work and thus has no potential to affect archaeological resources.
- c) The project will not disturb any human remains, including those interred outside of formal cemeteries. The project does not involve ground disturbing work and thus has no potential to affect human remains.

VI. Energy

- a) The project would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operations. Such an impact will not occur because the project will not use energy resources.

- b) The project will not affect nor obstruct any state or local plan for renewable energy or energy efficiency.

VII. Geology and Soils

- a i) The project will not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area, or based on other substantial evidence of a known fault. Such an impact will not occur because the project will not create any structures for human habitation.
- ii) The project will not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking. Such an impact will not occur because the project will not create any structures for human habitation.
- iii) The project will not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. Such an impact will not occur because the project will not create any structures for human habitation.
- iv) The project will not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. Such an impact will not occur because the project will not create any structures for human habitation.
- b) The project will not result in substantial soil erosion or the loss of topsoil. Such an impact will not occur because the project will not involve ground disturbing work.
- c) The project will not be located on a geologic unit or soil that is unstable, or that would become unstable and potentially result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse. Such an impact will not occur because the project will not involve ground disturbing work.
- d) The project will not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property. Such an impact will not occur because the project will not involve ground disturbing work.
- e) The project will not create any sources of waste water requiring a septic system.
- f) The project will not indirectly destroy a unique paleontological resource or site or unique geologic feature.

VIII. Greenhouse Gas Emissions

- a) The project will not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. The project will not involve construction, land alteration, or land use changes.
- b) The project will not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The project would result in the production of very low greenhouse gas emissions.

IX. Hazards and Hazardous Materials

- a) The project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The project will not involve the transport, use, or disposal of hazardous materials.
- b) The project will not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The project will not involve the transport, use, or disposal of hazardous materials.
- c) The project will not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. The project will not involve the transport, use, or emission of any hazardous materials.
- d) The project will not be located on any site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.
- e) The project will not be located within an airport land use plan area.
- f) The project will not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. The project will not involve any construction, land alteration, or land use changes.
- g) The project will not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. The project will not involve any construction, land alteration, or land use changes.

X. Hydrology and Water Quality

- a) The project will not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. The project will not involve any construction, land alteration, water use, or water discharge.
- b) The project will not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. The project will not involve any construction, land alteration, or groundwater use.
- c i) The project will not substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river or through the addition of impervious surfaces in a manner which would result in substantial erosion or siltation on- or off-site because the project will not involve any construction or land alteration.
- ii) The project will not substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river or through the addition of impervious surfaces in a manner which would result in flooding on- or off-site because the project will not involve any construction or land alteration.
- iii) The project will not create or contribute runoff water that would exceed the capacity of existing or planned storm-water drainage systems, or provide substantial additional sources of polluted runoff because the project will not involve any construction or land alteration.

- iv) The project will not impede or redirect flood flows because the project will not involve any construction or land alteration.
- d) In flood hazard, tsunami, or seiche zones, the project would not risk release of pollutants due to project inundation because the project would not involve any construction or land alteration.
- e) The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. The project will not involve any construction, land alteration, or groundwater use.

XI. Land Use and Planning

- a) The project will not physically divide an established community. The project will not involve any construction, land alteration, or land use changes.
- b) The project will not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The project will not involve any construction, land alteration, or land use changes.

XII. Mineral Resources

- a) The project will not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.
- b) The project will not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. Such an impact will not occur because the project will not involve any construction, land alteration, or land use changes.

XIII. Noise

- a) The project will not result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. The project will not involve construction or physical alteration of land, and its implementation will not generate noise levels in excess of agency standards.
- b) The project will not result in generation of excessive ground-borne vibration or ground-borne noise levels. The project will not involve construction or physical alteration of land.
- c) The project will not be located within the vicinity of a private airstrip or an airport use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport.

XIV. Population and Housing

- a) The project will not induce substantial unplanned population growth in an area, either directly or indirectly. Such an impact will not occur because the project will not construct any new homes, businesses, roads, or other human infrastructure.
- b) The project will not displace any existing people or housing and will not necessitate the construction of replacement housing elsewhere.

XV. Public Services

- a) The project will not have any significant environmental impacts associated with new or physically altered governmental facilities. The project will not involve any construction, land alteration, or land use changes.

XVI. Recreation

- a) The project will not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or would be accelerated.

The Commission concluded that any impacts would be Less than Significant because this proposed regulation amendment will likely not result in any change in angler/visitor trips. There is no substantial evidence, in light of the whole record before the agency, that the project will have a significant effect on the use of existing neighborhood and regional parks or other recreational facilities.

- b) The project does not require construction or expansion of recreational facilities.

XVII. Transportation

- a) The project will not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. The project involves no land use or transportation system modifications.
- b) The project will not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b), which pertains to vehicle miles traveled. The amount and distance of vehicle miles traveled by recreational anglers should not change substantially under the proposed regulations.
- c) The project will not increase hazards due to a geometric design feature or incompatible uses with equipment. There will be no land use or transportation system modifications.
- d) The project will not result in inadequate emergency access. The project involves no land use or transportation system modifications.

XVIII. Tribal Cultural Resources

- a) The project would not cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe. Furthermore,

- i) The project will not cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k). The project does not involve ground disturbing work and thus has no potential to affect tribal cultural resources.
- ii) The project will not cause a substantial adverse change in the significance of a tribal cultural resource that is determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. The project does not involve ground disturbing work and thus has no potential to affect tribal cultural resources.

XIX. Utilities and Service Systems

- a) The project will not require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunication facilities. The project does not involve construction or land alteration.
- b) The project requires no new water supplies.
- c) The project will not produce wastewater.
- d) The project will not generate solid waste. Thus, the project will be in compliance with state and local standards for solid waste.
- e) The project will not create solid waste. Thus, the project will be in compliance with federal, state, and local management and reduction statutes and regulations related to solid waste.

XX. Wildfire

- a) The project will not impair an adopted emergency response plan or emergency evacuation plan.
- b) The project will not exacerbate wildfire risks due to slope, prevailing winds, and other factors.
- c) The project will not require the installation or maintenance of any infrastructure.
- d) The project will not expose people or structures to significant risks, including downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes.

XXI. Mandatory Findings Of Significance

- a) The project does not have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. The project is consistent with the Department's mission to manage California's diverse fisheries resources for their ecological value, and their use for the public's enjoyment.

- b) The project does not have adverse impacts that are individually limited, but cumulatively considerable. Cumulative adverse impacts will not occur because there are no potential adverse impacts due to project implementation in all impact analyses except for one. Where there is a potential adverse impact to certain species identified as candidate, sensitive, or special status species, that impact is less than significant and the project would not incrementally contribute to a cumulative impact in combination with other projects causing related impacts because establishing an upper HSL at 30 inches will not likely contribute to population level impacts to salmonid and smelt populations.
- c) The project does not have environmental effects that will cause substantial adverse effects on humans, either directly or indirectly. The project will not involve any construction, land alteration, or the creation of new infrastructure.

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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 (Figure 13e-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 (Loboschewsky 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% of 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 7¹ 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

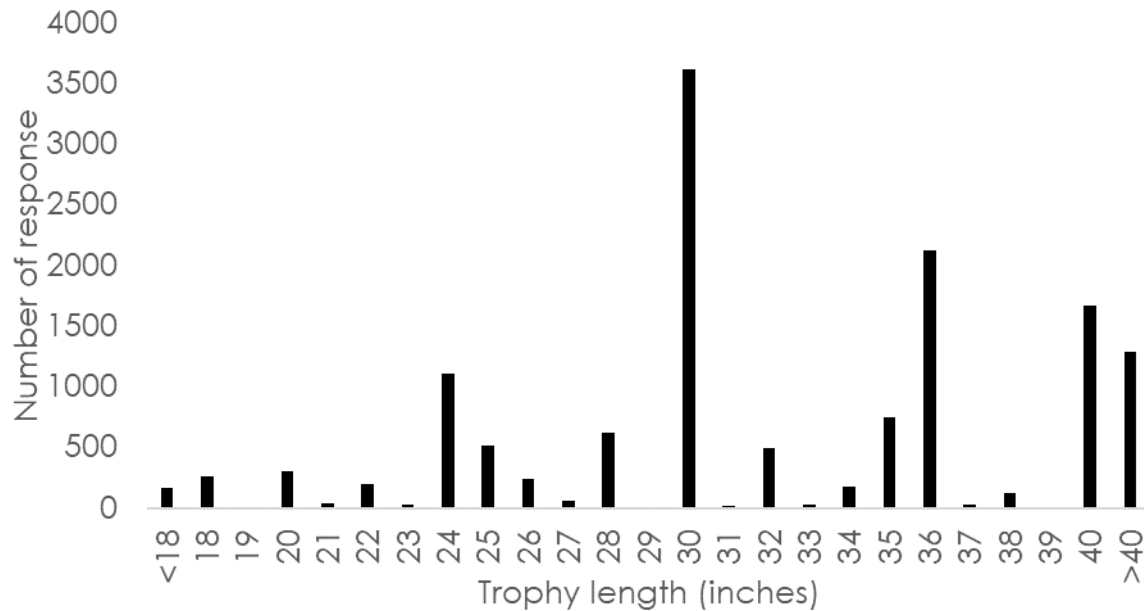


Figure 1. Figure 1.2 in Appendix 1, 2022 Striped Bass Angler Preference Questionnaire Results Summary. Fill-in-the blank responses to what size Striped Bass anglers considered a trophy. Data source: 2022 Striped Bass Angler Preference Questionnaire.

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.

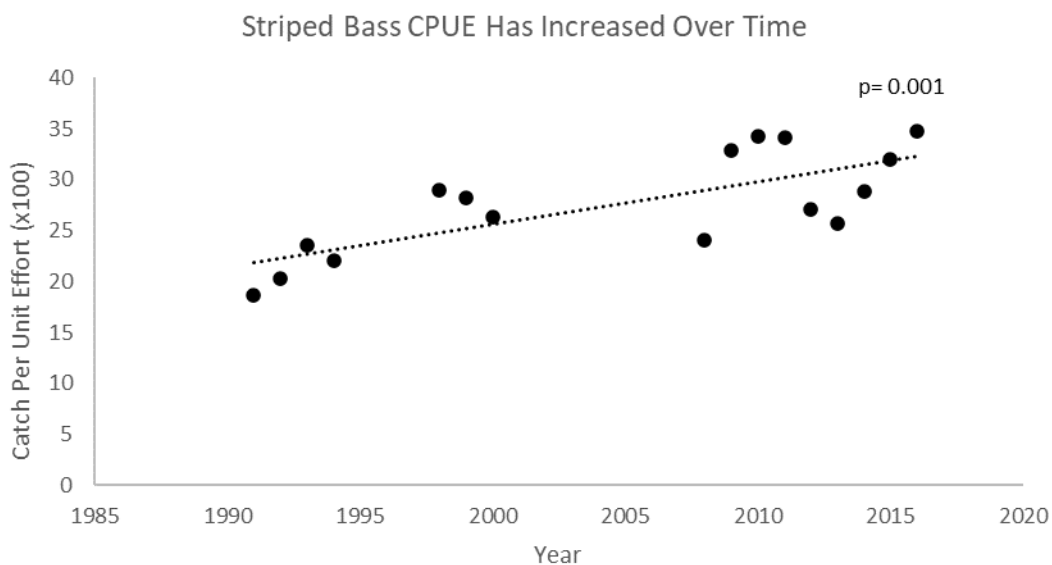


Figure 2. Average catch of Striped Bass per angler hour. Striped Bass CPUE has significantly increased over time ($p = 0.001$). Data source: CVAS data.

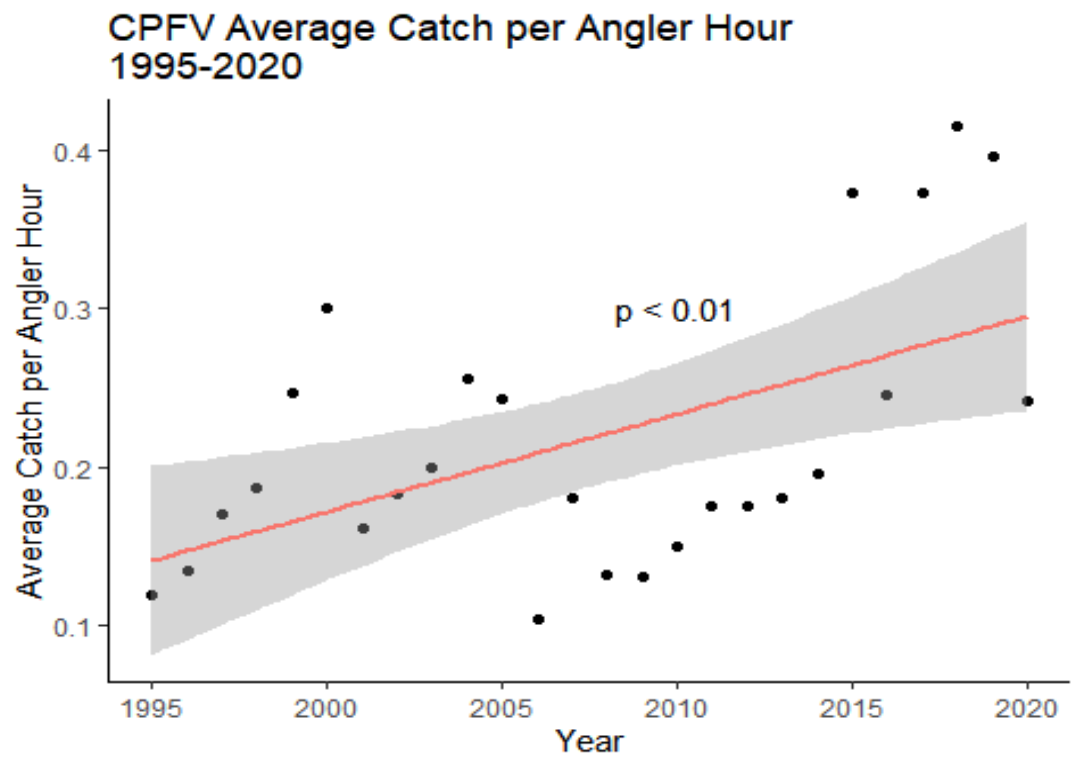


Figure 3. Average catch of Striped Bass per angler hour. Data source: CPFV Logs.

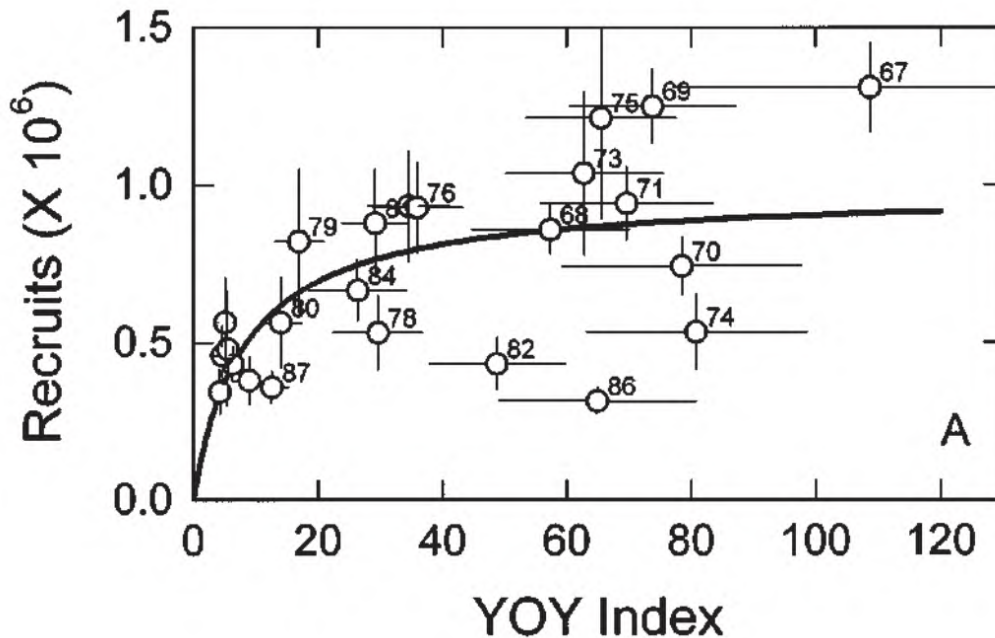


Figure 4. From Kimmerer et al. 2000 Fig 5(A). Young-of-the-year (YOY) index was estimated from a combination of Summer Townet Survey, Fall Midwater Trawl Survey and the San Francisco Bay Study. Recruits refers to abundance estimates of age-3 fish in the Adult Striped Bass Study.

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.

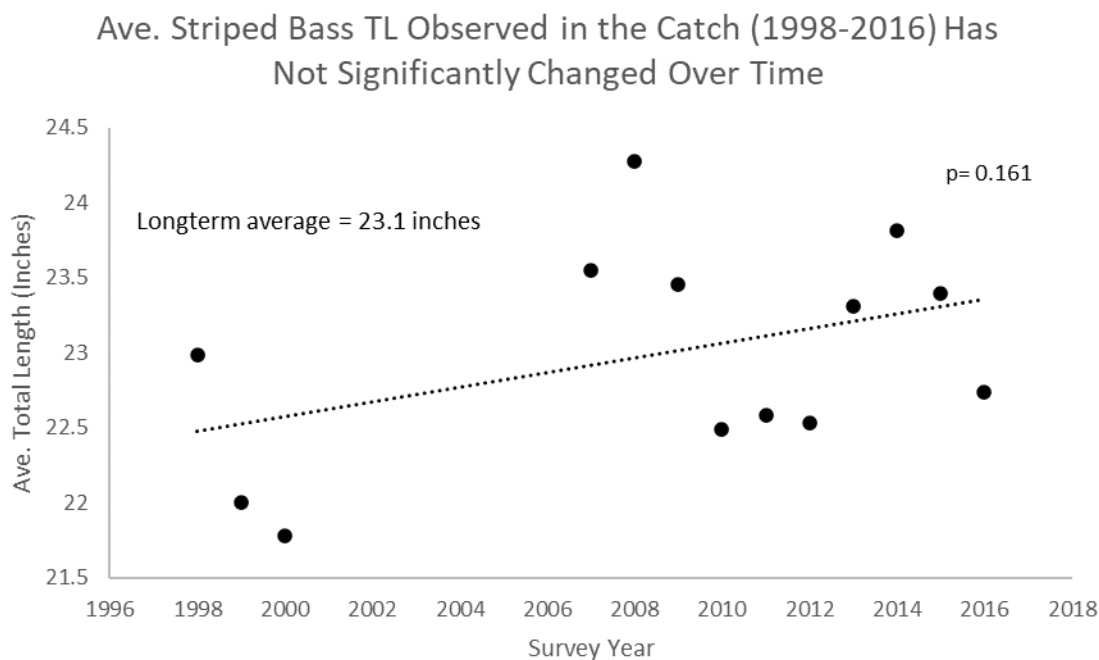


Figure 5. The average size of Striped Bass observed in angler catch by the Survey. The slope of the trend line is not significantly different than 0 ($p = 0.161$) over the sampling period 1998–2016. Data source: CVAS.

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).

