Fishing for Energy Fund: Project Summaries 2010 – 2014

Fishermen-led Fishing Gear Recovery and Recycling in California, *Regents of the University of California-Davis*
California
Fishing For Energy Fund 2014 Grant: $109,084.75 Partner Contributions: $10,434

The Regents of the University of California – Davis will link the California Lost Fishing Gear Recovery Project and the Fishing for Energy partnership so that the combined aims and efforts are both minimizing the discarding of unwanted gear into the ocean and recovering what has already been discarded or lost. Lost fishing gear in California's coastal ocean impacts ecologically and economically important living marine resources as well as fishermen's livelihoods. Since 2005 the California Lost Fishing Gear Recovery Project has been working with commercial fishermen to recover more than 90 tons of lost fishing gear from Southern California waters. This project's focus will be on the Dungeness crab fishery in commercial fishing ports between Crescent City and Moss Landing, CA. Commercial fishermen will lead lost gear recovery work on the water and will be solicited for input and recommendations on establishing gear recycling stations for the Fishing for Energy network. The project team will work closely with port managers to conduct a needs assessment for gear recycling and determine the feasibility for recycling stations on a port-by-port basis. The proposed project will result in a substantial quantity of fishing gear being both retrieved and recycled by commercial crab fishermen in Northern and Central California.

Crab Pot Escapement Study (WA), *Northwest Straits Marine Conservation Foundation*
Washington
Fishing For Energy Fund 2014 Grant: $55,166.26 Partner Contributions: $4,470

Northwest Straits Foundation will determine the escapement rates of Dungenesscrab from 5 different crab pot designs. Results will assist state and tribal crab fishery managers to promote best fishing practices in Puget Sound. Ghost fishing from derelict crab pots is a significant source of crab mortality in Puget Sound, Washington. Despite appropriate use of cotton escape cord that disintegrates to allow trapped crab egress from pots through an escape mechanism, up to 30,000 crabs are killed each year in pots whose design limits escape even when the pot's escape mechanism is acitivated. The Northwest Straits Foundation will conduct a research study to document the rates of crab escapement of 5 crab pot designs. These designs represent the breadth of designs used in Puget Sound. Results of the study will be disseminated to resource managers with the Washington Department for Fish and Wildlife and Puget Sound treaty tribes and leaders of the Puget Sound Anglers. The Foundation will provide recommended best management practices associated with each crab pot design including modifications that can be made to each design to improve rate of crab escapement. Recommendations may also include prohibition of some types of crab pot designs.

Evaluation of techniques to reduce crab trap float loss (SC), *South Carolina Department of Naural Resources*
South Carolina
Fishing For Energy Fund 2014 Grant: $49,394.00 Partner Contributions: $7,394

The South Carolina Department of Natural Resources will evaluate crab trap float losses for several rigging designs and survey commercial crabber float loss rates. The negative environmental impacts of derelict fishing gear are well documented. Despite efforts to reduce the number of lost traps, net generation of derelict crab traps continues annually in South Carolina. The Project Team will test three different technologies to identify new strategies to reduce the float loss rates and therefore reduce loss rates of crab pots. Control and treatment riggings will be attached to submerged weights rather than actual crab traps to minimize potential ghost fishing. Commercial crabbers will also be surveyed to better characterize annual crab trap loss rates in South Carolina.

Reducing Bycatch Mortality in Crab Pots (VA), *College of William and Mary , Virginia Institute of Marine Science*
Virginia
Fishing For Energy Fund 2014 Grant: $87,168 Partner Contributions: $148,480

The College of William and Mary, Virginia Institute of Marine Science will employ commercial fishermen to test biopanels and will use color avoidance mechanisms to reduce bycatch mortality of both actively fished regular pots and derelict peeler crab pots. Research to date has identified that both actively fished and derelict crab pots capture and kill crabs and other animals, including terrapins. This project builds upon work previously funded by the National Fish and Wildlife Foundation to modify pots to minimize by-catch mortality by developing a biopanel that degrades over one year and creates an escapement vent for trapped animals. This project will further the ongoing efforts to develop technologies to reduce the negative impact of two types of crab pots – regular and peeler pots - on target and non-target species. Peeler pots capture and retain greater numbers of animals because of how the pots are constructed, however, all work thus far has focused on minimizing mortality on regular pots. This project will fill the research gap with peeler pots. The project team will analyze differences of catch rate between peeler pots outfitted with biopanels and standard peeler pots. The project team will also analyze terrapin avoidance of crab pots based on entrance funnel color to study of there is a difference in catch rates between the regular and modified pots.

