

# Turning Vicious Cycles into Virtuous Ones

**Pathways for USAID Action on  
Illegal, Unreported, and Unregulated Fishing  
in Latin America and the Caribbean**



## CONTRACT INFORMATION

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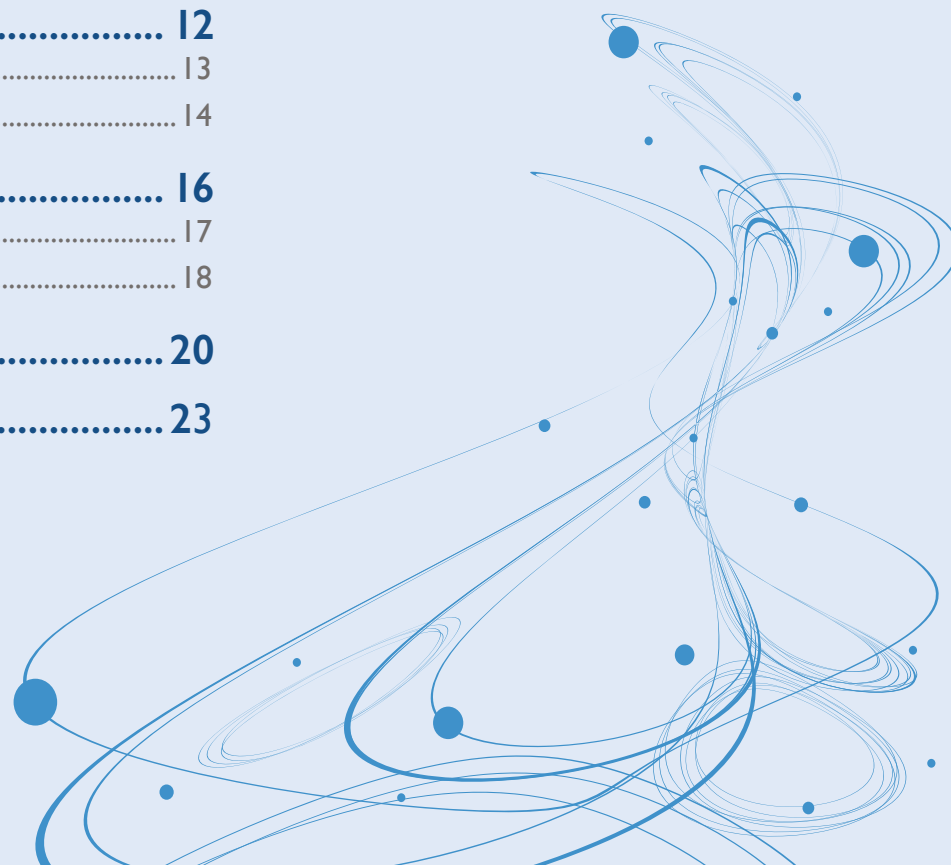
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# Context

Globally, illegal, unreported, and unregulated fishing (IUUF)—or a combination of these practices—accounts for one in five fish caught in the wild. That's 26 billion tons of fish a year with a global economic impact ranging from [\\$10 to \\$23 billion](#). These fishing practices impact the short- and long-term social and economic prospects of all coastal countries, and their negative effects on food security and environmental protection have local and global implications. IUUF impacts sustainable development outcomes in USAID partner countries. Whether enormous foreign fleets are fishing illegally in protected waters, as was [witnessed off the Galapagos](#), artisanal fleets are [overfishing in neighbor's waters](#), or local fishers are using [damaging practices in home waters](#), the result is not only damaged ecosystems, but also food insecurity, economic instability, and social distress, which ripple out from local communities to nations, to regions, and to the globe.

While estimates of the global scale of IUUF are available, and some of its local impacts are visible, ongoing research is needed to clarify the depth and breadth of such activities in different regions and specific to USAID partner countries. To start to illuminate the scope of IUUF in Latin America and the Caribbean (LAC), USAID's Bureau of Latin America and Caribbean Office of Regional Sustainable Development (LAC/RSD) supported the convening of expert roundtables on the drivers of IUUF and what development partners can do to address them in three seascapes: the Pacific Coast of South America, the Caribbean, and Central America. A [webinar](#), [commentary](#), and [podcast](#) shared lessons from those conversations. Finally, LAC/RSD engaged systems researchers to analyze that information, as well as data from a regionally focused literature review, to understand how the complex cause-and-effect relationships between factors affect IUUF in each area so that Missions can design activities to support local and national sustainable development while building resilience to the myriad and dynamic influences of the IUUF system.