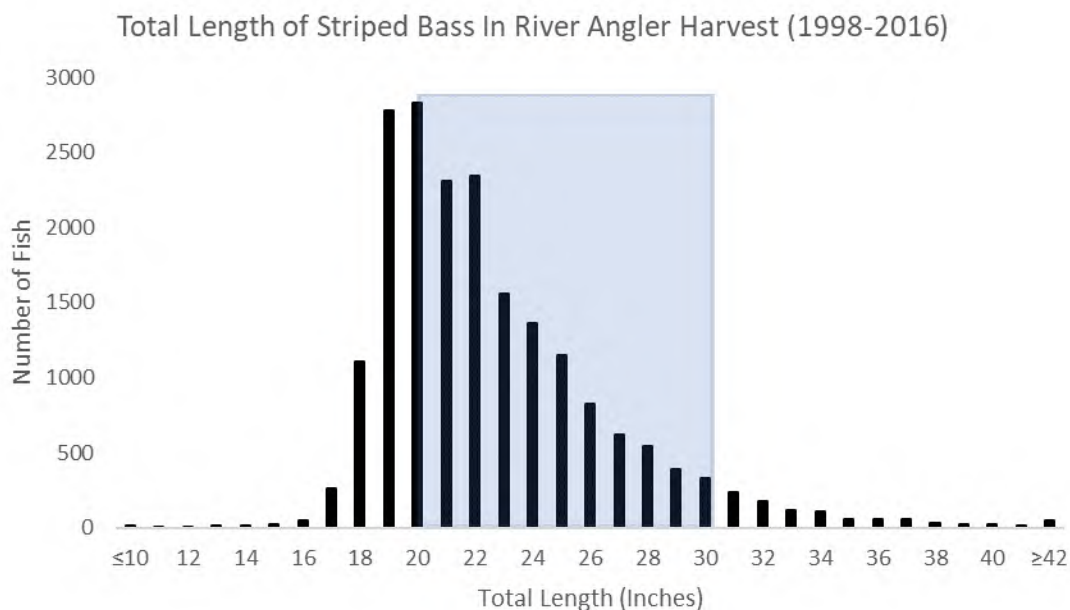


Figure 6. Length–frequency distribution of Striped Bass observed in angler harvest for Central Valley during 1998–2016. Proposed NCGASA slot limit highlighted in blue (74% of reported harvest falls within this range). Data Source: CVAS.

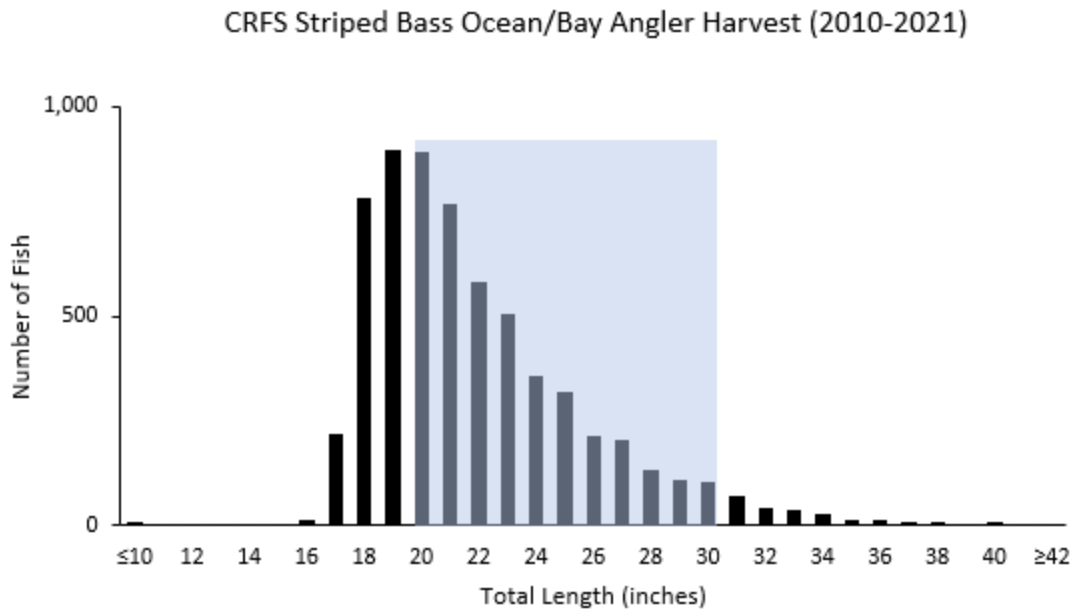


Figure 7. Length–frequency distribution of Striped Bass observed in angler harvest for Ocean/Bay during 2010–2021. Proposed NCGASA slot limit highlighted in blue (87% of reported harvest falls within this range). Data source: RecFIN (CRFS).

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.

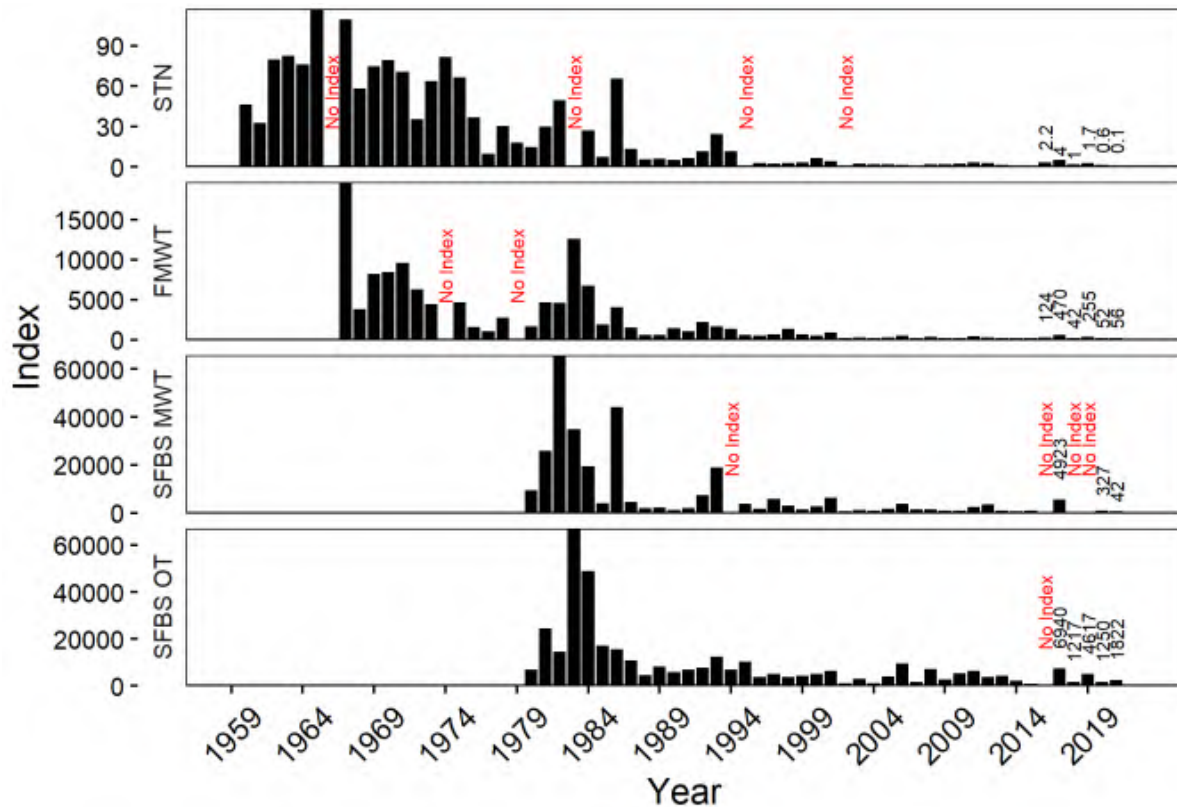


Figure 8. Figure 13 in Malinich et al. 2022. Index values for age-0+ (STN, FMWT) and age-0 Striped Bass (SFBS MWT, SFBS OT) from the Summer Townet Survey (STN), Fall Midwater Trawl (FMWT) and San Francisco Bay Study (SFBS) midwater trawl (MWT) and otter trawl (OT). See Malinich et al. (2022) for description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

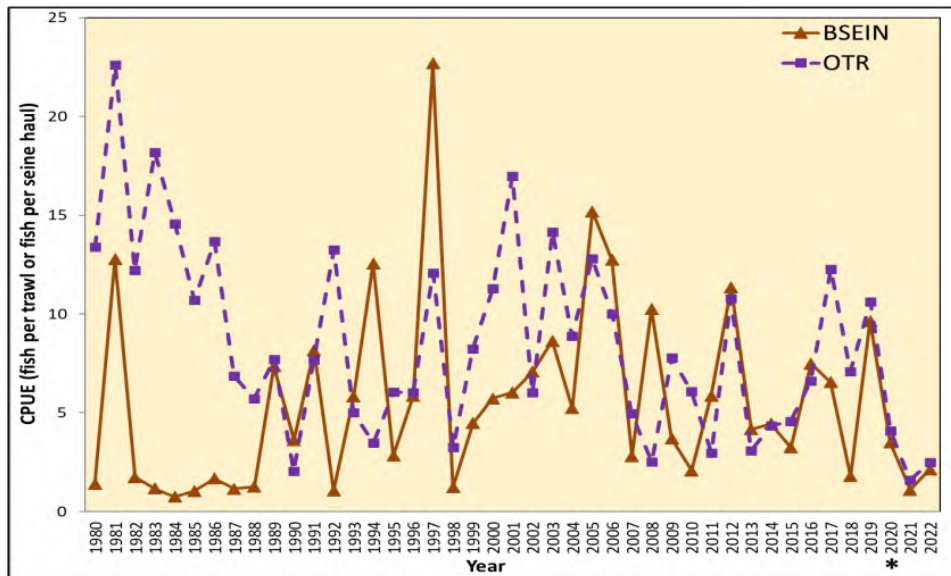


Figure 9. Figure 22 from O'Rear et al. (2022). Catch per unit effort (CPUE) of Striped Bass from the Suisun Marsh Fish Study beach seine (BSEIN) and otter trawl (OTR) surveys. See O'Rear et al. (2022) for description of CPUE calculations.

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.

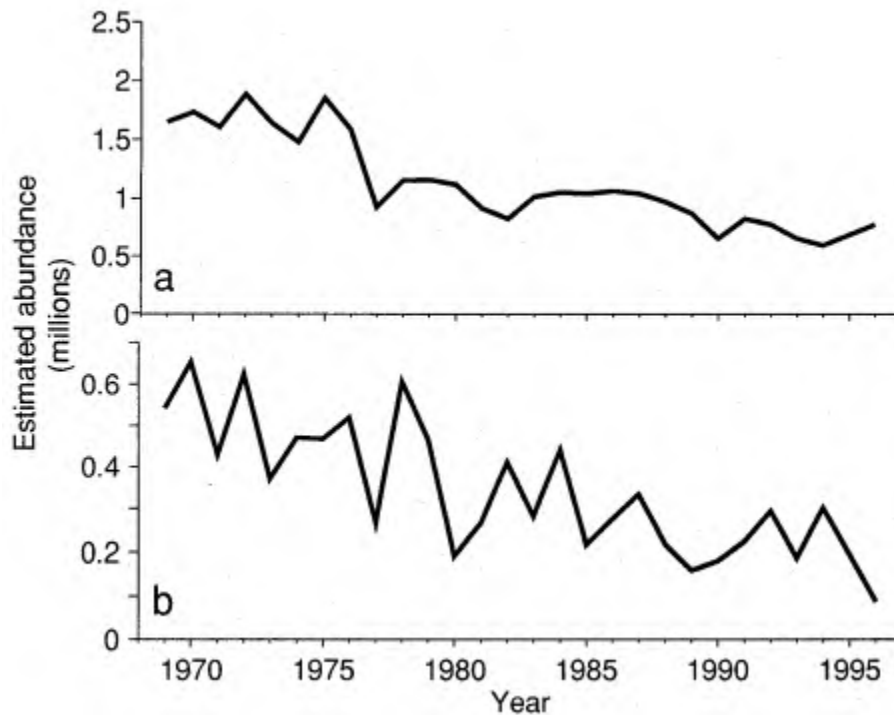


Figure 10. Estimated abundance of a) legal sized Striped Bass (≥ 18 inches total length) and b) age-3 Striped Bass in the Sacramento-San Joaquin Watershed from 1969–1996. Figure from Kohlhorst (1999).

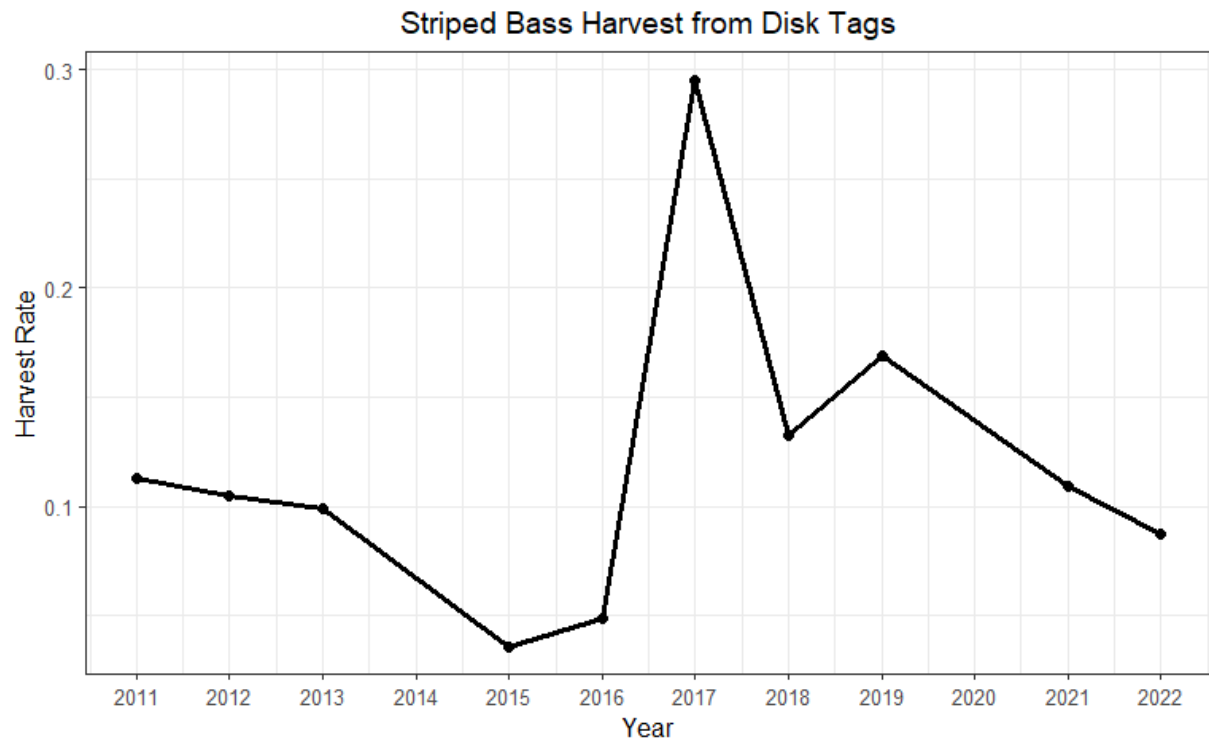


Figure 11. Estimated harvest rate of Striped Bass in the Sacramento–San Joaquin Watershed from 2011–2022.

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

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

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

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

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

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

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 $\pm 20\%$ 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 \bar{L}_{∞}). 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 \bar{L}_{∞} , 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	$CR \sim \text{MvN}(\mu, \Sigma)$
θ^2	Sex ratio: Fertility function parameter	-	50.4	$\theta \sim \text{U}(a = 20, b = 80)$
$L_{\infty, \min}^3$	Growth: Minimum asymptotic length (cm)	96.8	106.3	Derived
$L_{\infty, \max}^3$	Growth: Maximum asymptotic length (cm)	145.2	159.5	Derived
\bar{L}_{∞}^4	Growth: Average asymptotic length (cm)	121	132.9	$\bar{L}_{\infty} \sim \text{MvN}(\mu, \Sigma)$
k^4	Growth: Von Bertalanffy growth coefficient (yr^{-1})	0.1	0.1	$k \sim \text{MvN}(\mu, \Sigma)$
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	$L_{\text{mat}} \sim \text{MvN}(\mu, \Sigma)$
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	$M_{\text{ref}} \sim \text{MvN}(\mu, \Sigma)$
L_{ref}^5	Mortality: Reference length where $M = M_{\text{ref}}$ (cm)	90	90	Fixed
a^6	Length-weight: scaling parameter	$4.8 \cdot 10^{-5}$	$2.7 \cdot 10^{-5}$	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	$L_{low} + \Delta,$ $\Delta \sim \log N(\mu = \ln(5), \sigma = 1)$

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 $SPR \geq 0.35$ 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 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.

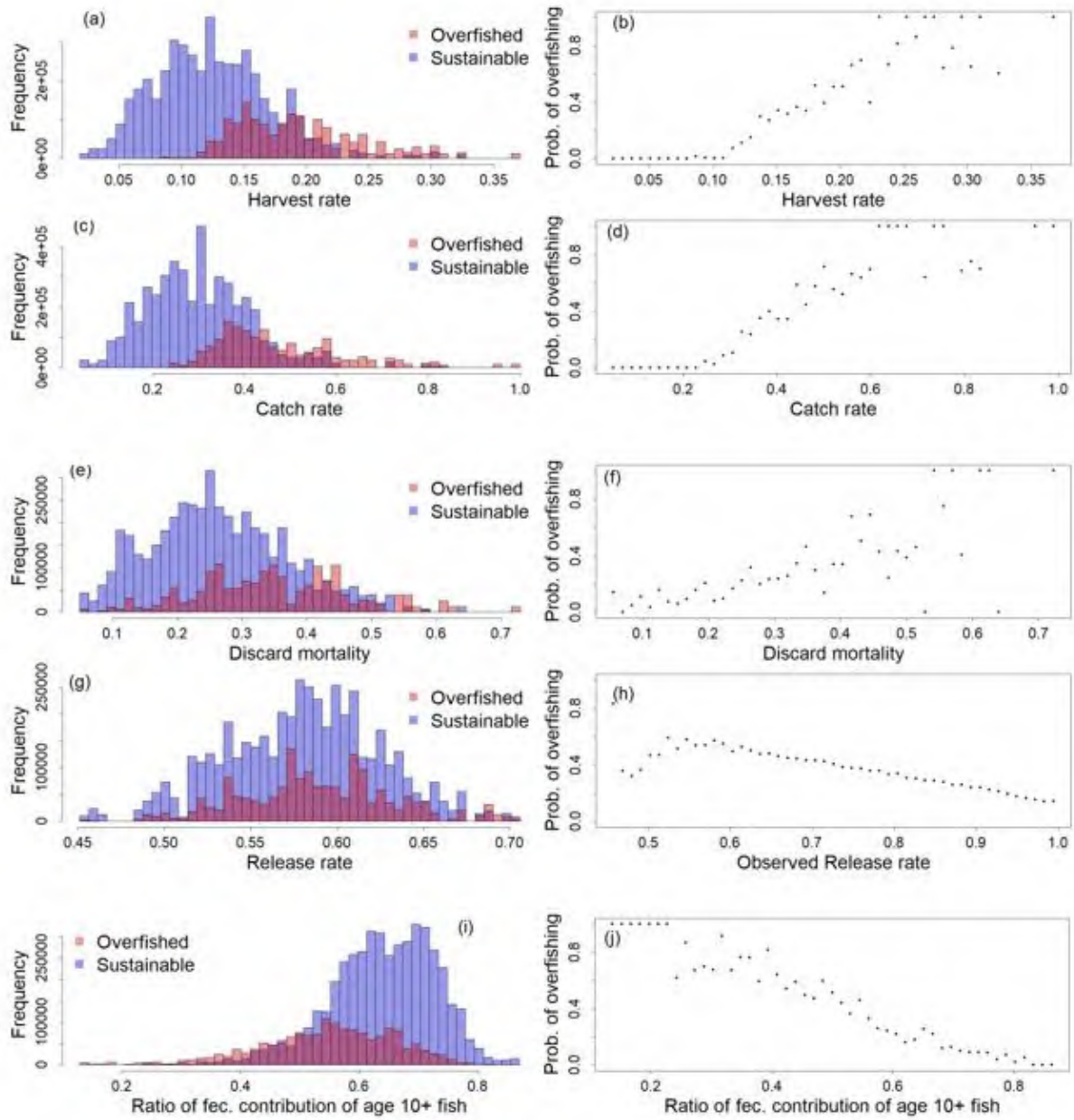


Figure 12. Histograms (left) and scatter plots (right) of simulated values for harvest rate (U , a–b), catch rate (\tilde{U} , c–d), discard mortality (D , e–f), release rate (δ , g–h), and outputs for fecundity contribution of older (age 10+) fish (γ , i–j) that result in SPR values representing overfished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

