



Southern Shrimp Alliance

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Foreign Affairs Officer
U.S. Department of State
Bureau of Oceans and International Environmental and Scientific Affairs
Office of Global Change
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Re: Options for Combating International Deforestation Associated with Commodities

Dear Ms. Dragisic,

On behalf of the Southern Shrimp Alliance, we hereby provide information and comments on options for combating international deforestation associated with commodities in response to the Department's request for comments¹ as it relates to President Biden's Executive Order 14072 *Strengthening the Nation's Forests, Communities, and Local Economies* ("EO 14072").²

I. Introduction

Founded in 2002, the Southern Shrimp Alliance is an organization of shrimp fishermen, farmers, processors, unloading docks, and associated shoreside businesses in the coastal states of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas. We are committed to enhancing the long-term viability of one of the nation's most valuable commercial fisheries and delivering a healthy, wholesome food product to the American public. A thriving U.S. shrimp industry supports thousands of small and medium-sized family-run

¹ *Request for Stakeholder Input on Options for Combating International Deforestation Associated With Commodities*, 87 Fed. Reg. 63,142 (Dep't of State October 18, 2022).

² *Strengthening the Nation's Forests, Communities, and Local Economies*, 87 Fed. Reg. 24,851 (Executive Office of the President April 22, 2022) (EO 14072).

enterprises, employs tens of thousands of Americans, and is vital to the economies of coastal communities over a wide geographic area of this country.

For roughly two decades, the Southern Shrimp Alliance has worked to improve the industry's understanding of how international trade impacts the prices fishermen receive at the dock. To that end, the Southern Shrimp Alliance endeavors to bring the voice of shrimpers as full participants in international trade policymaking. We believe that it is essential for the American public to recognize how non-market distortions of international trade – such as the unregulated use of antibiotics in aquaculture; export and fishery subsidies; illegal, unreported, and unregulated (“IUU”) fishing; market access limitations in other importing countries; and environmental devastation – are the foundations upon which cheap foreign shrimp is built.

To date, the U.S. shrimp industry has focused on environmental issues that provide the justification for the regulation of our fishermen. For example, the manner in which shrimp is harvested in U.S. waters is heavily regulated to limit adverse impacts on endangered marine mammal, sea turtle, and fish populations. The industry has been further required to develop and adopt measures that have substantially reduced bycatch through trawling and have done so under active regulatory enforcement agencies. At the same time, our shrimpers have been required to compete for sales in the U.S. market with foreign fishing industries that devastate their local environment, as well as with farmed shrimp raised on feed produced through IUU fishing. Accordingly, the Southern Shrimp Alliance has prioritized ensuring that the market access requirements imposed upon our industry equally apply to our foreign competition.

Nevertheless, there are other environmental issues raised by shrimp produced overseas that are also of great importance. One such issue, deforestation, is not implicated by the harvesting of shrimp in the United States. Quite to the contrary, shrimpers fully appreciate the seminal importance of mangrove forests in sustaining our commercial fisheries. However, outside of the borders of the United States, the rapid expansion of shrimp aquaculture has decimated mangroves on the coasts of several continents, while increasing demand for aquaculture feed produced through soy has incentivized the clear-cutting of wide swaths of forests in the tropics.

These comments summarize the successful actions taken by U.S. governmental authorities to protect and re-establish mangrove forests throughout the southern coastal United States; the simultaneous large-scale destruction of mangrove forests throughout the world as the result of shrimp aquaculture; and the ties between the deforestation of the Amazon rainforest with the farming of soybean used to produce feed for shrimp aquaculture.

II. Mangrove Forests

Whereas several environmental issues have moved up on policy agendas in recent decades, various environmental problems are not given the same attention as other, more institutionally embedded activities. It is critical that the objectives of EO 14072 and the Biden

Administration's *Plan to Conserve Global Forests: Critical Carbon Sinks*,³ are achieved using the most effective strategies, as ecological degradation from deforestation is increasingly linked to geopolitical instability and undermines economic prosperity. An overlooked yet catastrophic contributor to global deforestation associated with commodities is the destruction of mangrove forests for shrimp farming, especially in South/Southeast Asia and Latin America. In sharp contrast, within the United States, we have adopted significant regulatory controls to prevent mangrove deforestation and encourage the reclamation of mangrove forests.

Global maps developed by the Global Mangrove Alliance indicate that there were 136,000 km² of mangrove forests worldwide in 2016.⁴ Although this ecosystem is estimated to comprise just 0.7 percent of the world's forests,⁵ mangroves play an oversized role in carbon dioxide sequestration and are vital to the functioning of their surrounding environment. Semi-aquatic mangrove forests deliver a broad spectrum of ecosystem services, such as sequestering carbon at up to four times the rate of terrestrial forests, stabilizing coastlines, protecting coastal communities against storm surges, reducing coastal erosion, and serving as expansive nurseries and habitats for fish, crustaceans, shellfish, and other wildlife.⁶ Moreover, throughout the world, millions of people's economic security depends upon the health of mangroves, with estimates indicating that "in many countries, over 80% of small-scale fisheries rely on mangroves, and there are over 4.1 million mangrove fishers globally – each supporting a network or community of dependences."⁷

These mangroves are concentrated in areas that overlap with the production of shrimp, as "Southeast Asia houses almost a third of all mangroves, with Indonesia alone being home to almost 20%."⁸ Approximately 75 percent of the world's mangroves are found in just fifteen countries.⁹ Included in the top fifteen countries by area of mangrove coverage as of 2010 are: Indonesia ranked first with ~3,112,989 ha; Brazil ranked third with ~962,683 ha; and India

³ The White House, *Plan to Conserve Global Forests: Critical Carbon Sinks* (Nov. 2, 2021), available at: https://www.whitehouse.gov/wp-content/uploads/2021/11/Plan_to_Conserve_Global_Forests_final.pdf.