# Systems Mapping and Analyses

Systems maps identify the parts at play in a system and represent how they are connected. Systems analyses then investigate the characteristics of those connections, focusing on how action in one area can ripple across the system to have effects elsewhere. The systems analyses in this brief examined four important elements in each geography:



## KEY FACTORS

Things that are related to many other things in the system



## LEVERAGE POINTS

Things that can impact a lot of other things in the system



## FEEDBACK LOOPS

How factors connect through chains that circle back to influence themselves

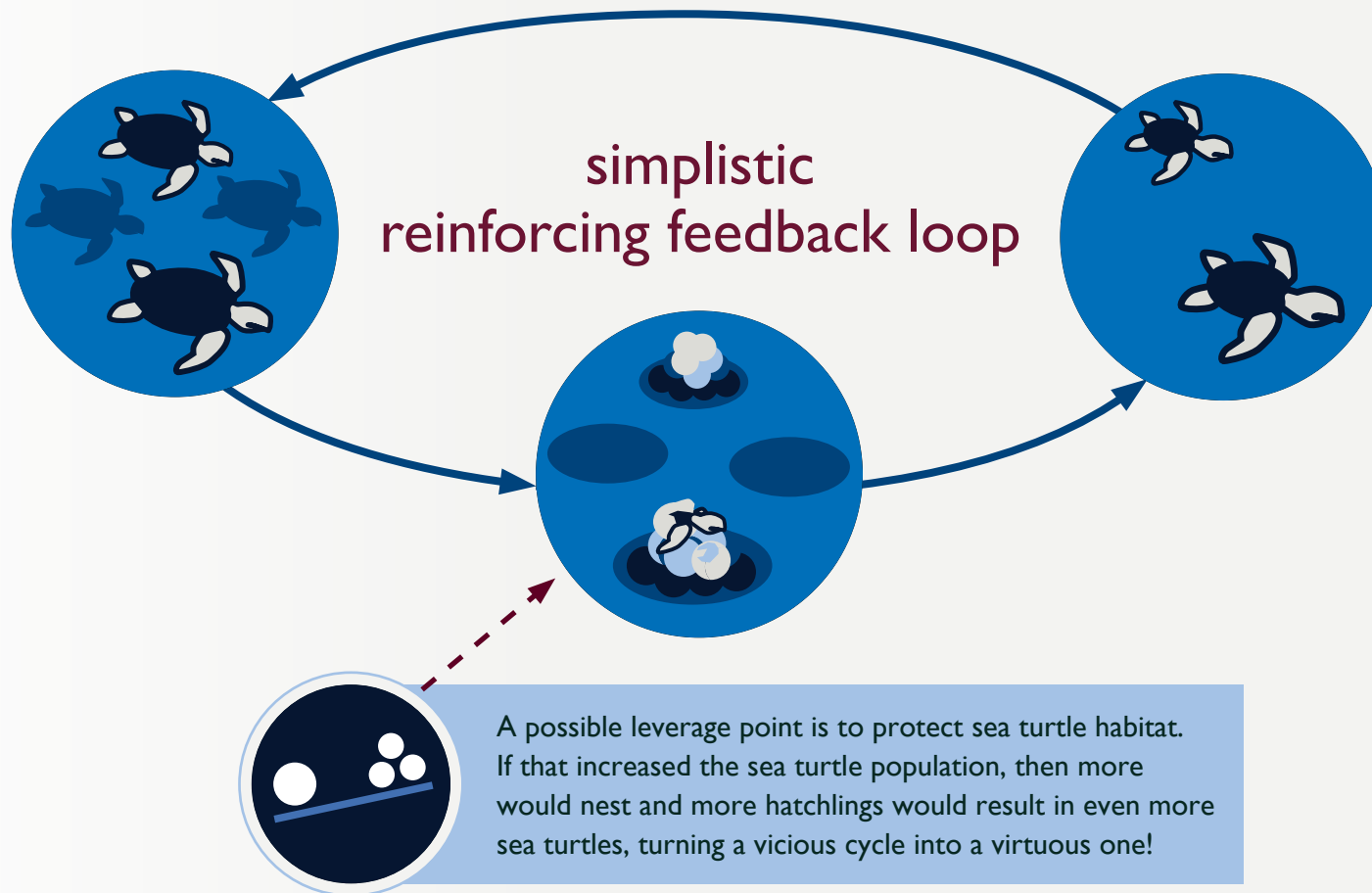


## KEY SYSTEM INDICATORS

Factors that are highly dependent on other factors

When key factors or leverage points are parts of feedback loops, they suggest particularly useful intervention points to address IUUF. Systems indicators, factors that respond to changes in other factors, can often serve as proxy indicators for the system itself; tracking shifts and trends in such indicators can show how the system is transforming. In this case, such indicators serve as proxies for measuring IUUF directly, which is challenging.

The analysis focused closely on reinforcing feedback loops in which a change in one factor creates a change in another factor which then reinforces the change in the first factor, commonly called vicious cycles. An example of a simplistic vicious cycle is the relationship between sea turtle populations and sea turtle hatchlings: as sea turtle populations decrease, there are fewer sea turtles nesting, and fewer hatchlings; with fewer hatchlings, the population decreases, which again reduces hatchlings.



## LIMITATIONS

As in any research process, the availability of information about LAC IUUF in general, and information specific to each region, limited this systems analysis. A total of 35 relevant documents from the last 20 years informed the literature review, with 12 specific to South American countries, five specific to Central America, seven specific to the Caribbean, and 11 on the general or global IUUF themes with some local examples. As such, the analysis provides an initial understanding and should be vetted with local experts when setting programming priorities in a given location. The purpose of this analysis and briefer is to give USAID a preliminary understanding of IUUF dynamics and unexpected insights into potential leverage points in each geography. This is the beginning of the journey.