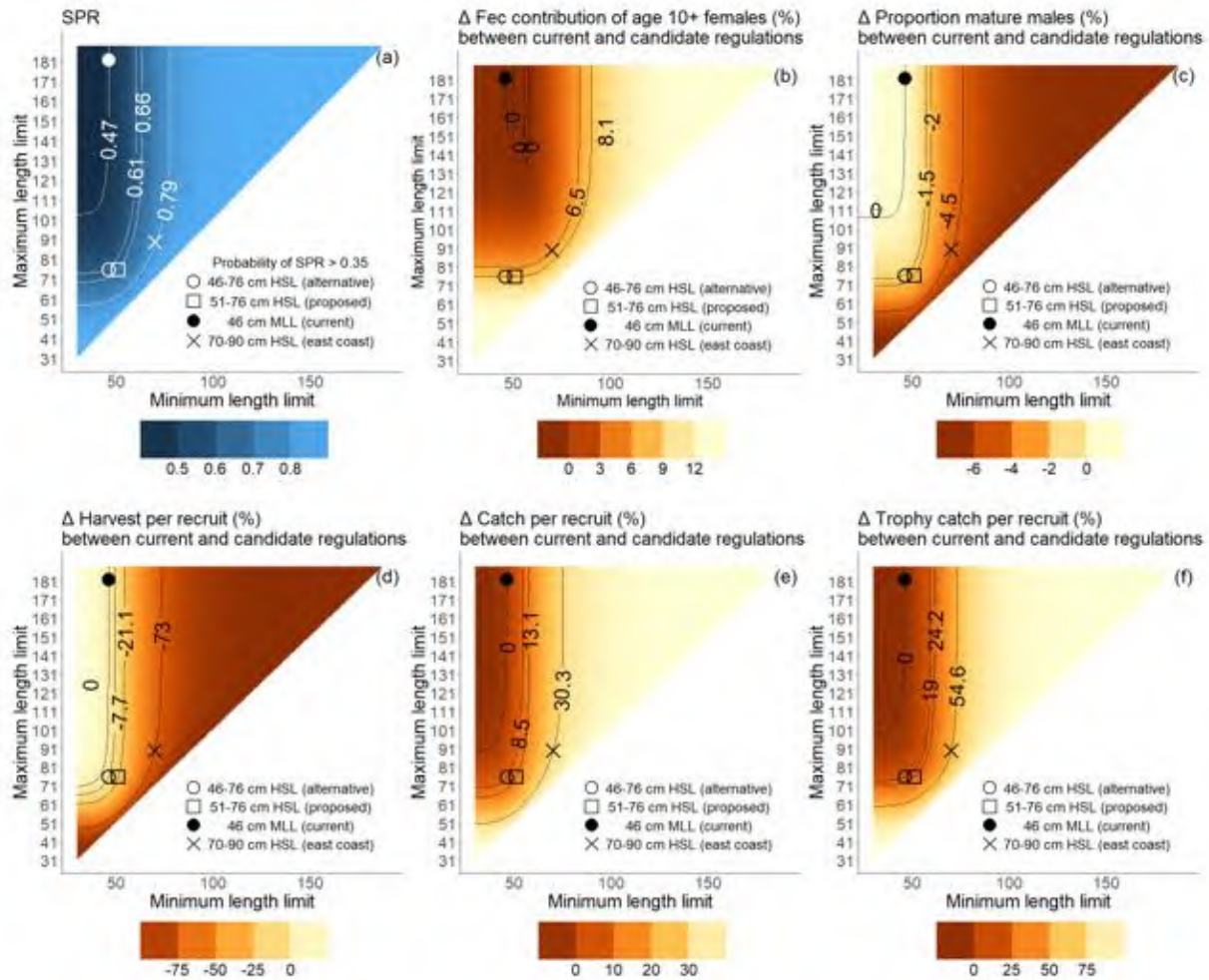


Figure 13. Model results describing (a) the probability of regulations resulting in an $\text{SPR} \geq 0.35$ and the percent difference in (b) the ratio of fecundity contribution of age 10+ females, (c) the proportion of mature males in the population, (d) harvest per recruit, (e) total catch per recruit, 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 (Bohabor et al., 2022), Gag Grouper (Tetzlaff 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.

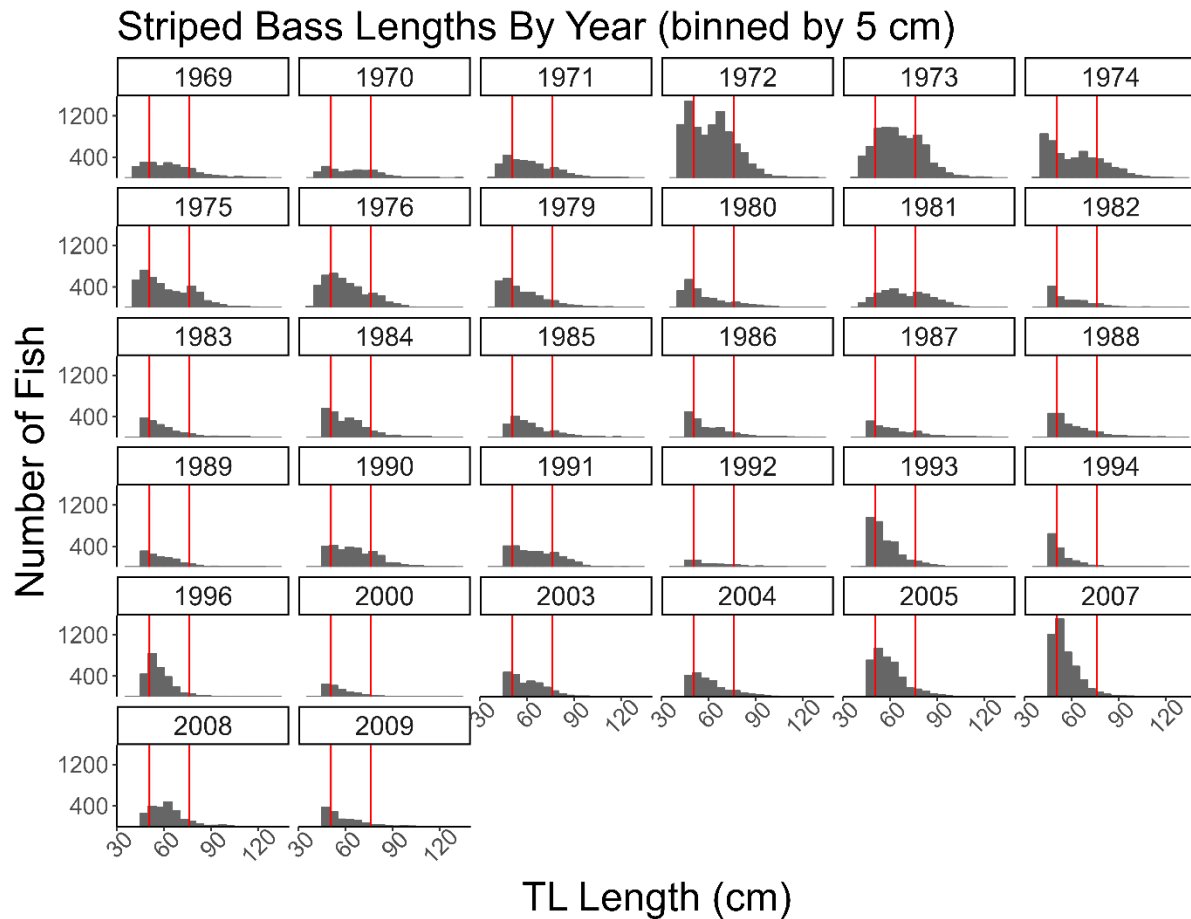
While Striped Bass are known opportunistic predators on salmonid and smelt species, their diets have been found to primarily consist of macroinvertebrates, crayfish, lamprey, and other non-native predator and prey species in aquatic and estuarine habitats (Raney 1952, Callahan et al. 1989, Grossman 2016, 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 ($r^2 = 0.26$) 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.



Fyke Net Tagging Program

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

State and Region	Season	Daily Possession Limit																																												
ME marine	All year ^a																											1*																		
NH marine	All year																											1* ⁺																		
MA marine	All year																											1*																		
RI marine	All year																											1*																		
CT marine	All year																											1*																		
NY marine	4/15–12/15																											1																		
Delaware River	All year																											1																		
Hudson River	4/1–11/30	1																																												
NJ marine	3/1–12/31																											1**																		
Delaware River & tribs	6/1–3/31																											1**																		
PA Delaware R. upriver	All year																											1																		
Delaware R. tidal	All year ^b	2										1																																		
DE marine	All year ^c	1 fish of either size*										1 fish of either size*																																		
MD marine	All year																											1 ⁺																		
Ches. Bay (CB) trophy	5/1–5/15																																		1 ⁺											
CB and tribs	5/16–5/31, 6/1–8/15 and 9/1–12/10 ^d	1 (private boat) or 2 (charter, only 1 >28")**																																												
DC all waters	5/16–12/31	1																																												
VA marine	1/1–3/31 and 5/16–12/31																											1* ⁺																		
CB spring	5/16–6/15											1* ⁺																																		
CB fall	10/4–12/31											1* ⁺																																		
NC all waters	All year																											1* ⁺																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	>38																							
		Total Length (inches)																																												

* 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**

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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, Section 1.2.1). 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 – non-English questionnaires are added	9/21/2022
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).

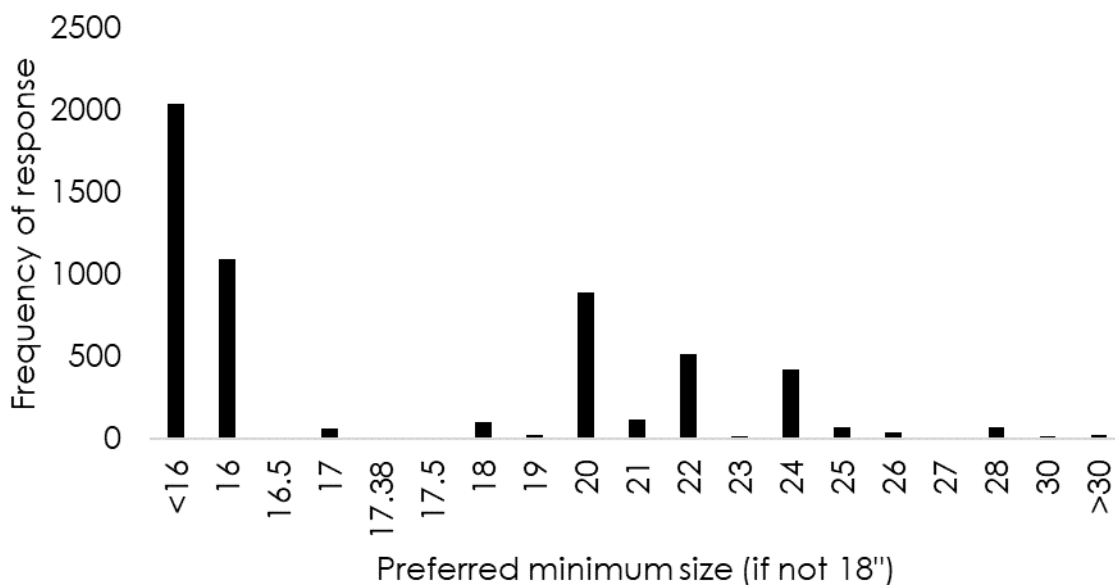


Figure 1.1. There were 5,527 written responses for preferred minimum sizes other than the current 18-inch minimum size (although some respondents entered 18 inches as their preference).

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.

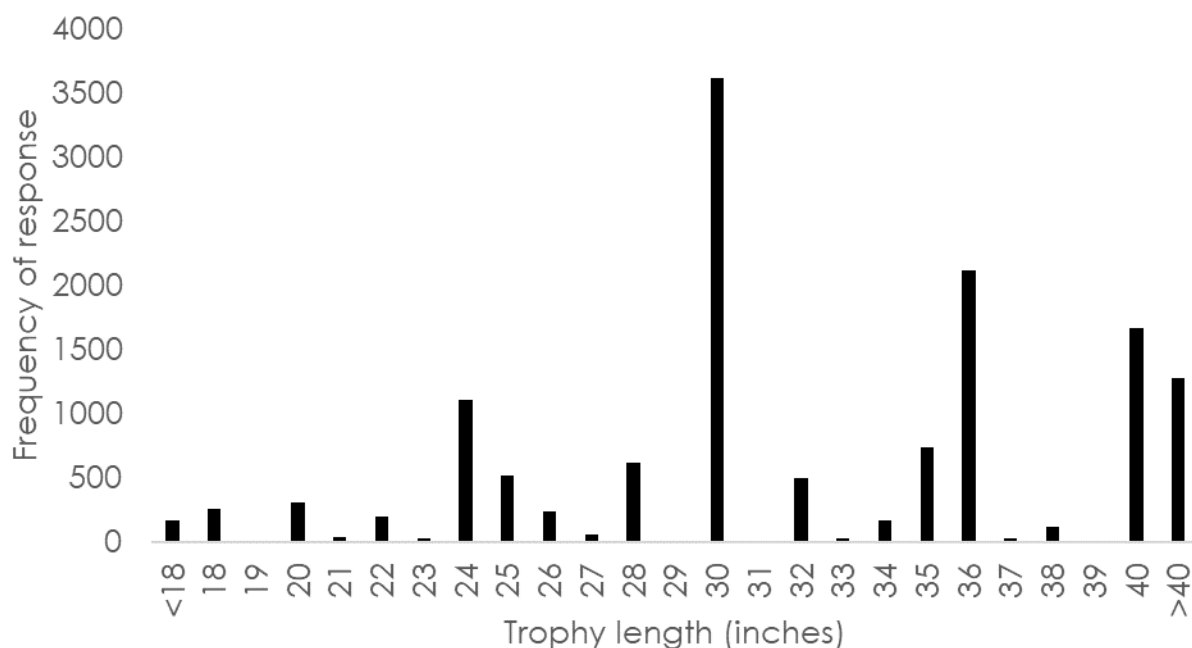


Figure 1.2. Fill-in-the-blank responses to what size Striped Bass anglers considered a trophy.

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 POPULATION 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).

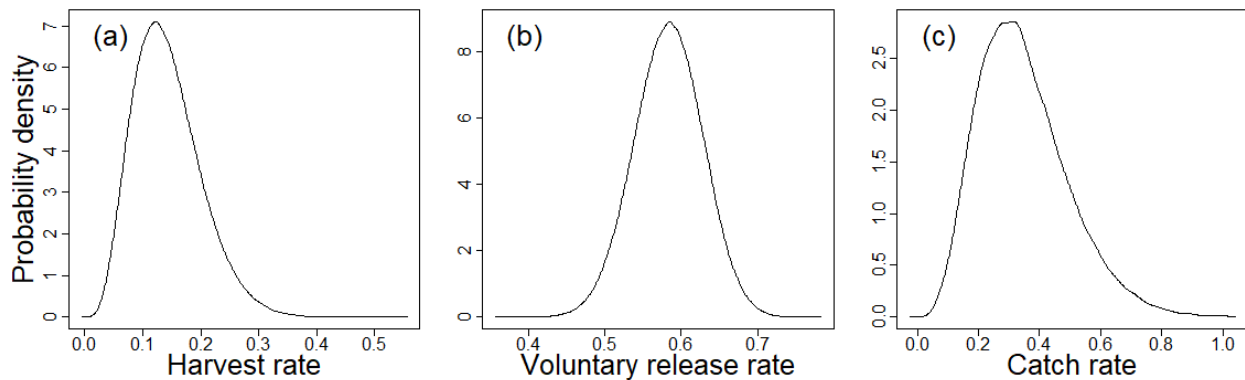


Figure 2.1. Probability distributions of parameter values for (a) harvest, (b) voluntary release rate, and (c) catch rates used to inform U , δ , \dot{U} (respectively) in the model.

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%

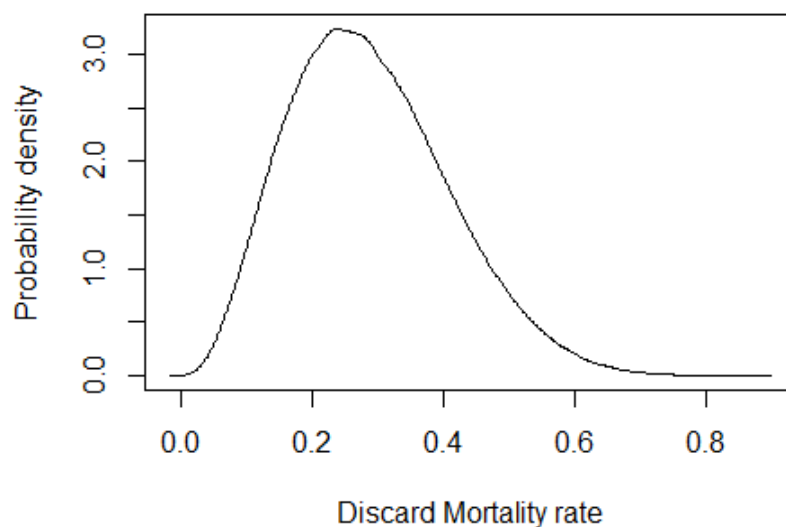


Figure 2.2. Probability distribution of parameter values for discard mortality rate used to inform D in the model.

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).

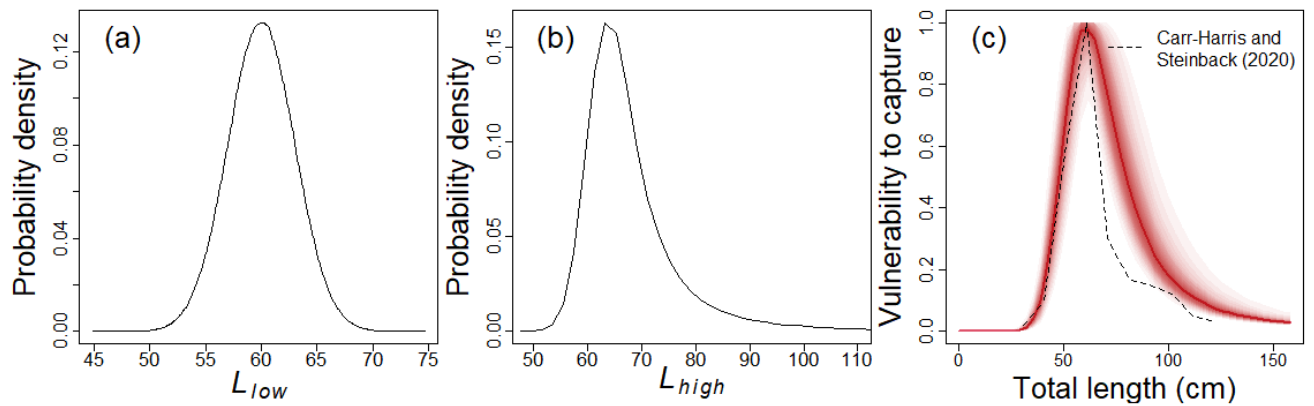


Figure 2.3. Probability distributions of parameter values for (a) lower length at 50% vulnerability to capture and (b) upper length at 50% vulnerability to capture used to inform the vulnerability of fish of length L to capture (c). The bold red line in panel (c) represents the length-based capture probability 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 \bar{L}_{∞} (Table 2.4), which approximates the 95% probability range of a normal distribution with a means of \bar{L}_{∞} 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 \bar{L}_{∞} and a standard deviation 10% of \bar{L}_{∞} (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 than 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).

