

**TRIUMPH GULF COAST, INC. PRE-APPLICATION FORM**

Triumph Gulf Coast, Inc. (“Triumph Gulf Coast”) has created a pre-application process to provide initial consideration of potential ideas for projects or programs that may seek an award of funding. Applicants are required to participate in the pre-application process. Notwithstanding the response from Triumph Gulf Coast on the pre-application form, an Applicant may still elect to submit an Application.

**APPLICANT INFORMATION:**

Name of Individual/Entity/Organization: Coast Watch Alliance; American Marine Research Company, LLC

Brief Description of Background of Individual/Entity/Organization: Coast Watch Alliance is a Pensacola based 501(c)3 nonprofit dedicated to marine conservation in Western Florida, with a leading track record in lionfish control & reef damage mitigation; AMRC is a Pensacola-based artificial intelligence & marine robotics startup developing scalable solutions for lionfish control

Contact Information:

Primary Contact Information: Yuan Wang  
Title: Owner/Founder  
Mailing Address: 120 Chief’s Way, Suite 1 PMB 1, Pensacola FL, 32507  
Telephone Number: (310) 200 0501  
Email Address: yuan@amrc.io  
Website: americanmarineresearch.org

Names of co-applicants, partners or other entities, organizations that will have a role in the proposed project or program: \_\_\_\_\_

**REQUIRED EXECUTIVE SUMMARY:**

In a maximum of three (3) pages, please describe the proposed project or program, including (i) the amount of funds being sought from Triumph Gulf Coast; (ii) the amount and identity of other sources of funds for the proposed project or program; (iii) the location of the project or program; (iv) summary description of the proposed program, including how the program will be transformational and promote economic recovery, diversification, and enhancement of the disproportionately affected counties, and (v) a summary timeline for the proposed project or program.

**IMPORTANT NOTICE**

This pre-application process will **not** result in an award of funding by Triumph Gulf Coast. Rather, this process is designed to facilitate submission of ideas for potential projects or programs before the Applicant expends time and/or resources to complete a full Application. All Applicants for funding are required to complete an Application, which will be scored, and then considered for award in the discretion of Triumph Gulf Coast Board.

## Permanent and Scalable Protection for Marine Fisheries Against Lionfish Scourge

The invasion of lionfish is devastating marine life and coral ecosystems in the Atlantic and was named one of the top 15 threats to global biodiversity<sup>1</sup>. Lionfish are voracious predators who are decimating stocks of native fish on which entire fishing communities depend. Studies show the lionfish invasion is responsible for reducing the number of fish surviving to maturity by 80% and cutting overall native species biomass by over 60%. This is of particular concern to Western Florida, where lionfish threaten the ~70,109 jobs and \$7.5 billion in sales that the fishing industry brings in each year (NOAA 2016) that are particularly critical to the Bay, Gulf, Escambia, Okaloosa and Santa Rosa counties' economic health. Our team has received estimates of current annual direct and indirect economic damages to states on the Gulf to be \$7 to \$12 billion as the region's key commercial species (especially vermillion snapper), is part of the primary diet of lionfish. Lionfish present risk profiles similar to that of voracious fisherman overfishing at an uncontrolled rate, which can tip populations into fishery collapse, as evidenced in the 1992 collapse of cod populations in Newfoundland resulting in a single-day layoff of 40,000 fishing professionals<sup>2</sup>. We provide interactive and data-rich research at [www.americanmarineresearch.org/research](http://www.americanmarineresearch.org/research). The protection of these marine ecosystems is particularly pertinent for Triumph Gulf Coast not only because they are crucial to our region's renowned tourism and seafood sectors, but also because the original objective of the NRDA funding was to restore the very systems that were most directly affected by the Deepwater Horizon oil spill.

Given the long-term systemic risk<sup>3</sup> of failing to control this infestation, the goal of this proposal is to institute economically self-sustaining long-term control efforts with industry partners nationwide in order to restore and protect the environment, preserve jobs and stimulate further economic growth. The urgency of our mission is underscored by the extraordinary opportunity to apply recent cutting edge advances in technology to fishing ecosystem protection, and to correct suppressed market interest in lionfish consumption for the entire industry. For example, a single AMRC drone harvesting lionfish at a rate of 30 fish per hour, operating a third of the year (120 days) for 10 hours, can capture 36,000 lionfish each year. Conservatively estimating that each lionfish consumes an ounce of biomass (flounder, red snapper etc.) daily, and each pound of biomass is conservatively worth \$3 to the commercial charter boat industry, each drone alone could save ~\$2.5M worth of biomass, while generating sufficient fish sales to sustain its ongoing operation and maintenance without subsidies.