⁴ See Mark D. Spalding and Maricé Leal (Eds.), *The State of the World's Mangroves 2021*, Global Mangrove Alliance (2021), available at: <https://www.mangrovealliance.org/wp-content/uploads/2021/07/The-State-of-the-Worlds-Mangroves-2021-FINAL.pdf>.

⁵ See Tiffany Stecker, *Restoring Mangroves May Prove Cheap Way to Cool Climate*, Scientific American (July 31, 2012), available at: <https://www.scientificamerican.com/article/restoring-mangroves-may-prove-cheap-way-to-cool-climate/>.

⁶ Mark D. Spalding and Maricé Leal (Eds.), *The State of the World's Mangroves 2021*, Global Mangrove Alliance (2021), available at: <https://www.mangrovealliance.org/wp-content/uploads/2021/07/The-State-of-the-Worlds-Mangroves-2021-FINAL.pdf>.

⁷ *Id.*

⁸ *Id.*

⁹ Chandra Giri et al., *Status and distribution of mangrove forests of the world using earth observation satellite data*, *Global Ecology and Biogeography*, Vol. 20, No. 1 (2011) at 154–159.

ranked eleventh with ~368,276 ha of mangrove coverage.¹⁰ With ~161,000 ha of mangrove coverage reported in 2020, Ecuador is within the top twenty countries for the size of this habitat.¹¹ Overall, approximately 75 percent of the world's farmed shrimp production comes from South/Southeast Asian countries, mainly from India and Indonesia, but also from Thailand and Vietnam, where mangroves are also endemic. The other 25 percent are produced in the western hemisphere, with Ecuador responsible for approximately 20 percent of the world's exported shrimp.¹²

A. The United States Has Adopted Significant Measures to Preserve and Restore Mangrove Forests

Although mangrove forests are concentrated elsewhere, there are significant mangroves in the United States, “found from the southern tip of Florida along the Gulf Coast to Texas.”¹³ In fact, “Florida’s southwest coast supports one of the largest mangrove swamps in the world.”¹⁴ All told, there are approximately 600,000 acres of mangrove forests that are essential to the overall health of Florida’s southern coastal zone.¹⁵

According to the Florida Department of Environmental Protection (“DEP”), conserving mangrove forests is not only imperative due to the sheer amount of carbon they sequester, but also because they provide critical, symbiotic microbiomes for juvenile fish, crustaceans, and other marine life.¹⁶ Additionally, the leaves from mangrove trees provide organic matter that serves as nutrients for marine animals and increases the concentration of organic matter in sediment.¹⁷ The Florida DEP also highlights the more direct benefit humans receive from mangroves, emphasizing how storm protection depends on the width of the forest; the wider the

¹⁰ *Id.*

¹¹ Fausto López-Rodríguez, *Mangrove in Ecuador: Conservation and Management Strategies*, In Y. Zhang, & X. S. Liang (Eds.), *Coastal Environments*, IntechOpen (2021), available at: <https://doi.org/10.5772/intechopen.95572>.

¹² *Shrimps and prawns, Frozen*, Observatory of Economic Complexity (n.d.), available at: <https://oec.world/en/profile/hs/shrimps-and-prawns-frozen/>.

¹³ United States Environmental Protection Agency, *Mangrove Swamps*, available at: <https://www.epa.gov/wetlands/mangrove-swamps>.

¹⁴ *Id.*

¹⁵ Florida Department of Environmental Protection, *Florida’s mangroves* (May 23, 2022), available at <https://floridadep.gov/rcp/rcp/content/floridas-mangroves/>.

¹⁶ *Id.*

¹⁷ Claude E. Boyd, et al., *Perspectives on the Mangrove Conundrum, Land Use, and Benefits of Yield Intensification in Farmed Shrimp Production: A Review*, *Journal of the World Aquaculture Society*, Vol. 53, No. 1 (2021) at 22.

“fringe” of mangroves, the greater reduction of wave and flood damage.¹⁸ As Florida’s DEP observes, the ecological services mangroves provide “cannot be overemphasized.”¹⁹

While the state experienced anthropogenic deforestation in the first half of the 20th century, with input and research from scientists, the Florida Wildlife Research Institute, and the Smithsonian Institute, Florida has implemented regulations to protect mangrove forests. Based on analyses between 1984 and 2011, the Florida Atlantic Coast has regained more than 3,000 acres of mangroves. Some of this regrowth is a result of the 1996 Mangrove Trimming and Preservation Act²⁰ which regulates the trimming and alteration of mangroves while also banning the use of herbicides and other chemicals used to defoliate mangroves.²¹ Under existing state law, mangroves cannot be removed, trimmed, or disturbed without a permit to do so from the Florida DEP.²²

Florida’s regulatory system for protecting mangroves is designed to meaningfully deter harm to this ecosystem and has succeeded in this objective. For first violations, property owners may have to restore the mangrove coverage harmed; for any further offense, property owners can be fined up to \$100 per mangrove illegally trimmed and \$200 per mangrove altered unlawfully.²³ As just one example, in 2020, the Florida DEP issued over \$10,000 worth of fines to two parties responsible for illegally cutting over 500 mangrove trees in Volusia County, Florida.²⁴ Accordingly, Florida’s significant commitment of resources to the preservation of mangroves demonstrates the vital importance of this natural resource to our country’s environmental health.