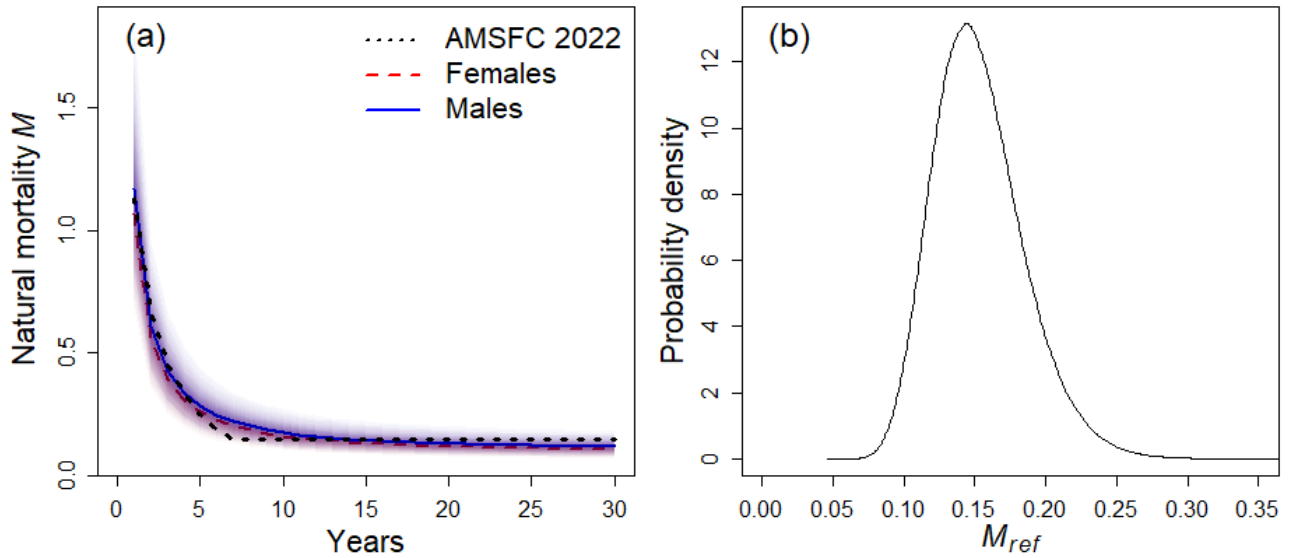


Figure 2.4. Sex-specific natural mortality-at-age estimates for Pacific Striped Bass (bold blue line and dashed red line) compared to natural mortality reported for Atlantic Striped Bass (dotted line; 2022 ASMFC) (a). Panel (b) describes the probability distribution of parameter values for M_{ref} used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

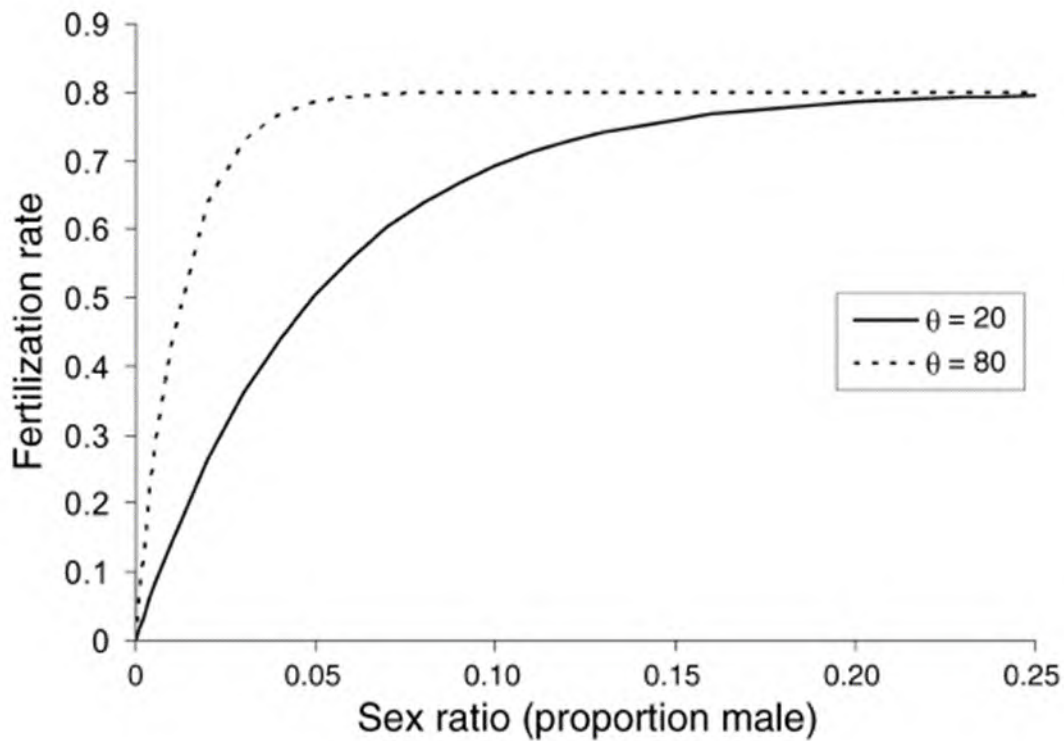


Figure 2.5 Model relationship between fertilization rate and sex ratio (proportion of males) based on two different levels of fertility function, θ (Fig.3 from Heppell et al. 2006).

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

Loboschefskey et al. 2012

Loboschefskey, 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 = 18.1×10^6 kg prey for sub-adults versus 17.9×10^6 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, *Morone 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 *Morone 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 Striped 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, striped 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 size. 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 ($P < 0.05$, $r^2 = 0.26$), 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.

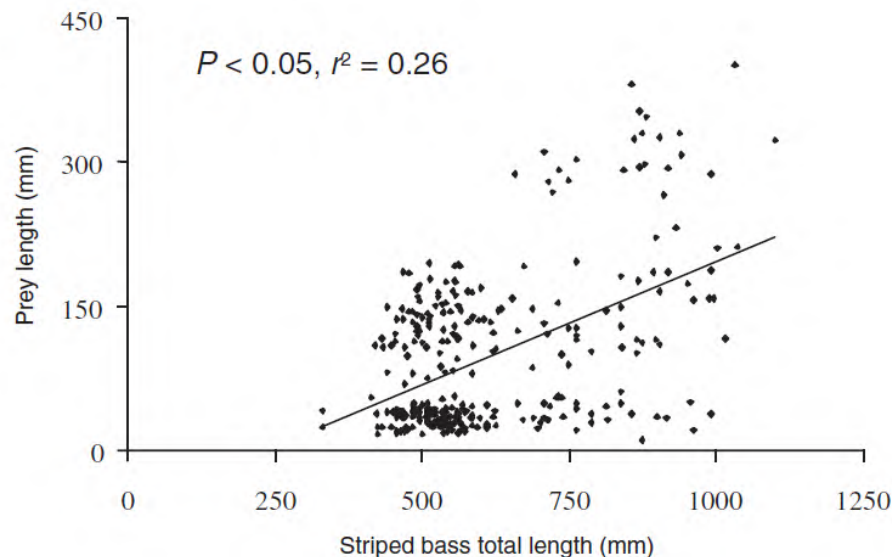
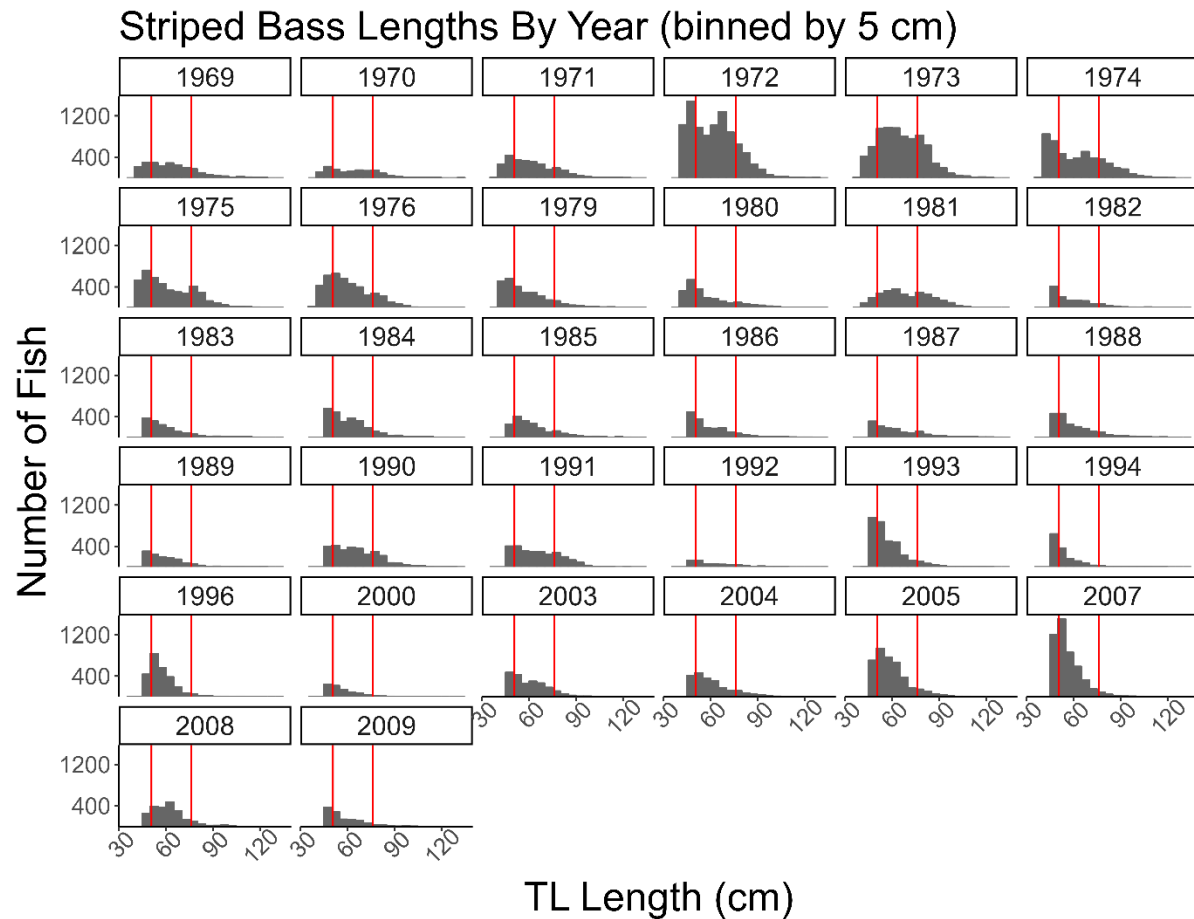


Figure 3.1. In Walter and Austin 2003 (Figure 4). Plot of prey total length against total length for Striped Bass.

- 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.



Fyke Net Tagging Program

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 Strait 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).

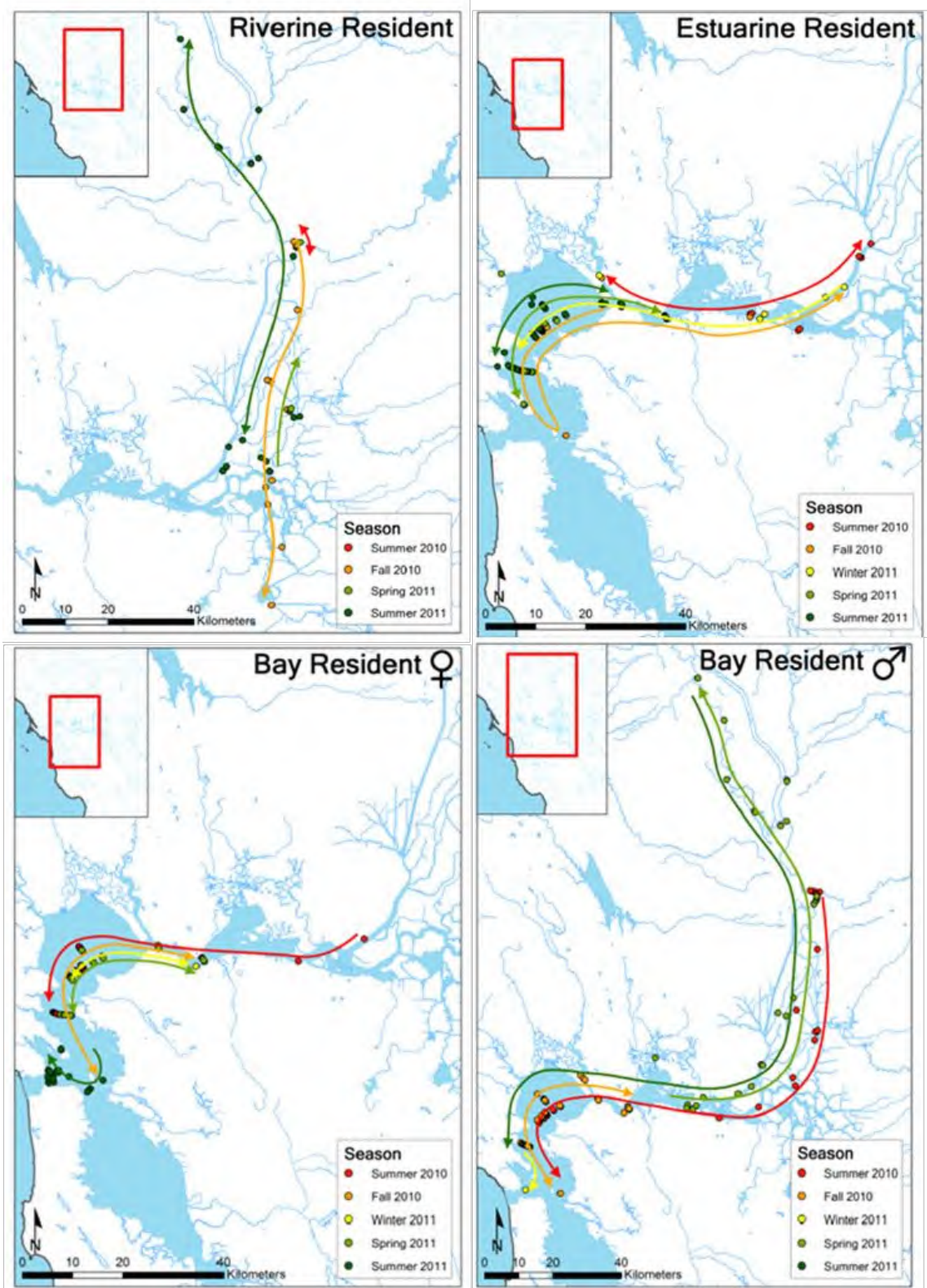


Figure 3.3. *In Le Doux-Bloom 2012.* Figures depict seasonal movement patterns of male and female Striped Bass in the summer of 2010 and 2011.

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 (Loboschewsky 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 assertion 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.

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
 For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2025090234

Project Title: Proposed Amendments to Sections 5.75(c) and (d), and 27.85(c), Title 14, California Code of Regulations, Re: Striped Bass Harvest Limits

Lead Agency: California Fish and Game Commission

Contact Person: Melissa Miller-Henson

Mailing Address: PO Box 944209

Phone: (916) 653-4899

City: Sacramento

Zip: 94244-2090

County: Sacramento

Project Location: County: Inland anadromous and marine waters City/Nearest Community:

Cross Streets: Zip Code:

Longitude/Latitude (degrees, minutes and seconds): ° ' " N / ° ' " W Total Acres:

Assessor's Parcel No.: Section: Twp.: Range: Base:

Within 2 Miles: State Hwy #: Waterways:

Airports: Railways: Schools:

Document Type:

CEQA: <input type="checkbox"/> NOP	<input type="checkbox"/> Draft EIR	NEPA: <input type="checkbox"/> NOI	Other: <input type="checkbox"/> Joint Document
<input type="checkbox"/> Early Cons	<input type="checkbox"/> Supplement/Subsequent EIR	<input type="checkbox"/> EA	<input type="checkbox"/> Final Document
<input checked="" type="checkbox"/> Neg Dec	(Prior SCH No.)	<input type="checkbox"/> Draft EIS	<input type="checkbox"/> Other:
<input type="checkbox"/> Mit Neg Dec	Other:	<input type="checkbox"/> FONSI	

Local Action Type:

<input type="checkbox"/> General Plan Update	<input type="checkbox"/> Specific Plan	<input type="checkbox"/> Rezone	<input type="checkbox"/> Annexation
<input type="checkbox"/> General Plan Amendment	<input type="checkbox"/> Master Plan	<input type="checkbox"/> Prezone	<input type="checkbox"/> Redevelopment
<input type="checkbox"/> General Plan Element	<input type="checkbox"/> Planned Unit Development	<input type="checkbox"/> Use Permit	<input type="checkbox"/> Coastal Permit
<input type="checkbox"/> Community Plan	<input type="checkbox"/> Site Plan	<input type="checkbox"/> Land Division (Subdivision, etc.)	<input checked="" type="checkbox"/> Other: Sport Fishing Regulations

Development Type:

<input type="checkbox"/> Residential: Units _____ Acres _____	<input type="checkbox"/> Transportation: Type _____
<input type="checkbox"/> Office: Sq.ft. _____ Acres _____ Employees _____	<input type="checkbox"/> Mining: Mineral _____
<input type="checkbox"/> Commercial: Sq.ft. _____ Acres _____ Employees _____	<input type="checkbox"/> Power: Type _____ MW _____
<input type="checkbox"/> Industrial: Sq.ft. _____ Acres _____ Employees _____	<input type="checkbox"/> Waste Treatment: Type _____ MGD _____
<input type="checkbox"/> Educational: _____	<input type="checkbox"/> Hazardous Waste: Type _____
<input type="checkbox"/> Recreational: _____	<input checked="" type="checkbox"/> Other: Sport Fishing Regulations
<input type="checkbox"/> Water Facilities: Type _____ MGD _____	

Project Issues Discussed in Document:

<input checked="" type="checkbox"/> Aesthetic/Visual	<input type="checkbox"/> Fiscal	<input checked="" type="checkbox"/> Recreation/Parks	<input type="checkbox"/> Vegetation
<input checked="" type="checkbox"/> Agricultural Land	<input checked="" type="checkbox"/> Flood Plain/Flooding	<input type="checkbox"/> Schools/Universities	<input checked="" type="checkbox"/> Water Quality
<input checked="" type="checkbox"/> Air Quality	<input checked="" type="checkbox"/> Forest Land/Fire Hazard	<input checked="" type="checkbox"/> Septic Systems	<input checked="" type="checkbox"/> Water Supply/Groundwater
<input checked="" type="checkbox"/> Archeological/Historical	<input checked="" type="checkbox"/> Geologic/Seismic	<input type="checkbox"/> Sewer Capacity	<input checked="" type="checkbox"/> Wetland/Riparian
<input checked="" type="checkbox"/> Biological Resources	<input checked="" type="checkbox"/> Minerals	<input checked="" type="checkbox"/> Soil Erosion/Compaction/Grading	<input checked="" type="checkbox"/> Growth Inducement
<input type="checkbox"/> Coastal Zone	<input checked="" type="checkbox"/> Noise	<input checked="" type="checkbox"/> Solid Waste	<input checked="" type="checkbox"/> Land Use
<input checked="" type="checkbox"/> Drainage/Absorption	<input checked="" type="checkbox"/> Population/Housing Balance	<input checked="" type="checkbox"/> Toxic/Hazardous	<input checked="" type="checkbox"/> Cumulative Effects
<input checked="" type="checkbox"/> Economic/Jobs	<input checked="" type="checkbox"/> Public Services/Facilities	<input checked="" type="checkbox"/> Traffic/Circulation	<input checked="" type="checkbox"/> Other: GHG, Fishing

Present Land Use/Zoning/General Plan Designation:**Project Description:** (please use a separate page if necessary)

The California Fish and Game Commission (Commission) proposes to amend California Code of Regulations, Title 14, subsections 5.75(c) and (d), and 27.85(c) related to striped bass harvest limits for sport fishing for the 2026 season and onward. Currently, any striped bass 18 inches or greater may be harvested within anadromous and marine waters north of Point Conception with a daily bag limit of two fish. The proposed regulation change would impose a "slot limit" within these waters whereby only striped bass from 18 to 30 inches total length would be available for harvest in the sport fishery, with no proposed change to the bag limit or season.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with an "X".
If you have already sent your document to the agency please denote that with an "S".