Sustainable Reduction in Maryland 'Ghost Crab Pot' Fishing, *Simthsonian Institution, Environmental Research Center*
Maryland
Fishing For Energy Fund 2014 Grant: $48,647.00

The Smithsonian Institution, Environmental Research Center will pursue a sustainable reduction in the impact of Maryland ghost crab pots in the Chesapeake Bay by engaging watermen and state agencies in evaluating disabling and recovery technolgy. The project team will engage and involve Maryland watermen and state agencies in developing and evaluating technologies to evaluate options for research and implementation of existing technologies for either disabling the ability of lost pots to fish or enabling the recovery of pots by watermen. As a first step, the project team, in collaboration with watermen and state managers, will assess the need for new technologies to reduce the amount of lost fishing gear. Second, the group will plan which existing technologies under development and in use in other fisheries should be tested in the field. The project will promote a collaboration that will have both strong conservation outcomes and positive economic benefits to those who employ the technology.

National Aquarium Marine Debris Outreach Intitiative, *National Aquarium in Baltimore, Inc.*
Maryland
Fishing For Energy Fund 2014 Grant: $44,196.09

Marine debris – including derelict and abandoned fishing gear – represents a serious ongoing environmental threat to the health of aquatic systems and animals. The public expects and trusts aquariums, zoos, and museums to communicate solutions to environmental and ocean issues, and to advance conservation initiatives. Aquariums play an important role, both providing information and inspiring the public, potentially transforming visitors' heightened interest into conservation action. We know that aquariums are uniquely positioned to reach a broad audience, with critical information and in ways that will make a difference, specifically in support of addressing challenges like marine debris and derelict and abandoned fishing gear, which have immediate and easily recognized detrimental impact on the animals, habitats, and resources our visitors are inspired to care for. The National Aquarium proposes to achieve a significant increase in public awareness of these threats, via a strategic multi-platform campaign of exhibit content and educational outreach programming.

Toolkits for Sustainable Oceans (CT), *Sea Research Foundation, Inc.*
Connecticut
Fishing For Energy Fund 2014 Grant: $35,542.25 Partner Contributions: $15,714

The overarching goal of Toolkits for Sustainable Oceans is to increase public awareness and knowledge about the issue of derelict fishing gear and to enlist their help in reducing the impact of marine debris. Leveraging a 2013 Fishing for Energy (FfE) grant awarded to Mystic Aquarium, this project strives to: • Increase public awareness and education of the threats that marine debris presents to ocean and coastal health • Motivate people to actively participate in efforts to protect and restore ocean habitat health • Provide tangible actions that the public can take to mitigate their impact on ocean health. Mystic Aquarium will work with North American Marine Environment Protection Association (NAMEPA), FfE, and NOAA to tailor the toolkit to highlight private and public partnerships and community based solutions to marine debris issues in a method that best serves community members within port communities and sea farers. NAMEPA will disseminate the toolkit to the Coast Guard, The American Association of Port Authorities, and the North American Maritime Ministry Association – reaching over 100 flotillas and ports combined – and ensuring a wide dissemination to the people living in these communities. In this manner, the toolkit will reach FfE's priority ports on both the Atlantic and Pacific coasts of the United States and become an even more powerful outreach mechanism, engaging both visitors to informal science organizations and community members in port communities alike.