Moreover, some relationships in the data are either unclear or nonlinear, meaning the cause and effect are difficult to understand. For example, *the relationship between IUUF and fisheries health is characterized differently in different regions and by different actors*. In some cases, a healthy fishery seems to lead to IUUF as the abundance of catch attracts IUUF actors. In other cases, a damaged fishery encourages IUUF as fishers need to harvest out of season, out of size, or illegal species. Thus, careful and continued monitoring of fishery health should be instituted to ensure interventions produce intended outcomes and not perverse ones and to help further illuminate the complex relationship between these two key factors.

Additional conversations with regional IUUF experts and stakeholders are strongly recommended to vet, clarify, deepen, and revise the systems analysis and associated recommendations informing this briefer. Regularly updating the systems maps would hone the analysis and elucidate how the IUUF systems are shifting over time: better data builds more accurate models, which then yield more targeted and effective recommendations.

## Structure

This briefer includes system analyses for each of the three geographies; the analyses uncovered key factors, leverage points, and relevant feedback loops. These in turn underpin recommendations for possible actions, including to leverage feedback loops (i.e., transform vicious circles into virtuous ones), to improve understanding of the system (i.e., monitor key indicators and fill knowledge gaps), and to build coalitions to scale impacts (i.e., partner with key organizations). The briefer concludes with a section detailing what regional actions could be helpful to scale and strengthen those at the local and national levels. Throughout the briefer, we highlight how organizations in other regions have implemented similar interventions in blue boxes.



All models are  
inaccurate;  
some models  
are useful

A map of South America and the surrounding Pacific Ocean. The Pacific coast of South America is highlighted in a solid blue color, while the rest of the continent and the ocean are in a light blue-grey tone. The text 'IUUF in the Pacific Coast of South America' is overlaid on the left side of the map.