In Texas, the mangrove forest is comprised of black mangrove, a tropical plant found from the United States in the north to Brazil and Ecuador in the south.²⁵ Mangroves are protected within the state as part of the complete coastal environment, managed by multiple state agencies under the rubric of a comprehensive coastal program:

¹⁸ Florida Department of Environmental Protection, *Florida’s mangroves* (May 23, 2022), available at <https://floridadep.gov/rcp/rcp/content/floridas-mangroves/>.

¹⁹ *Id.*

²⁰ Fla. Stat. § 403.9321 (1996).

²¹ Florida Museum, *Urban development is a major threat to mangrove habitats* (Oct. 3, 2018), available at: <https://www.floridamuseum.ufl.edu/southflorida/habitats/mangroves/conservation/#:~:text=Mangroves%20cannot%20be%20removed%2C%20trimmed,Florida%20Department%20of%20Environmental%20Protection.>

²² *Id.*

²³ Florida Department of Environmental Protection, *Trimming Mangroves*, available at: <https://www.floridadep.gov/sites/default/files/mangrove-trimming-2-08-16.pdf>.

²⁴ Abigail Brashear, *DEP fines other responsible parties for illegal mangrove cutting in Wilbur-by-the-Sea*, The Daytona Beach News-Journal (Mar. 31, 2020), available at: <https://www.news-journalonline.com/story/news/environment/2020/03/31/dep-fines-other-responsible-parties-for-illegal-mangrove-cutting-in-wilbur-by-the-sea/1420123007/>.

²⁵ See Benny Simpson, *Texas Native Shrubs* (n.d.), available at: <https://aggie-horticulture.tamu.edu/ornamentals/nativeshrubs/avicenniagermin.htm>.

The Texas Legislature has addressed and delegated the authority to protect and manage coastal resources to a number of state agencies including Texas Parks and Wildlife Department (TPWD) and the General Land Office (GLO). Each of these agencies has specific responsibilities and authorities through which they achieve their respective missions, however, a memorandum of agreement in 1987 provided a basis and guidelines for cooperation for preservation and protection of the state's natural coastal resources, through the creation of the Texas Coastal preserve program.²⁶

Within Texas, five different areas have been designated Texas Coastal Preserves, including South Bay, a 3,420-acre estuary containing mangroves that adjoins a federal wildlife preserve (Loma Ecological Preserve).²⁷ The South Bay Coastal Preserve was established in December 1984 and is subject to a management plan that recognizes the importance of the black mangroves.²⁸

The state of Texas's measures to broadly protect coastal environments, inclusive of the four Coastal Preserves outside of South Bay, have presented a novel challenge that researchers are currently grappling with: the consequences of large-scale expansion of mangroves along the state's coastline. Changing environmental conditions have encouraged the spread of the black mangrove to other parts of Texas, at times displacing existing salt marshes. The impact of this shift in ecosystems is not well understood and has resulted in the launch of the *Mangroves in Texas* collaborative study led by Texas A&M University and the University of Houston.²⁹ This study, led by Professor Steve Pennings (University of Houston) and Professor Anna Armitage (Texas A&M), is premised in part on models of temperature increases that could potentially lead to black mangroves replacing salt marshes throughout all of Texas's coast line as well as the vast majority of Louisiana's coast.³⁰ Thus, within the United States, the substantial resources invested in the preservation of coastal environments may facilitate the further, broad expansion of mangrove forests at the same time as these trees are deforested in other nations to make way for the expansion of shrimp aquaculture.

B. Farmed Shrimp and Global Mangrove Deforestation

Despite rigid protections for mangrove forests located within the country, historically, the federal government has taken minimal steps to protect and preserve mangroves outside the

²⁶ See Ed Hegen, Texas Parks & Wildlife Department, *Protection of Fragile Coastal Ecosystems: Texas Coastal Preserves* (n.d.), available at: <https://tpwd.texas.gov/fishboat/fish/didyouknow/coastal/coastpreserve.phtml>.

²⁷ See *id.*

²⁸ See Texas Parks & Wildlife Department, *Texas GEMS – South Bay Coastal Preserve* (n.d.), available at: <https://tpwd.texas.gov/landwater/water/conservation/txgems/southbay/index.phtml>.

²⁹ See University of Houston, *Mangroves in Texas* (n.d.), available at: <https://uh.edu/mangrove/>.

³⁰ See Osland, MJ, N. Enwright, RH Day, TW Doyle, *Winter climate change and coastal wetland foundation species: salt marshes versus mangrove forests in the southeastern U.S.*, *Global Change Biology* (2013) doi: 10.1111/gcb.12126.

nation's borders. Certainly, there have been no efforts to curtail the importation of goods produced in areas where mangroves have been denuded. As such, American consumers have unwittingly contributed to financially incentivizing mangrove deforestation.