Preventing Fishing Gear Impacts Through Education (CA), *Aquarium of the Bay*
California
Fishing For Energy Fund 2014 Grant: $77,020.74 Partner Contributions: $87,424

Aquarium of the Bay's mission is to protect, restore and inspire conservation of San Francisco Bay and its watershed, from the Sierra to the sea. As part of an ongoing efforts to educate the community about ocean health and science, they are launching a new interpretive nature center on PIER 39 in Fisherman's Wharf, where more than 5.5 million visitors flock each year to see resident California sea lions. These charismatic mammals sun themselves on PIER 39's floating docks daily – currently with only minimal naturalist interpretation for the millions of tourists who come to view these animals in the wild. Aquarium of the Bay will collaborate with The Marine Mammal Center – who work to rescue and rehabilitate sea lions and other marine life from derelict fishing gear, and with 5 Gyres Institute – who give plastic pollution in the ocean a global scope, to craft new, robust interpretive programming and hands-on activities that will show visitors how they can make a meaningful reduction in derelict fishing gear in San Francisco Bay, nearshore coastal areas, and other locations around the world. The Aquarium's trained naturalist staff will be trained to help educate visitors about the impacts of derelict gear on marine life and simple ways of preventing these materials from entering our waterways. Outreach will take place at our new Sea Lion Center, Aquarium of the Bay, and at the Aquarium's special events – reaching nearly 550,000 guests in our first year alone.

Toolkits for Sustainable Oceans (CT), *Sea Research Foundation, Inc.*
Connecticut
AZA Outreach and Development 2013 Grant: $31,793 Partner Contributions: $23,776

The Sea Research Foundation will develop toolkits that provide hands-on experiences to illustrate the impacts of marine debris to the public. Through on-site activities at Mystic Aquarium, off-site conservation events, online tools, and exporting the proposed toolkit to regional facilities, the project team aims to engage at least 700,000 members of the general public during the project period. The project's goal is to increase public awareness and knowledge about the issue of derelict fishign gear and enlist their help in reducing the ipmact of marine debris. Few resources

exist to increase public awareness and knowledge about issues surrounding derelict fishing gear and other sources of marine debris. Currently available resources for the public are limited, consisting of printouts such as informational sheets and coloring books. This project strives to increase public awareness and education on this topic; motivate people to actively participate in efforts to protect and restore ocean habitat health; and, provide

tangible actions that the public can take to mitigate their impact on ocean health. By offering specific ways for people to get involved, the project aims to serve as an integral mechanism for empowering the public and cultivating a new generation of environmental stewards to protect, conserve, and advocate for the nation's waterways.

Impacts of Marine Debris: Educating National Zoo Visitors (DC), *Smithsonian Institution*
Washington, DC
AZA Outreach and Development 2013 Grant: $76,390

The Smithsonian Institution will feature a message campaign in the National Zoo's American Trail exhibit's new graphics and displays and through the volunteer interpreter program, to motivate visitors to take action to prevent injuries to wildlife from marine debris. The National Zoo's American Trail is home to several species that are affected by marine debris: California sea lions, harbor seals, gray seals and brown pelicans. The Zoo's brown pelicans have been made flightless as a result of injuries that they suffered as victims of fishing debris. Through enhanced interpretation along the American Trail in exhibits that feature animals impacted by fishing debris, the project team can further the message of habitat preservation and encourage visitors to think about alternative forms of energy. The Zoo has an active annual clean-up program that will be utilized to further promote and encourage visitors to participate in coastal clean-ups, to think of ways to reduce their own energy consumption, and to recycle more – all recommendations that are reinforced through the primary messaging of the Fishing for Energy program. In addition to the nearly 2.5 million guests who visit the National Zoo annually, about 12 million visit via the Smithsonian's website. The same messages expressed at the exhibits through signage, graphics, games and interpreters will be echoed online.

