

## The Brosnan Center Science-Based Environmental Solutions

Twenty-five years experience in reducing risk and successfully crafting science-based solutions in all areas of the environment (endangered species, land-and coastal-zone use, restoration, natural resource and energy), disaster risk management, sustainability and resilience.

The Brosnan Center solves problems. We reduce risks for discerning clients, governments and communities in the USA and worldwide. We have an independently validated and proven ability to mobilize the best scientific and technical expertise, target the real problems, and find lasting solutions that sustain resources and save clients' money and time. We are experienced working with major environmental laws, policies and regulations. The Center's core network of top scientists allows us to rapidly deploy and design solutions to pressing issues and crises. We thrive on finding solutions in high-stake and high-conflict situations.



### Service Categories: Key Examples

#### **Evaluation and Due-Diligence for Decisions**

- Energy and Technology Evaluation for Investors
- Colorado Wetlands for land acquisition actions.
- Atlantic Salmon Hatchery

#### **Science Arbitration (complex and litigated issues)**

- S. Florida Everglades Restoration
- Missouri River Biological Opinion
- Columbia River Dredging

#### **Master Environmental Planning**

- Environmental Design and Planning for Several Developments
- Siting Energy Pipeline Mooring, Evaluation & Mitigation of Environmental Risks
- Site Evaluation and Mitigation to Preserve Beaches for Island Development

#### **Disaster Risk Management and Climate Adaptation**

- Mitigating Sea Level Rise in Virginia USA
- California State Tsunami Risks and Planning
- Colorado Floods Assessment



## The Brosnan Center Projects Short Summaries

### EVALUATION AND DUE DILLIGENCE



**Energy Technology Evaluation for Investors.** Several clients are exploring investing in alternative energy projects. They've requested our help in evaluating the soundness of the underlying science and technology and/or in understanding the environmental risks and regulatory issues that are likely to affect them. We have been able to effectively assist them in both of these areas. CLIENTS Private clients/companies.



**Colorado Wetlands for land acquisition** We provided key biological assessments, valuation and assistance to group of Private Clients in Telluride Colorado in their efforts to conserve and purchase a major wetland complex (1k acres). In addition we identified issues that helped them to avoid major contaminant-related pitfalls. We charted a course that was successfully implemented. In this project we managed 32 scientists and liaison with government, stakeholders, and media. CLIENTS Several private clients.



**Atlantic Salmon Hatcheries and Recovery.** The State of Maine in cooperation with the NOAA requested our review of their hatchery science and practices for the Atlantic salmon because populations were declining. All attention centered on the adequacy of hatchery practices. When we started, many were resigned to a solution of investing millions more dollars in new hatcheries. Having first assessed the issues, we identified and assembled an expert team for site visits and to meet with all stakeholders. Our review team consisted of experts in hatchery practices, biology and genetics, and oceanography. The expert team found that the hatchery practices were exemplary and excellent. The issues were related to river conditions and the oceans where salmon spend most of their lives. We were able to provide a list of actions that would improve the river conditions for salmon, and show how to evaluate the role of the marine factors. Importantly we helped to save the State from needlessly investing millions of dollars, which it could not afford, on more hatcheries, as these were not the cause of the problem. CLIENT- STATE OF MAINE.

### SCIENCE ARBITRATION



**Columbia River Dredging.** An eleven-year litigation had no end in sight. At odds were the Corps of Engineers, National Marine Fisheries, the Ports of Portland and Vancouver, State governments of Washington and Oregon and environmental groups over whether to dredge 103 miles of Columbia River an extra 3 feet. The extra depth was needed to accommodate the larger commercial vessels without which the region would lose millions in income and jobs. Environmentalists argued that dredging would lead to the extinction of at least 7 endangered salmon species. NFMS had concurred issuing a jeopardy opinion in its BiOp. The parties asked for our help. We mobilized our process of assessment, engagement of experts, trust-building, and designing the right process for the problem. That included three public meetings with the science panels. Through our expert science arbitration process we were able to navigate the issues, deal with unexpected challenges, and reach solution. The panel concluded that there was high certainty in the science and low risk to the species from dredging. They also provided guidelines, for actions that would aid recovery of species. All parties including the environmental groups concurred, the NMF gave permission, lifting the jeopardy opinion. The project moved forward without adverse impact to salmon and with improved recovery measures in place, and provided positive economic boost impact to the region. We resolved this 11-year problem in less than 12-months. CLIENT US Army Corps of Engineers in cooperation with NMFS and Ports.