Mangrove forests are disappearing faster than their rainforest counterparts, although their decimation has drawn far less attention. In other parts of the world, the rate at which mangrove deforestation is occurring will continue to cause severe consequences for the global climate. To put this into perspective, the mangrove cover in South/Southeast Asia decreased from 6,360,000 km² (636 million ha) in 2000 to 6,020,000 km² (602 million ha) in 2010.³¹

As a significant driver of global mangrove deforestation, shrimp farming is responsible for approximately 15,000 km² (1.5 million ha) of that loss.³² Across the globe, mangroves have been cleared to make way for short-lived shrimp farms, many of which are quickly abandoned due to disease and pollution.³³ The increase in mangrove deforestation due to shrimp farming is directly connected with the fact that shrimp has become one of the most widely consumed seafoods in the world over the last four decades.³⁴

Globally, farmed shrimp comprised 63.5 percent of total shrimp production in 2018.³⁵ In the U.S. specifically, shrimp continues to top seafood consumption charts. National Oceanic and Atmospheric Administration ("NOAA") Fisheries ("NOAA Fisheries" or "NMFS") reports that between 1990 and 2000, American per capita consumption of shrimp increased from 2.3 pounds to 3.2 pounds, increasing again to 4.0 pounds in 2010, and then to 4.7 pounds in 2019.³⁶ In its most recent report, covering 2020, NOAA Fisheries changed its reporting to now omit a full historical accounting of American per capita consumption of shrimp, but included a summary

³¹ One square kilometer is equal to 100 hectares. See Martin Dorber et al., *Can we locate shrimp aquaculture areas from space? – A case study for Thailand*, Remote Sensing Applications: Society and Environment, Vol. 20 (Mar. 30, 2020).

³² *Id.*

³³ Alfredo Quarto, et al., *Mangroves & Aquaculture*, Mangrove Action Project, available at: http://mangroveactionproject.org/wp-content/uploads/2021/04/MAP_NSA-Poster.pdf.

³⁴ *Consumption of Aquatic Foods*, The State of World Fisheries and Aquaculture 2022, FAO, (2022) available at: <https://www.fao.org/3/cc0461en/online/sofia/2022/consumption-of-aquatic-foods.html>.

³⁵ Claude E. Boyd, et al. *Perspectives on the Mangrove Conundrum, Land Use, and Benefits of Yield Intensification in Farmed Shrimp Production: A Review*, Journal of the World Aquaculture Society, Vol. 53, No. 1 (2021) at 39.

³⁶ National Marine Fisheries Service, *Fisheries of the United States, 2019*. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2019 at 119, available at: <https://media.fisheries.noaa.gov/2021-05/FUS2019-FINAL-webready-2.3.pdf?null=>.

chart indicating that U.S. shrimp consumption had further increased to nearly 5 pounds per person.³⁷

Developing countries with zero, negligible, or poorly enforced regulations surrounding mangrove deforestation continue to invest heavily in the farmed shrimp industry no matter the environmental impact. As environmental and seafood author Paul Greenberg puts it, as long as people want cheap shrimp, there will always be a market for poorly-raised animals.³⁸

C. **Origins of Imported Farmed Shrimp in the U.S. Market and Corresponding Mangrove Deforestation**

While there is a plethora of documentation regarding illegal mangrove deforestation in several countries due to shrimp farming,³⁹ two countries of particular concern are Ecuador and India. This year, these two countries alone accounted for over two-thirds of the volume of shrimp imported into the United States.⁴⁰ The experience of Ecuador and India effectively illustrates the catastrophic consequences of mangrove deforestation to facilitate shrimp farming.

1. **Ecuador**

In the case of Ecuador, mangrove forests are cleared mainly for the development of shrimp aquaculture sites. This pattern began in 1969, and by 2006, approximately 27.7 percent of Ecuador's coastal mangrove ecosystem had been destroyed.⁴¹ The waning of mangroves unequivocally corresponds with the development of Ecuador's shrimp farm industry. Since the clearing of mangroves began in 1969, Ecuador's share of the global and regional shrimp market

³⁷ National Marine Fisheries Service, *Fisheries of the United States, 2020*. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2020 at 26, available at: <https://www.fisheries.noaa.gov/national/sustainable-fisheries/fisheries-united-states>.

³⁸ Melissa Clark, *What Are We Supposed to Think About Shrimp?* The New York Times, available at: <https://www.nytimes.com/2019/10/15/dining/shrimp-sourcing-united-states.html>.

³⁹ See, e.g., Elizabeth Ashton, *The impact of shrimp farming on mangrove ecosystems*, Cab Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources (2008), available at <https://doi.org/10.1079/PAVSNNR20083003>; Laura Villadiego, *Thailand: Reclaiming mangroves for shrimp production*, Al Jazeera, (Sept. 22, 2016), available at: <https://www.aljazeera.com/features/2016/9/22/thailand-reclaiming-mangroves-for-shrimp-production>; Luiz Drude De Lacerda, et al., *20-Years Cumulative Impact From Shrimp Farming on Mangroves of Northeast Brazil*, *Frontiers in Forests and Global Change*, Vol. 4, (Apr. 23, 2021) available at: <https://doi.org/10.3389/ffgc.2021.653096>; and Jéssica Merecí-Guamán, et al., *Impact of Shrimp Ponds on Mangrove Blue Carbon Stocks in Ecuador*, *Forests*, Vol. 12, No. 816, (June, 22, 2021) available at: <https://doi.org/10.3390/f12070816>.

⁴⁰ John Evans, *The battle for the US shrimp market is growing more intense*, IntraFish (Aug. 11, 2022), available at: <https://www.intrafish.com/shrimp/the-battle-for-the-us-shrimp-market-is-growing-more-intense/2-1-1275264>.

⁴¹ Fausto López-Rodríguez, *Mangrove Concessions: An Innovative Strategy for Community Mangrove Conservation in Ecuador*, Coastal Research Library (Apr. 2018) at 559, available at: https://doi.org/10.1007/978-3-319-73016-5_25.

has risen quickly. While catastrophic for mangroves throughout the country, the expansion of shrimp farming was economically beneficial for private companies and the government.

