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DEPARTMENT OF LAND AND NATURAL RESOURCES
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Testimony of
RYAN K.P. KANAKA'OLE
Acting Chairperson

Before the Senate Committee on
WATER, LAND, CULTURE AND THE ARTS

Friday, February 13, 2026
1:01 PM

State Capitol, Conference Room 224

In consideration of
SENATE BILL 3201
RELATING TO CORAL REEF RESILIENCE

Senate Bill 3201 proposes to require the Division of Aquatic Resources (DAR) of the Department of Land and Natural Resources (Department) to: (1) manage and administer aquatic life and resources, with the highest priority being to protect, restore, and maintain ecosystem integrity, using the best scientific data available; (2) restore and maintain reef ecosystems and indigenous species to a level that is not less than 80% of their natural biomass potential; and (3) expand and maintain live coral cover at not less than 25% on reefs that have historically supported naturally occurring live coral cover, requires DAR to develop plans and take actions to increase reef resilience around the island of O'ahu by certain dates; and requires annual reports to the Legislature. **The Department appreciates the intent of this bill and offers the following comments.**

Coral reef ecosystems statewide, and particularly on O'ahu, have experienced significant degradation due to long-term, cumulative impacts from multiple sources, including coastal development, watershed degradation, recreational and commercial overuse, invasive species, fishing pressure, and warming ocean temperatures. While halting or reversing this decline can seem daunting—especially given global climate stressors—coral reef ecosystems are inherently resilient, and evidence shows they can recover when adverse impacts are reduced. In most cases, however, there is no single solution. Threats to ecosystem health vary by location, and identifying the most effective management actions requires a careful understanding of local ecosystem drivers and dynamics. To support this,

managers must rely on the best available science, integrating both western scientific approaches and local ecological knowledge.

DAR understands the importance of ecosystem-based management, as well as the importance of involving local resource users, and has developed a wholistic nearshore management strategy called the Holomua Marine Initiative (Holomua). Holomua, which in the Hawaiian language means “to progress and move forward into the future,” brings local fishers, cultural practitioners, and community representatives together with scientists and resource managers to collaboratively develop island-scale management actions aimed at improving the health of nearshore resources. Importantly, these actions extend beyond fishing regulations to address other key drivers of ecosystem integrity, including water quality and quantity, land-based sources of pollution, commercial and recreational use, and degraded habitats. Addressing these issues requires coordination across multiple agencies and authorities and depends on strong partnerships to achieve shared goals for nearshore ecosystem health and coral reef resilience.

Holomua was first launched on Maui in October 2022 as a pilot management planning process. The Maui planning team is currently finalizing its proposed management plan and draft rules for Maui, and DAR will be launching the Holomua process on Hawai‘i island this summer. It may be another two years before the Holomua process is launched on O‘ahu.

The requirements for DAR, by July 1, 2027, to “increase the amount of live coral cover to no less than twenty-five per cent on reefs that have historically supported naturally occurring live coral cover” and to “increase the density of herbivorous fish inhabiting reefs to at least forty grams per square meter or eighty per cent of the potential biomass of the respective moku, as determined by the best available science,” are well-intentioned but impossible to achieve given the time it takes for corals and fish to grow and reproduce. Moreover, many of the main drivers of coral decline and fish density and biomass, including water quality and habitat degradation, are beyond DAR’s jurisdiction for management.

The Department notes that House Bill 2599, a similar measure that requires DAR to publish goals and create a framework to significantly increase coral reef resilience around O‘ahu by 2030, provides DAR with more latitude to set realistic goals and work with local communities and stakeholders to co-develop management actions to achieve those goals.

Mahalo for the opportunity to comment on this measure.



To: The Honorable Senator Chris Lee, Chair, the Honorable Senator Lorraine Inouye, Vice Chair, and Members of the Committee on Water, Land, Culture and the Arts.

From: Hawai'i Reef and Ocean Coalition (by Ted Bohlen)

Re: Hearing **SB3201 RELATING TO CORAL REEF RESILIENCE**

Hearing: Friday, February 13, 2026, 1:01 p.m.

Aloha Chair Lee, Vice Chair Inouye, and Members of the Committee on Water, Land, Culture and the Arts!

The Hawai'i Reef and Ocean Coalition (HIROC) is a group of scientists, educators, filmmakers and environmental advocates who have been working since 2017 to protect Hawaii's coral reefs and ocean.

The Hawai'i Reef and Ocean Coalition STRONGLY SUPPORTS the intent of SB3201!

Coral reefs are dying around the world because of ocean heating and land-based pollution such as sediments and wastewater. Overfishing of herbivores that clean the reef of smothering algae is also an important factor on Oahu. Coral reef decline is a huge problem for Hawaii, where reefs protect our shorelines and beaches and avoid over \$836 million in flood damage to property and economic activity value per year according to research by the US Geologic Survey. Live coral cover around the State reportedly ranges from less than one percent to 69 percent.

Our reefs need greater protection!

The Hawai'i Reef and Ocean Coalition **SUPPORTS** the portions of the bill that would require the Department of Land and Natural Resources' (DLNR) Division of Aquatic Resources to manage the aquatic life and aquatic resources of the State with the highest priority given to protecting, restoring, and maintaining ecosystem integrity and use the best scientific data available. The Hawai'i Reef and Ocean Coalition also **SUPPORTS** requiring the Division of Aquatic Resources to set goals to substantially increase coral-reef resilience around Oahu and develop a framework to meet those goals.

Hawai'i Reef and Ocean Coalition thinks that the **specific requirements on page 4, lines 11-20, if they are included in the bill, should be as goals for the DLNR Division of Aquatic Resources, not requirements.**

Please pass a version of this bill that protects the resilience of our coral reefs!

Mahalo!

Hawai'i Reef and Ocean Coalition (by Ted Bohlen)

Opposed to SB 3201

By Ron Tubbs B.S.N.D. UHM

While the intent of this bill seems fine, its actual effects could harm sustainable fisheries, which are unsustainable for the state.

The sky is not falling, and fishing, more than any other activity in the state, is the most important renewable resource that the state should be utilizing to its fullest extent. With sustainable management.

The state has already prepared for future impacts of global warming and can, at any time, close fisheries or portions of fisheries, as it has done so with Sea Cucumbers and others. DAR has demonstrated its ability to manage ocean ecosystems effectively, with fish populations stable and many fisheries are sustainable as a result.

Let's not ban these important, sustainable activities and listen to nonscientist, tourism- and earth-justice-biased lawyers advocating for total closures or creating legislation that could impact these important sustainable fisheries.

Ocean closures will create a heavy reliance on unsustainable, high-carbon-footprint businesses like tourism. The state is suffering ecologically and economically from non-sustainable business activities!