For organizational background, the Coast Watch Alliance (CWA) is a 501(c)3 non-profit founded and based in Pensacola dedicated to lionfish control research and education, and has emerged as one of the most effective organizations in organizing talent and resources towards lionfish control via resourceful partnerships with NOAA, Florida Fish & Wildlife, the US Coast Guard and various scientific research centers. CWA is also a proud incubator of American Marine Research Company (AMRC), a technology start-up developing artificial intelligence, data science solutions and marine robotics for lionfish control. Our teams include industry veterans and professionals in artificial intelligence, investment, scientific research, government contracting, engineering, marketing, product development, and beyond, in high-powered firms including Intel, NASA-JPL, Bridgewater Associates, General Electric, Bain & Company, Magic Leap, Princeton University, Georgia Institute of Technology, Carnegie Mellon University, and multiple high-powered startups. Beginning in the counties of Bay, Gulf, Escambia,

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<sup>1</sup> Sutherland, William J., et al. "A Horizon Scan of Global Conservation Issues for 2010." *Trends in Ecology & Evolution*, vol. 25, no. 1, 2010, pp. 1-7., doi:10.1016/j.tree.2009.10.003.

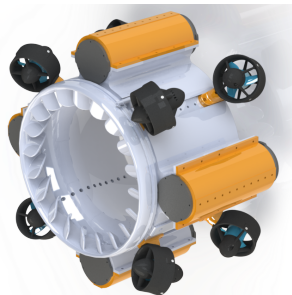
<sup>2</sup> Hutchings, Jeffrey A., and Ransom A. Myers. "What Can Be Learned from the Collapse of a Renewable Resource? Atlantic Cod, Gadus Morhua, of Newfoundland and Labrador." *Canadian Journal of Fisheries and Aquatic Sciences*, vol. 51, no. 9, 1994, pp. 2126-2146., doi:10.1139/f94-214.

<sup>3</sup> Morris, James A., et al. "A Stage-Based Matrix Population Model of Invasive Lionfish with Implications for Control." *SpringerLink*, Biological Invasions, 5 June 2010, link.springer.com/article/10.1007/s10530-010-9786-8.

Okaloosa and Santa Rosa, we will take the first key steps to decisively control the lionfish scourge with a passionate and multi-talented team.

There are four key components to our team's efforts. First, we are developing logistics and marketing pipelines via licensing reciprocity and lionfish product R&D that will open major markets nationwide for West Floridian seafood professionals to deliver products with minimal friction. This has the potential to increase profitability for regional seafood professionals by over 50% per pound by expanding both delivery channels and lionfish product lines. Second, we are developing traps, artificial intelligence, and marine robotics componentry for invasive lionfish harvest at depths exceeding 130ft to serve as long term control solutions, as well as drivers for high-growth technology sector innovation that synergizes with our region's natural resources, seafood industry, and research institutions. Thirdly, we will conduct critically important field work, testing technology incubated within this program and beyond while simultaneously gathering intelligence and cleaning commercially important reefs. Finally, we will accelerate our external outreach and education efforts for tourists and constituents to drive conservation interest, engage with seafood and technology industry players to attract private sector investment in control efforts, and equip regional seafood professionals with tools, techniques, and networks to profitably and safely assist in lionfish control efforts.

CWA is widely regarded as a leading proponent in lionfish control efforts, with an excellent track record in educational events, driving industry partnerships, and attracting national awareness from large players including the National Geographic, Whole Foods, NOAA and state wildlife commissions. AMRC's patent-pending technologies have demonstrated high maneuverability and power underwater with successful operation at depths of over 200 feet. Triumph funding will allow us to optimize key design and operational parameters for our drone through a series of open ocean trials, and eventually deploy at scale.



*Figure 1. Digital rendering of chassis and mobility systems for AMRC's Epsilon prototype featuring a rim driven propeller and modular attachment system.*

CWA's network of industry veterans and marine researchers together have revealed exciting opportunities in providing end-to-end solutions for improving market access for West Florida seafood and fishing professionals through innovations in consumer packaged goods, alternative byproduct usage in fertilizers, and saltwater product license reciprocity, which can collectively improve per-pound profits from \$6 per pound to over \$9 per pound, with the potential to stabilize at \$30 per pound. These innovations, coupled with CWA's initiatives in safety, logistics, distribution, education and coordination for constituents and industry professionals will augment CWA's own harvesting efforts, all while making strides towards turning lionfish control in a perpetually self-sustaining effort.