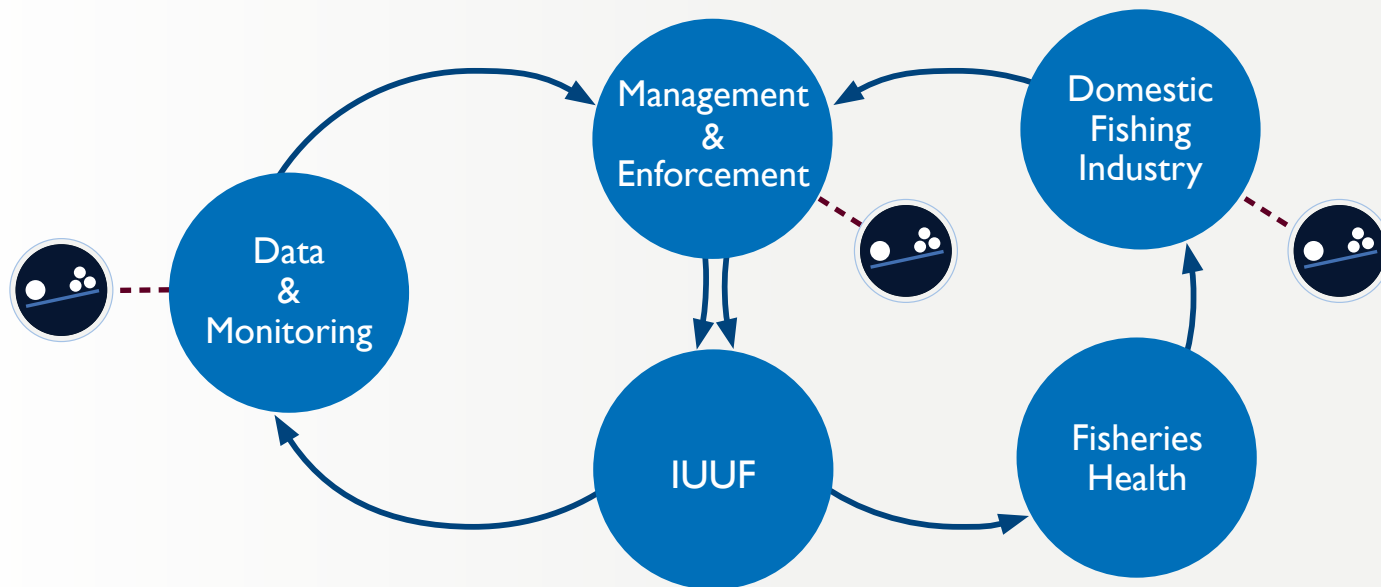
# IUUF in the Pacific Coast of South America



# Systems Analysis Findings

Systems analysis of IUUF near the Pacific Coast of South America revealed active distant water fleets (DWFs) in the region, meaning large vessels that fish the high seas and other waters far from their home ports, such as the hundreds of vessels from China found fishing off of the Galapagos Islands in 2020. Analysis also showed Colombian, Ecuadoran, and Peruvian fishers skirting regulations, failing to register their vessels, or fishing illegally in neighbors' waters. However, the analysis suggests that currently, DWFs have a much larger impact than local fishers.

In this region, the analysis identified two interlinked feedback loops. In the first, IUUF reduces data accuracy, obscuring the source of fish, size of catch, and vessel information among other key data points. In turn, a lack of accurate data weakens monitoring and reporting on fisheries. Poor monitoring and reporting constrains national fisheries management and enforcement, which in turn allows IUUF to flourish. This feedback loop connects to a second loop in which IUUF damages the local fisheries and ecosystems. Without a robust fishery, the domestic fishing industry suffers and can offer less tax and other revenue to bolster enforcement capacity, leading to more IUUF.



Main feedback loop in the Pacific Coast of South America



The Australian government recently ran a capacity-building program implemented by the CSIRO, Australia's national science institution, to build capacity for monitoring **fisheries data** across the Southeast Asian region.

# Possible Programming Actions

## TURN VICIOUS CYCLES INTO VIRTUOUS ONES

In the feedback loops identified above, **fisheries data and monitoring, management and enforcement**, and **domestic fishing industry** were identified as leverage points in the system. None of these factors is a particularly influential factor on its own, but they are singly and together part of multiple feedback loops. This suggests that strengthening national fisheries management and improving the fisheries data such management requires could reduce IUUF and improve fishery health, in turn improving government revenue from legal fishing and funding improved data and national fisheries management. Thus, a relatively small investment in improving management and data systems could reap significant rewards. Similarly, small investments to improve enforcement capacity could reduce IUUF, increase legal revenue, and strengthen domestic fishing industries. Such industries could then generate resources to further strengthen enforcement capacity.