The most sustainable Island nations in the Pacific are 80 percent dependent on fisheries. Hawaii should prioritize renewable resources through sustainable agriculture, aquaculture, and fisheries!

“Hawaii Aquarium Fishery Economic Value with Sustainability”

During the fishery collections, the highest fish populations were shown. If the fishery were not sustainable, there would have been a decline.

Ctenochaetus Strigosus Kole Tangs, Zebrasoma flavescens Yellow Tangs are currently among the most populous fish.

See the findings in the chart below.

Hawaii DC114 2020 Rpt; Findings and Recommendations of Effectiveness of the West Hawaii Regional Fishery Management Area (WHRFMA) Report; DLNR.

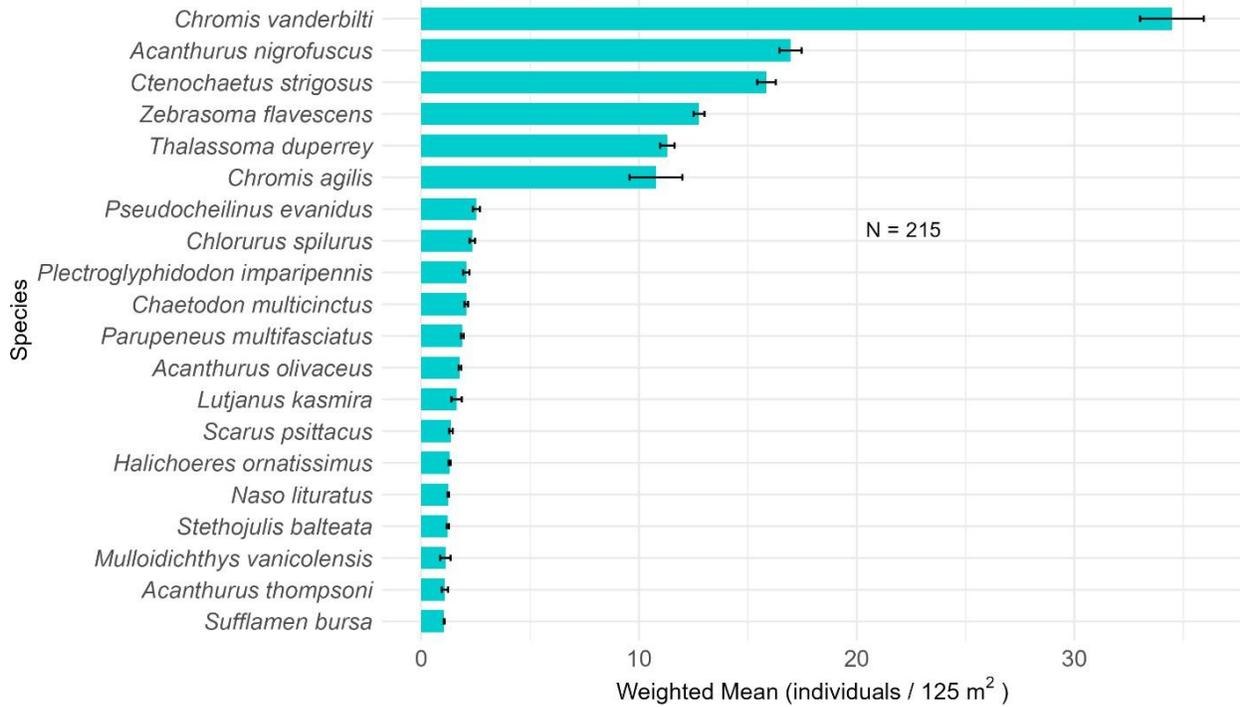


Figure 20. The 20 most abundant reef fish species recorded during 2022-2023 FAHU surveys. Mean density per transect (125 m²) weighted by stratum weights with error bars to show weighted standard error for the sample size of 215 surveys across nine strata. Scientific names were used to distinguish species with overlapping Hawaiian names. Translations can be found in Appendix table A-1.

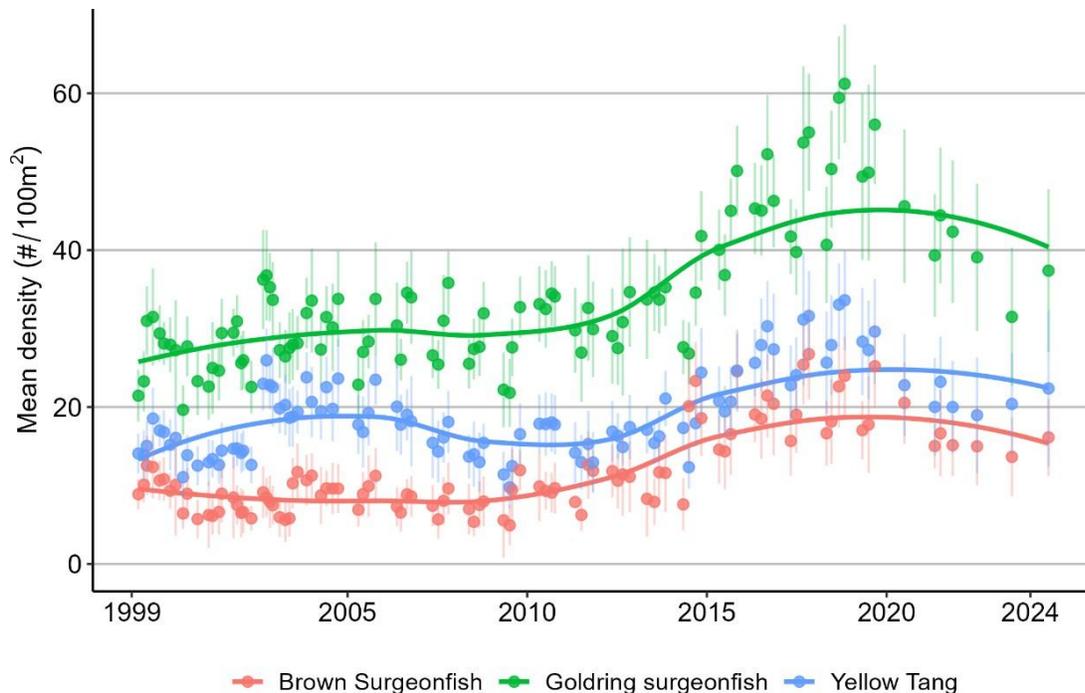


Figure 23. Mean density of select small surgeonfishes in WHAP surveys. Points represent mean density across 25 WHAP sites for each survey round per species. Error bars represent standard deviation to depict the level of variability between sites. Recruit sized individuals are removed from these data for ma'i'i'i (red), kole (green), and lau'ipala (blue).