As a technology firm, AMRC is also committed to developing high-tech and research talent in the region. Our team consists of proud Pensacola locals alongside newly arrived engineering, investment, and research professionals who have joined to develop this unique and emergent vertical in artificial intelligence, fisheries data science, and marine robotics. AMRC's successful scaling will provide high quality employment and economic diversification, all while resisting pressures to relocate to traditional tech capitals due to synergies with the region's seafood industry and research institutions. The addition of high-paying, highly skilled technical jobs will further stimulate job creation: studies have shown that 7 and 4 additional jobs were created for every additional tech job in Washington and San Francisco respectively<sup>4</sup>,<sup>5</sup>. Cost of living adjustments place this ratio in excess of 7 for Western Florida. Focused efforts at

<sup>4</sup> Washington Technology Industry Association. *Information and Communication Technology: Economic & Fiscal Impact Study* (2015)

<sup>5</sup> Bay Area Council. *Technology Works: High-Tech Employment and Wages in the US* (2016)

promoting tech entrepreneurship is an internationally trending means of economic diversification and job creation, and for good reason: it has uncorrelated growth compared to other industries and boasts rapid rates of job creation<sup>6</sup>. We believe AMRC's success as a technology start-up in Western Florida will serve as a role model that inspires and mentors the next generation of Floridian entrepreneurs, and as a compelling example of how start-ups can succeed and scale outside of Silicon Valley.

Direct job creation in the constituent counties from this project exceeds \$865,300 for 19 newly created jobs, with indirect job creation estimated at over \$4,130,000 for 89 newly created jobs during the first two phases of the project. Long term job preservation protects approximately \$5 billion in fishing economic activity and over 70,000 jobs in the region's fishing industry, along with more than \$17 billion in tourism revenue and over 220,000 employees in the region.



*Figure 2. Native Pensacola engineers (from left) Kiara Korkuc, Zachary Pennington, and Brian Arnold install electronics to the main chassis of an early Epsilon unit (Pensacola News Journal)*

Support for our work has been forthcoming from regional institutions and beyond. AMRC has secured matching liquid assets via a generous grant funding from the Florida Fish and Wildlife Commission (FWC) (\$50,000), donations from private individuals (exceeding \$60,000), private investment (over \$90,000), scheduled investment (over \$125,000) as well as donated private charter resources, Gulfarium Marine Adventure Park usage, workshop working space, and other resources valued collectively at over \$150,000. CWA has secured \$100,000 from Escambia County's very own Impact 100 grant, cash donations exceeding \$45,000; in-kind donations of \$148,000, and grant funding from FWC of \$35,000. CWA's resources include marine research vessels, specialized harvest equipment, dive equipment, reconnaissance and side scan equipment, which dramatically reduce operating costs in our projects.

- I. Phase 1 (6 months): Accelerate immediate reef cleanup of commercially sensitive reefs; Lead safety and awareness training for tourism and constituents; Lead marketing and logistics development for private sector lionfish purchasing and distribution; Construct a "hardened" prototype for ROV (\$1,054,915 Total Cost, \$591,415 Triumph Contribution)
- II. Phase 2 (6 months): Continue reef cleanup and education activities with private industry partners; Develop more profitable processing and marketing techniques for whole lionfish with fertilizer, consumer packaged goods, and high-end seafood providers; Develop cloud-based market and ecological data-sharing tools; Refine precision incapacitation mechanisms; Develop local manufacturing capabilities for ROV (\$1,253,515 Total Cost, \$650,765 Triumph Contribution)

In total, we are requesting \$1,242,180 which comprises 54% of our project costs. We used historical budget benchmarks for federal Phase II Small Business Innovation Research (SBIR) grants to determine the appropriate funding schedule for technology development. Our organization falls in Phase II of the SBIR grant, having already established the technical merit, feasibility and commercial potential of our R&D effort and received funding from the FWC (Phase I requirements). We also interpolated and extrapolated costs based on operating experience in field work and outreach work.

Our progress will be measured by 1) successful delivery of marketing, logistics, and product development materials and partnerships with large private sector actors, 2) measurable technological benchmarks for operational efficiency of developed technology, and 3) market and fishery data for job preservation and measurable improvements towards economically self-sustaining control measures.

<sup>6</sup> Fetsch, Emily. *The Economic Impact of High-Growth Startups*. 2016, *The Economic Impact of High-Growth Startups*.