<input type="checkbox"/> Air Resources Board	<input type="checkbox"/> Office of Historic Preservation
<input type="checkbox"/> Boating & Waterways, Department of	<input type="checkbox"/> Office of Public School Construction
<input type="checkbox"/> California Emergency Management Agency	<input checked="" type="checkbox"/> Parks & Recreation, Department of
<input type="checkbox"/> California Highway Patrol	<input type="checkbox"/> Pesticide Regulation, Department of
<input type="checkbox"/> Caltrans District # _____	<input type="checkbox"/> Public Utilities Commission
<input type="checkbox"/> Caltrans Division of Aeronautics	<input type="checkbox"/> Regional WQCB # _____
<input checked="" type="checkbox"/> Caltrans Planning	<input checked="" type="checkbox"/> Resources Agency
<input checked="" type="checkbox"/> Central Valley Flood Protection Board	<input type="checkbox"/> Resources Recycling and Recovery, Department of
<input type="checkbox"/> Coachella Valley Mtns. Conservancy	<input type="checkbox"/> S.F. Bay Conservation & Development Comm.
<input type="checkbox"/> Coastal Commission	<input type="checkbox"/> San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
<input type="checkbox"/> Colorado River Board	<input checked="" type="checkbox"/> San Joaquin River Conservancy
<input checked="" type="checkbox"/> Conservation, Department of	<input type="checkbox"/> Santa Monica Mtns. Conservancy
<input type="checkbox"/> Corrections, Department of	<input checked="" type="checkbox"/> State Lands Commission
<input checked="" type="checkbox"/> Delta Protection Commission	<input type="checkbox"/> SWRCB: Clean Water Grants
<input type="checkbox"/> Education, Department of	<input checked="" type="checkbox"/> SWRCB: Water Quality
<input type="checkbox"/> Energy Commission	<input type="checkbox"/> SWRCB: Water Rights
<input type="checkbox"/> Fish & Game Region # _____	<input type="checkbox"/> Tahoe Regional Planning Agency
<input type="checkbox"/> Food & Agriculture, Department of	<input type="checkbox"/> Toxic Substances Control, Department of
<input type="checkbox"/> Forestry and Fire Protection, Department of	<input checked="" type="checkbox"/> Water Resources, Department of
<input type="checkbox"/> General Services, Department of	<input checked="" type="checkbox"/> Other: <u>Fish and Wildlife Dept. of (Headquarters)</u>
<input type="checkbox"/> Health Services, Department of	<input checked="" type="checkbox"/> Other: <u>Sacramento-San Joaquin Delta Conservancy</u>
<input type="checkbox"/> Housing & Community Development	
<input checked="" type="checkbox"/> Native American Heritage Commission	

Local Public Review Period (to be filled in by lead agency)

Starting Date _____ Ending Date _____

Lead Agency (Complete if applicable):

Consulting Firm: _____	Applicant: _____
Address: _____	Address: _____
City/State/Zip: _____	City/State/Zip: _____
Contact: _____	Phone: _____
Phone: _____	

Signature of Lead Agency Representative: _____ Date: Sept. 5, 2025

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Summary Form for Electronic Document Submittal

Form F

Lead agencies may include 15 hardcopies of this document when submitting electronic copies of Environmental Impact Reports, Negative Declarations, Mitigated Negative Declarations, or Notices of Preparation to the State Clearinghouse (SCH). The SCH also accepts other summaries, such as EIR Executive Summaries prepared pursuant to CEQA Guidelines Section 15123. Please include one copy of the Notice of Completion Form (NOC) with your submission and attach the summary to each electronic copy of the document.

SCH #: [2025090234](#)

Project Title: Proposed Amendments to Sections 5.75(c) and (d), and 27.85(c), Striped Bass Harvest Limits

Lead Agency: California Fish and Game Commission

Contact Name: Melissa Miller-Henson

Email: fgc@fgc.ca.gov

Phone Number: (916) 653-7229

Project Location: Inland anadromous and marine waters

City

County

Project Description (Proposed actions, location, and/or consequences).

The California Fish and Game Commission (Commission) proposes to amend Sections 5.75(c) and (d), and 27.85(c) related to striped bass harvest limits for sport fishing for the 2026 season and onward. Currently, any striped bass 18 inches or greater may be harvested within anadromous and marine waters north of Point Conception with a daily bag limit of two fish. The proposed regulation change would impose a "slot limit" within these waters whereby only striped bass from 18 to 30 inches total length would be available for harvest in the sport fishery, with no proposed change to the bag limit or season.

Identify the project's significant or potentially significant effects and briefly describe any proposed mitigation measures that would reduce or avoid that effect.

The initial study and the Commission's review of the project showed that the project will not have any significant or potentially significant effects on the environment and therefore no alternatives or mitigation measures are proposed to avoid or reduce any significant effects on the environment.

The project will not have a significant effect on aesthetics, agriculture and forestry resources, air quality, biological resources, cultural resources, energy, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation, tribal cultural resources, utilities and service systems, and wildfire.

Therefore, a negative declaration is filed pursuant to the California Environmental Quality Act (CEQA), Public Resources Code Section 21080, subdivision (c).

If applicable, describe any of the project's areas of controversy known to the Lead Agency, including issues raised by agencies and the public.

During the California Fish and Game Commission meeting in which this project was noticed, there was discussion among the Commissioners and Department staff regarding the impact of striped bass predation on native salmonids. The discussion lead to questions about the degree of impact and what level of evidence is necessary to make a decision on this rulemaking. To date, the Department has conducted a literature and data review of 24 published documents that focused on striped bass diet, foraging, behavior, and predation. The Department found there is insufficient evidence to determine that a 30 inch harvest size limit will have population level impacts to native salmonids.

Provide a list of the responsible or trustee agencies for the project.

California Department of Fish and Wildlife

Memorandum

Date: September 23, 2025

To: Melissa Miller-Henson
Executive Director
California Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: **Submittal of Pre-Adoption Statement of Reasons to Amend Subsection (c) and (d) of Section 5.75 and Subsection (c) for Section 27.85, Title 14, California Code of Regulations, Re: Recreational Striped Bass Harvest Size Limits**

Please find attached the Pre-Adoption Statement of Reasons (PSOR) for the striped bass harvest limits regulations. The PSOR includes responses to oral comments received at the August 13, 2025, Fish and Game Commission meeting, and all written comments received through August 13, 2025. This regulation will be on the agenda for adoption during the California Fish and Game Commission meeting on October 8, 2025.

If you have any questions regarding this item, please contact Jay Rowan, Chief, Fisheries Branch, by email at Fisheries@wildlife.ca.gov.

ec: Chad Dibble, Deputy Director
Wildlife and Fisheries Division

Jay Rowan, Branch Chief
Fisheries Branch
Wildlife and Fisheries Division

Maggie McCann, Sr. Environmental Scientist
Fisheries Branch
Wildlife and Fisheries Division

Ona Alminas, Env. Program Manager
Regulations Unit
Wildlife and Fisheries Division

Melissa Miller-Henson, Executive Director
California Fish and Game Commission
September 23, 2025
Page 2

Emily McKim, Regulatory Scientist
Regulations Unit
Wildlife and Fisheries Division

Dixie Van Allen, Program Manager
California Fish and Game Commission

Ari Cornman, Wildlife Advisor
California Fish and Game Commission

David Haug, Analyst
California Fish and Game Commission

State of California
Fish and Game Commission
Pre-Adoption Statement of Reasons for Regulatory Action
Amend Sections 5.75(c) and (d), and 27.85(c)
Title 14, California Code of Regulations
Re: Recreational Striped Bass Harvest Size Limits

I. Date of Initial Statement of Reasons: March 27, 2025

II. Date of Pre-adoption Statement of Reasons: August 13, 2025

III. Dates and Locations of Scheduled Hearings:

(a) Notice Hearing:

Date: June 11, 2025

Location: Sacramento, CA

(b) Discussion Hearing:

Date: August 13, 2025

Location: Sacramento, CA

(c) Adoption Hearing:

Date: October 8, 2025

Location: Sacramento, CA

IV. Description of Modification of Originally Proposed Language of Initial Statement of Reasons (ISOR):

No changes have been made to the originally proposed regulatory language.

V. Reasons for Modification of Originally Proposed Language of ISOR

No changes have been made to the originally proposed regulatory language.

VI. Summary of Primary Considerations Raised in Opposition and in Support

Responses to oral comments received at the August 13, 2025, Fish and Game Commission meeting, and all written comments received up through August 13, 2025 are included in Attachment 1—Responses to Public Comment.

Updated Informative Digest/Policy Statement Overview

Currently, any striped bass 18 inches or greater may be harvested within anadromous and marine waters north of Point Conception with a daily bag limit of two fish. The proposed regulation change would impose a slot limit within these waters whereby only striped bass from 18 to 30 inches total length would be available for harvest in the sport fishery, with no proposed change to the bag limit or season.

Striped bass are native to the East and Gulf Coasts of North America, and were introduced to San Francisco Bay in 1879. A commercial fishery was established in the San Francisco Bay area by the late 1880s but 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. In response to declines in legal-size striped bass in the 1970's and at the request of anglers, the California legislature established a 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, which remain in effect today. The Striped Bass Management Plan was ended in 2004 due to increases in the striped bass population and concern over the impact of striped bass predation on native fish species. In 2020, the Fish and Game Commission committed to sustain striped bass populations in support of a recreational fishery.

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 proposal was to change the MLL for striped bass from 18 inches to 20 inches and impose a maximum size of 30 inches. The stated goals were:

- To protect the species by increasing the minimum length to allow more fish to mature and successfully spawn prior to harvest and
- To protect the larger fish that tend to be the best spawners and are becoming increasingly rare in the fishery

The Department developed a report, California Department of Fish and Wildlife Evaluation of Nor-Cal Guides and Sportsmen's Association (NCGASA) Proposed 20-30 Inch Harvest Slot Limit (HSL) for Striped Bass. On September 12, 2024, the Department provided the Wildlife Resources Committee with a presentation of the report's findings. The Department supported an 18-30-inch HSL because it would benefit anglers by creating a trophy fishery and increasing total catch.

The Department is proposing changes to the following regulations in Title 14, CCR:

- Amend Section 5.85 Striped Bass, subsection (c)
 - Add the maximum harvest size limit of 30 inches.
 - Add reference to the section defining anadromous waters.
 - Amend text to replace references to "minimum size limit" to "harvest size limit".
- Add Section 5.85 Striped Bass, subsection (d)(2)
 - Add section that specifies that in non anadromous waters not mentioned in 5.75(d)(1), a minimum size of 18 inches total length and a harvest bag limit of 2 applies.
- Amend Section 27.85 Striped Bass, subsection (c)
 - Add the maximum harvest size limit of 30 inches.

Amend text to replace references to “minimum size limit” to “harvest size limit”.

Benefits of the Regulations:

As stated in Fish and Game Code Section 1700, Conservation of Aquatic Resources, it is the policy of this state to encourage the conservation, maintenance, and utilization of the living resources of the ocean and other waters under the jurisdiction and influence of the state for the benefit of all the citizens of the state and to promote the development of local fisheries and distant water fisheries based in California in harmony with international law, respecting fishing and the conservation of the living resources of the ocean and other waters under the jurisdiction and influence of the state. The objectives of this policy include, but are not limited to, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence, and the maintenance of a sufficient resource to support a reasonable sport use. Adoption of scientifically based harvest size limits, and bag and possession limits provide for the maintenance of sufficient sport fish populations to ensure their continued existence.

The benefits of the proposed regulations are consistent with the sustainable management of California’s sport fisheries, general health and welfare of California residents, and promotion of businesses that rely on sport fishing throughout California.

Consistency and Compatibility with Existing Regulations:

Article IV, Section 20 of the State Constitution specifies that the Legislature may delegate to the Commission such powers related to the protection and propagation of fish and game as the Legislature sees fit. The Legislature has delegated authority to the Commission to promulgate recreational fishing regulations (Fish and Game Code sections 200 and 205). Commission staff has searched the California Code of Regulations and has found no other state regulations that address the recreational take of striped bass. The Commission has reviewed its own regulations and finds that the proposed regulations are consistent with other recreational fishing regulations in Title 14, CCR, and therefore finds that the proposed regulations are neither inconsistent nor incompatible with existing state regulation.

Update

There are no changes to the ISOR proposal or regulatory text. This document only responds to comments received through August 13, 2025. Comments received after August 13th will be responded to in the Final Statement of Reasons (FSOR)

5.75 Pre-Adopt Statement of Reasons –Striped Bass Harvest Size Limits

Attachment 1– Responses to public comments

- *Comments are paraphrased from the commenters for succinctness.*
- *Responses to oral comments received at the August 13, 2025, Fish and Game Commission meeting (14,16-25), and all written comments (1-13,15) received up through August 13, 2025.*

Responses to Comments

#	Name, Organization, Comment Format, Date Sent	Public Comment Summary	Responses
1	Joshua Mezman, email dated 7/30/25	<p>1a. Commenter thinks regulation change only benefits those who are making money as fishing guides.</p> <p>Commenter opposes the proposal for multiple reasons:</p> <p>1b. The issue at the heart here is the salmon population. Striped bass are an invasive species.</p> <p>1c. Low water leads to higher predation.</p> <p>1d. Conservation of native fish and the economic importance of the Chinook salmon industry are of higher importance than improvements to the recreational striped bass fishery.</p>	<p>1a. The Commission and Department acknowledge the comment. The proposed regulation change aims to provide species and fisheries benefits by adding protections to the most fecund females, which in turn could increase recruitment into the harvest slot and improve fishery metrics. If successful, all striped bass anglers would benefit, not just fishing guides.</p> <p>1b. Striped bass have coexisted with salmon in California waters for more than 140 years. The recovery of salmon populations is a high priority for the Commission and the Department and they are working on many aspects to help rebuild and sustain healthy populations. The Department has observed declines in the populations and health of multiple fish species in the Central Valley rivers and Delta over the past decades which can be attributed to many factors including habitat loss, poor water quality, limited flow, salt intrusion, harmful algal blooms, and invasive aquatic vegetation.</p> <p>Striped bass are managed differently than other species in California. Management of striped bass is guided by the Commission's Striped Bass Policy, which states:</p> <p>1. The Department of Fish and Wildlife shall monitor and manage the striped bass fishery of the Sacramento-San Joaquin Estuary for vitality, consistent with Commission policy that the</p>

**[5.75 Pre-Adopt Statement of Reasons –Striped Bass Harvest Size Limits]
Public Comments and Responses**

#	Name, Organization, Comment Format, Date Sent	Public Comment Summary	Responses
			<p>Department emphasize programs that ensure, enhance, and prevent loss of sport fishing opportunities.</p> <p>2. The Department shall ensure that actions to increase striped bass abundance are consistent with the Department's long-term mission and public trust responsibilities including those related to threatened and endangered species and other species of greatest conservation need. Recognizing issues associated with potential incidental take of these species, the Department shall strive to maintain a healthy, self-sustaining striped bass population in support of a robust recreational fishery. Consistent with the Commission Policy on Cooperation, the Department shall work with relevant stakeholders, organizations, and the public to develop appropriate objectives to achieve these broad aims.</p> <p>3. The Department shall work toward these goals through any appropriate means. Such means may include actions to help maintain, restore, and improve habitat beneficial to striped bass, reduce impacts of invasive aquatic vegetation, improve water quality, reduce loss of striped bass from water projects and diversions, and assess the status and population of striped bass in the Delta.</p> <p>1c. The largest impacts to native fishes are from the broader environmental and human induced factors including flow. Literature does indicate that predators are more successful when flows are low as opposed to when flows</p>

**[5.75 Pre-Adopt Statement of Reasons –Striped Bass Harvest Size Limits]
Public Comments and Responses**

#	Name, Organization, Comment Format, Date Sent	Public Comment Summary	Responses
			<p>are higher; however, it does not indicate that predation by striped bass is having population level impacts on native fishes.</p> <p>1d. The salmon population and the associated industry are of high priority to the Commission and the Department for both their ecological benefits as well as use and enjoyment by the public. Please see response 1b.</p>
2	Lance Bain, email dated 7/30/25	2a. Commenter asserts that this topic has been discussed in the Commission already. They assert that after careful study by the Department, it was suggested that regulations be changed to no size limit and no bag limit for striped bass to protect salmon. This proposal did not go into place and now the issue is being brought up again.	2a. In 2009 the Department was asked to present more liberal angling regulations by the Commission. This was in response to litigation. The proposed regulation changes would have increased the take of striped bass in the recreational fishery. The angling public came out in strong numbers opposing the regulation change and no action was taken. The accompanying report which was written by the Department has since been updated with more recent population information, creel survey results, and input provided by the angling public through a questionnaire, which has formed the current opinion presented in the evaluation documents (See June meeting documents). The current regulation change proposal was brought forth by the NorCal Guides and Sportsman's Association, not the Department, with the intention of enhancing the Striped Bass population and improving the sport fishery. The Department can support the proposed regulation change because it is the Department's opinion that recreational fishing is not having population level impacts on striped bass, and because the proposed change would not significantly change the angling effort or harvest behaviors currently observed in the fishery. The proposed regulation

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#	Name, Organization, Comment Format, Date Sent	Public Comment Summary	Responses
			change may have population level improvements which would manifest as improved long-term fishery performance and would create a trophy catch and release fishery. Both of which would benefit anglers.
3	Peter C., email dated 7/30/25	3. Commenter supports the proposal and advocates for a slot limit of 20-30 inches. He believes this is a necessary change to protect the fishery.	3. The Commission and Department acknowledge and appreciate the comment.
4	Matt Bond, Director with Allwaters Protection and Access Coalition, email dated 7/30/25	<p>4a. Allwaters' opposes the proposed rule change involving the implementation of a slot limit for striped bass.</p> <p>4b. There does not seem to be conclusive data showing that the striped bass population is in a state of decline due to fishing effort.</p> <p>4c. There has not been a thorough analysis of the impact of this proposal on salmonid populations.</p> <p>4d. Department creel surveys and observations point to a stable and even expanding biomass particularly from accounts of spearfishing participants.</p> <p>4e. Changes in water allocation explains why guides and surveys showed less fish.</p> <p>4f. There has been no or limited study of impacts of ecosystem, particularly with respect to species not important to fishing.</p> <p>4g. Spearfishing for striped bass will need to be eliminated as a method of take. This</p>	<p>4a. The Commission and Department acknowledge the comment and respond to specific points in the responses below.</p> <p>4b. The fishery metrics analyzed do indicate that the fishery is currently stable.</p> <p>4c. The Department conducted a comprehensive predation literature review titled "California Department of Fish and Wildlife's Striped Bass Diet, Foraging Behavior, and Predation Literature Review" and was submitted to the Fish and Game Commission as part of the June 11-12, 2025 Commission Staff Summary in Appendix 3 of the evaluation. The Department's conclusion was that 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.</p> <p>4d. Fisheries dependent studies such as creel surveys</p>

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		<p>disproportionately impacts those least impactful to the resource.</p> <p>4h. The potential negatives of a slot limit for striped bass outweigh the positives. There is not a proved stock decline that would demand this action. Salmonids are in peril and could be negatively impacted by this action.</p> <p>4i. The commenter implores the Commission to reject this proposal and advocate for the allocation of time and resources to native species.</p>	<p>cannot measure population biomass; however, the fishery metrics analyzed do indicate that the fishery is currently stable.</p> <p>4e. The Department has observed declines in the populations and health of multiple fish species in the Central Valley rivers and Delta over the past decades which can be attributed to many factors including limited flow. Other factors include habitat loss, poor water quality, salt intrusion, harmful algal blooms, and invasive aquatic vegetation.</p> <p>4f. There are many examples of research focusing on non-game species, such as delta smelt and longfin smelt.</p> <p>4g. The proposed regulation would not eliminate spearfishing as a method of take for striped bass. Just like with current regulations, the participant must ensure that the striped bass is between the lawful size limit prior to harvest.</p> <p>4h. See responses 4b and 4c.</p> <p>4i. The Department and Commission acknowledge and appreciate this comment.</p>
5	John Lopez, email dated 7/31/25.	<p>5a. Commenter requests that the current regulations stay in place.</p> <p>5b. The fishing reports from the Valley Rivers, San Francisco Bay Area and coastal beaches show that there is no significant decline.</p> <p>5c. To protect more vulnerable populations of aquatic life such as Coho salmon, Chinook salmon, Delta smelt etc. it would make sense to not</p>	<p>5a. The Department and Commission acknowledge and appreciate this comment.</p> <p>5b. See response 4d.</p> <p>5c. See response 4c.</p>

