

CALIFORNIA FISH AND GAME COMMISSION
FINDING OF EMERGENCY AND
STATEMENT OF PROPOSED EMERGENCY REGULATORY ACTION

Emergency Action to
Amend subsections (b) and (c) of Section 29.15,
Title 14, California Code of Regulations
Re: Emergency Abalone Take Reduction Due to Harmful Environmental Conditions

Date of Statement: December 8, 2016

I. Statement of Facts Constituting the Need for Emergency Regulatory Action

The recreational red abalone (*Haliotis rufescens*) fishery is one of California's most successful and popular fisheries, and is economically important, particularly to Sonoma and Mendocino counties where approximately 95 percent of the multi-million dollar fishery takes place. Over 25,000 fishermen participate in the fishery each year. Red abalone may be taken with a sport fishing license subject to regulations prescribed by the Fish and Game Commission (Commission).

Under existing statute (Fish and Game Code Section 5521) and regulation (Section 29.15, Title 14, CCR), abalone may only be taken for recreational purposes north of a line drawn due west magnetic from the center of the mouth of San Francisco Bay, except in the closed Fort Ross area. The current regulation also specify the season, hours, daily and annual limits, special gear provisions, measuring devices, abalone report card requirements, and minimum size. Red abalone may only be collected by skin diving (without SCUBA) or rock picking during low tides, so that a deep-water refuge population is maintained to enhance productivity of the fishery. The recreational red abalone season is scheduled to open April 1, 2017.

In 2005, the Commission adopted the Abalone Recovery and Management Plan (ARMP) pursuant to requirements in statute (Fish and Game Code Section 5522), to provide a cohesive framework for recovering depleted abalone populations in southern California, and for managing the northern California fishery and future fisheries, including red abalone. The ARMP articulates a framework for sustaining abalone populations based largely on densities, catch, size, and reproductive success as triggers for adjusting total allowable catch (TAC) and engaging other management measures. Using criteria described in the ARMP, the TAC is adjusted when specific triggers are met, through various management actions such as changes to daily bag limits, seasonal limits, and season length.

In 2013, when average densities in northern California fell below established triggers and site closure triggers were met, the Commission took action to adjust the TAC from 280,000 to 190,000, with the goal to sufficiently reduce take such that densities would stop declining and eventually recover to target densities. The

Commission also took management action to meet the adjusted TAC by amending the annual limit for abalone north of the Mendocino/Sonoma county line from 24 to 18, amending the annual limit south of the Mendocino/Sonoma county line from 24 to 9, and moving the start time for fishing from one half hour before sunrise to 8:00 a.m. The Fort Ross area was closed to abalone fishing as a result of hitting the closure trigger. The new regulations went into effect in 2014, resulting in a 35 percent decline in take to approximately 148,000; in 2015, take was down 31 percent from 2013 at approximately 155,000.

In 2015, a combination of unprecedented environmental and biological stressors began to take their toll on abalone populations, including warmer-than-normal waters and decreasing food resources, leading to starvation conditions. Throughout 2016, the Department of Fish and Wildlife (Department) has conducted surveys, visual assessments, and histological sampling of north coast abalone, and has also been documenting citizen reports of unhealthy or moribund abalone within the fishery. The Department has identified wide-sweeping changes in the density, occurrence, size and health of red abalone and the kelp upon which it depends for food. Specifically, the Department has found:

- **Warm Water Conditions and Kelp and Algae Declines.** Red abalone are herbivores that live on rocky reefs in kelp forests, eating red and brown algae. In 2014, the kelp forests in the abalone fishery region declined by 93 percent due to extreme warm water conditions and an unprecedented increase in herbivorous red and purple sea urchin populations. Unlike abalone, sea urchin populations are generally resilient to food shortages and can survive longer, such that even if water conditions cool, grazing pressure from surviving sea urchins may still keep kelp from wide-spread recovery. Warm water conditions persisted through 2015, impacting kelp recovery and abalone health. Recently there has been some improvement in kelp growth with cooler water this year, but the warm water appears to be returning this fall and current kelp canopies are still very sparse compared to normal years. Recent oceanographic reports suggest that warm-water conditions may return again in 2017.
- **Starvation Conditions.** Red abalone are susceptible to starvation when kelp and algal abundances decline. Kelp and other algal species are being actively cleared from rocky bottom habitat that is dominated by purple sea urchin, which is greater than sixty times more abundant now than prior to 2013. Urchin populations increased, in part, due to large-scale loss of predatory starfish species in 2013 due to sea star wasting disease. Bull kelp and other algal food sources for abalone have remained at extremely low levels since 2014; the large number of purple urchins is likely keeping kelp recovery confined to very limited areas.