In the early 1990s, the Ecuadorian government began to recognize the environmental costs of losing mangroves. The country developed laws facially intended to spur the recovery of mangrove forests.⁴² Ecuador's Constitution, enacted in 2008, recognizes mangroves as "fragile and threatened ecosystems," giving them a special "status" relative to other ecosystems.⁴³ On paper, all mangroves in Ecuador are protected under mechanisms like community mangrove concessions and protected areas. The policies adopted by the government include Resolution No. 056 of the Ministry of the Environment of 2011, which established fines of up to \$89,273 USD for mangrove deforestation, and The Organic Environment Law (2017), which confirmed earlier regulations that all mangrove forests are property of the State.⁴⁴

Nevertheless, although these laws prohibit deforestation and degradation of protected areas, between 2010 and 2018, mangrove coverage was reduced by another 150.34 ha to make way for even more shrimp farms.⁴⁵ This is due in part to Executive Decree 1391 (2008) ("the Decree"), which regularized shrimp farming.⁴⁶ The Decree acknowledged the illegal situation in which thousands of hectares of shrimp farms have been operating together with the deforestation of mangroves caused by the industry. Nevertheless, the Decree *rewarded* shrimp farming by granting concessions in areas that are a National Asset of Public Use. In result, Executive Decree 1391 disregards much of the protective legislation put in place and ultimately legitimized the shrimp aquaculture industry's illicit destruction of mangroves.

Even ignoring the contradictions in domestic law, such as between the Constitution of Ecuador and Executive Decree 1391, some major shrimp farms in Ecuador have failed to abide by the mangrove reforestation requirement of the Decree. Specifically, the Decree obligates companies to implement a reforestation level of 10 percent when the area of aquaculture installation covers up to 10 ha, 20 percent when it covers from 11 to 50 ha, and 30 percent from 51 to 250 (or more) ha.⁴⁷

Available evidence establishes that one of Ecuador's largest shrimp exporters, Omarsa, has not honored this reforestation requirement despite taking advantage of government-

⁴² Paul Burgess, et al., *Mangroves in Ecuador: An application and comparison of ecosystem service models*, Duke University (2018) at 5, available at: <https://hdl.handle.net/10161/9597>.

⁴³ Fausto López-Rodríguez, *Mangrove in Ecuador: Conservation and Management Strategies*, In Y. Zhang, & X. S. Liang (Eds.), *Coastal Environments*, IntechOpen (2021), available at: <https://doi.org/10.5772/intechopen.95572>.

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ *Executive Decree 1391 for the 'Legalisation' of Shrimp Farming Industry*, Mangrove Action Project (Apr. 13, 2012), available at: <https://mangroveactionproject.blogspot.com/2012/04/executive-decree-1391-for-legalisation.html>.

⁴⁷ *Id.*

sponsored regularization. Omarsa today has 3,748 ha of ponds and is fully vertically integrated, controlling the chain of production, processing, and domestic/international marketing of its shrimp. On Omarsa's website, the company states that it has reforested 98 ha of mangrove forest, which is 3.3 percent of the total area its ponds occupy—massively below the 30 percent required by the Decree.⁴⁸ With 3,748 ha, Omarsa should have recovered over ten times the amount of forest: approximately 1,124 ha of mangroves.

While Ecuadorian shrimp companies have fallen tremendously short of reforestation requirements, these failures have not impacted the ability of the industry to reach foreign markets. In fact, Ecuadorian shrimp is accompanied by certifications from private parties that ignore the environmental consequences of the industry's expansion. For example, third-party certification companies for organic products, such as Germany's Naturland, have elected to excuse underperformance on reforestation targets by Ecuadorian shrimp companies because costs are too high for "their reality." As the World Rainforest Movement has observed, this means that "[d]espite the massive clearing of mangroves to make way for shrimp farms, and the oppression of fishing and gathering communities, this industry has access to certifications that not only facilitate its entry into foreign markets; they also conceal a history of violence against the people of the mangroves."⁴⁹ In consequence, companies like Omarsa have benefitted not only from government regularization, but also receive premium prices associated with shrimp certified as "organic" without bearing the cost of remediating deforestation.⁵⁰

2. India

In India, as in Ecuador and other countries where shrimp farming is a dominant industry, a legislative framework for the conservation and management of mangroves has been in place for almost a century. The Indian Forest Act, 1927⁵¹ and the Wildlife (Protection) Act, 1972⁵² protect flora and fauna. Although they do not specifically mention mangroves, these acts can also apply to conserving mangrove ecosystems. For example, since it was enacted, the Indian Forest Act has been applied to the mangrove forests of the Sundarbans, which have been declared as a reserved area. Other laws implemented more recently, such as The Forest Conservation Act,

⁴⁸ *Ecuadorian Sustainable Shrimp*, Omarsa (n.d.), available at: <https://www.omarsa.com.ec/>.

⁴⁹ World Rainforest Movement, *Ecuador: The Certification of Industrial Shrimp Aquaculture Intensifies Rights Violations and the Destruction of Mangroves* WRM Bulletin 254 (Mar. 9, 2021), available at: <https://www.wrm.org.uy/bulletin-articles/ecuador-the-certification-of-industrial-shrimp-aquaculture-intensifies-rights-violations-and-the>.

⁵⁰ Swedish Society for Nature Conservation, *Murky Waters: The Environmental and Social Impacts of Shrimp Farming in Bangladesh and Ecuador* (2011) at 4, available at: http://nijerakori.org/wp-content/uploads/2019/01/report_murky_waters.pdf.