## MONITOR KEY INDICATORS OF SYSTEM CHANGE

IUUF reduces legal fishing revenue; while it is often difficult to track IUUF directly, monitoring trends in **legal revenue** could reveal the status of IUUF. Legal revenue sources include government revenue from licensing and catches, industry taxes or profits, even fishing employment and livelihoods data. Monitoring such data trends also can determine the economic strength of the legal fishing industry and help build political will to address IUUF and strengthen coastal communities.

[+]

South Africa's **FishFORCE** academy is a platform for training **fisheries management** officials to address IUUF.

## FILL KNOWLEDGE GAPS

Overall, this region suffers from a lack of **fisheries data**, including catch data and data on the conditions of marine protected areas. However, since DWF is a highly influential factor in this region, USAID’s current work to understand the scale and impacts of DWF globally, and in the region, through the [USAID DWF Research Agenda](#) is a key first step in addressing a critical information gap. The research outputs from the Agenda will synthesize useful data to inform interventions at multiple scales. Missions in the region can supplement that work by learning from local partners how DWF impacts local fishers, markets, and ecosystems, as well as strengthening local fisheries data systems.

## PARTNER WITH KEY ORGANIZATIONS

**Table 1:** Organizations working on suggested intervention points in South America’s Pacific Coast fisheries.

ORGANIZATION(S)	MODEL OR SUCCESS STORY	SUGGESTED INTERVENTION POINTS			
		Fisheries Management	Fisheries Data	Enforcement Capacity	Domestic Industries
Global Fishing Watch & U.S. Southern Command (SOCOM)	Global Fishing Watch <a href="#">partners with SOCOM</a> to improve IUUF data-sharing.		✓		
<a href="#">Fisheries Transparency Initiative</a> (FiTI)	Since January 2020, the FiTI has been collaborating with stakeholders in <a href="#">Peru</a> and <a href="#">Ecuador</a> to raise awareness about the importance of transparency for the country’s marine fisheries sector and to obtain a public commitment from these governments to implement the FiTI, recently launching a data transparency initiative.		✓		
Organización Regional Pesquera de Ordinación Pacífico Sur ( <a href="#">OROP-PS</a> )	OROP-PS has had success in tracking down illegally operating ships.	✓		✓	✓
<a href="#">RedPesca INDNR</a>	<a href="#">RedPesca INDNR</a> is a platform for facilitating regional collaboration to address IUUF.	✓		✓	
Committee for the Sustainable Management of the Southern Pacific Jumbo Flying Squid ( <a href="#">CALAMASUR</a> )	Established in 2018, this working group of private and public sector members seeks to conserve the giant squid fishery in Mexico, Ecuador, Peru, and Chile. It focuses on increasing <b>fisheries data and supporting artisanal fishers’ access to international waters</b> .	✓	✓		✓



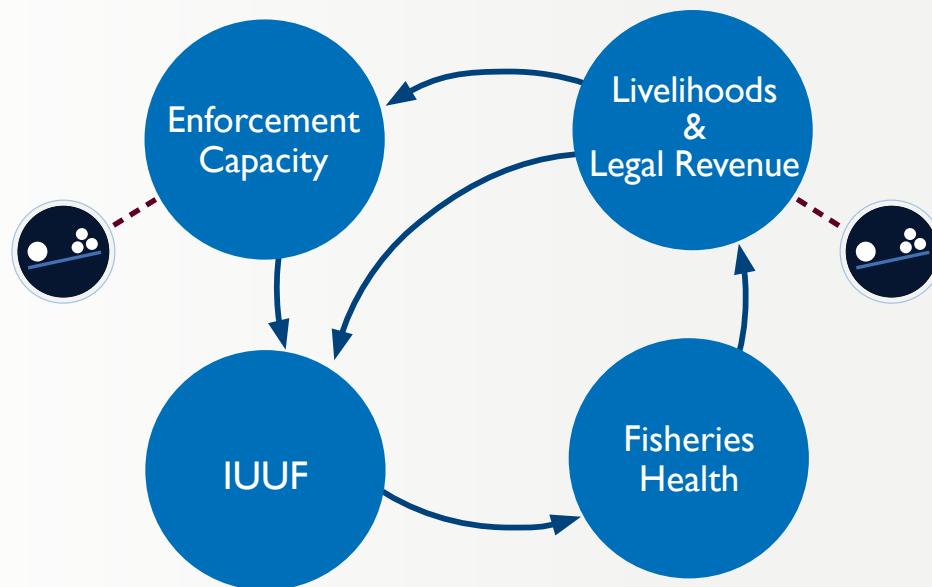
The [INTERPOL/GFiE](#) program facilitates international law enforcement information sharing and contributes to higher awareness of crime challenges in the maritime domain, as well as providing subject matter expertise to the maritime security community.