**California Redwoods** When a private Redwoods Lumbar Company was purchased, the new owners attempted to raise revenues and profits by increasing logging. However, they had not appreciated in advance the environmental regulations including those governing the endangered species living in the forests or the high degree of environmental interest. Almost immediately they were in major crisis over endangered species, Litigation mushroomed, regulatory violations increased, and tree-sitters and protesters soon moved in. They sought our help on the marbled murrelet, an endangered bird. Using our process and experts our team was able to build bridges between the company, governments, and stakeholders. The company, the government and the environmental groups accepted our scientific analyses and solution for the endangered species. While other issues were litigated our solution was not challenged. Later when the company decided to sell portions of its land to the Government in a comprehensive agreement, our analysis was pivotal in ensuring a fair deal for the company and for nature. CLIENT- Corporate Client.

## MASTER ENVIRONMENTAL PLANNING



**Environmental Design and Planning for Several Developments** Developer clients are often looking to create unique projects that meet the needs of investors, clients/purchasers, and that leverage the beauty and ecological services provided by the natural surroundings. We have carried out assessment of habitats and species, created unique master environmental designs, successfully navigated issues of green certifications, endangered species, habitat recovery and zoning, and government permitting for our clients. CLIENTS Companies and private clients including designing for “whole-island” projects.



**Siteing Energy, Pipeline Mooring, Evaluation & Mitigation of Environmental Risks** A client, a major energy company sought ways to improve fuel delivery to reduce costs and minimize environmental and tourism risks. We conducted a thorough environmental feasibility assessment, site location analysis, and assessment of stakeholder environmental concerns, We developed a framework for evaluating risk that allowed the client, stakeholders and government to see the proposed project in a broader light and that engaged all parties effectively. CLIENTS Company



**Site Evaluation and Mitigation to Preserve Beaches for Island Development** Developers, private clients and existing developments have sought our assistance in solving their issues of beach preservation and reducing their vulnerability to loss and damage. We have conducted site evaluations, hydrodynamic models and forecasting, developed solutions that have ranged from ecological to engineered and hybrid ones, engaged government and stakeholders, swiftly secured planning and most importantly for our clients helped to implement those solutions successfully. CLIENTS Numerous development and private clients. Island Governments

## DISASTER RISK MANAGEMENT AND CLIMATE ADAPTATION



**California State Tsunami Risk and Planning** At the request of USGS we engaged in analysis, and disaster risk management for the Strategic Science Team evaluating the potential effects of a major tsunami, (one that is likely to occur) on California’s coastal zone, We led the effort for ports, fisheries, natural resources ecosystems and endangered species. We worked with six different teams of experts and met with stakeholders to develop response and planning. CLIENT US Geological Survey





**Assessing and Translating Risks from Sea Level Rise** Many coastal communities, particularly those on the eastern seaboard are exposed and vulnerable from rising sea level and the associated higher inundation during storms. Natural habitats, essential infrastructure and services, commerce and the cultural ties of communities to their sense of place are all threatened. Working with our clients NASA and The Nature Conservancy and teams of modeling scientists we have been helping to develop innovative tools and applications that will allow for better forecasting of impacts and visualizations. We have designed a science-translation process that we will use to engage with stakeholders from all sectors (from government to private) assisting them to use the tools and information in their decision-making. CLIENTS The Nature Conservancy and NASA (with a wider target audience).



**Colorado Flood Assessment** Following the devastating Colorado floods in 2013 we were asked to evaluate the ecological and environmental effects of the floods and address the environmental-human interactions. We conducted intensive site visits immediately following the floods. We assessed impacts on landscape, endangered species and restoration zones as well as mobilization of contaminants during the flood. CLIENT Natural Hazard Center Colorado.