Abalone have been observed stacked on top of each other in shallow water, which could be attributed to either abalone moving from deeper water to shallower water where algae is slightly more abundant, or abalone trying to graze whatever algae is growing on the shells of other abalone; shells were observed to be unusually clean of algal growth.

Recent evidence indicates the starvation conditions have not yet abated; additional impacts are expected through the 2017 and 2018 seasons.

- **Density Declines.** In spite of the Commission's 2013 actions to reduce take and recover densities, the actions were ineffective in preventing densities from continuing to decline, from an average of 0.47 per square meter (m²) in 2013 to 0.44 per m² in 2016. The Department believes the density decline is largely due to the environmental conditions described herein.
- **Deep-Water Refuge.** Deep-water refuge is believed to be a critical component in maintaining a highly productive recreational fishery. Deep-water abalone are generally safe from take and can be a source of both adults to replace abalone removed from shallower waters and larvae to enhance abalone reproduction rates. Summer of 2016 surveys showed dramatic reductions in abalone densities in deep water refuges (greater than 28 foot depths). The average density of deep-water red abalone populations over the past four years has declined below the ARMP management trigger and increases the risk that the fishery is not sustainable. It should be noted that abalone movement from deep water into shallow water or from cryptic locations to exposed shallow areas can give the impression that abalone populations are stable or have increased if the absence of abalone in deeper waters is not considered.
- **Abalone Health, Reproduction, and Mortality.** The abundance of warm water, coupled with a lack of algae, has severely impacted the health and reproductive development of abalone. Fishermen and the public have reported weak, shrunken, and dying abalone, as well as unusually high numbers of empty shells of all size classes throughout 2016. Department surveys revealed more than 25 percent of catch at 10 survey sites had body mass that was shrunken (meat smaller than the shell). Reductions in body mass lead to reduced reproductive fitness; just a 20% reduction in body mass can reduce reproduction by 60-90 percent. Red abalone require approximately 12 years to grow to minimum legal size, so that multi-year gaps in reproduction will be observed in the fishery for years to come. Furthermore, recent laboratory feeding studies of starved wild red abalone indicate that reproductive capability may take more than one year to recover to normal levels after algal conditions improve.

The weakened condition of abalone may also reduce their ability to withstand normal storm waves during the winter of 2016 – 2017, and increase mortality. Both 2015 and 2016 were poor reproduction years compared with previous average or good years, which may put future sustainability of the fishery at risk. Lack of kelp and other algae greatly reduces cover for red abalone, making them easier to locate by fishermen.

Existence of an Emergency and Need for Immediate Action

The Department considered the following factors in determining whether an emergency exists: The magnitude of potential harm; the existence of a crisis situation; the immediacy of the need; and whether the anticipation of harm has a basis firmer than simple speculation. Department field surveys in 2015 and 2016 demonstrate that all these factors have been met. The Department is proposing emergency regulatory action because the urgency of the situation requires actions to go into effect prior to the start of the upcoming 2017 season, to allow adequate time to communicate the changes to affected stakeholders and amend abalone report cards. The Department will also recommend making the proposed emergency regulations permanent pursuant to a standard rulemaking because the impacts from the harmful conditions are expected to be long-lasting.

Studies, Reports, or Documents Supporting Factual Emergency

The Department relied on the following documents in proposing this emergency rulemaking action:

- (1) The Abalone Recovery and Management Plan
<https://www.wildlife.ca.gov/Conservation/Marine/ARMP>

Department staff has documented critical negative impacts to red abalone fishing grounds:

- (1) A dramatic decline in sea stars, important sea urchin predators, due to sea star disease.
- (2) A dramatic decline (93 percent) of the kelp canopy in Sonoma and Mendocino counties in 2014.
- (3) A dramatic increase (60 times) in the density of purple sea urchins in 2015, increasing competition with abalone for food.
- (4) Warm seawater conditions in Sonoma and Mendocino counties in 2014 and 2015.
- (5) A lack of kelp, which increases the efficiency of fishing efforts in shallow habitats.
- (6) A decline in deep-water abalone densities.
- (7) Continued decline in overall average abalone densities in spite of significant take reductions implemented in 2014.