This data are significant because, following the closure of the fishery in 2017, no population increase was observed. Meaning the fishery did not affect fish populations. The opposition points out that, 5 years later, populations declined and attributes this to fishery. Natural declines and increases occur.

<https://www.hawaii.edu/news/2024/07/02/economic-diversification-opportunities-uhero/>

Where can Hawai'i diversify its economy? UHERO finds areas

[UH News](#) » [Research](#) » Where can Hawai'i diversify...

Hawai'i's economy depends heavily on tourism, and is therefore vulnerable to sudden drops in visitor numbers as well as inconsistent and slow growth in tourism revenue for the past 30 years.

A new report, 2024, by the [University of Hawai'i Economic Research Organization](#) (UHERO) identifies potential opportunities to diversify the state's economy by analyzing the variety of industries across counties in the U.S. and Hawai'i.

“Based on industries already in Hawai'i, the study shows Hawai'i has great potential for ocean-based industries—such as fishing, fish farming and hatcheries, boat building, port and harbor operations, and seafood packaging. Diversifying into these industries can create long-term stability and support growth beyond tourism”.

Sustainability is Key to Hawaii's future. As the most isolated island in the world, Hawaii is too dependent on tourism, the military, and other non-sustainable, [unreliable economic sources. UHERO Forecast for the State of Hawai'i: Mild recession and weak recovery in 2026 - UHERO](#)

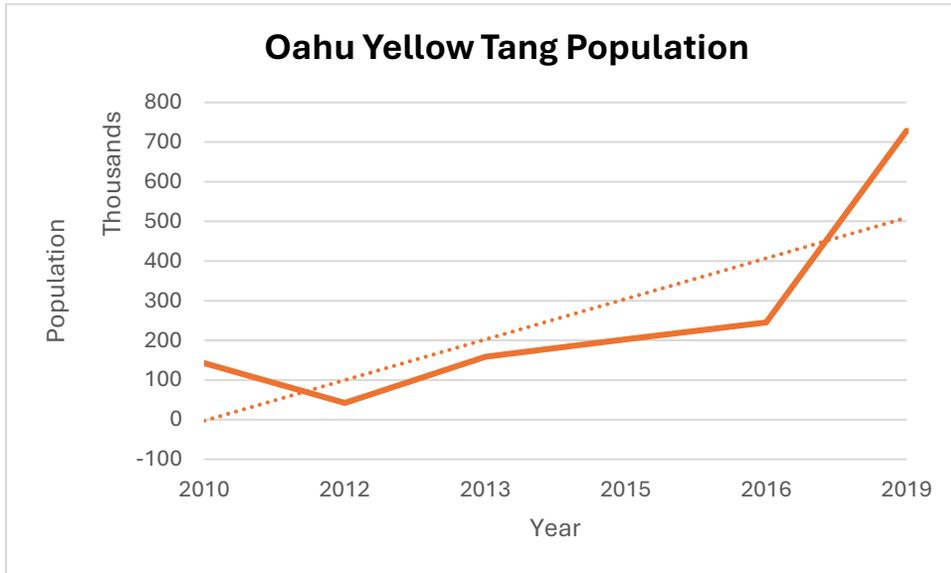
The [value of Hawaii's nearshore oceans](#) is worth [15.3 billion dollars](#) in highly renewable resources in 2024, with a current 50% estimated increase every 20 years, which means one of The state of Hawaii's most valuable resources is our Ocean. *Tourism impacts are Hawaii's biggest ocean ecological offender and the largest source of Carbon Footprint and is not sustainable.*

Sustainability is clear. DAR researchers have been clear on this repeatedly.

The Facts Oahu Yellow Tang CML take stats:

Oahu Yellow Tang, *Zebrasoma flavescens*, DAR Catch Report Data for the Aquarium Fishery between 2009 to 2020, comparison to Fish Populations 2010 to 2019 done by **PIFSC**, Pacific Islands Fisheries Science Center (PIFSC). One would expect to see an inverse relationship in these charts if the fishery were not sustainable. The Oahu Aquarium

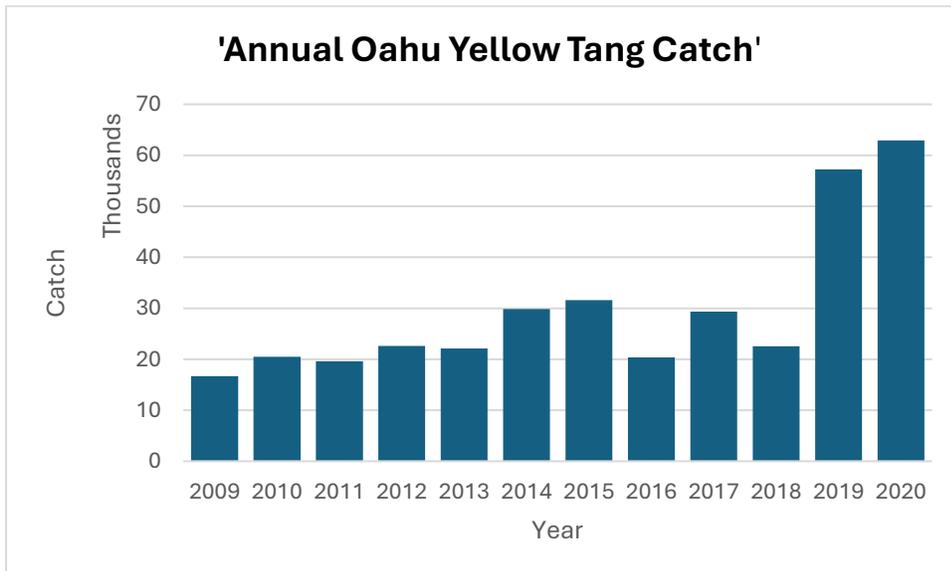
Fishery's most targeted species, Yellow Tangs, from 2009 to 2020, has the following data that supports the fishery despite increased take being done at a sustainable level.



2010 to 2019 done by PIFSC, Pacific Islands Fisheries Science Center (PIFSC)

Yellow Tangs *Zebrasoma flavescens* 2010-2019 Oahu Population Hard Bottom

0-98 ft only. Currently done only every three years. Data is only available for the years of surveys listed above



DAR Catch Report Stats Yellow Tangs *Zebrasoma flavescens* 2009-2020

Clearly, Fish Counts and all available data show a Sustainable Fishery!

Long-term science studies prove the aquarium fishery does not cause coral damage.