**Volcanic Eruption Mitigation** The British island of Montserrat faced a difficult choice. To build a new port and settlement in a pristine location, or to risk that a volcanic eruption would destroy its main city, port and airport, leaving the island helpless and cut-off. Building a port could potentially destroy the fishing and tourism coral reefs on which the economy and individual lives were almost wholly dependent upon. We were asked for help in finding a solution. We worked with the government and NGO community to first establish a local stakeholder team. Our scientists carried out essential biological assessments and reported on their findings. Based on the scientific conclusions we were able to identify the risks and consequences of different scenarios. We engaged with the stakeholders, government, and with an engineering firm using our science to shape solutions that would meet their needs. We helped to develop a unique jetty design that would ensure that vital habitats were protected. As part of the effort, we “moved” and restored a coral reef that was at risk during construction. Within 24 hours of relocation hundreds of small fish had taken up residence on the new coral heads. We used the opportunity to train local people in science and field monitoring. Shortly after the completion of the project, the volcano erupted violently. As had been feared, the main town, original port, and the airport were buried under ash and destroyed. The new port, that we helped create, was the only access. It has continued to serve the needs of the people and the reefs have continued to thrive providing food, dive sites, biodiversity, and tourism services. CLIENT British Government, Montserrat Government.



## The Brosnan Center FEATURED PROJECT

Scientific Arbitration (complex and litigation) SOUTH FLORIDA EVERGLADES RESTORATION  
Client: Department of Interior and South Florida Task Force.



The Dept. of Interior requested our help to resolve the impasse over endangered species and S. Florida Everglades ecosystem restoration. Restoration was stymied and several endangered species were pitted against each other. Opinions were bitterly divided and distrust was high. Different interest groups charged that the Service was favoring selected endangered birds at the expense of others. The issues were already in litigation; several lawsuits had been filed and more were pending. Initially the Service requested that we convene panel of avian experts. We worked with the Service and South Florida (SF) Taskforce to drill down on the issues and create clarity in identifying their underlying

problems and questions. It became apparent that understanding habitat dynamics and hydrology were critical to evaluating the endangered species issues and answering the concerns of all stakeholders. With the USFWS and the SF Task Force agreement we added the required expertise to our expert scientific panel. This provided a better, more comprehensive and useful review.

A critical part of the success in the project was Dr. Brosnan's upfront investment in reaching out to all the parties in order to build trust in the process. She worked intensively with each group to ensure that she knew their issues, that they felt their voices were heard and concerns addressed. As a direct result, the parties showed up to public meetings as active participants in a more cooperative process. Investing in laying the groundwork to refine the questions, assemble the right experts, build cooperation and bring people together on the core issues, even when they have diverging opinions are central to many of our projects. In the Everglades we were able to reframe the debate away from pitting species and interests against each other to one of managing species and habitats, and stakeholder needs through transition. Our expert panel developed a set of priority actions that could be (and were) undertaken by the Service and SF Task Force and that resolved the impasse. For instance, the panel found that the apparent conflicts among the species were short-term and could be resolved by managing the transition process more effectively. In a major agreement the regulating agencies recognized that changes in abundance of endangered species were to be expected in differing habitats during transition and that issuing a jeopardy call under ESA (BiOp) would not always be warranted in these circumstances. This proved important to the stakeholders and other government entities, as a previous jeopardy opinion had stalled the water-flow restoration and created mistrust and litigation.

Through our experts and process we were able to provide the parties with specific short term actions that could be incorporated at no cost into existing efforts and monitoring, We were also able to outline an action plan for gathering information going forward, and for helping species through the transition to full restoration. For instance, the scientists concluded that developing a translocation plan now to relocate critically endangered populations would help to secure recovery and prevent extinction. By carrying out the work now it would provide greater insurance and avoid problems later. The Service and SF Task Force incorporated all of our recommendations and the restoration has moved forward. This included the raising of the Tamiami Trail (E-W highway through the Everglades) to allow for more normal and historic water flow from Lake Okeechobee area in the north, through the Everglades National Park, and to Florida Bay- a step deemed critical for the survival of the Everglades and its species.

When new information emerged on other Everglades issues, the Service continued to request our re-engagement to review and incorporate the knowledge. We carried out two additional and successful scientific reviews for them.



## The Brosnan Center FEATURED PROJECT

Assessment and Science Arbitration. MISSOURI RIVER  
Client: US Army Corps of Engineers. Yankton SD Office



We were originally contacted by the USACE who in cooperation with the USFWS, Missouri Dept. of Conservation, Nebraska Game and Parks Commission, US Geological Service University of Missouri and with input from South Dakota, Iowa and Kansas requested that we conduct several independent scientific evaluations.