Department staff has documented critical negative impacts to red abalone health:

- (1) Visual abalone body health scores for abalone taken in the fishery during the spring of 2016 show that more than 25 percent of abalone were shrunken in body mass at sites in northern California.
- (2) Body condition index declined at Van Damme State Park by 20 percent, but no significant difference was observed at Fort Ross in summer of 2016 (60 abalone per site).

- (3) Department staff and abalone fishermen have observed weak abalone washed up on shore and easy to remove from the rocks as well as many new shells of all size classes, indicating increased natural mortality.

Department staff has documented critical negative impacts to red abalone reproduction:

- (1) Gonad index declined significantly at Van Damme State Park and at Fort Ross in the summer of 2016 (60 abalone per site).
- (2) Small numbers of larval abalone observed in plankton surveys in Sonoma and Mendocino counties in 2015.
- (3) Small numbers of newly settled abalone observed in coralline-covered rock samples from Sonoma and Mendocino counties in 2015.
- (4) Few juvenile (< 21 millimeter) red abalone observed in artificial reefs in Van Damme State Park in 2015.

Regulatory Proposal

The ARMP provides the framework for regulatory proposals that should be designed to maintain the sustainability of the resource and fishery. The Department makes the following determinations in regards to the ARMP:

- (1) The existing TAC is 190,000 (amended 2013).
- (2) The deep density trigger requires 25 percent reduction in TAC, which equates to reducing TAC from 190,000 to 142,500.
- (3) Average densities continue to decline leading to a second trigger requiring an additional 25 percent reduction in TAC, which equates to reducing it from 142,500 to 106,875.
- (4) The new TAC would be 107,000 (rounding to the nearest thousand).
- (5) While considerable uncertainty exists under the current conditions regarding how the abalone population will respond, all factors are currently negative. Marine protected areas provide a benefit in protecting a segment of the population from fishing pressure, but do not necessarily help the fishery or the stock in terms of the current negative environmental conditions that are affecting both.

The proposed regulation to achieve the specified TAC are based on catch patterns, human behavior, and the many uncertainties of future conditions. Public input to date indicates reductions in take should primarily come from the annual limit rather than the daily limit. Season changes can produce savings, but because efforts can shift to other months, yield is unpredictable and likely less than otherwise expected. Considerable uncertainty exists regarding the response by fishermen to new restrictions and, therefore, actual take. Table 1 provides an analysis of likely take using changes to the annual limit along with some season reductions. Fishermen have consistently and clearly indicated that a reduction to the daily bag limit is considered an action of last resort and therefore has not

been considered or recommended in this regulation change as other options provide reasonable alternatives for likely achieving the specified TAC.

Table 1. Estimated take based on changes to annual limit and with season length reductions

Target TAC = 107,000 Daily Bag limit = 3	Annual Limit				
	6	9	12	15	18
Estimated Catch	93,000	119,000	136,000	149,000	155,000
Estimated Catch + November Closure	91,000	118,000	135,000	147,000	155,000
Estimated Catch + November Closure + April Closure	80,000	104,000	119,000	129,000	136,000

Based on the analysis summarized in Table 1, the Department proposes:

- a. Reduce annual limit from 18 to 12, with the exception that the lower limit of “not more than 9 abalone of the yearly trip limit may be taken south of the boundary between Sonoma and Mendocino Counties” found in subsection 29.15(c) will continue to apply.
- b. Reduce season by closing November and April
- c. Estimated take = 119,000

The Department understands the importance of the recreational red abalone fishery and its sustainability. The Department's recommendation is proposed as a result of discussions at the November 15, 2016 Marine Resources Committee, which is designed to achieve the desired take reduction through fewer days on the water (season length) and a lower total take opportunity (annual limit) in the open area above the Mendocino/Sonoma county line.

The Department's recommendation is based on the numerous uncertainties and risks involved and the impacts to fishermen from such dramatic reductions. The current environmental conditions are unprecedented and the impacts to the abalone resource are yet to be fully realized or understood. Not implementing significant reductions in take risks pushing an already stressed population below sustainable levels. We have already witnessed the consequences of inaction, which resulted in the imposition of a statutory moratorium of the fishery south of San Francisco since 1997.

The Department expects a larger savings the first year with a rebound the following year; this is not unusual behavior when drastic changes are made to recreational fisheries. The Department is not recommending closure of the abalone fishery because abalone population densities (0.44 abalone per m²) are above the ARMP's fishery closure trigger of 0.3 abalone per m².