Dr. Bill Walsh DAR study Link: <https://files.hawaii.gov/dlnr/reports-to-the-legislature/2020/AR20-WHRFMA-Rpt-FY19.pdf>

Dr. Brian Tissot study link p.68: <https://www.malamamaunaloa.org/wp-content/uploads/DLNR-DAR-2010.pdf>

Most of isles' coral recover from mass bleaching

By Audrey McAvoy Associated Press POSTED: 04:53 a.m. HST, Jan 29, 2015

The DLNR studied coral for bleaching -- a stress response that causes corals to lose algae and color from their tissue -- in Kaneohe Bay.

So when the stress of warmer-than-average ocean temperatures prompted many of Hawaii's corals to expel algae last year -- a phenomenon called bleaching because coral lose their color when they do this -- many were worried they might die.

Now the Hawaii Department of Land and Natural Resources says most of the bleached corals have recovered. It plans to announce the result of its coral surveys on Thursday.

Even so, scientists say the experience weakened the coral, making them more likely to get sick. It's also going to be harder for them to withstand warm temperatures in the future.

Coral Science Summary:

Coral relies on an algae symbiotic relationship for food and their survival. Corals, when they overheat, expel their algae, leaving an appearance of bleaching, but they are not dead. They can survive without algae for up to three months. Previous coral bleaching events were short-lived, and corals mostly recovered.

The Hawaii coral bleaching event years were **1996, 2002, 2004, 2014, 2015, and 2019**. The 2014-2015 events were particularly severe, leading to high mortality rates and covering large areas, especially around Maui Nui and West Hawaii. The last severe Coral Bleaching event was in 2015, and no coral bleaching events have occurred in Hawaii since 2019.

Coral regrowth can occur quickly, with corals in shallow areas showing light-dependent growth rates, and some species growing 3 to 7 inches a year.

[Coral Spawning Volume](#):(embedded link):

Massive Scale: The synchronized, mass spawning involves trillions of gametes released by entire reef systems, significantly increasing the chances of fertilization.

Bundle Composition: Most hermaphroditic corals release buoyant pink, white, or orange bundles containing both eggs and sperm, ensuring they float to the surface for fertilization.

One-Time Event: Because producing such large amounts of gametes is energy-intensive, most corals only perform this mass broadcast spawning once a year.

Key Findings on [Hawaii Coral Regrowth](#)

Recolonization Timeline:

Hawaii lava flows created the perfect study area for coral regrowth. Many areas saw coral growth within a few years, with exposed areas, such as the Puna coast, coral communities can show significant recovery within 20 years. In contrast, more sheltered areas, may require more than 50 years to fully develop.

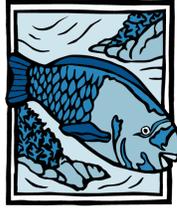
Pioneer Species: *Pocillopora meandrina* (cauliflower coral) is a primary pioneer species, thriving in high-energy, recently formed lava environments.

Deep-Sea Coral: While shallow corals recover relatively quickly, deeper, slow-growing gold coral communities may take thousands of years to develop on submerged lava flows. But they are less affected by bleaching and global warming events.

Process of Growth: Lava entering the ocean creates a new, often steep, substrate of rock and sediment. While initially sterile, these areas are quickly colonized by algae, followed by corals, though the process can be delayed by sedimentation or water quality issues.

- **Environmental Factors:** Recovery depends on exposure to waves, with more robust, wave-exposed areas often developing faster than protected ones.

Studies of past lava flows, such as those in Puna and Kona, indicate that these ecosystems are resilient and capable of creating new, thriving reefs over time.



FRIENDS of HANAUMA BAY

CONSERVE • PROTECT • RESTORE

*Dedicated to the conservation of coastal and marine environments,
emphasizing stewardship of the natural resources of Hanauma Bay*

To: The Honorable Senator Chris Lee, Chair, the Honorable Senator Lorraine Inouye, Vice Chair, and Members of the Committee on Water, Land, Culture and the Arts.

From: Friends of Hanauma Bay

Re: Hearing SB3201 RELATING TO CORAL REEF RESILIENCE

Hearing: Friday, February 13, 2026, 1:01 p.m.

Aloha Chair Lee, Vice Chair Inouye, and Members of the Committee on Water, Land, Culture and the Arts,

Friends of Hanauma Bay **STRONGLY SUPPORTS** the intent of SB3201, with the proffered amendments.

Coral reefs are dying around the world. Coral reef decline is a huge problem for Hawaii, where reefs protect our shorelines and beaches and avoid over \$836 million in flood damage to property and economic activity value per year according to research by the US Geologic Survey. Live coral cover around the State reportedly ranges from less than one percent to 69 percent, and overfishing of herbivores that clean the reef of smothering algae is also an important factor on Oahu.

Friends of Hanauma Bay therefore **SUPPORTS the portions of the bill** that would require the Department of Land and Natural Resources' Division of Aquatic Resources (DAR) to **manage the aquatic resources** of the State with the highest priority given to protecting, restoring, and maintaining ecosystem integrity and use the best scientific data available.

Friends of Hanauma Bay also **SUPPORTS requiring DAR to set goals** to substantially increase coral reef resilience around Oahu and develop a framework to meet those goals.

However, we **recommend the following amendments to the bill**:

1. If the specific requirements on page 4, lines 11-20, are included in the bill, they should set as goals for DAR, not requirements.
2. Change Page 4, line 21, to (c)The division:

3. Change Page 5, line 1, to start with **(1) May collaborate with**
4. Change Page 5, Line 5, to start with **(2) Shall ensure....**
5. Change Page 5, Line 7, to start with **(3) Shall incorporate**

6. Section 5 should be deleted in its entirety.

Friends of Hanauma Bay strongly supports the intent of this bill with **constructive changes** that will help ensure DAR can meet the intended goals of protecting, restoring, and maintaining the ecosystem integrity of our marine resources using the best scientific data while still having maximum agency over expenditure of tax payer dollars.

Please pass an **amended version** of this bill that can do all of these things to protect the resilience of our coral reefs for generations to come.

With Aloha,

Lisa Bishop, MS
Friends of Hanauma Bay I President

SB-3201

Submitted on: 2/12/2026 12:58:05 PM

Testimony for WLA on 2/13/2026 1:01:00 PM

| Submitted By | Organization | Testifier Position | Testify |
|---------------------|---------------------------------|---------------------------|----------------------|
| Inga Gibson | Testifying for Pono Advocacy | Comments | Remotely Via Zoom |

Comments:

WLA Committee Members

RE: COMMENTS ON SB3201

Dear Chair Lee and Committee Members,

Thank you for the opportunity to provide comments on SB3201. Subsequent written testimony will be submitted on behalf of For the Fishes.