We initially analyzed and reviewed three programs in the USACE's efforts to restore the Missouri River Ecosystem and comply with the Biological Opinion (BiOp). Our reviews and assistance were focused on Population Assessment Programs; Adaptive management; Habitat Assessment and Monitoring Programs; Hydrological Models and the Biological data linked to those models.

We assembled a first team of six scientists who comprised the range of skills necessary to address the complex issues affecting species, their relationship to habitats and the extensive river management programs that had changed the flow and navigation regimes along the length of the Missouri River. As our assessment involving endangered species progressed it became obvious that the agency groups needed statistical support in the development of adequate monitoring and analysis techniques in order to comply with the Biological Opinion (BiOp). We secured that support developing a rigorous program and the appropriate training for the federal and state agency staff. Subsequently, we recognized that a Population Viability Analysis would help to resolve management issues regarding the actions necessary for the endangered pallid sturgeon. We secured the leading academic scientist to complete this analysis and were able to resolve the outstanding questions. The management of the Missouri River rested on an adaptive management program. However our review found that the management program was inadequately designed. It lacked a conceptual framework and consequently did not have any acceptable standards of scientific rigor. There were no reliable means to distinguish between irreversible changes and transitions or opportunities for better management and progress towards goals. Our lead Dr. Brosnan engaged Dr. Jim Quinn (quantitative ecologist and professor at the Information Center for the Environment at UC Davis) and together they developed an adaptive management framework and plan for the program. The parties adopted the framework and plan.

Testimony to the value of our work, our assistance was sought in several subsequent Missouri River environmental issues. That included a request from the USGS to review their Missouri River Biological Research Program and Regional Laboratory.





## Brosnan Center

900 N Glebe Road Arlington VA 22203

Mailing Address 4201 Wilson Blvd #110-38 Arlington VA 22203

Tel +1.503.869.5769 email [services@brosnancenter.com](mailto:services@brosnancenter.com)

<http://www.brosnancenter.com>

## The Brosnan Center: Expertise and Solutions

The Brosnan Center provides the expertise and manages the process for clients who need scientific and technical expert analyses, due-diligence, litigation support, and help in building relationships with government and stakeholders. Since its inception the organization has become a leading provider of scientific reviews and solutions. It has a reputation for credible, high-quality, and practical technical assessments and for interventions that have successfully resolved environmental problems, allowing parties to move forward. Through the quality integrity, and fairness of its scientific process, the Brosnan Center has built trust with all sides. At the Center's core is its group of 700



top scientists, who, peer-selected and nominated, have agreed to serve as the Center's technical network. Our Center is skilled at identifying and recruiting the right experts who can help in a variety of situations including analysis and evaluation, implementation, scientific arbitration, and litigation support. Our excellence in this area has been recognized and sought after by clients including the US Government. The Department of Interior asked the Center to sign an MOU to provide the USGS with scientific expertise needed in times of natural and human-induced disasters (e.g. oil spills). We have been a go-to organization for US government seeking scientific review of decisions and critical endangered species and land use issues.

The Center's work in mobilizing its scientific expert process to resolve natural resources issues has been independently assessed. Our work is consistently ranked highly by all parties including industry, government, stakeholders, and scientists.

## Services: Engaging the Center

The Center provides a broad range of services to clients. Clients may first request an independent evaluation of environmental risks as part of due diligence. We recently conducted an assessment of the technology and regulatory risks of an alternative energy program for a potential investment group. Depending on our findings and client needs, our work can evolve into a second phase of more in-depth environmental planning, implementation, or engagement with government and other stakeholders. Our work on evaluating coastal hazards for several private clients led to the clients asking us to identify and assemble the skills needed to implement solutions to safeguard clients' investments and the natural environment. We had in the course of our work

[brosnancenter.com](http://brosnancenter.com) [brosnan@deborahbrosnan.com](mailto:brosnan@deborahbrosnan.com) +15038695769

Scientific and Environmental Services



also built good relationships with government and stakeholders. Governments adopted our analyses and solutions and permits were issued directly on the basis of the findings and recommendations we presented.