⁵¹ *Indian Forest Act, 1927*, Drishti IAS (Sept. 3, 2020), available at: <https://www.drishtias.com/to-the-points/Paper2/indian-forest-act-1927>.

⁵² *Wildlife Protection Act, 1972*, BYJUS (June 23, 2022), available at: <https://byjus.com/free-ias-prep/wildlife-protection-act-1972/>.

1980⁵³ and The Environment (Protection) Act, 1986,⁵⁴ keep forests protected from non-forestry purposes without the approval of the Indian government and create Coastal Regulation Zones in which industrial activities, such as dumping waste, are restricted to protect the coastal environment.

Nevertheless, Indian shrimp aquaculture has flourished despite expanding in clear violation of these laws. In August 2016, the Maharashtra government deemed 15,087.60 ha of mangroves across the state as reserved forests and decreed that any construction within 50 meters of a mangrove belt was illegal.⁵⁵ This notification excluded 10,000 ha of privately-owned mangrove land, but in 2018, the Bombay high court asked the Maharashtra government to identify all such private plots and declare them as protected or reserved forest areas within 18 months per the Indian Forests Act of 1927. The jurisdiction of those lands was then transferred to the Maharashtra Forest Department. Indian conservationists, emphasizing the importance of mangroves to the country's ecosystem, argued before the Court that the Maharashtra government had regularized over 3,800 illegal structures on mangrove land.

In 2015, the Bombay Natural History Society reported that rampant bund building, used for unsustainable aquaculture and industrial growth, severely damaged mangroves on the Konkan coast.⁵⁶ As of October 2021, thousands of hectares of mangroves in Navi Mumbai were yet to be taken over by the government for conservation as per the orders of the Bombay High Court. This delay has further facilitated the destruction of mangroves for additional land grabs for the proliferation of even more illegal shrimp farming.⁵⁷

Just this past week, Al Jazeera published a video news story documenting the harm being caused by shrimp farms to mangroves in southern India, emphasizing that, in the state of Kerala, the government is promoting the expansion of shrimp aquaculture by subsidizing land and providing technical support to farmers.⁵⁸ “But mangroves are being cleared to make way for them. Kerala's forest cover has reached a historic low. In some areas, there are more shrimp

⁵³ *Forest Conservation Act 1980*, BYJUS, (Nov. 10, 2011), available at: <https://byjus.com/free-ias-prep/forest-conservation-act-1980/>.

⁵⁴ *Environment (Protection) Act, 1986*, Drishti IAS (June 28, 2021) available at: <https://www.drishtiiias.com/to-the-points/paper3/environment-protection-act-1986>.

⁵⁵ *Maharashtra gives reserved forests status to mangroves*, Down To Earth (Aug. 23, 2016) available at: <https://www.downtoearth.org.in/news/forests/mangroves-notifies-as-reserved-forest-in-maharashtra-55371>.

⁵⁶ *Mangroves destruction violates fundamental rights of citizens: Bombay HC*, Down To Earth (Sept. 19, 2018) available at: <https://www.downtoearth.org.in/news/environment/mangroves-destruction-violates-fundamental-rights-of-citizens-bombay-hc-61674>.

⁵⁷ Vijay Singh, *Maharashtra government includes 961 ha mangroves in reserved*, The Times of India (Oct. 30, 2021) available at: <https://timesofindia.indiatimes.com/city/mumbai/mumbai-state-govt-includes961-ha-mangroves-in-reserved-forest/articleshow/87379231.cms>.

⁵⁸ *See Shrimp Cultivation Threatens India's Mangrove Forests*, Al Jazeera English (Nov. 26, 2022), available for viewing here: <https://www.youtube.com/watch?v=kBuwtPTwc3M>.

farms than mangroves. Most of what remains is privately owned and unprotected.”⁵⁹ Yet, despite this dire state of affairs, there is a clear recognition of the importance of mangroves, particularly with respect to capturing carbon emissions.⁶⁰ This recognition is insufficient to counter the expansion of intensive shrimp aquaculture, leading conservationists within India to warn that “unchecked farming could wipe away critical forest cover and endanger thousands of lives.”⁶¹

3. **Importance of Integrating Ecosystem Services into the Global Economy**

Although there are laws in place that ostensibly protect mangroves where they exist in countries like Ecuador and India, their governments are either ill-equipped to manage conservation efforts or simply do not prioritize the enforcement of regulations. The United States has played a substantial role in discouraging the meaningful enforcement of these paper laws. While preserving and encouraging the proliferation of mangroves within our borders, the United States has permitted, without hesitation, the importation of billions of dollars in shrimp produced in deforested mangroves worldwide.

In much of the developing world, it is difficult to account for the vast array of ecological services mangroves provide, and instead, it is much easier to be motivated by the short-term economic gain shrimp farms offer. But as Kennedy Warne observes in his book *Let Them Eat Shrimp*:

The total value of ecosystem services has been estimated to be \$10,000 per hectare per year. In other words, when a hectare of mangroves is cut down, the environment loses \$10,000 worth of annual support. Thus a 100-hectare (250-acre) shrimp farm constructed by clearing mangroves incurs an annual environmental deficit of \$1 million – a cost that, if it were included in the price of the product, would take farmed shrimp off the fast-food menu.⁶²

A more recent study covering five farmed shrimp-producing countries – Ecuador, India, Indonesia, Thailand, and Vietnam – put the average value of 1 ha of mangroves per year at \$21,075 in ecosystem services.⁶³ Both of these figures demonstrate that the monetary value of

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² Kennedy Warne, “A Mangrove’s Worth,” *Let Them Eat Shrimp: The Tragic Disappearance of the Rainforests of the Sea*, Island Press (2011) at 150.