Thank you,

Inga Gibson, Pono Advocacy

**Testimony of The Nature Conservancy
Commenting on SB3201, Relating to Coral Reef Resilience
Committee on Water, Land, Culture and the Arts
February 13, 2026 at 1:01 pm
Conference Room 224 and via Videoconference**

Dear Chair Lee, Vice Chair Inouye, and Members of the Committee:

Mahalo for the opportunity to testify today. The Nature Conservancy (TNC) Hawai'i and Palmyra respectfully comments on SB3201, which requires the Division of Aquatic Resources (DAR) of the Department of Land and Natural Resources to: (1) manage and administer aquatic life and resources, with the highest priority being to protect, restore, and maintain ecosystem integrity, using the best scientific data available; (2) restore and maintain reef ecosystems and indigenous species to a level that is not less than 80% of their natural biomass potential; and (3) expand and maintain live coral cover at not less than 25% on reefs that have historically supported naturally occurring live coral cover. Additionally, this bill requires the DAR to develop plans and take actions to increase reef resilience around the island of Oahu by certain dates.

TNC's mission is to conserve the lands and waters on which all life depends, and TNC strongly supports policies that preserve and sustain the integrity of Hawai'i's ecosystems. We believe that only by applying the best available Indigenous and Western science, together with traditional ecological knowledge, can we solve Hawai'i's most challenging conservation problems. For our reefs, this means supporting flexible management that maintains the composition, function, and structure of ecological systems, so they can withstand environmental pressures, adapt to changing conditions, and continue supporting our communities for generations to come. This includes protecting the diversity and abundance of native species, safeguarding ecological interactions, maintaining water and habitat quality, and ensuring that ecosystems remain resilient in a rapidly changing climate. Maintaining ecosystem integrity preserves not only individual species or places, but the essential functions that enable ecosystems to continue providing environmental, cultural, and economic benefits.

SB3201 reflects a strong commitment to coral reef resilience, and we deeply appreciate DAR's long-standing leadership in advancing science-based management for Hawai'i's nearshore ecosystems. We strongly support the intent of the bill to restore and maintain ecosystem integrity. However, the bill's strict quantitative requirements for increasing coral cover and species biomass may present an unachievable mandate given that many key stressors, such as wastewater and stormwater runoff, sedimentation, and increasing marine heat, lie outside DAR's purview. These external factors can negatively affect ecological recovery regardless of marine management efforts, and DAR should not be held solely accountable for achieving fixed ecological thresholds.

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We respectfully suggest the Committee consider legislative language that provides flexibility to DLNR and does not hold the agency to unachievable statutory mandates. Instead, we recommend that goals and metrics should lie within DAR's authority, such as strengthened management measures, coordinated watershed efforts, and science-based recovery planning, that contribute to the ecological outcomes desired.

Mahalo for the opportunity to comment on SB3201.

Guided by science, TNC is a non-profit organization dedicated to the preservation of the lands and waters upon which all life depends. The Conservancy has helped protect more than 200,000 acres of natural lands in Hawai'i and Palmyra Atoll. We manage 84,000 acres in 13 nature preserves and 18 managed areas and have supported over 50 coastal communities to help protect and restore the nearshore reefs and fisheries of the main Hawaiian Islands.



LATE

February 13, 2026

TO: Chair Lee, Vice Chair Inouye and members of the Water, Land, Culture and the Arts Committee

SUBMITTED BY: Inga Gibson, Policy Consultant, For the Fishes; PonoAdvocacy@gmail.com, 808.922.9910

RE: SUPPORT for SB3201, with amendments; Relating to Coral Reef Resilience

For the Fishes respectfully urges your support of SB3201, which would require DLNR to strengthen coral reef resilience statewide.

Coral reef ecosystem failure in Hawai'i is not a future threat—it is already underway. One clear indicator is the failure of heavily targeted aquarium species to recover after commercial aquarium collection was halted by court order in 2017.

Based on population doubling time—a recovery theory cited 41 times in the aquarium trade's most recent EIS—and prior recovery following protection, yellow tang populations in previously open areas of West Hawai'i were expected to approximately double by 2021. The EIS claimed yellow tang are highly resilient and would double in less than 15 months. Historically, however, recovery in West Hawai'i occurred over roughly four years following protection—an outcome so strong that leading researchers described it as “unequivocal evidence of population recovery.”

That long-established recovery benchmark has not been met. The failure of yellow tang populations to rebound as expected makes this species Hawai'i's “canary in the coal mine” for broader reef ecosystem decline.

The scientific literature is clear: sufficient abundance and biomass of herbivorous fishes are essential to prevent turf algae dominance and support reef resilience. Best available science shows that fish abundance—not simply fish size—drives algal control.¹ As Dr. Greg Asner has noted, “more mouths on the reef make the reef a healthier and more resilient place.”

For this reason, we respectfully suggest amending SB3201 to explicitly include herbivore abundance metrics, particularly for small-bodied herbivores such as yellow tang and kole.

Mahalo for the opportunity to testify in STRONG SUPPORT of SB3201 and for your consideration of this amendment.

¹ Foo and Asner, 2021. Depth-dependent indicators of algal turf herbivory throughout the Main Hawaiian Islands

Aquarium Collecting and the Failure of Reef Fish Recovery in Hawai‘i

Independent state and federal monitoring data show that yellow tang populations in Hawai‘i failed to recover—and in some cases declined—after aquarium collecting ceased, contradicting sustainability claims, population doubling theory, and Hawai‘i’s own historical recovery experience.

Background

Since at least the 1960s, fisheries scientists have used species-specific life-history traits to estimate rates of population increase and recovery following reduced fishing pressure, a concept that is sometimes expressed in management and applied contexts as population doubling time.^{i, ii, iii, iv} This concept was invoked 41 times in the most recent Hawai‘i aquarium trade Environmental Impact Statement (EIS) to support claims that aquarium collecting could be conducted sustainably, despite the absence of a clear, empirically testable definition of sustainability in management decision-making.^v

For yellow tang, the theoretical population doubling time cited in the EIS is less than 15 months.^{vi} However, empirical data tell a very different story.

Long-term monitoring conducted by the Division of Aquatic Resources (DAR) within the West Hawai‘i Regional Fishery Management Area (WHRFMA) shows that actual yellow tang population doubling required approximately **four years**, not months (Fig. 1). Following the establishment of Fish Replenishment Areas (FRAs) on December 31, 1999, yellow tang populations within these protected areas surged and doubled in abundance by 2004. Thereafter, abundance closely tracked that of long-term Marine Protected Areas, which serve as a proxy for natural population levels (Fig. 1).^{vii}

Importantly, this documented recovery demonstrates that rapid population doubling was historically possible under effective protection and provides an empirical benchmark against which more recent post-closure outcomes can be evaluated.