We are frequently called in when situations are in crisis, when parties are polarized and in litigation. At these times the stakes are high, tensions and mistrust abound. We rapidly and thoroughly assess the situation, identify the core issues and find ways to address them and diffuse tensions. We will typically use our established expert-based process to resolve them. Our engagement at the request of the parties has helped to resolve many controversial issues and crises. Our scientific panel work in the Florida Everglades helped to resolve long-standing and bitter controversies over the fate of endangered species in the restoration. It reframed the debate from conflict to focus on the goals of cooperative ecosystem recovery. Importantly it ended the paralysis so that restoration work could proceed. We provided a panel-based and public scientific evaluation of the USFWS's draft Recovery Plan for the Spotted Owl, which had attracted congressional investigations. Our review halted the controversy on this program, re-asserted the primacy of scientific opinion, and through the transparency and impartiality of the process allowed the interest groups to begin working together more successfully. We have been able to solve critical problems for the parties in every one of the projects where we've been engaged. Moreover, when the issues were embroiled in litigation our efforts have helped to halt litigation and our resolutions have not been subsequently challenged. Testimony to our work, clients have repeatedly hired us when new issues have arisen for them.

The Brosnan Center's scientific review and evaluation programs have connected many clients, and government agencies with the scientists who have the expertise and willingness to analyze and assess risks, data, models, etc., and to serve on review and implementation teams. We have, for instance, reviewed approximately 50 written assessments and plans for federal agencies on topics including species listing decisions under Endangered Species Act, harvest plans, and monitoring for regulatory actions. We set up, administered and facilitated 37 review/arbitration panels. In our tailor-designed process we have engaged our experts with agency staff, stakeholders' private sector, and often in public meetings, where we have evaluated different scientific information and identified the best available science and solution options.



We are known for our hands-on and ethical approach. We invest the time to fully understand the clients needs and issues, to target the core problems and design ways to solve them. We work diligently and closely with our clients, keeping them informed and engaged every step of the way to resolution. We are familiar and protective of client sensitivities. Our clients can always depend on us for a reliable and high-caliber assessment that can withstand scrutiny. We build trust all parties. That is why governments and clients have repeatedly sought out our involvement and advice on their environmental challenges



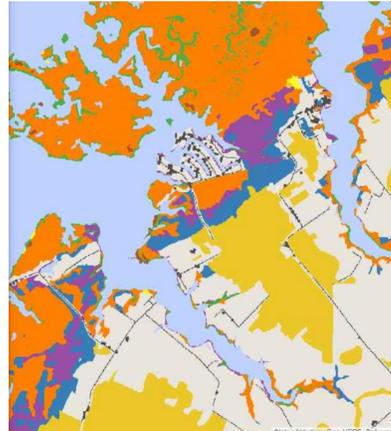
## Established Excellence and Expertise

A unique feature of the Center is our strong links to scientists at other institutions, who support our programs and are a backbone of the organization. Over 700 scientists have agreed to serve on our analysis and review programs. These scientists have provided essential assistance to government (e.g., USFWS, NMFS, USDA USFS, USACE (Corps of Engineers), USGS and other federal and state agencies) as well as to private sector (companies and individuals), Foundations, and NGOs. Our experience setting up and managing these kinds of programs gives us a demonstrated understanding of the tasks inherent in administering an effective scientific review.



As determined by project needs, the organization also hires well-established scientists on a short-term basis (one such project, on spotted owls, employed 14 such scientists from academia). We frequently combine cutting edge scientific analysis to help in environmental regulatory issues, and have strong experience in working in legal and policy environments including e.g., Endangered Species Act (at federal and state levels), NEPA process, Clean Water Act etc. We are able to bridge scientific knowledge with its application to the relevant sections of these statutes to help clients reach solutions.