In the absence of this emergency regulation, take of abalone at current levels would continue during the coming season on abalone populations that have declined below minimum sustainable levels prescribed in the ARMP for the deep water (refuge) segment of their range. These emergency regulations are designed to protect broodstock during this period of harmful environmental

conditions when abalone is exceptionally vulnerable to both high natural and fishing mortalities. This period is clearly one of reduced productivity of the abalone population and it is uncertain how long the unfavorable conditions will persist. Even with improved environmental conditions, the fishery will remain at risk due to reduced productivity for more than one year. The decline of the deep-water refuge population, coupled with ongoing starvation conditions and subsequent poor abalone body condition, presents an emergency situation requiring immediate management action to protect the fishery.

The Commission received public input on a potential emergency action at the November 15, 2016 meeting of the Marine Resources Committee, where the Department reported on the most recent survey findings, and at the Commission's December 7-8, 2016 meeting.

II. 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 determinations relative to the required statutory categories have been made:

- (a) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State: None.
- (b) Nondiscretionary Costs/Savings to Local Agencies: None.
- (c) Programs Mandated on Local Agencies or School Districts: None.
- (d) 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.
- (e) Effect on Housing Costs: None.

III. Authority and Reference

The Commission proposes this emergency action pursuant to the authority vested by sections 200, 202, 240, and 5520 of the Fish and Game Code and to implement, interpret, or make more specific sections 200, 202, 205, 220, 240, and 5520 of said code.

IV. Section 240 Finding

Pursuant to Section 240 of the Fish and Game Code, the Commission finds that the adoption of this regulation is necessary for the immediate conservation, preservation, or protection of birds, mammals, reptiles, or fish (abalone).

Informative Digest (Plain English Overview)

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Under existing statute (Fish and Game Code Section 5521) and regulation (Section 29.15, Title 14, CCR), red abalone may only be taken for recreational purposes north of a line drawn due west magnetic from the center of the mouth of San Francisco Bay, except in the closed Fort Ross area. The current regulation also specifies the season, hours, daily limits, special gear provisions, measuring devices, abalone report card requirements, and minimum size. Red abalone may only be collected by skin diving (without SCUBA) or rock picking during low tides. The recreational red abalone season is scheduled to open April 1, 2017.

The Department has identified wide-sweeping changes in the density, occurrence, size and health of red abalone and the kelp upon which it depends for food. Specifically, the Department has found warm water conditions, kelp and algae declines, starvation conditions, abalone density declines, movement from deep-water refuge, and negative impacts on abalone health, reproduction and mortality.

To determine whether an emergency exists, the Department considered the following factors: The magnitude of potential harm; the existence of a crisis situation; the immediacy of the need; and whether the anticipation of harm has a basis firmer than simple speculation. Department field surveys in 2015 and 2016 demonstrate that all these factors have been met.

The Department has confirmed that management triggers under the Abalone Recovery and Management Plan (ARMP) have been reached calling for a reduction of fishery catch and is recommending this reduction be approved due to harmful environmental conditions for abalone.

Proposed Regulatory Action

The proposed emergency regulation will reduce the take of abalone within the entire fishery to levels anticipated to be sustainable under current environmental conditions.

Acting under the guidance contained in the ARMP, the Department requests the Commission take emergency action to reduce allowable take by amending abalone subsections (b) and (c) of Section 29.15, Title 14, CCR, to reduce the red abalone allowable annual take from 18 to 12 abalone, with the exception that the lower limit of "not more than 9 abalone of the yearly trip limit may be taken south of the boundary between Sonoma and Mendocino Counties" found in subsection 29.15(c) will continue to apply, and to close April and November to fishing.

Benefits: The proposed emergency reduction within the abalone fishery will benefit the environment by protecting the valuable abalone resource from excessive fishing mortality, which will allow the resource the opportunity to rebuild and be sustainable for the future.

Consistency and Compatibility with Existing State Regulations: The Legislature has delegated authority to the Commission to promulgate sport fishing regulations (Fish and Game Code, sections 200, 202, and 205). No other state agency has the authority to promulgate such regulations. The Commission has conducted a search of Title 14, CCR and determined that the proposed regulation is neither inconsistent nor incompatible with existing State regulations and that the proposed regulations are consistent with other sport fishing regulations and marine protected area regulations in Title 14, CCR.