Post-closure outcomes

In 2017, a court order halted aquarium collecting in the previously open areas of the WHRFMA. Based on population doubling time theory and historical recovery patterns, yellow tang populations in these formerly collected areas should have doubled by approximately 2021.

Although a strong increase in abundance was observed in 2018 following the cessation of collection, this increase was short-lived. **Rather than continuing toward population doubling, yellow tang populations declined**, and by 2021, had reverted to the level observed during the last year of active collection, based on DAR monitoring data (Fig. 1). This pattern is consistent with NOAA monitoring results (Fig. 2).^{viii}

While both DAR and NOAA data show an upward trend in 2023 and 2024, this pattern must be interpreted with caution. **In 2022, DAR reduced its long-standing monitoring program from 3–6 survey rounds per year to a single annual survey, substantially reducing statistical power and rendering recent data scientifically inconclusive.** This represents a significant monitoring and management failure. NOAA abundance estimates are similarly imprecise in most years, limiting the ability to draw robust conclusions regarding recovery or population doubling (Figs. 1–2).

Aquarium collecting on O‘ahu was halted in 2020 following a second court order, after decades of intense harvest pressure. Using West Hawai‘i as an empirical benchmark, population doubling would have been expected by approximately 2024. NOAA monitoring data instead show **that yellow tang abundance around O‘ahu in 2024 is based on sufficiently precise estimates and is significantly lower than in 2019** (Fig. 3).^{ix} **This decline occurred during the period when population recovery and doubling would have been expected based on historical precedent.**

Conclusion

Despite the cessation of aquarium collecting, **yellow tang populations have failed to recover** as predicted by population doubling time theory. In West Hawai‘i, abundance in formerly collected areas briefly increased following the 2017 closure but subsequently declined, reverting by 2021 to levels comparable to those observed during active collection and failing to double thereafter. On O‘ahu, where aquarium collecting was halted in 2020 after a longer period of intense harvest pressure, NOAA monitoring data show that yellow tang abundance declined significantly by 2024 relative to pre-closure levels, rather than increasing and doubling. Taken together, independent state and federal monitoring data indicate that ending collection alone has not produced sustained population recovery on management-relevant timescales. **These findings show that assumptions of sustainability and reliable post-harvest recovery are not supported by empirical evidence.**

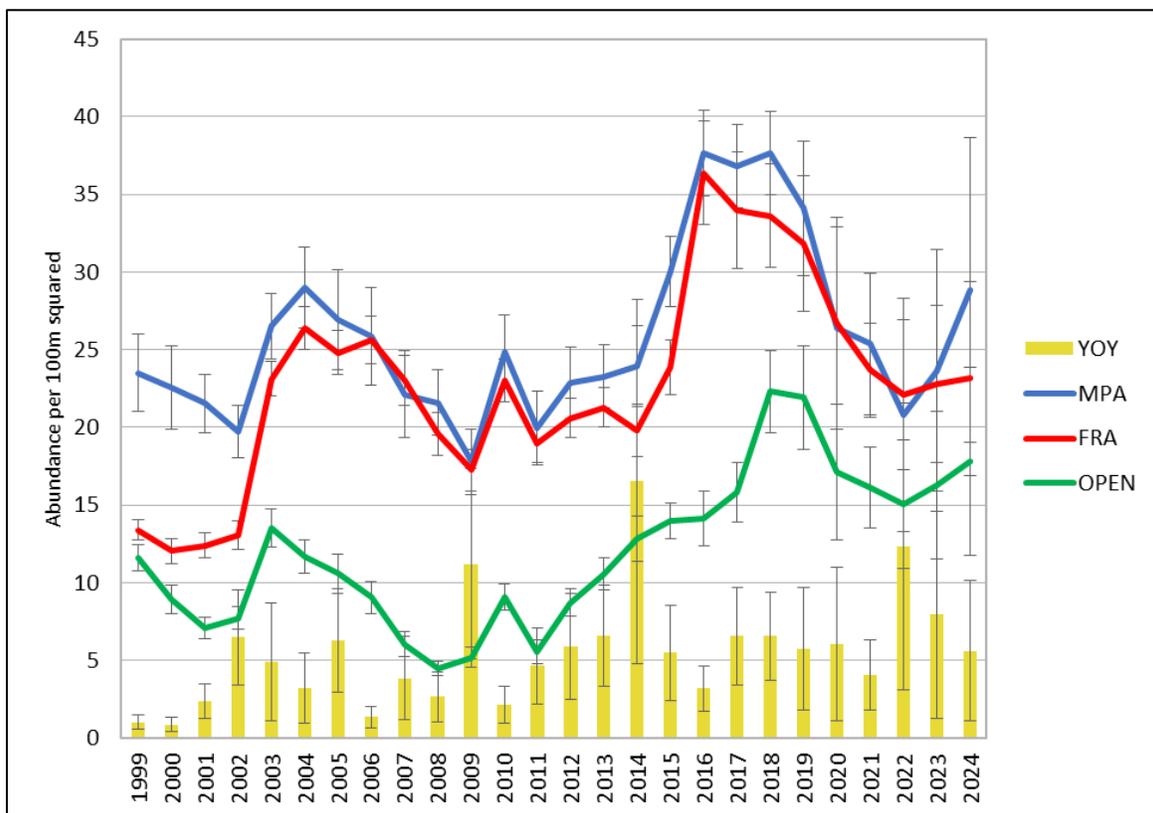


Figure 1. WHRFMA Yellow tang abundance by management area ^x

Mean estimated yellow tang abundance by management area in the West Hawai‘i Regional Fishery Management Area (WHRFMA). **In recent years, reduced sampling effort has produced imprecise abundance estimates**, removing the ability to distinguish differences among management areas or to assess temporal recovery trends.

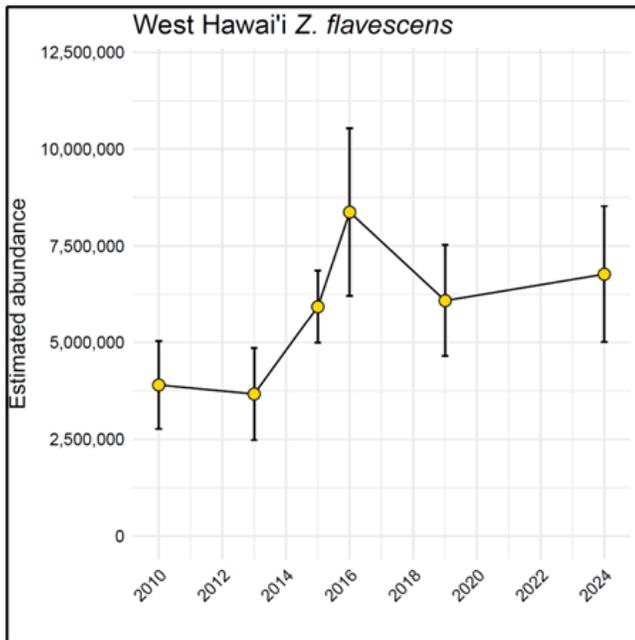


Figure 2. West Hawai'i yellow tang abundance (NOAA monitoring). NOAA abundance estimates for West Hawai'i are imprecise in many years, limiting the ability to evaluate fine-scale temporal trends. **Nevertheless, the data are sufficient to rule out population doubling following the cessation of aquarium collecting and remained well below levels that would indicate population doubling through 2024.**