A map of the Caribbean region showing the outlines of the continents and islands. Several islands are highlighted in a dark blue color, including the Bahamas, the Cayman Islands, the Virgin Islands, the British Virgin Islands, the Turks and Caicos Islands, and the Windward Islands (Cuba, Haiti, and Santo Domingo). The rest of the map is in a light beige color.

# IUUF in the Caribbean

# Systems Analysis Findings

Caribbean countries' coastlines are disproportionately large compared to their land area; people here rely on healthy coastal ecosystems for not only fishing livelihoods but also tourism and other marine ecosystem-related livelihoods. Analysis suggests that small-scale Caribbean fishers engage in IUUF to make a basic living, and to feed their families. In feedback loop analysis, the relationships that emerge as most transformative are those between legal fishing livelihoods and legal revenue and IUUF; analysis shows that when people can support themselves and their families through legal livelihoods, they do not participate in IUUF. The feedback loop below shows that IUUF damages fishery health and cuts into legal fishing revenues. Legal revenues support local livelihoods directly, and through taxes and other regulations, enforcement capacity. Both livelihoods and enforcement capacity loop back to impact IUUF.



Main feedback loop in the Caribbean



The government of the Dominican Republic is hoping to bolster livelihoods associated with Tilapia farming.

# Possible Programming Actions

## TURN VICIOUS CYCLES INTO VIRTUOUS ONES

In the Caribbean, causal loop analysis indicates that improving **legal fishing** opportunities and other **livelihoods** could have transformative effects, improving fishery health, legal revenue, and fishing-related livelihoods over the long term. Moreover, the leverage point analysis suggests that investments to improve national **enforcement capacity** could also trigger a virtuous cycle, wherein improved enforcement reduces IUUF, which can help strengthen revenues from domestic legal fishing, in turn increasing revenue to support additional enforcement.

Leverage analysis suggests that strengthening multi-national **regional management bodies** and increasing participation in international **fisheries management treaties** could more effectively combat IUUF, though unrelated to the feedback loop identified above. In fact, strong regional bodies in the Caribbean have built national capacity to address IUUF across the region, and many states in the Caribbean were early adopters of the National Oceanic and Atmospheric Administration's IUUF best practices and the [Port State Measures Agreement](#).

## MONITOR KEY INDICATORS OF SYSTEM CHANGE

Since **fishing livelihoods** are critical in this region, monitoring data related to those livelihoods is important to understanding whether efforts to improve livelihoods and reduce IUUF are having an impact. USAID could track catch data in markets, fishing industry and processing revenues, or even nutrition and food security in fishing communities. The trends in these metrics could also indicate if the system is transforming, and if IUUF is declining.



In Belize, the Nature Conservancy has successfully piloted a project that improves local livelihoods while rebuilding critical fisheries.

## FILL KNOWLEDGE GAPS

In the Caribbean, one key knowledge gap is the **extent of IUUF** in poorly monitored fisheries. While in some areas of Jamaica and Suriname, studies have painted a fuller picture of IUUF, more information is needed to help understand how fisheries and the communities who depend upon them [are being impacted](#). USAID could support local agencies in piloting and scaling common methods to investigate IUUF and its impacts to develop a shared knowledge base across the region as a foundation for regional collaboration and shared management.

Another key knowledge gap in this region is **how IUUF overlaps with criminal activities**, whether human, animal, or drug trafficking, illegal labor practices, or other criminal behaviors. Illegal actors may be infiltrating and destabilizing fishing communities and undermining fisheries management and the rule of law; policy makers need to understand when and how IUUF is a symptom of a broader problem. USAID could partner with and support organizations investigating these connections.