Removal of 'ghost' blue crab pots from known hotspots in VA, *College of William and Mary, Virginia Institute of Marine Science*
Virginia
Fishing for Energy Fund 2012 Grant: $50,000 Partner Contributions: $50,118

Project team will employ four commercial watermen to locate, document and remove lost or abandoned blue crab pots from hotspots across the Virginia portion of the Chesapeake Bay. The participants will mark with GPS all recovered pots, photograph and record pot condition and bycatch. The project will build upon efforts that began in 2008, where about 70 unemployed watermen were hired to remove lost and abandoned blue crab pots, resulting in the recovery of over 32,000 pots over four winters. Lost and abandoned blue crab pots continue to capture and kill both target and non-target species for several years. Trapped in those pots were not only crabs but also Atlantic croaker, white perch, catfish, spot, red drum, black drum, striped bass, flounder, diamondback terrapins, and even muskrats and ducks. The participants worked during the winter and utilized side scan sonar units that enabled obtaining GPS locations for all recovered pots. The GPS locations allowed the marking of particular "hotspots" of high density pot loss.

Testing biodegradable panels & O-rings for traps (MA, ME), *College of William and Mary, Virginia Institute of Marine Science*
Maine, Massachusetts
Fishing for Energy Fund 2012 Grant: $78,872 Partner Contributions: $78,874

Project team will collaborate with the Massachusetts Lobstermen's Association, Woods Hole Sea Grant, Woods Hole Oceanographic Institution, and the Gulf of Maine Lobster Foundation to test the efficacy of fully biodegradable panels in lobster pots and the rate of degradation of standard ferrous "O" rings. Participants at the 2012 New England Derelict Fishing Gear Workshop identified that existing methods to 'disarm' lost and abandoned lobster pots have proven to be ineffective, enabling lobster pots to continue to ghost fish for up to several years. There was significant interest in developing technologies or mechanisms to reduce the impact of pots when they are lost. Commercial lobstermen will test the catch rate of lobster pots outfitted with biodegradable panels compared with standard pots. Testing will also be conducted on the rate of degradation of standard "O" rings and the biodegradation rate of experimental panels. A successful outcome of the project would be the reduction of bycatch resulting from lost or abandoned lobster pots.

Derelict Gear Assessment and Retrieval Program (MA), *Provincetown Center for Coastal Studies*
Massachusetts
Fishing for Energy Fund 2012 Grant: $104,926 Partner Contributions: $85,936

Project team will assess derelict fishing gear density in a portion of Cape Cod Bay to improve the understanding of the extent, longevity and impact of derelict gear. The assessment will inform issues related to gear interactions, modification, reporting and disposal. The project team will use two types of sonar to test the efficacy of these technologies for use in similar New England habitats and to help estimate the presence of derelict fishing gear in similar locations. The project team will compare project data with multidisciplinary data, including presence of eelgrass beds and right whales in the target area. The project will then remove an estimated 40 tons of lost gear located during the assessment, thus protecting sensitive resources and aiding in short- and long-term fisheries management. Fishermen employed for gear recovery efforts will use both lobster boats and draggers to extract the derelict gear from the seabed, and all removal will occur during reduced effort fishing seasons. All gear will be recycled and converted into renewable energy through the Fishing for Energy disposal program.

Gulf of Maine Derelict Fishing Gear and Industry Assessment, *Gulf of Maine Lobster Foundation*
Maine, Massachusetts, New Hampshire
Fishing for Energy Fund 2012 Grant: $149,982 Partner Contributions: $51,250

The project team will manage a two-part project to estimate the quantity of derelict fishing gear on the seabed of Northern New England. First, the project team will execute an at-sea derelict fishing gear assessment to determine the relative abundance of lost gear within state waters. Second, the project team will mail out a questionnaire to commercial fishermen in Maine, Massachusetts, and New Hampshire to quantify the occurrence, impact, and costs the fishermen encounter when interacting with derelict gear. The collective spatial data will be used to relate relative abundance estimates of derelict fishing gear in state waters, hotspots of gear clusters, and local trends of causes of derelict fishing gear. The results of this project will inform interested stakeholders in future derelict fishing gear mitigation and research measures.