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		encourage increased numbers of predatory striped bass.	
6	Paul Young, emails dated 7/30/25	<p>6a. The commenter opposes the proposed regulatory action to add a harvest size limit for striped bass.</p> <p>6b. The commenter alleges that the population of striped bass is plentiful.</p> <p>6c. The commenter asserts that observations by the petitioners of a declining striped bass fishery was due to the drought and changes in fish behavior.</p> <p>6d. Commenter has observed striped bass predation on salmonids.</p> <p>6e. Commenter disagrees with the protection of an invasive species at the potential detriment of an important native species.</p> <p>6f. Commenter requests that the current regulations stay in place.</p>	<p>6a. The Commission and Department acknowledge and appreciate this comment.</p> <p>6b. Striped bass populations have declined from historical highs but appear to have stabilized in the last several decades.</p> <p>6c. See responses 4d and 4e.</p> <p>6d. The Department acknowledges this comment. See response 4c.</p> <p>6e. See response 1b.</p> <p>6f. See response to 6a.</p>
7	Maddie Munson, Coalition for a Sustainable Delta, email dated 7/31/2025	<p>7a. The Coalition for a Sustainable Delta supports the proposal, as long as the Commission receives federal approval of the changes under the federal Endangered Species Act (ESA) and determines that the changes are consistent with the Commission's Delta Fisheries Management Policy and Striped Bass Policy.</p> <p>7b. The express purpose of the regulatory change is to increase the striped bass population, and</p>	<p>7a. The Commission and Department acknowledge this comment. The subject of compliance with federal laws is outside the substantive scope of the regulation.</p> <p>7b. The recovery of salmon populations is a high priority for the Department and we are working on many aspects to help rebuild and sustain healthy populations. See response 4c.</p>

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		<p>there is uncontroverted evidence that striped bass prey on listed species. There can be no question that an increase in the striped bass population will increase the likelihood and magnitude of striped bass predation on listed species.</p> <p>7c. Compliance with the federal ESA is consistent with the <i>Delta Fisheries Management Policy</i> and <i>Striped Bass Policy</i> as it will ensure that the regulatory change is implemented in a manner that avoids or minimizes adverse effects of the regulatory change on listed species.</p>	7c. See response 7a.
8	Diane Burgis, Chair and Supervisor, Contra Costa County, Delta Protection Commission, email dated 7/31/25	<p>8a. The California Delta Protection Commission supports the proposed slot limit, supporting efforts to both maintain a self-sustaining striped bass population for a robust recreational fishery and the overall mission of conservation and protection of listed species.</p> <p>8b. An additional study is still needed on striped bass predation on listed species. The commenter asks that the Commission promote assessment and monitoring of the relationship between striped bass and listed species, including habitat and predation, to ensure a balance in managing game fish and species of conservation need.</p>	<p>8a. The Commission and Department acknowledge and appreciate the comment.</p> <p>8b. See response 4c.</p>
9	Paul Young, email dated 7/31/25	<p>The commenter adds the following comments to their previous email (comment letter 6).</p> <p>9a. Striped bass do not need a slot limit as there is</p>	9a. There is not currently a trophy fishery for striped bass. Though there are large fish available to catch in the fishery, anglers are currently allowed to harvest those fish. For responses about the status of the population and fishery

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		<p>presently a trophy fishery and a stable population. This proposal was written during the drought with out scientific support.</p> <p>9b. A slot limit will cost more money to enforce.</p> <p>9c. The proposal will only bolster a nonnative predator at the expense of native salmon and steelhead which need help.</p> <p>9d. Commenter asserts that the last 3 years have corrected water concerns in the delta and bay. The fishing has greatly improved. Drought effects all fish; Commenter alleges that striped bass unfortunately thrive in it, particularly in far reaches of the Sacramento River.</p>	<p>see responses 1b, 4d, and 6b.</p> <p>9b. Enforcing a regulation change would fall within the regular duties of Wildlife Officers and would not cost more money to enforce.</p> <p>9c. See responses 1b and 4c.</p> <p>9d. There have not been studies conducted or conclusive evidence presented that indicate that in the past three years in-river conditions have improved the quality of habitat, striped bass populations, or fisheries in general. Striped bass do however, have a broad distribution within California waters.</p>
10	Kevin Godes, member of Coastside Fishing Club, email dated 8/1/25	<p>10a. Commenter is wondering if any current stock assessments are available.</p>	<p>10a. The Commission and Department acknowledge and appreciate the comment. Due to funding cuts over the past decade, the Department has not been able to conduct comprehensive monitoring for striped bass and does not have current stock estimates. The Department does conduct angler surveys and collects information on size, catch, and distribution; but this information can not be used to estimate stock status. The Department conducted an evaluation of the proposed slot limit regulation change submitted by NorCal Guides and Sportsman's Association. The evaluation includes a summary of information and estimates for striped bass populations from monitoring and creel data collected over time. This evaluation was developed in coordination and review with NorCal Guides and their Science Advisors. The evaluation was submitted</p>

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			to the Fish and Game Commission as part of the June 11-12, 2025 Commission Staff Summary .
11	Mike C, email dated 8/4/25	11. Commenter supports the Department's proposed regulatory action to add a harvest size limit for striped bass. Is a recreational angler who reports observing fewer and smaller fish. Supports the striped bass slot limit as a way to protect the fishery.	11. The Commission and Department acknowledge and appreciate the comment.
12	Anupa Asokan, Executive Director of Fish On, letter received 8/8/2025	<p>The commenter opposes the Department's proposed regulatory action to add a harvest size limit for striped bass and makes the following points in comment letter:</p> <p>12a. The proposed slot limit for striped bass seems like a precautionary management action that does not fully consider the unknown impacts that enhancing the population of a nonnative species on California's ecosystems and existing native species. In this instance, no regulatory change is the most precautionary approach to fishery management.</p> <p>12b. Commenter believes that enhancing the population of striped bass will inequitably benefit a small subset of the fishing industry to the detriment of many other native fisheries that communities across California rely upon and enjoy.</p> <p>12c. Of particular concern are impacts of striped bass predation on state and federally listed species</p>	<p>12a. The Commission and Department acknowledge and appreciate the comment. See response 4c.</p> <p>12b. See response 1a.</p> <p>12c. See response 4c.</p> <p>12d. The Commission and Department acknowledge and appreciate the comment.</p> <p>12e. There are historical abundance estimates for marine and inland Striped Bass, but there are no recent estimates. See responses to 4c and 8b.</p> <p>12f. Modelling results indicate that a slot limit would improve long-term stability of the fishery while potentially improving population metrics. Please see model results in the appendix document titled "Appendix 2: Striped Bass Population Model Parameter Input Justifications".</p> <p>12g. See response 4d.</p> <p>12h. Results of the Angler Preference Questionnaire indicate that 71% of Striped Bass anglers currently support</p>

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		<p>such as Chinook salmon and steelhead. Based on both published scientific literature and discussions with leading experts, there is ample evidence that striped bass predate on salmon and steelhead and even minimal predation levels will significantly undermine recovery efforts for these threatened species. Commenter asserts that the argument that striped bass predation on salmonid species is negligible is not supported by scientific evidence, and that their mere presence influences salmonid behavior and movement, which can lead to inhibited feeding and growth with population-wide impacts. A review of striped bass on the coast of California also notes that independent efforts to recover salmon populations may attract mature striped bass for spawning and increase the predation pressure on local salmonid populations, as well as other vulnerable fish species such as tidewater goby.</p> <p>12d. From economic risk to broader ecosystem impacts, data gaps and limitations must favor the health and resilience of native species and habitat.</p> <p>12e. Given that striped bass are opportunistic predators which move readily through a wide range of temperature, salinity, and habitat structure that there are impacts on nearshore marine species. Many of these fisheries are not well understood nor do they have robust management. These unknowns are a significant concern, have outsized</p>	<p>the minimum size limit, and 54% support the current regulations. However, if given the opportunity, 64% of Striped Bass anglers supported a catch and release fishery for trophy Striped Bass even if that meant implementing a harvest slot limit. Results can be found in Appendix 1: 2022 Striped Bass Angler Preference Questionnaire Results Summary as part of the June 11-12, 2025 Commission Staff Summary.</p> <p>12i. The Commission and Department acknowledge the comment. The use of slot limits for other species is outside the scope of this rulemaking.</p>

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		<p>impacts on already vulnerable and marginalized fishing communities and alarmingly, were missing from the Department’s evaluation.</p> <p>12f. The conclusion that an 18-30-inch harvest size limit would “provide the best balance between angler opportunity and biological benefits” is not supported by science, the broader angling community or the Commission’s policies on striped bass and relevant impacted species.</p> <p>12g. The 1991-2022 creel data reported in the Department’s petition evaluation concluded that angling effort targeting striped bass has not significantly changed, while catch and catch-per-unit-effort have significantly increased and harvest has remained relatively stable.</p> <p>12h. From feedback among Fish On’s angling and spearfishing community, as well as recognizing that data from the Angler Preference Questionnaire on striped bass represent less than 3% of licensed anglers in California, does not believe this change is supported by the broader fishing community.</p> <p>12i. Commenter is interested in slot limits as a general management approach and would like to understand the practicalities of how this could be implemented for other species. They do not support the harvest size limit proposed for striped bass.</p>	

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13	Allison Febbo, General Manager, Westlands Water District received as a letter on 8/8/25	<p>13a. The commenter urges the Commission to not adopt the proposed regulatory changes.</p> <p>13b. There is concern that the proposed regulation may negatively impact native fish species, in particular California ESA and federal ESA –listed smelt and salmonid species. Stating that there is a lack of affirmative evidence that listed fish species will not be negatively impacted by the proposed regulation and that makes it difficult for stakeholders to evaluate if the proposed regulation is consistent with Commission policies.</p> <p>13c. Commenter noted that there has not been an environmental analysis under the California Environmental Quality Act circulated, as should be required due to potentially significant impacts.</p>	<p>13a. The Commission and Department acknowledge and appreciate the comment.</p> <p>13b. See response to 4c.</p> <p>13c. Per the requirements under CEQA, a Negative Declaration has been circulated for comment.</p>
14	Minh Tran, email dated 8/12/2025	<p>14a. The commenter requests that all limits and restrictions be removed from striped bass.</p> <p>14b. Striped bass are not native to California and predate on native species. Commenter suggests eradicating them.</p> <p>14c. Commenter suggests adding striped bass to the invasive species list.</p>	<p>14a. The Commission and Department acknowledge and appreciate the comment.</p> <p>14b. See response to 4c, 6e, and 8b.</p> <p>14c. This suggestion is outside of the scope of this regulation change.</p>
15	Maddie Munson, Coalition for a Sustainable Delta, verbal comment	<p>15a. Commenter stated that the coalition is prepared to drop opposition to the regulation changes if the Department and Commission seek incidental take approval from the federal</p>	<p>15a. The Commission and Department acknowledge and appreciate the comment. See response 7a.</p> <p>15b. See response 1b and 4c.</p>

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	8/13/2025	<p>government under the federal ESA.</p> <p>15b.The purpose of the regulatory changes is to increase the striped bass population, and there is uncontroverted evidence that striped bass prey on listed species. Commenter asserts that an increase in the striped bass population will definitively increase the likelihood and magnitude of striped bass predation on listed species.</p> <p>15c. Commenter contends that the commission and the Department must comply with the same federal requirements that all other federal and non-federal entities must fulfill if taking listed species. Compliance with federal ESA is consistent with the Delta Fisheries Management policy at the Commission, which ensure that the regulatory change is implemented in a manner that avoids or minimize adverse effects.</p>	15c. See response 7a.
16	Glenn Chaderis, Big Red Worm Company, verbal comment 8/13/2025	16. Commenter supports the proposal: due to recent challenges with the sturgeon harvest closure and the invasion of golden mussels, stabilization and protection of the striped bass fishery is an economical necessity for the survival of the fishing industry.	16. The Commission and Department acknowledge and appreciate the comment.
17	Mike Phillips, Vice President of the California Striped Bass Assoc. Isleton Delta	17. Commenter supports the proposal for a striped bass slot limit.	17. The Commission and Department acknowledge and appreciate the comment.

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	chapter, verbal comment 8/13/2025		
18	Anupa Asokan, Executive Director of Fish On, verbal comment 8/13/2025	<p>18a. Commenter is asking the commission to reject this regulatory change amendment.</p> <p>18b. Commenter does not see any current threat to striped bass that must be addressed through creating this harvest size limit.</p> <p>18c. Commenter is concerned with the potential impacts on native species. There's ample evidence that even the smallest amounts of predation on salmon and steelhead risk the recovery of these listed threatened species. There is little to no data on the impacts to native near shore fisheries that many anglers in the community rely upon. Though there has been plenty of anecdotal accounts highlighting the potential negative impacts to perch populations over the years up and down the coast. Given critical known impacts and the unknown consequences of this introduced species on California's native ecosystems the commenter feels it's irresponsible and unnecessary to adopt this proposed management measure.</p>	<p>18a. The Commission and Department acknowledge and appreciate the comment.</p> <p>18b. See response 1b.</p> <p>18c. See response 4c.</p>
19	Tom Cannon, independent scientist for Nor- Cal Guides and Sportmen's Assoc., verbal	19. Commenter gave a presentation to demonstrate how the slot limit would allow for a catch-and-release trophy fishery and increased egg production, helping to stabilize the population and create a more robust fishery.	19. The Commission and Department acknowledge and appreciate the presentation.

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	comment 8/13/25		
20	James Cox, Striped Bass Assoc., verbal comment 8/13/25	20. Commenter has observed the striped bass population fluctuate throughout career. Commenter supports the proposal and thinks it's needed for the species.	20. The Commission and Department acknowledge and appreciate the comment.
21	Roger Mammon, Striped Bass Assoc. West Delta Chapter, verbal comment 8/13/25	21. Commenter supports the proposal for a striped bass slot limit and wants to see striped bass protected.	21. The Commission and Department acknowledge and appreciate the comment.
22	Ken Baccetti, California Striped Bass Assoc. Isleton Delta Chapter, verbal comment 8/13/25	22. Commenter supports the proposal for a striped bass slot limit of 18-30 inches.	22. The Commission and Department acknowledge and appreciate the comment.
23	Noel de Guzman, StriperFest, verbal comment 8/13/25	23. Commenter supports the proposal for a striped bass slot limit of 18-30 inches.	23. The Commission and Department acknowledge and appreciate the comment.
24	James Stone, Nor- Cal Guides and Sportsmen's Assoc., verbal comment 8/13/25	24. Commenter supports the proposal and advocates for a slot limit. Maintains that striped bass is one of the best remaining anadromous fisheries. All of our anadromous fisheries are falling in parallel decline because of water and the habitat. Commenter asserts that the population is under a half of a million fish and declining. Striped bass is listed as one of the top five reasons on CDFW's website to purchase a fishing license in California. This fishery is loved by so many	24. The Commission and Department acknowledge and appreciate the comment.

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		because it's a 365 day a year fishery. Found through the CDFW survey that there's 67% support for a trophy 30 inch fishery. This supports so many communities from Monterey all the way to the inland communities in over 15 counties, and has an economic impact in the millions. Commenter requests that the Commission vote in support of the proposal.	

Striped bass slot limit

From Tristin N [REDACTED]
Date Sun 08/10/2025 04:31 AM
To FGC <FGC@fgc.ca.gov>

Hello,

I hope the proposed plan of introducing a slot limit to striped bass will go through. I have been fishing California waters, mainly the delta, since I was a child and I'm now 27 years. As a naive child fishing my father, I recall catching specimens up to 36 inches and keeping them. I reflect back regretfully wishing to have released those fish as they now seem scarce. As an adult I haven't caught a specimen over 36 inches and afraid that chance dwindles with our current regulations. I believe a slot limit would be largely beneficial to our fishery as well as the health of consumers.

Best,
Tristian Nguyen

Slot limit

From JAMES SMITH [REDACTED]
Date Tue 08/12/2025 11:52 AM
To FGC <FGC@fgc.ca.gov>

My name is James Smith
Owner operator of California Dawn Sportfishing and vice president of GGFA
Myself and our organization is in favor of having the slot limit.
Thank you

Sent from my iPhone

Agenda Item 13/Striped Bass Slot Limit

From Isleton CSBA [REDACTED]
Date Tue 08/12/2025 12:24 PM
To FGC <FGC@fgc.ca.gov>

To the Members of the California Fish and Game Commission,
My name is Kenneth Baccetti. I am the President of the California Striped Bass Association Isleton Delta Chapter. I'm writing you to advise you that I, along with more than 250 regular and commercial members of our chapter, support agenda item 13 the 18" to 30" slot limit for the striped bass. I solicit your support on this agenda item and thank you for your time.

Sincerely,
Kenneth Baccetti
President, California Striped Bass
Association Isleton Delta Chapter

Sent from my iPhone

Letter of Support: Proposal for an 18–30-inch Harvest Slot Limit

From Cynthia M LeDoux-Bloom [REDACTED]

Date Tue 08/12/2025 05:00 PM

To FGC <FGC@fgc.ca.gov>

Dear Fish & Game Commission:

I am writing to strongly support the Nor-Cal Guides and Sportsmen's Association (NCGASA) proposed harvest slot limit that was amended by the Department of Fish and Wildlife.

In 1879, Dr. Stone introduced Striped Bass and began introducing other species into the Sacramento-San Joaquin Delta to enhance fishing opportunities. Striped Bass were introduced to mitigate the decline of Chinook salmon which began prior to 1850. Since then, the two populations have declined cyclically together.

Fishers are the voice of fish. Striped bass have been declining for years. Please save this fishery.

Thankyou,
Cynthia

Dr. Cynthia M. Le Doux-Bloom, Faculty Research Associate

Cal Poly Humboldt, Department of Fisheries Biology

<https://fisheries.humboldt.edu/people/cynthia-le-doux-bloom-phd>

O:(707) 826-3523 & WDFS 266; M:(916) 813-6731

[REDACTED]

American Fisheries Society (AFS) - Certified Fisheries Professional #3365 (Emeritus)
AFS - Humboldt Bay Student Subunit Advisor

RE: slot limit for Striped Bass

From Mitchell Gauthier [REDACTED]
Date Fri 08/15/2025 07:22 AM
To FGC <FGC@fgc.ca.gov>

Dear Fish & Game Management,

Please maintain—and where prudent, strengthen—the slot size limits for striped bass in the Delta and San Francisco Bay. Striped bass regulation change to slot limit 18" to 30". The largest, oldest fish are the proven "genetic survivors." They produce far more—and higher-quality—eggs, pass on resilience, and stabilize year-classes through tough water years. Harvesting these brood fish erodes age structure and weakens the stock over time. In short: let the big mamas (and grandpas) do what they do best—make more fish.

Key points:

- Preserve age/size structure: Protecting oversize fish keeps high-fitness breeders in the water, sustaining recruitment.
- Future-proofing: A robust broodstock buffers the population against droughts, warm water, and habitat swings.
- Angler benefits: Healthy year-classes mean better fishing tomorrow without sacrificing opportunity today.

Practical steps:

- Keep the oversize release rule intact (and consider modestly widening it only if current data supports this).
- Emphasize barbless/single-hook guidance and quick release during warm-water periods.
- Pair enforcement with clear public education (ramp signage, regs cards) and ongoing spawn/age-composition monitoring.

This is low-cost, high-impact conservation. Protect the big breeders now so our kids inherit a strong, fishable striped bass fishery.

Respectfully,

R.Mitchell Gauthier

[REDACTED]

[REDACTED]

California Striped Bass Proposal

From Dan Simms [REDACTED]
Date Thu 09/18/2025 11:07 AM
To FGC <FGC@fgc.ca.gov>

Dear Person;

My name is Dan Simms and I am 74 years old. Growing up in the late 50's and 60's, my family fished for Stripes between the Feather River and the Hog Farm near Knights Landing on the Sacramento River. Each year there were Striped Bass Derby's all along the Sacramento River; from Knights Landing to Rio Vista. These Striped Bass Derby's generally run from April 1 st to June 1's.