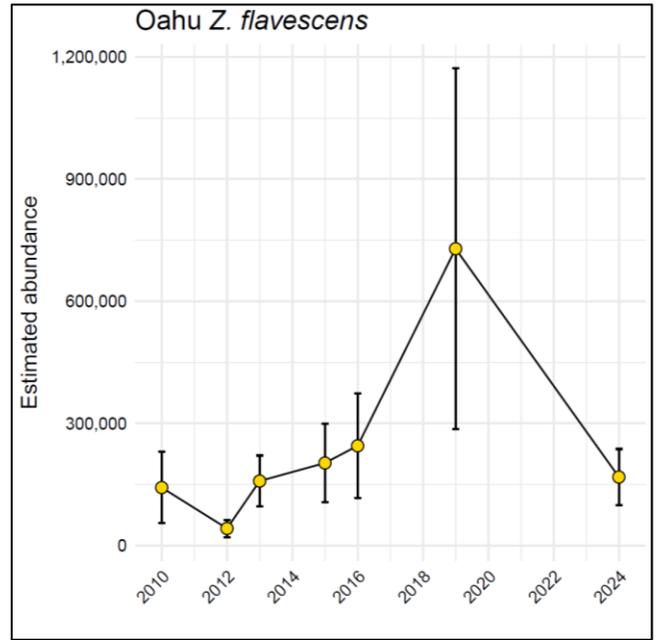


Figure 3. O'ahu yellow tang abundance (NOAA monitoring). NOAA abundance estimates for O'ahu are imprecise in many years, limiting the ability to assess long-term recovery trends. **However, the data are sufficient to demonstrate a decline relative to 2019, and the time series provides no evidence of population doubling following the 2020 cessation of aquarium collecting.**

References:

- ⁱ Caughley, G. (1977). *Analysis of Vertebrate Populations*. John Wiley & Sons
- ⁱⁱ Myers, R. A., Hutchings, J. A., & Barrowman, N. J. (1997). Why do fish stocks collapse? The importance of life history traits. *Ecological Applications*, 7(1), 91–106.
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- ^{iv} Dulvy, N. K., et al. (2004). Extinction vulnerability in marine populations. *Fish and Fisheries*, 5(1), 25–64.
- ^v Oahu 2023 Revised Draft EIS. Available at: https://www.dropbox.com/scl/fi/qaksdcud95xop5nobzqcz/RDEIS_Oahu_10102024_final_reducedsize.pdf?rlkey=fdmnlt4nxzkl0zsnt50ywg9l1&st=ku3h7v4k&dl=0
- ^{vi} Oahu 2023 Revised Draft EIS pg. 53, 75
- ^{vii} Hawai'i Division of Aquatic Resources (DAR). Long-term monitoring of yellow tang abundance in West Hawai'i following establishment of Fish Replenishment Areas (1999–2024).
- ^{viii} National Oceanic and Atmospheric Administration (NOAA) National Coral Reef Monitoring Program
- ^{ix} Ibid.
- ^x Independent Marine Biologist Analysis of DAR WHRFMA Data

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SB-3201

Submitted on: 2/10/2026 3:49:52 PM

Testimony for WLA on 2/13/2026 1:01:00 PM

| Submitted By | Organization | Testifier Position | Testify |
|-----------------|--------------|--------------------|------------------------|
| Frederick Smith | Individual | Support | Written Testimony Only |

Comments:

TESTIMONY IN SUPPORT OF SB3201

S.B. 3201 – Relating to Coral Reef Resilience

Senate Committee on Water, Land, and Agriculture (WLA)

Aloha Chair Lee, Vice Chair Inouye, and Members of the Committee,

My name is Frederick Smith, and I live in the Kealakekua ahupua'a in South Kona, Hawai'i Island. I am a TCBES graduate student focused on marine science and policy at the University of Hawai'i at Hilo, and I submit this testimony as an individual in **strong support of SB3201**.

Hawai'i's nearshore reefs continue to experience intense pressure from repeated bleaching events, nutrient loading, sedimentation, and high user impacts - particularly on O'ahu, where reef condition is among the most degraded statewide. SB3201 gives DAR a needed, science-based mandate to prioritize ecosystem integrity, use the best available ecological data, and track progress through clear, measurable resilience targets.

I support the bill's goal of restoring live coral cover to at least 25% on reefs that historically supported coral-dominated benthic communities. This $\geq 25\%$ coral cover target is consistent with NOAA's long-term coral reef monitoring, which shows that reefs with low coral cover are more vulnerable to algal dominance and reduced resilience. As such, it represents a practical, scientifically grounded benchmark for sustaining coral recruitment, the herbivore-coral balance, and basic reef resilience.

I also support the bill's target of restoring fish biomass to at least 80% of natural biomass potential. For legislative clarity, this 80% benchmark aligns with the findings of DAR's Holomua Marine 30x30 technical report (Donovan et al., 2023). That analysis, based on contemporary DAR and NOAA survey data, modeled each site's potential herbivore biomass and found that reef condition begins to decline below roughly 80% of that modeled potential. The same study also shows that most moku statewide already meet or exceed the ~80% threshold, with primary shortfalls concentrated on O'ahu and parts of Maui Nui. This demonstrates that the benchmark in SB3201 is realistic, science-based, and aligned with current reef conditions.

Finally, I support the bill's requirement for O'ahu-specific resilience actions and annual progress reporting, ensuring that management attention is directed where reef decline is most severe and where targeted interventions can produce the greatest benefit. O'ahu urgently needs focused planning and action to restore coral cover and fish biomass to functional thresholds, and this legislation provides DAR with the clear statutory direction needed to advance that work.

Mahalo for the opportunity to testify and for your continued commitment to advancing Hawai'i's marine ecosystem resilience.

Frederick Smith

Captain Cook, HI 96704

Reference:

Donovan, M. K., Williams, I. D., Stamoulis, K. A., Couch, C. S., & Friedlander, A. M. (2023). Evidence for managing herbivores for reef resilience. Holomua Marine 30×30 Technical Report, Division of Aquatic Resources (DAR).