Derelict Lobster Gear Assessment, Removal, and Prevention (NY) - II, *Cornell Cooperative Extension Association of Suffolk County*
New York
Fishing for Energy Fund 2011 Grant: $49,969 Partner Contributions: $34,045

The Cornell Cooperative Extension Association of Suffolk County will accurately characterize the extent & distribution of derelict lobster gear in the adjacent waters to the ports of Mount Sinai and Mattituck within the Long Island Sound. The project also proposes to remove all such identified gear from the study sites by employing the experience and expertise of commercial lobstermen from the area. The condition of retrieved gear, lobsters & other ensnared by-catch will be monitored. Collected derelict gear will be recycled through the Fishing for Energy Partnership.

Maine Derelict Trap Prevention and At-Sea Recovery, *Gulf of Maine Lobster Foundation*
Maine
Fishing for Energy Fund 2011 Grant: $63,450 Partner Contributions: $63,450

The Gulf of Maine Lobster Foundation will enlist twenty fishermen (lobstermen or draggers) to conduct at-sea derelict trap recovery efforts on four days in two areas of the Maine coast, for a total of eight boat-based derelict fishing gear clean-ups. Additionally, four land-based gear disposal opportunities will be offered, focusing the outreach in the same communities where the at-sea recovery effort takes place. The project will either be a stand-alone regional effort; or will be embedded into a larger coast-wide gear recovery initiative (federal award TBA). Project staff will document age, condition, and by-catch of each trap recovered at-sea. Good traps will be returned to the owners or held by enforcement for future distribution; non-fishable gear will be recycled at a waste-to-energy facility.

Derelict Gear Assessment and Clean-up in the Gulf of Maine, *Blue Ocean Society for Marine Conservation*
Maine, Massachusetts, New Hampshire
Fishing for Energy Fund 2011 Grant: $40,217 Partner Contributions: $17,661

This project will work with fishermen and state agencies to identify and retrieve gear along the NH coast through a spring trap cleanup, on the Isles of Shoals and in surrounding waters, concentrate all project data into a web site and publicize project results. Specifically, this project will coordinate and fund annual spring lobster trap cleanups in April 2012 and 2013, assess the scope of marine debris at the Isles of Shoals, a known collecting point for debris, but an area that has never been cleaned, and organize a cleanup of the Isles of Shoals, focusing on removing as much derelict gear from shore and grappling for gear underwater in known concentration areas where possible. Anticipated outcomes include improvement of shoreline and underwater habitat for wildlife through removal of an estimated 40 tons of derelict gear. Partners include commercial and recreational fishermen (including the NH Commercial Fishermen's Association), NH Fish and Game (as the regulatory agency in charge of granting permission for gear removal), a local vessel that will be engaged in a survey cruise, staff and students at the Shoals Marine Lab on Appledore Island, Blue Ocean Society volunteers, and students and teachers from Winnacunnet High School.

Marine Debris Identification and Removal in Biscayne Bay (FL), *University of Florida*
Florida
Fishing for Energy Fund 2011 Grant: $14,775 Partner Contributions: $0

UF/IFAS Florida Sea Grant and partners will assess and implement a marine debris removal program in Biscayne Bay, Florida. Phase I of the program will use NOAA Fisheries data to create a long-term database for marine debris along the Florida Keys reef tract. Phase II entails implementation of deep water and shallow-water marine debris removal events that will target the hotspot locations in Southeast Florida. Preliminary examination of the database indicates that approximately 50% of all debris is trap debris. As such, the cleanup events will correspond with the June-July, 2012 spiny lobster and stone crab closed seasons when, according to Florida Administrative Code 68B-55.004, any trap is considered to be derelict and may be retrieved as part of approved coastal cleanup events. During the course

of this project, the applicants expect that: 1) sensitive habitat areas and hotspot marine debris locations will be identified; 2) commercial fishermen will participate in removal events by volunteering and/or by properly disposing of unwanted fishing gear; 3) all volunteers will increase their understanding of the impacts of marine debris and demonstrate their ability to properly identify and safely remove marine debris from sensitive habitats; 4) members of the marine recreational community will participate in the Florida Department of Environmental Protection's marine debris reporting system; and 5) impacts to coral habitats will be reduced as a result of removal events.