My family participated in a lot of these derby's. From April 1's to June 1's, my family (Father, Mother, brother and myself) caught between 105 to 110 Stripers per year. Please note; my father had an "Iron Clad" rule, "NO" fish under 10 pounds were kept, with the exception, if the fish was hooked so deep the fish was bleeding.

Yes, no fish under 10 pounds were kept. Catching stripes 10 to 15 pounds was routine; it was like catching Carp or Catfish in the Sacramento River.No big deal. However, catching Stripes over 15 pounds was a different story. We did catch Stripers over 15 pounds, but not big enough to win a Bass Derby; with the exception my brother won a Derby with a 22 pounder.
(Please see the attachment.)

I have 2 grandchildren (13 & 16) who are avid fishermen. I would give anything to take them back to the 50's and 60's to experience what I experienced growing up; but I can't.
However, what I can do is support the size limit of 20 inches to 30 inch plan.

Therefore; I strongly support no Striper to be kept under 20 inches or over 30 inches.

Dan Simms

To whom this concerns at Fish and Game Commission:
Change to Striped Bass "harvest size limit".

Aug 2025

I am opposed to the Striped Bass harvest size limit 18" to 30" change!
The 18" size limit should stay the same as it is.

This change will have a big effect on all fish populations mostly Salmon and Steelhead, and all other living species in or on the water ways in the future. Trophy size Striped Bass will devastate many living creatures. Most experience adult fisherman want them eliminated. Experience fisherman normally never fish on guided fishing boats unless handicapped, novices or someone that is looking for a cheap thrill. Hopefully the F&G Commission is not in the business of promoting this business of trophy fishing and cheap thrills using our natural resources. This proposal is insanity.

Print Name & Date: *JAMES LAMBERT*

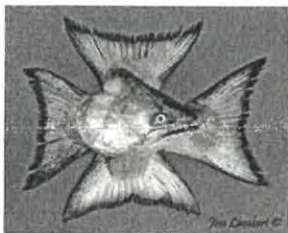
Signature: *8/7/2025*
Address:

Dear F&G Commission:

I would like to propose a new fishing rule regarding Striped Bass fishing.
That all Striped Bass fish hooked 32 inches or greater in length must be retain, these fish cannot be released. This will help level the playing field and increase striped Bass population. Also improve other wild life and fish populations that are in grave danger and decline due to Striped Bass predation.

Print Name & Date: *JAMES LAMBERT*

Signature: *8/7/2025*
Address:



The Salmon Cross is a symbol that represents those individuals who have made it their mission in life to save the Wild Steelhead and Wild Salmon from extinction. Their work, dedication and sacrifices provide future generations the enjoyment of this treasured natural resource. @ Jim Lambert. Contemporary Photographs, 831 394

Note: Striped bass can live for up to 30 years, and female striped bass become sexually mature at around four to five years of age. At their first spawning, they can produce half million striped bass eggs, though not all will be fertilized or develop into fry. As females get larger and older, they will be able to produce many more eggs, sometimes up to 5 million ripe eggs.



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F+G Commission
P.O. Box 944209
Sacramento, Ca. 94244-2090

94244-2090



30" striped bass limit

From Karen Siano [REDACTED]
Date Fri 08/15/2025 12:47 PM
To FGC <FGC@fgc.ca.gov>

I do not support the 30" striper bass limit.
Michael Pipkins

Concern Re: Striped Bass Harvest Limit

From Pasha Foroudi [REDACTED]
Date Fri 09/12/2025 08:14 AM
To FGC <FGC@fgc.ca.gov>

Hello,

Not sure if this is too late, but FWIW, I want to express my opposition to the proposed 18-30in harvest slot limit for striped bass.

From my perspective as a recreational angler, the striped bass population appears healthy and robust under the current 18-inch minimum length limit.

Unless there is clear data indicating otherwise, it's hard to imagine there's a shortage of breeding stripers given the high quality striper fishing the last several years.

I worry that a slot limit could actually impact other fisheries negatively given the voracious nature of striped bass.

Thank you for your consideration.

Sincerely,

Pasha Foroudi
[REDACTED]
[REDACTED]

Proposed Striped Bass Slot Limits

From K [REDACTED]
Date Mon 09/22/2025 06:18 PM
To FGC <FGC@fgc.ca.gov>

Dear Commissioners,

I urge you to reject the proposed changes to the regulations on the invasive striped bass.

Protecting a non-native invasive species for the gain of some misguided commercial guide operators at the expense of native species, native fisheries, and the rest of the public (who are not financially benefiting) is a completely unacceptable path.

These suggested regulations are not based on science, conservation, or any data and should not be entertained any further. Before any such regulations could ethically be pursued detailed studies of the impacts of striped bass on the populations our native species must be undertaken.

How many of the salmon, that the state devotes huge resources to rearing and releasing, are immediately consumed by hordes of non-native invasive striped bass? What sort of impact are the striped bass having on the young white sea bass being released in Southern California? What impact do the striped bass have on surf perch abundance?

All of those questions and many more deserve research before adding regulations that protect a species that has no natural presence in our waters.

The commission must reject these proposed changes and focus on data driven, science based, conservation minded regulations that protect the ability to enjoy a bountiful harvest of our many diverse native species today and for generations to come. If the commission must make a change to the regulations on striped bass it should start with lifting all size and bag limits on the species.

Thank you for doing the right thing in rejecting these proposed slot limit regulations for striped bass.

Best regards,

Kevin Lentz

[REDACTED]

Striped Bass Slot Limit

From Josh Zhou [REDACTED]
Date Thu 09/25/2025 04:54 PM
To FGC <FGC@fgc.ca.gov>

Hello,

Please do not pass the slot limit proposed for striped bass.

They're non native and compete with native species, which have seen extreme declines in population in recent years. Keep the existing striped bass regulations, and allow other species like salmon to have reduced competition.

Comment on Striped Bass regulation change

From Raymond Hiemstra [REDACTED]

Date Thu 09/25/2025 05:00 PM

To FGC <FGC@fgc.ca.gov>

Dear Commissioners,

I am writing to express my opposition to the proposed changes in the striped bass regulations to create a size limit for harvesting Striped Bass. These fish are a invasive species that have a devastating impact on the environment. I am a active fisherman and regularly fish for Striped Bass both to eat and to keep the species in check. This proposed regulation is designed to support trophy fishing, not the environment or fisheries, I dont think there should be any limit of any kind on Striped Bass and I urge you to reject this proposed regulation.

Thanks,

Ray Hiemstra

Oppose Striped Bass Slot Limit

From Dylan Sohngen [REDACTED]
Date Thu 09/25/2025 09:28 AM
To FGC <FGC@fgc.ca.gov>

Dear Commissioners,

I am writing to urge you to reject the proposed changes to striped bass harvest regulations.

Striped bass are an introduced species in California, not a native fish. As an angler, I know striped bass are a fun and popular fish to target, but I also see that they are significant predators of salmon, steelhead and countless other nearshore species. Salmon and steelhead are already in crisis due to water use and pollution issues and cannot withstand further pressure. A trophy fishery for striped bass would directly undermine efforts to recover our native fisheries and restore balance to our ecosystems.

Furthermore, the angler survey being used to justify this proposal represents less than 3% of licensed anglers in California and does not reflect the views of the broader fishing community, myself included. Policy decisions of this importance must be based on sound science and representative input, not limited or biased data.

I ask the Commission to prioritize California's native fisheries, ecosystem health and what's best for the broader angling community. Please reject this striped bass regulation change.

Thank you for your leadership and consideration.

Sincerely,

Dylan Sohngen
[REDACTED]



September 24, 2025

California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090

Submitted via email to fgc@fgc.ca.gov

RE: Item 14. Recreational take of striped bass - Oppose harvest size limit

Dear President Zavaleta and Honorable Commissioners,

Fish On is dedicated to science-based and precautionary approaches to ocean and fishery management, underpinned by a commitment to advancing social equity in management and coastal access. While the proposed slot limit, or harvest size limit, for striped bass may seem like a precautionary management action, the outsized and unknown impacts of enhancing the population of this non-native, introduced species on California's ecosystems and myriad other native fisheries is a significant concern. In this instance, **no regulatory change** is the precautionary approach to fishery management. We believe that enhancing the population of striped bass will inequitably benefit a small subset of the fishing industry to the detriment of many other native fisheries that communities across California rely upon and enjoy.

Of particular concern are impacts of striped bass predation on state and federally listed species such as Chinook salmon¹ and steelhead.² Based on both published scientific literature and discussions with leading experts, we find 1) ample evidence that striped bass predate on salmon and steelhead³ and 2) agreement that even minimal predation levels will significantly undermine recovery efforts for these already threatened species. Even if we accept the unsupported argument that striped bass predation on salmonid species is negligible, the mere presence of striped bass influences salmonid behavior and movement, which can lead to inhibited feeding and growth. These sublethal effects have population-wide impacts, undermining survival and resilience of native and vulnerable fisheries.⁴ A review of striped bass

¹ [Chinook Salmon; Chinook Salmon \(Protected\): Conservation & Management | NOAA Fisheries](#)

² [Coastal Rainbow Trout / Steelhead; Steelhead Trout: Conservation & Management | NOAA Fisheries](#)

³ Brandl et al., 2016. Generation of quantitative polymerase chain reaction detectability half-lives and comparison of sampling protocols for genetic diet studies of San Francisco Estuary Fishes. Transactions of the American Fisheries Society 145:441–449; Loboschewsky et al., 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):Article 3;

Michel et al., 2018. Non-native fish predator density and molecular-based diet estimates suggest differing effects of predator species on juvenile salmon in San Joaquin River, California. San Francisco Estuary and Watershed Science 16(4):Article 3;

Stompe, D. K., 2018. Habitat-specific diet analysis of Sacramento pikeminnow (*Ptychocheilus grandis*) and striped bass (*Morone saxatilis*) in the Sacramento River. Thesis, California State University Chico, Chico, CA, USA.

⁴ Bond et al., 2008. Marine survival of steelhead (*Oncorhynchus mykiss*) enhanced by a seasonally closed estuary. Canadian Journal of Fisheries and Aquatic Sciences 65:2242–2252;

Koski, K. V. 2009. The fate of coho salmon nomads: The story of an estuarine-rearing strategy promoting resilience. Ecology and Society 14(1):Article 4;

on the coast of California also notes that independent efforts to recover salmon may attract mature striped bass for spawning and increase the predation pressure on local salmonid populations, as well as other vulnerable fish species such as tidewater goby.⁵

The striped bass fishery cannot be managed under the same principles which underpin management of other fisheries. From economic risk to broader ecosystem impacts, data gaps and limitations must favor the health and resilience of native species and habitat. Given that striped bass are opportunistic predators—which move readily through a wide range of temperature, salinity, and habitat structure⁶—it is reasonable to assume, and supported by anecdotal evidence,⁷ that there are impacts on nearshore marine species, as well. Many of these fisheries are not well understood nor do they have robust management. These unknowns are a significant concern, have outsized impacts on already vulnerable and marginalized fishing communities and alarmingly, were missing from the Department’s evaluation. The conclusion that an 18-30-inch harvest size limit would “provide the best balance between angler opportunity and biological benefits” is not supported by science, the broader angling community or the Commission’s policies⁸ on striped bass and relevant impacted species.

The 1991-2022 creel data reported in the Department’s petition evaluation concluded that angling effort targeting striped bass has not significantly changed, while catch and catch-per-unit-effort have significantly increased and harvest has remained relatively stable. These data support the notion that this regulatory change is unwarranted and potentially irresponsible given the aforementioned threats to California’s native and vulnerable fisheries. From feedback among Fish On’s angling and spearfishing community, as well as recognizing that data from the Angler Preference Questionnaire (also reported in the Department’s petition evaluation) on striped bass represent less than 3% of licensed anglers in California⁹, we do not believe this change is supported by the broader fishing community.

While we are interested in slot limits as a general management approach and would like to understand the practicalities of how this could be implemented for other species, **we are opposed to the harvest size limit for striped bass**. California must prioritize recovery and sustainability of our native species. Without fully understanding the ecosystem impacts of striped bass predation in inland and marine waters, we find this proposed management measure imprudent and unnecessary.

Sabal et al., 2016. Habitat alterations and a nonnative predator, the striped bass, increase native Chinook salmon mortality in the Central Valley, California. *North American Journal of Fisheries Management* 36:309–320

⁵ Boughton, D.A., 2020. Striped Bass on the coast of California: a review. *California Fish and Wildlife* 106(3):226-257

⁶ Calhoun, A.J., 1952. Annual migrations of California striped bass. *California Fish and Game* 38:391–403;

Sabal et al., 2019. Seasonal movement patterns of striped bass (*Morone saxatilis*) in their nonnative range. *Estuaries and Coasts* 42:567–579.

⁷ From reports among Fish On’s community, perch species and forage fish were most commonly noted in stomach contents of striped bass caught nearshore.

⁸ [Fisheries Policies](#)

⁹ Calculated using 2022 license data, the same year the Questionnaire was distributed. There were 26,410 total responses to the questionnaire; 18,751 of those respondents fish for striped bass and 7,659 did not fish for striped bass. There were 1,629,198 licenses sold in 2022. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178047&inline>

Respectfully,

Anupa Asokan
Executive Director
Fish On

**Westlands Water District Comment for August 13-14, 2025, Commission Meeting- Agenda Item 13
Striped Bass**

From Allison Febbo [REDACTED]
Date Thu 09/25/2025 04:52 PM
To FGC <FGC@fgc.ca.gov>
Cc Wildlife DIRECTOR <DIRECTOR@wildlife.ca.gov> Wildlife Fisheries <Fisheries@wildlife.ca.gov> Wildlife Striped Bass <StripedBass@wildlife.ca.gov>

September 25, 2025

Dear Commissioners:

Westlands Water District ("Westlands") submits this comment letter to the Fish and Game Commission ("Commission") for its August 13-14, 2025, meeting for Agenda Item 13: Recreational Take of Striped Bass and Associated Environmental Review under the California Environmental Quality Act ("CEQA").

Sincerely,



Allison Febbo
General Manager
cell 916-541-1463
[REDACTED]



Westlands Water District

Thursday, September 25, 2025

Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090

Via email: fgc@fgc.ca.gov

Re: Comment for August 13-14, 2025, Fish and Game Commission Meeting—Agenda Item 13: Recreational Take of Striped Bass and Associated Environmental Review under the California Environmental Quality Act (“CEQA”)

Dear Commissioners:

Westlands Water District (“Westlands”) submits this comment letter to the Fish and Game Commission (“Commission”) on (1) the *Notice of Proposed Rulemaking to Amend Sections 5.75(c) and (d), and 27.85(c) Title 14, California Code of Regulations Re: Striped Bass Harvest Size Limits* (“Proposed Regulation”) and associated documents and (2) the *DRAFT Negative Declaration for Proposed Amendments to Recreational Striped Bass Harvest Size Limits Title 14, California Code of Regulations* (SCH 2025090234) (“Draft Negative Declaration”) prepared pursuant to the California Environmental Quality Act (“CEQA”). Consistent with the past letters submitted to the Wildlife Resources Committee on January 10, 2025, and the Commission on June 6, 2025 and August 8, 2025, Westlands continues to urge the Commission **not** to adopt the proposed regulatory changes.

Westlands is a California water district formed pursuant to California Water Code sections 34000 et seq. Westlands’ principal office is in Fresno, California and its service area in western Fresno and Kings counties encompasses approximately 614,000 acres that include some of the most highly productive agricultural lands in the world. Westlands also provides water for some municipal and industrial uses, including for use by disadvantaged communities, and to Naval Air Station Lemoore. To provide water in its service area, Westlands has contracted with Reclamation to receive water from the Central Valley Project (“CVP”). Westlands works collaboratively with state, federal, and local agencies to prevent impacts to state and federally listed native fish species, including as an agency supporting the Healthy Rivers and Landscapes Program which seeks to enhance habitat for native fish species through flow and non-flow measures.

286 W. Cromwell Ave, Fresno, CA 93711
P.O. Box 5199, Fresno, CA 93755
Phone: 559-224-1523 | wwd.ca.gov

Letter to Fish and Game Commission
 Re Proposed Rulemaking on Recreational Take of Striped Bass and Associated CEQA Review
 September 25, 2025

This comment letter addresses specifically the information and analysis provided in the Initial Statement of Reasons (“ISOR”) and supporting documents¹ as well as the analysis in the Draft Negative Declaration.²

1. The Need for Protective Measures for Striped Bass Stock Conservation Benefits is Not Supported by the Rulemaking Record.

The ISOR notes that the regulation would include “stock conservation benefits” and stated that the regulation is “necessary for the continued preservation of the resource.”³ However, it is not clear from the record that the stock conservation actions are necessary for the fishery. Per the Department’s own analysis and statements at the Commission meeting, the striped bass population is stable.⁴ No data provided in the ISOR or presented by the Petitioners supports the assertion that the adult striped bass population has declined. Importantly, angler catch-per-unit-effort (“CPUE”)—the only metric available which reflects recent abundance of the adult striped bass population—has increased significantly since the 1990’s.⁵ The Commission’s Draft Negative Declaration asserts “a decline in recruitment of striped bass juveniles has been observed over the past several decades.”⁶ This claim is not supported by data presented in the ISOR. Open water trawl surveys in the Delta (e.g. FMWT, STN, and SFBS MWT) show that juvenile striped bass declined precipitously in the mid-1980’s and that catch indices have been consistently low since about 2001.⁷ Importantly, Sommer et al (2011) showed that juvenile striped bass have changed their rearing behavior (i.e. shifting from pelagic to littoral rearing), suggesting these trawls no longer provide a reliable indicator of juvenile striped bass recruitment success. Further emphasizing this point, adult striped bass abundance has increased since 1995 (according to CPUE data) while juvenile striped bass abundance indices have remained consistently very low.⁸

¹ Available at <https://fgc.ca.gov/Regulations/2025-New-and-Proposed#5-75>.

² Available at <https://ceqanet.lci.ca.gov/2025090234>.

³ ISOR at 3, 5.

⁴ California Department of Fish and Wildlife, 2024. Evaluation of Regulation Change Petition 2022-12: Proposed 20 – 30-inch harvest slot limit for Striped Bass (*Marone saxatilis*) (“Petition Evaluation”) at 10 (“Data from inland and marine creel surveys indicate that Striped Bass CPUE, size of catch, and harvest have been stable for decades, and both fisheries have seen an increase in the number of released Striped Bass.”) available in June 11-12, 2025, Meeting Binder Agenda Item 25 Staff Summary (“Staff Summary”) on Commission’s website at <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=232675&inline> at 74; *id.* at 13 (“Creel data suggests that the Striped Bass fishery in California is currently stable, and the current regulations are not contributing to perceived population declines.”) (Staff Summary at 77); *see also* Department presentation at June 12, 2025, Commission meeting at slide 10 (noting adult abundance of striped bass has stabilized) (Staff Summary at 55); video from June 12, 2025, meeting at 4:16:36 (President Zavaleta confirming that there isn’t any evidence as to currently declining population of striped bass), available at https://cal-span.org/meeting/cfg_20250612/.

⁵ See Petition Evaluation at 18 (Staff Summary at 82).

⁶ Draft Negative Declaration at 4.

⁷ Petition Evaluation at 24-25 (Staff Summary at 88-89).

⁸ See James Stone Presentation at August 13, 2025, Commission meeting (FGC: Agenda Item 13 California Striped Bass Trophy Fishery: Slot Limit Proposal Protecting a Valued Recreational Resource) at slide 11; *see also*

Letter to Fish and Game Commission
 Re Proposed Rulemaking on Recreational Take of Striped Bass and Associated CEQA Review
 September 25, 2025

At the June 12, 2025, meeting, the Commission requested that the Department provide updated information on the status of the striped bass fishery and potential impacts to salmon.⁹ That information might have included, for example, CPUE data since 2021 gathered by the Department's Central Valley Angler Survey to supplement on the record information which only provides inland striped bass CPUE data through 2016.¹⁰ An assessment of striped bass CPUE data since 2021 could have been shared with the Commission. In addition, we believe the Department is in possession of information regarding the acoustic tag-based studies of juvenile hatchery fall-run salmon survival in the Sacramento River that have been conducted annually since at least 2019. Further, we believe this information would have informed the discussion on this regulatory proposal but it was not presented at the August 14, 2025, Commission meeting.