<https://dlnr.hawaii.gov/holomua/files/2023/12/Evidence-for-managing-herbivores-for-reefresilience.pdf>

Aloha Chair Lee and members of WLA,

I am the Hsiao Endowed Professor of Marine Biology at UH Mānoa, testifying as a private citizen in **conditional support of SB3201**. I have studied Hawai'i's coral reefs since the 1970s, so I have personally witnessed the degradation of our reefs over the decades. It is truly sad that some fishers and members of state agencies are in denial regarding the need for immediate action to restore our reefs and fisheries. Overwhelming data in peer-reviewed scientific journals and the consensus of the marine science community is that many Hawaiian coral reef ecosystems have collapsed or are very close to collapse, especially around O'ahu. Fortunately, abundant data also show that local actions can strongly enhance the ecological resilience (recovery and resistance) of our reefs, even in the face of ever-worsening ocean warming and coral bleaching. Unfortunately, after decades of neglect, the absence of immediate and substantial remedial action is now a major issue that must be faced. Our reefs simply cannot wait another 3-5 years for the Holomua Marine Initiative to play-out on O'ahu.

SB3201 would address the present lack of immediate strong action to save our coral reefs by establishing explicit benchmarks and schedules for remedial regulations. That said, some of these benchmarks and schedules are unrealistic, so I recommend amendments:

In Section 2, the species that must be increased to 80% of their unexploited biomass to enhance reef recovery are not every indigenous species, as presently worded, but rather the herbivorous fishes that keep reef surfaces clean of benthic algae so corals can settle, survive, and grow. These critically important and depleted fishes include the parrotfishes (uhu, Family Scaridae), certain surgeonfishes (especially kala, Family Acanthuridae), and chubs (nenuē, Family Kyphosidae). SB2972 is an example of such immediate remedial action.

Regarding Section 5 goal (1), there is no way to increase live coral cover to 25% by 2027 – our corals grow far too slowly. Rather, the 25% target could possibly be attained within several decades if substantial action begins now. As for goal (2), it will take at least a full decade to replenish herbivorous fish populations on depleted reefs, even with full protection. Two decades may be more realistic. Finally, I believe goal (3) is completely unrealistic because we will likely never have sufficient knowledge of what constitutes 80% of the pristine abundances of the thousands of species on our reefs. Instead, a more realistic goal would be for Hawai'i to once again join the global "30 by 30" initiative to protect 30% of state waters by the year 2030.

You will hear the opposition berating this bill for trampling on traditional fishing rights, destroying commercial fishing, and being based on worthless data by clueless scientists and erroneous assertions by alarmist environmentalists. I have witnessed this scenario play-out elsewhere in the world multiple times. In all cases, ignoring the science resulted in collapsed fisheries and ecosystems, some of which will never recover. I urge you to pass this bill with realistic amendments and lobby for its passage into law. Our keiki will never forgive us if we simply let our reefs die. (I'm sorry I could not testify in person due to teaching duties at UH.)

Mahalo,



Mark Hixon

SB-3201

Submitted on: 2/12/2026 7:31:38 AM

Testimony for WLA on 2/13/2026 1:01:00 PM

| Submitted By | Organization | Testifier Position | Testify |
|---------------------|---------------------|---------------------------|----------------------|
| Kim Koch | Individual | Support | Remotely Via Zoom |

Comments:

I support this bill.

SB-3201

Submitted on: 2/12/2026 10:07:43 AM

Testimony for WLA on 2/13/2026 1:01:00 PM

| Submitted By | Organization | Testifier Position | Testify |
|---------------------|---------------------|---------------------------|---------------------------|
| Douglas Perrine | Individual | Support | Written Testimony Only |

Comments:

SB3201 codifies the expectation that most of us believe - that the DAR should prioritize malama kai - that the highest order should be protection of the natural resources that our lives, livelihoods, and lifestyles depend upon. Unfortunately, sometimes DAR has instead sometimes prioritized profits of extractive industries, benefitting a small portion of the population to the detriment of others. Therefore we need to enshrine into law that DAR's mission is first and foremost to protect our marine natural resources. Please pass SB3201.

TESTIMONY ON SENATE BILL 3201

February 13, 2026

LATE

Aloha Chair Lee and members of WLA:

I recently retired as NOAA's research coordinator for the Papahānaumokuākea National Marine Sanctuary, and maintain affiliate faculty status with UH Manoa. I am testifying today as a private citizen. I have spent over 40 years studying Hawaii's coral reef ecosystems, and have also been an avid recreational diver and fisher for all of my adult life. In this time span, I have witnessed the serious degradation of our coral reefs. Specifically, we have over-harvested herbivorous fishes, the so-called "lawnmowers of the reef", to levels so low that we are at risk of losing our coral reefs entirely in coming years. In the wake of a major perturbation, such as a tsunami or major hurricane, herbivorous fishes are needed to keep the algae in check until new corals can settle on the reef and grow. Without herbivores such as uhu (parrotfish) and kala (surgeonfish), the algae takes over and corals may never recover.

The scientific data documenting this precipitous drop in fish abundance is incontrovertibly documented in the scientific literature (see testimony and data provided separately by Drs. Mark Hixon and Alan Friedlander). Herbivore abundances on O'ahu's reefs are **BELOW FIVE PERCENT** of the pristine stocks in the Northwestern Hawaiian Islands. This constitutes an emergency by any definition of the word, and requires immediate action. We are literally one coral bleaching event away from losing a majority of our coral reefs.

Coral reefs are critically important to modern Hawaiian society. A recent study put their valuation in the hundreds of millions of dollars a year in terms of the protection they provide from storms and coastal inundation. As residents of this state, many (if not most) of us partake of ocean recreation, whether it involves swimming, diving, fishing, surfing, paddling, sailing, or just sitting on a sandy beach while enjoying the sunset. Coral reefs make all of these things possible. These ecosystem services are also a large draw for tourism, the economic engine upon which our state is heavily dependent. Finally, during recent economic and social upheavals due to the COVID pandemic, coral reef fisheries also provided a measure of food security for many local families.

SB3201 immediately addresses the current lack of action to save our coral reefs. . Coral reef restoration truly requires a multi-pronged approach, one that ultimately must be inclusive of watershed restoration, cessation of pollution, etc. However, given the urgency of herbivore depletion on our reefs. I strongly support SB3201 as a companion to SB2972 (protecting coral reef herbivores) as measures that can be quickly,

inexpensively, and effectively deployed ASAP. At risk of sounding alarmist, I believe very strongly that urgent action is needed. I thus ask for your support on SB3201.

Thank you for your consideration.

A handwritten signature in cursive script, appearing to read "Randall Kosaki".

Randall Kosaki, Ph.D.