Finally the Center has long-term relationships and partnerships with several academic institutions and departments including for instance The Information for the Environment, UC Davis, which specializes in analyses, GIS and mathematical modeling and simulations of complex issues, as well as the UC One Health Institute and Virginia Tech Global Forum and Regional Resilience among others. Depending on and project needs, we also engage additional necessary services e.g. reputable engineering, architectural and urban-planning entities with which established relationships.



formal  
Center  
statistical  
Davis  
for Urban  
client  
we have

*The Center serves as a trusted resource that is focused on solutions, delivers value for investment, has saved clients tens of thousands of dollars in drawn out litigation, conflicts and poor-decisions, and while helping to sustain the natural world, its resources and those who depend on them.*



## Business Relations and Client Satisfaction



In all our work the Brosnan Center seeks not simply to comply with contractual requirements and client expectations but to exceed them. Our goal is to provide a level of scientific and strategic support to clients at a standard that is not available elsewhere.

We have established our reputation for scientific excellence, credibility, and reliability and for finding innovative and lasting solutions for clients. We have often operated under tight deadlines in crises situations. To resolve the status of the Prebles Jumping Mouse our client had 30-days to complete the evaluation. We undertook to meet that deadline during which time we assembled the highest qualified expert team, carried out the evaluation which included setting up and holding a public meeting in another State, and produced a 60 page final report. Our findings were fully accepted. Our reports are regarded as state of the art summaries of material. For those project that do not involve privilege or confidentiality, our projects have frequently resulted in widely cited peer-reviewed publications – the hallmark of scientific standards and of courtroom science standards.

In our client engagements and contracts we set out clear expectations for our work on behalf of our clients as well as articulating the expectations on all sides. Our success in meeting deadlines and exceeding expectations is due in part to clear project deliverables and milestones, and careful management and monitoring of the scientists engaged in our work. We work hard but will not take on contracts that we believe are unrealistically scoped. We take pride in meeting our responsibility to ensure that projects run smoothly and on time and intervene immediately to correct any potential issues. For the Northern Spotted Owl Status Review we were responsible for the work of 16 scientists under contract to us, and liaison with Service biologists, media relations, staff, managers and decision-makers. Following this review of a highly emotive and important issue where we maintained the integrity of the technical information and process, the timber industry and environmental community expressed satisfaction with our work and the Public and Service expressed great appreciation for our efforts.



## **Brosnan Center Bio**

### **Deborah Brosnan Ph.D. President and Founder**



Deborah Brosnan has 30 years experience in leveraging science to design solutions for the environment and people. She has been a pioneer in the development of peer-review processes to identify and incorporate best available science into environmental decisions. As program lead and at the request of clients she has skillfully shepherded projects from inception to completion always on time and on budget. Under her leadership the Center has successfully used science to break deadlocks on issues of national significance, including Everglades Restoration, endangered species, Missouri River, and where the issues have been embroiled in controversy and litigation. The Center has always found science-based and supported solutions. Dr. Brosnan's is also an expert on extreme events, hazards and climate change, including how they affect

ecosystems and human communities.

She graduated with a B.S. (honors) and M.S. in Fisheries Science at the National University of Galway, Ireland, where she became the first woman to qualify in SCUBA at the University. She received her Ph.D. in marine science from Oregon State University, USA. Soon afterwards she founded the Center (first as SEI and later the Brosnan Center), and quickly recruited some 700+ scientists to affiliate with the organization in order to provide clients with the best expertise and solutions. She has given testimony before US Senate and House Committees on issues of science and the environmental stewardship.

Dr. Brosnan has strong academic credentials. She is adjunct Professor of Biology at Virginia Tech University, serving on faculty for the Global Change Program and Global Forum for Urban and Regional Resilience in Arlington. She has served two sabbatical periods at Stanford University. Author of numerous peer-reviewed articles and papers in Scientific and Environmental Law Journals, she is an editor for two scientific journals. In 2015 she was inducted into the Irish Education 100 for her services to higher scientific education and learning.

She serves on several Board of Directors including the University of California Davis SeaDoc Board, as Chair of the Irish Diaspora of scientists (Wild Geese Network of Irish Scientists), the National Courts and Sciences Institute and Project AWARE and serves as advisor to the St Barthelemy Dept of Environment. and Davos International Risk Forum. She is a commissioner for IUCN Commission on Ecosystems. She chaired a blue ribbon panel on the development and review of a scientific code of ethics for the U S Dept. of Interior, and served on the design committee for the National Environment Observation Network (NEON), and the OSU College of Forestry Board. She has been an accredited delegate to several U.N. meetings including the Sendai Disaster Risk Reduction Negotiations representing scientific, academic and environmental interests