Without the benefit of striped bass angler survey data (which only Department can provide), it is appropriate to consider other available sources of information relevant to evaluating the condition of the striped bass population and recreational fishery. We commissioned a review of striped bass angling reports since 2010, which then ranked the quality of striped bass fishing on the Sacramento River from 2021-2025 (see Appendix A for details).¹¹ Angler reports suggest that striped bass fishing has been "excellent" to "good" in four of the last five years.¹² Similarly, the angler survey undertaken by the Department and public comments submitted to the Commission meeting indicate anglers are generally satisfied with the state of the fishery. To the extent the regulation is intended to increase angler opportunity, the ISOR states that the "[t]he proposed action is not anticipated to change the level of fishing activity enough to affect the demand for goods and services related to striped bass sportfishing enough to impact the demand for labor, nor induce the creation of new businesses, nor eliminate or induce the expansion of businesses in California."¹³ If the Proposed Regulation is not anticipated to have any impact on fishing activity, it is unclear how it would address any perceived concerns as to angler dissatisfaction with the fishery (to the extent those concerns exist at all).

Unless and until the Department provides the Commission with the information that contradicts our understanding that the striped bass population is stable and recreational fishing opportunity is good to excellent in most years, the Commission should refrain from making any changes at this time.

Department presentation at June 12, 2025, Commission meeting at slide 10-11 (Staff Summary at 55-56); Department presentation at September 12, 2024, Wildlife Resources Committee meeting at slides 6-8 (Staff Summary at 10-12).

⁹ See video from June 12, 2025, meeting at 3:52:30 (Director Bonham noting "we'd be glad to come back and talk a little bit more about this particular sub aspect"), 4:13:01 (Commissioner Murray stating that the Department would "come back and bring us more information about the salmon issue at the next meeting."), 4:17:24 (Jonathan Nelson, Environmental Program Manager at the Department, stating that in relation to the status of the fishery, "we can talk more about that in the discussion meeting."). Video available at https://cal-span.org/meeting/cfg_20250612/.

¹⁰ See Petition Evaluation at 18-19 (Staff Summary at 82-83).

¹¹ This data is combined in Table 1 below, which also includes Sacramento River conditions and information on juvenile salmon survival.

¹² See Table 1.

¹³ ISOR at 6.

Letter to Fish and Game Commission
Re Proposed Rulemaking on Recreational Take of Striped Bass and Associated CEQA Review
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2. The Discussion of Anticipated Benefits of the Regulation is Incomplete and Fails to Note the Potential for Negative Impact on Listed Salmon Species.

The ISOR in multiple places provides an incomplete explanation of possible negative impacts on the environment. Regarding mitigation measures, the ISOR noted there is no significant adverse effect on the environment and that no mitigation measures are needed.¹⁴ This is problematic for several reasons.

First, there is no environmental analysis listed in the documents regulation change,¹⁵ and no California Environmental Quality Act (CEQA) environmental review was released concurrent with noticing the ISOR that might support the statement that the Proposed Regulation will have no significant adverse effect on the environment. The Department's Petition Evaluation specifically notes that the Proposed Regulation will require review under CEQA.¹⁶

Additionally, the ISOR fails to adequately consider negative impact on species protected under the federal and state Endangered Species Acts despite discussion on that issue at multiple Commission meetings, in comment letters prior to notice, and Department staff's own statements as to known predation of striped bass on listed species. The Department applied a population model to assess conservation benefits to the striped bass population resulting from the slot limit regulation,¹⁷ but did not use the same model to evaluate impacts to native fish species—particularly Chinook salmon. However, the ISOR and supporting documents contain ample scientific evidence that striped bass often have substantial predation impacts on juvenile salmon in Central Valley rivers during later winter and spring months. For example:

- “Spring diet largely consisted of king salmon (65%). Individuals were found in the Upper Sacramento River.”¹⁸
- “Twenty four percent of striped bass caught were observed to have consumed at least one Chinook salmon.”¹⁹

¹⁴ ISOR at 5.

¹⁵ See ISOR at 4.

¹⁶ Petition Evaluation at 46.

¹⁷ *Id.* at 28-45 (Staff Summary at 92-109).

¹⁸ Petition Evaluation, Appendix 3 at 7 (summarizing Thomas 1967) (Staff Report at 160).

¹⁹ *Id.* at 15 (summarizing Peterson et al. 2023) (Staff Report at 168).

Letter to Fish and Game Commission
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- “Striped bass were estimated to have the largest impact on salmon populations in the sturdy area compared to other predators.”²⁰
- “The striped bass removal-salmon survival experiment showed a 10.2% increase in the survival of juvenile Chinook salmon after 11 striped bass were removed. Diet energetic analysis demonstrated that the 7.9%-13.1% of the emigrating juvenile Chinook salmon population were consumed.”²¹
- “A local predation hot spot (WIDD) was associated with increased per capita consumption (PCC) of juvenile Chinook salmon by striped bass and attracted large numbers of striped bass, thus decreasing the survival of emigrating juvenile salmon by 8%-29%.”²²
- “The current striped bass population...consume about 9% of winter-run Chinook salmon outmigrants.”²³
- “Striped bass predation at the current population level may be a nontrivial sources of mortality for winter-run Chinook salmon.”²⁴

While the Department acknowledged these findings, it still emphasized uncertainty when making high-level conclusions regarding predation impacts from the proposed regulation, stating that “[d]espite these considerations, most of the literature reviewed suggests that striped bass consumption of salmonids...was low compared to other prey items” and “[c]limate 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.”²⁵

When evaluating the potential of striped bass to prey upon juvenile salmon, some studies are more relevant than others. For predation impacts on salmon, most relevant context to evaluate is Central Valley rivers between March and May (when juvenile salmon are emigrating) Here, scientific evidence strongly demonstrates striped bass can have a significant adverse impact on the survival of juvenile salmon. Since the proposed regulation is expected to increase the reproductive capacity of striped bass, it may also increase the abundance of striped bass

²⁰ *Id.* at 16 (summarizing Peterson et al. 2023) (Staff Report at 169).

²¹ *Id.* at 33 (summarizing Sabal et al. 2016) (Staff Report at 186).

²² *Id.*

²³ *Id.* at 40 (summarizing Lindley and Mohr 2003) (Staff Report at 193).

²⁴ *Id.* at 41 (summarizing Lindley and Mohr 2003) (Staff Report at 194).

²⁵ Petition Evaluation at 48-49 (Staff Report at 112-113).

Letter to Fish and Game Commission
Re Proposed Rulemaking on Recreational Take of Striped Bass and Associated CEQA Review
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generally—including fish between 13” and 27,” which are most likely to prey upon juvenile salmon.²⁶

In conjunction with the angler satisfaction data discussed above, we evaluated Sacramento River conditions and survival of acoustically tagged Chinook salmon between April and May of these same years. Results from both analyses are summarized in Table 1 below. Several relevant patterns emerge. First, the poorest striped bass fishing occurred in 2023, a wet year when survival of juvenile Chinook salmon was at its highest (averaging 41% from Red Bluff to Sacramento)—an indication that fewer striped bass in the system overlapped with better results for juvenile salmon. Relative to 2023, survival of juvenile Chinook salmon in 2024 and 2025 was much lower than would have been expected given Sacramento River flows—an indication that excellent striped bass fishing opportunity, and perhaps higher populations of striped bass, overlapped with lower salmon survival. Importantly, Sacramento River flows in 2024 and 2025 were explicitly managed to provide a series of pulses intended to improve survival of juvenile salmon. Of course, multiple factors influence patterns of juvenile salmon survival and the relative contributions of river flows, water temperatures, and striped bass predation cannot be disentangled from these data alone. However, these data (along with prior studies cited previously) do suggest that the abundance of striped bass—unquestionably the most prolific, effective juvenile salmon predator occurring in Central Valley rivers—can substantially influence the survival of juvenile salmon. Importantly, there is insufficient data at this time to understand the relationship between these factors largely because effective monitoring of the striped bass population continues to be unavailable. Reliable population estimates for striped bass—particularly the age-specific abundance of striped bass spawning in the Sacramento River basin—are needed in order to implement harvest management strategies that more effectively balance salmon and native fish protections with the striped bass fishing opportunities.

²⁶ *Id.* at 47 (Staff Report at 111).

Letter to Fish and Game Commission
 Re Proposed Rulemaking on Recreational Take of Striped Bass and Associated CEQA Review
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TABLE 1: Summary of Striped Bass Relative Abundance, Sacramento River Flows, and Survival of Juvenile Salmon.

	Sacramento River Striped Bass Relative Abundance		Sacramento River below Wilkins Slough		Acoustically tagged juvenile hatchery fall-run survival from Red Bluff Diversion Dam to Tower Bridge (Sacramento)		
Year	Angler Reports ₁	Angler CPUE	Avg. Flow (cfs)	Avg. Water Temp (°F)	Survival (average)	Survival (range)	Acoustic tag (AT) study information
2025	Excellent	Data collected by CDFW CVAS, but not available	10,641	63.1	10%	1.2% to 18%	1,975 AT fish, eight release groups, mid April to late May
2024	Excellent		11,743	62.9	24%	4.3% to 63%	1,375 AT fish, seven release groups, mid April to late May
2023	Average		14,447	60.6	41%	25% to 54%	1,251 AT fish, five release groups, mid April to mid May
2022	Excellent		4,344	65.8	2.7%	0.3% to 6.0%	1,103 AT fish, three release groups, early April to early May
2021	Good		4,835	67.2	0.3%	0.2% to 0.4%	961 AT fish, two release groups, late April and early May
Acoustic tagging data sources:							
	2025	https://oceanview.pfeg.noaa.gov/CalFishTrack/pageSpringPulse_2025.html					
	2024	https://oceanview.pfeg.noaa.gov/CalFishTrack/pageSpringPulse_2024.html					
	2023	https://oceanview.pfeg.noaa.gov/CalFishTrack/pageSpringPulse_2023.html					
	2022	https://oceanview.pfeg.noaa.gov/CalFishTrack/pageSeasSurv_2022.html					
	2021	https://oceanview.pfeg.noaa.gov/CalFishTrack/pageCNFH_FMR_2021.html					
Angler Reports ₁		See Appendix A of comment letter for methods					

Without any supporting environmental review, and in consideration of the discussion above on potential impacts to listed salmon species, the ISOR's conclusion that there is no significant impact on the environment is unsupported. At a minimum, the ISOR must fully consider the possible negative impacts to listed fish species of an increasing striped bass population.

3. The Regulation is Inconsistent with Commission Policies.

The ISOR describes the Proposed Regulation as consistent with Fish and Game Section 1700, which states that “the policy of the state . . . to promote the development of local fisheries. . . .” However, the ISOR does not discuss multiple other applicable policies, including the following:

- Fish and Game Code section 2052: “The Legislature further finds and declares that it is the policy of the state to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat”

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- Delta Fisheries Management Policy: “Recognizing that listed species have the highest priority, the Department shall manage Delta Fisheries to protect and enhance each species’ abundance, distribution, and genetic integrity to support their resiliency and (where applicable) recovery” and that the Department should manage Delta fisheries with an eye to “avoiding or minimizing adverse effects to native and listed species. . . .”²⁷
- Striped Bass Policy: “The Department shall ensure that actions to increase striped bass abundance are consistent with the Department’s long-term mission and public trust responsibilities including those related to threatened and endangered species and other species of greatest conservation need.”
- Salmon Policy: Noting “non-native fish species will not be planted, or fisheries based on them will not be developed or maintained, in drainages of salmon waters, where, in the opinion of the Department, they may adversely affect native salmon populations by competing with, preying upon . . . them.”²⁸

The Commission must consider whether the Proposed Regulation complies with all relevant policies, not simply with Fish and Game Code section 1700.

4. The Commission Must Prepare an Environmental Impact Report.

Under CEQA, the CEQA Guidelines, and the Commission’s implementing regulations, a proposed project (such as the proposed regulatory change at issue here) which may have a significant effect on the environment requires preparation of an environmental impact report (“EIR”).²⁹ The threshold for finding an EIR is required is low, requiring only a fair argument that the project may have significant effect on the environment.³⁰

The Draft Negative Declaration improperly characterizes the potential impact of the Proposed Regulation as “less than significant.”³¹ First, the Draft Negative Declaration erroneously states that “[t]he Department’s evaluation concludes that instituting [the Proposed Regulation] would have a less than significant impact on salmonid and smelt populations through striped bass predation” and “there is insufficient evidence to support that striped bass predation is a primary

²⁷ Delta Fisheries Management Policy (2020), available at <https://fgc.ca.gov/About/Policies/Fisheries#DeltaFisheries>.

²⁸ Salmon Policy (2008), available at <https://fgc.ca.gov/About/Policies/Fisheries#Salmon>.

²⁹ Pub. Resources Code, § 21100; CEQA Guidelines § 15064; Cal. Code Regs., tit. 14, § 750 et seq.

³⁰ *Berkeley Hillside Preservation Co v. City of Berkeley* (2015) 60 Cal.4th 1086, 1111 (noting if there is a fair argument of potentially significant impacts, an EIR is required even if there exists “other substantial evidence that the project will not have a significant effect.”).

³¹ Draft Negative Declaration at 11.

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contributor or limiting factor to survival of salmon and smelt populations.”³² Nowhere in the Department’s Petition Review does the Department make a determination as to potentially significant impacts. In fact, the Department notes that additional review under CEQA would be required and only states the Department’s conclusion that striped bass predation is not a primary contributor to the decline of listed fish species.³³ Just because something is not a primary contributor does not necessarily require the conclusion it also does not cause a potentially significant impact. Furthermore, as discussed above, the Department’s analysis fails to recognize data supporting the conclusion that striped bass predation may have a significant impact on juvenile salmon survival rates. The Department’s own literature review cites multiple sources that indicate substantial predation impacts from striped bass.³⁴

The Draft Negative Declaration’s conclusion as to the mandatory findings of significance is similarly flawed. The Proposed Negative Declaration concludes that the Proposed Regulation would not cause a fish or wildlife population to drop below self-sustaining populations.³⁵ However, even if Westlands assumes for the sake of argument striped bass predation is not a primary contributor to the decline of listed fish species, it does not necessarily mean that predation would not cause the population of a fish species to drop below self-sustaining levels, in particular when considering the statements from the scientific literature that striped bass predation is a “nontrivial source of mortality” for certain fish species.³⁶ The discussion on mandatory findings of significance also states the Proposed Regulation is consistent with the Department’s mission.³⁷ However, as discussed above, the Proposed Regulation is inconsistent with multiple policies which are not considered in the Draft Negative Declaration.

The analysis of potential impacts to listed native fish species from the Proposed Regulation discussed above in this letter presents a fair argument that the Proposed Regulation may have significant effect on the environment. Therefore, the Commission must prepare an environmental impact report to ensure an adequate environmental analysis is undertaken and the Commission is fully informed of potential environmental impacts prior to making a final decision on the Proposed Regulation.

5. Additional Explanation from the Department is Required on Key Points Related to Striped Bass Management.

In addition to responding to the points raised above, Westlands asks the Commission to request the Department provide a written response to the following questions:

³² *Id.* at 4, 23.

³³ Petition Evaluation at 46 (Staff Summary at 110).

³⁴ See *supra* at 5 listing statements from the scientific literature.

³⁵ Draft Negative Declaration at 21.

³⁶ Petition Evaluation, Appendix 3 at 41 (Staff Summary at 194).

³⁷ Draft Negative Declaration at 29.

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1. The absence of an adequate striped bass population monitoring program was repeatedly attributed to a lack of funding.³⁸ The Department should provide its most recent striped bass population monitoring proposal, independent peer reviews of that proposal, funding sources sought (who and when), and the documented outcomes of those funding requests.
2. The Department evaluated potential predation impacts of the regulation change by assessing if there was “evidence to support that striped bass predation is a primary contributor to declining salmonid and smelt populations.”³⁹ Salmonid and smelt populations are known to be declining from a variety of stressors, changing with time and varying among life stages. The Department should explain why evidence for predation as a “primary contributor” to salmonid and smelt population decline is the appropriate standard in evaluating whether the proposed regulation would impact salmonid and smelt populations. As discussed above, even if not a primary contributor, predation does have an impact. As noted by President Zavaleta at the June 12, 2025, Commission meeting, “take” of listed species is evaluated at an individual level, not a population level.⁴⁰ The Department should explain why the “primary contributor” standard was used in evaluating predation impacts as opposed to a “take,” “adverse impact,” or other standard in evaluating the Proposed Regulation.

6. Conclusion

There simply is not enough information at this time to definitively say that measures which are likely to increase the striped bass population will not have a negative impact on listed fish species, and apparently insufficient funding to fully evaluate the impacts of any regulation change on listed native fish species. The Commission should refrain from taking any regulatory or other action that might lead to increased striped bass populations until there is sufficient information to fully understand the current status of the striped bass population, the need for any additional conservation efforts, and the possible impacts on native listed fish species.

³⁸ See Staff Summary at 22 (“Lack of funding prevents current Striped Bass adult population monitoring to ensure the effectiveness or impact of a regulation change.”) (Department presentation at September 12, 2024 Wildlife Resources Committee Meeting), 59 (same in Department presentation for June 12, 2025, Commission Meeting), and 78 (Petition Evaluation, noting “absence of additional funding, monitoring, and staffing that would be necessary to conduct a more comprehensive, multifaceted approach” to striped bass regulation).

³⁹ Petition Evaluation at 12 (Staff Summary at 76).

⁴⁰ Video from June 12, 2025, Commission Meeting at 3:50:09-3:50:28 (stating “I guess I’m asking that not just at the population level” and noting the lengths that are taken in other contexts to avoid take of a single individual of a listed species because “it’s not just a population level thing.”)

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Additionally, the potentially significant impacts to listed fish species require the Commission to prepare an EIR to comply with CEQA. Westlands urges the Commission **not** to adopt the Proposed Regulation.

Thank you for your consideration of these comments.

Sincerely,



Allison Febbo
General Manager
Westlands Water District



cc:

Director Bonham,



Jay Rowan, Fisheries Branch Chief



Jonathan Nelson, Environmental Program Manager,



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Appendix A: ChatGPT assessment of striped bass fishing quality on the Sacramento River

Prompt to ChatGPT: Review information available on the internet to evaluate the quality of spring season (March-May) striped bass fishing on the Sacramento River since 2010. Based on this review, rank the quality of striped bass fishing for each of the following years: 2021, 2022, 2023, 2024 and 2025. Ranking categories are: Excellent, Good, Average, or Poor. Provide a one sentence explanation for each of your rankings.

Chat GPT Response:

Here's how spring (Mar–May) striped bass fishing on the Sacramento River stacked up by year, based on guide reports and regional fishing roundups:

- **2025 — Excellent:** Multiple April–May reports called the Colusa reach “nothing short of amazing,” with limits common and a “season to remember.”
- **2024 — Excellent:** Late-April updates described “limit-out” fishing across the Colusa area and season retrospectives rated 2024 among the best in decades, tapering only after a river-wide spawn in late May.
- **2023 — Average:** High, muddy water in April pushed many anglers off the Sac and onto the Feather for nearly two weeks, with the bite returning but remaining conditions-driven and patchy.
- **2022 — Excellent:** April reports from the Sacramento River near Colusa/Tisdale consistently described a “wide open”/“off the hook” bite with limits.
- **2021 — Good:** Mid-April saw “red hot” limit days from Verona to Colusa, though low water and lots of undersized fish kept overall consistency a notch below the banner years.

Notes: I [ChatGPT] focused on spring reports specifically mentioning the **Sacramento River** (often the Verona–Colusa corridor), using multiple independent sources to balance out individual-guide hype.