⁶³ Claude E. Boyd, et al. *Perspectives on the Mangrove Conundrum, Land Use, and Benefits of Yield Intensification in Farmed Shrimp Production: A Review*, *Journal of the World Aquaculture Society*, Vol. 53, No. 1 (2021) at 28.

mangrove ecological services is far less than the economic value of even the most extensive shrimp farming operation.⁶⁴

The U.S. seemingly understands that destroying the ecological services mangroves provide should be viewed not simply as a negative externality but also as harmful to the development of market economies. The countries that capitalize on shrimp farming via mangrove deforestation must be encouraged through EO 14072 to recognize that the deforestation of mangroves will substantially undermine the well-being of their domestic populations and their economic prosperity, along with the rest of the world's.

III. How Shrimp Farming Promotes Deforestation Indirectly – Soybean Production

The destruction of mangroves for conversion to shrimp ponds is not the only means by which the shrimp aquaculture industry is responsible for global deforestation. Shrimp feed is a critical input in farmed shrimp production and soy is the most used protein in aquaculture feeds.⁶⁵ Thus, humans indirectly consume soy through the farmed shrimp they eat, and as the demand for farmed shrimp increases, so does the demand for soy protein. According to Courtney Knupp, the director of animal/aquaculture nutrition meal at the U.S. Soybean Export Council, “[t]here are no viable alternatives to soy that can provide the volume of protein needed in [farmed fish diets] to keep up with increasing demand.”⁶⁶

Soybean meal has replaced animal protein for aquaculture feed because of its year-round availability and because it is significantly cheaper than fish and animal meals.⁶⁷ Pursuant to a report from the University of Oxford's Food Climate Research Network, 6 percent of global soy is processed into aquaculture feed⁶⁸ and that number is predicted to rise as aquaculture production is anticipated to increase by 22 percent by 2030.⁶⁹ Although plant-based feed producers are increasingly required to prove their products are sustainable and traceable through the supply chain, deforestation for soy production continues as demand for farmed shrimp remains on a steady incline. Deforestation for soybean farms hastens climate change by

⁶⁴ *Id.*

⁶⁵ Lisa Jackson, *Soy helped build aquaculture into a global force. How far can it take it?*, Global Seafood Alliance (Mar. 29, 2021) available at: <https://www.globalseafood.org/advocate/soy-helped-build-aquaculture-into-a-global-force-how-far-can-it-take-it/>.

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ Hannah Ritchie and Max Roser, *Soy*, Our World in Data (2021) available at: [https://ourworldindata.org/soy#:~:text=Over%20one%2Dthird%20\(37%25\),meat%20and%20dairy\)%20human%20consumption.](https://ourworldindata.org/soy#:~:text=Over%20one%2Dthird%20(37%25),meat%20and%20dairy)%20human%20consumption.)

⁶⁹ *The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation*, FAO (2022) at 212 available at: <https://www.fao.org/3/cc0461en/cc0461en.pdf>.

releasing carbon, destroying wildlife habitats, and upsetting hydrological cycles, which exacerbates water scarcity.⁷⁰

Brazil is the top producer of soybeans in the world. Consequently, soybean production is one of the significant drivers of deforestation in the Amazon basin and in the Cerrado, a Brazilian tropical savanna.⁷¹ The Cerrado has already lost over half its native vegetation to farmland conversion. In 2020 alone, 207,813 ha of deforestation occurred on soybean farms, representing 28.3 percent of all Cerrado deforestation in 2020.⁷² As a whole, the Cerrado contains farms that produce 60 percent of Brazil's total soy production, which is twenty times the amount grown in the Amazon.⁷³

Like Brazil, the U.S. is also a leader in global soybean production and exports approximately 60 percent of its harvest.⁷⁴ Similar to how the U.S. protects its mangrove forests, our domestic soybean industry has adopted a much more sustainable approach to farming than those of other soy-producing countries. All factors considered, the climate change impact of agricultural expansion concerning soy production in the United States is 319 times less than Brazilian soy production.⁷⁵ The U.S. does not face the same land-conversion issues as Brazil either; our nation ranks as one of the top countries in the world for its preservation of public forestry land.⁷⁶ However, our industry is not the predominant supplier of choice for the global soy-based aquaculture feed industry, holding just 34 percent of the market in 2018.⁷⁷

Brazil's soybean industry serves as just one example of how the farmed shrimp industry contributes to global deforestation in more than one way. Moreover, there is evidence of deforestation as the result of the expansion of soybean farms in Argentina and Paraguay's Chaco

⁷⁰ *Cargill: The Worst Company In The World*, Mighty Earth (2019) available at: <https://stories.mightyearth.org/cargill-worst-company-in-the-world/index.html>.

⁷¹ Lisa Jackson, *Soy helped build aquaculture into a global force. How far can it take it?*, Global Seafood Alliance, (Mar. 29, 2021) available at: <https://www.globalseafood.org/advocate/soy-helped-build-aquaculture-into-a-global-force-how-far-can-it-take-it/>.

⁷² *Key Cerrado Deforesters in 2020 Linked to the Clearing of More Than 110,000 Hectares*, Chain Reaction Research, (Mar. 30, 2021) available at: <https://chainreactionresearch.com/report/cerrado-deforestation-2020-soy-beef/>.