Clean-up of Provincetown Harbor Seabed (MA), *Provincetown Public Pier Corporation*
Massachusetts
Fishing for Energy Fund 2009 Grant: $33,104.78 Partner Contributions: $7,700

This project comprises two integral parts; increasing our capacity to efficiently capture and transfer the debris and partnering with our commercial fishing fleet to bring in the material. Both parts utilize the lessons learned from our previous work and leverage the participation we have garnered within the fleet. The needed eqiupment was designed for the task by our fishers. They consist of multi-grapple drags adapted from existing fishing gear designs and a transfer platform with hydraulic winch system for transferring debris from vessels to multiple disposal containers. We aviod working in active fishing gear by timing of the project. The area fishing grounds are closed to lobster pots from January 15 to March 15. We are working in concert with Mass. Division of Marine Fisheries and the Environmental Police to alleivate those conflicts.

The direct outcome of this project is the removal of accumulated marine debris from the federal channel and other areas of Provincetown Harbor. This will lead to cleaner harbor floor, improved water quality and more viable habitat for vegetation, fin and shellfish. We anticipate several indirect outcomes. The equipment will be useful in future Fishing for Energy projects in Stellwagen Bank and Cape Cod Bay. The educational components of the project are two-fold. Utilizing our fishing fleet creates buy-in to proper disposal of outdated fishing gear. The press associated with this project engages public understanding.

Marine Debris Removal in the Stellwagen Bank National Marine Sanctuary, *Stellwagen Alive! Friends for our National Marine Sanctuary*
Maine, Massachusetts, New Hampshire
Fishing for Energy Fund 2009 Grant: $73,785 Partner Contributions: $25,000

This proposal involves innovative industry-community collaboration. The continuation of these efforts has the strong support of the communities and the commercial fishing industry. An ongoing marine debris program is critical to the Stellwagen Bank National Marine Sanctuary and adjacent waters given the intensity of a centuries old fishing industry, which is still in active operation. The project's geographic area is located in one of the most active fisheries in the world. 337 million of the 684 million pounds of seafood landed among New England states in 2006 came from Massachusetts alone (NMFS 2007). The intensity of fishing activity using gillnet, trap, and other static gear in this area, makes this a critical area for intensive derelict gear recovery efforts.

There are three primary long-term outcomes of this project. First is the improvement of the fishery and of the ecosystem in SBNMS and surrounding waters. Second is the greater awareness and documentation of the extent of the problem of marine debris through record keeping during identification and retrieval sweeps. Third is the economic benefit to the commercial fishing industry that will see fewer entanglement hazards and less time spent of disentangling, therefore reducing their replacement costs.

Derelict Lobster Gear Assessment, Removal, and Prevention (NY), *Cornell Cooperative Extension of Suffolk County*
New York
Fishing for Energy Fund 2009 Grant: $52,785 Partner Contributions: $27,890

The Cornell Cooperative Extension Association of Suffolk County will complete the first assessment and removal of derelict lobster gear in the Northport/Huntington complex within Western Long Island Sound. Abandoned, lost or discarded lobster pots and other marine debris are problems of increasing concern in Long Island Sound. The Northport/Huntington Complex has been identified as a well delineated area with a historically high density of lobster gear deployment. The project will characterize the extent and distribution of derelict lobster gear in NY waters of Western Long Island Sound. The project will then work with commercial lobstermen to remove gear from the study site. The project also proposes to remove all such identified gear from the study site by employing the experience and expertise of commercial lobstermen from the area. The condition of retrieved gear, lobsters, and other ensnared by-catch will be monitored.

The long-term goals of the project are to establish a precedent to begin to address the Long Island Sound derelict lobster gear problem; formulate an accurate evaluation of the quantity of derelict lobster gear currently impacting the study site; determine the biological impacts of derelict lobster gear on the living resources within the study site; and complete a controlled and precise removal program without disrupting the ongoing legal harvest and insuring that retrieved derelict lobster gear is managed in a manner consistent with New York State Department of Environmental Conservation. Furthermore, the project will provide a template for ongoing recycling, proper storage and disposal activities for inactive fishing gear across Long Island.