⁷³ David Yaffe-Bellany, *From Environmental Leader to 'Worst Company in the World.'* The New York Times (July 29, 2019) available at: <https://www.nytimes.com/2019/07/29/business/brazil-deforestation-cargill.html>.

⁷⁴ Lisa Jackson, *Soy helped build aquaculture into a global force. How far can it take it?*, Global Seafood Alliance (Mar. 29, 2021) available at: <https://www.globalseafood.org/advocate/soy-helped-build-aquaculture-into-a-global-force-how-far-can-it-take-it/>.

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ U.S. Soybean Export Council, *Aquaculture is Fastest Growing Food Production Sector, According to FAO Report*, (July 16, 2018) available at: <https://ussec.org/aquaculture-fastest-growing-food-production-sector-fao-report/>.

province, a region made up of highly diverse woodlands.⁷⁸ Argentina is the third largest producer of soybeans, and, like Brazil, most of Argentina's soy exports are dedicated to China, in part to accommodate the high demand in that country for aquaculture feed.⁷⁹ Overall, soy-based aquaculture feed will continue to rise because of its low cost and this will place even greater pressure on tropical forests throughout the world.

IV. Conclusion

Most farmed shrimp are produced in tropical and subtropical countries but are exported to the developed world for consumption, with massive volumes directed to the United States. An abundance of shrimp is raised on shrimp farms, where mangrove forests have been deforested, often illegally.

It is imperative that when the State Department and other federal agencies look at how to tackle forest restoration and greenhouse gas mitigation objectives as they apply to certain commodities, that there is an emphasis on the immense deforestation resulting from the shrimp aquaculture supply chain. The operations of shrimp aquaculture overseas have dealt a significant blow to the planet's ability to sequester carbon and moderate climate change in the aggregate.

Between 1980 and 2005, 20 percent of the world's mangrove forests have disappeared,⁸⁰ and although deforestation has slowed, remote sensing analysis estimates that mangrove loss continues at a rate of between 0.13 and 0.66 percent each year.⁸¹ Additionally, the land area reserved for soybean farming continues to proliferate worldwide. Between 2009 and 2018, global acreage grew 23 percent, and by 2028, it is expected to grow by an additional 28 percent. A significant driver of mangrove loss and deforestation in South America from soybean farm expansion is the continued unchecked growth of the shrimp aquaculture industry.⁸²

Actions taken pursuant to EO 14072 must account for the harmful externalities of the shrimp aquaculture industry and must meaningfully deter commodity-driven illegal deforestation worldwide by restricting access to U.S. markets for commodities originating from illegally

⁷⁸ Jane Byrne, *New report documents soy-linked deforestation in Argentina and Paraguay*. Feednavigator.com (Mar. 28, 2018) available at: <https://www.feednavigator.com/Article/2018/03/28/New-report-documents-soy-linked-deforestation-in-Argentina-and-Paraguay>.

⁷⁹ Mark Godfrey, *Chinese aquaculture sector's demand for soy keeps ticking up*. SeafoodSource (Mar. 15, 2021) available at: <https://www.seafoodsource.com/news/aquaculture/chinese-aquaculture-sector-s-demand-for-soy-keeps-ticking-up>.

⁸⁰ Rhett A. Butler, *20% of the world's mangroves lost since 1980*, Mongabay (Nov. 11, 2005) available at: <https://news.mongabay.com/2005/11/20-of-the-worlds-mangroves-lost-since-1980/>.

⁸¹ Dan Friess, *Turning the Tide on Global Mangrove Forest Loss*, Georgetown Journal of International Affairs (Jan. 24, 2022) available at: <https://gja.georgetown.edu/2022/01/24/turning-the-tide-on-global-mangrove-forest-loss/>.

⁸² *Fish farming corporations make a lame attempt to solve their big deforestation problem*. GRAIN (Mar. 5, 2020) available at: <https://grain.org/en/article/6425-fish-farming-corporations-make-a-lame-attempt-to-solve-their-big-deforestation-problem>.

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deforested land. Although countries like Ecuador and India, as well as Thailand, Vietnam, Brazil, and Indonesia, have legal frameworks in place to deter illegal deforestation (of mangroves and other forests), the federal government should use U.S. market leverage to not only improve those laws, but also generate stricter enforcement and monitoring concerning shrimp farming. Beyond the impact on our planet as a whole, illegally clearing mangroves for shrimp farms and denuding other forests for the production of shrimp feed presents an existential threat to local communities and wildlife.

The federal government should impose an obligation on U.S. shrimp importers to provide information documenting their entire supply chain, along with a description of measures taken to ensure the shrimp was not produced on deforested land. Through the use of trade measures, the Southern Shrimp Alliance believes that EO 14072 can be a significant positive development in the development of a comprehensive global effort to combat deforestation. While EO 14072 is more focused on agricultural commodities, like cattle, oil palm, and cocoa as the cause of deforestation around the world, it is critical to look at the extreme damage well under way by mangrove and Cerrado deforestation resulting from shrimp aquaculture.

Due to the increasing global population, a shift in diet trends, and relative affordability, seafood is more popular than ever. In result, aquaculture-related deforestation is approaching the point of no return. Because of their preference for healthy seafood, millions of American consumers are unknowingly incentivizing the further devastation of forests around the world. Recognition of these unfortunate circumstances will help to mitigate the harm caused by shrimp farming on our global forests.

Thank you for any consideration you are able to give to these comments. I am available to address any questions you might have regarding this correspondence.

Sincerely,

A handwritten signature in black ink, appearing to read "John Williams". The signature is fluid and cursive, written in a professional style.

John Williams
Executive Director