## PARTNER WITH KEY ORGANIZATIONS

**Table 2:** Organizations working on suggested intervention points in Caribbean fisheries.

ORGANIZATION(S)	MODEL OR SUCCESS STORY	SUGGESTED INTERVENTION POINTS			
		Legal Fishing Livelihoods	Enforcement Capacity	Regional Management Bodies	Fisheries Management Treaties
Western Central Atlantic Fishery Commission ( <a href="#">WECAFC</a> )	WECAFC is the regional fisheries management mechanism and hosts a <a href="#">working group</a> on IUUF.		✓	✓	
Caribbean Network of Fisherfolk Organizations ( <a href="#">CNFO</a> )	CNFO works primarily to support local livelihoods within sustainable limits, including leadership training for fisherfolk organizations.	✓		✓	
Caribbean Regional Fisheries Mechanism ( <a href="#">CRFM</a> )	CRFM is a convener in the region that recently signed on to the <a href="#">Blue Justice Initiative</a> with the Government of Norway to combat transnational crime in Fisheries.			✓	✓
Implementation Agency for Crime & Security ( <a href="#">CARICOM IMPACS</a> )	Provides many <a href="#">training programs</a> to member state enforcement agencies.		✓	✓	
<a href="#">Fish Right, Eat Right</a>	A partnership linking fishers, communities, and fishery managers in Belize, Fish Right, Eat Right strengthens sustainable fishing livelihoods using market-based incentives and consumer education to encourage voluntary certification.	✓	✓		

A map of Central America is highlighted in a solid blue color, set against a light blue background. The rest of the map, including North and South America, is shown in a very light, almost white, color. The text "IUUF in Central America" is overlaid on the bottom left of the map.

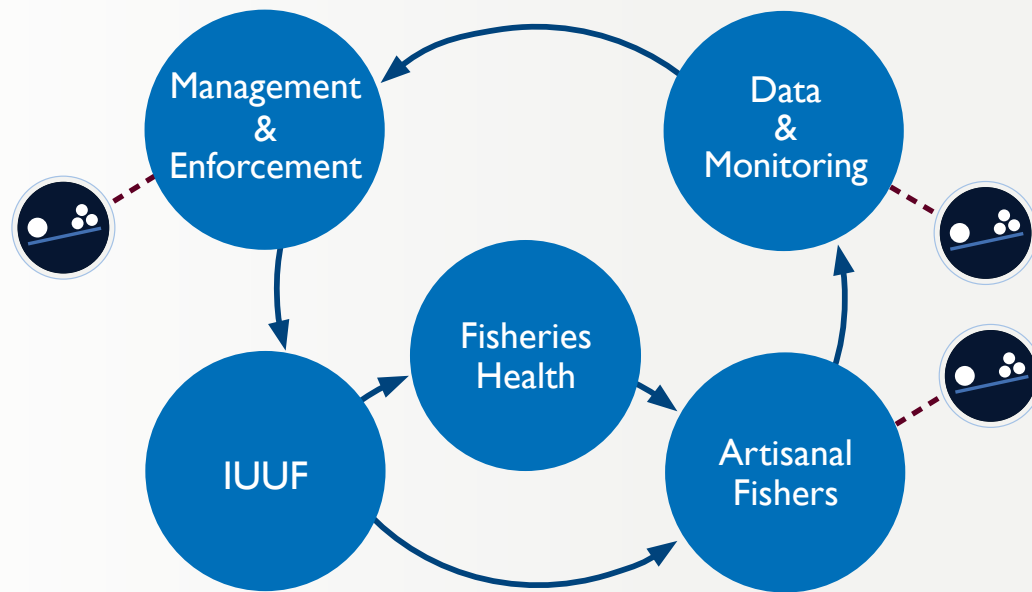
# IUUF in Central America



# Systems Analysis Findings

In Central America, causal loop analysis shows that domestic industrial fleets predominate IUUF in the northern range of the region, and artisanal fishing contributes more to IUUF further south. While both types of fishers make their livelihoods from fishing, industrial fleets are generally larger operators with bigger catches sold into national and global markets while artisanal fishers are smaller entrepreneurs who typically sell their catch into local markets. Both are key factors in IUUF in the region, and leverage analysis revealed that changes both or either make are likely to trigger transformative changes across the system.

Feedback loop analysis shows that IUUF damages local fisheries, which reduces the fish available for artisanal fishers. Moreover, IUU fishers compete with local fishers directly. The decline in fishery health and competition with IUUF hurt artisanal fishers. This competition is a disincentive for artisanal fishers to track or report their catch, contributing to poor fisheries reporting and monitoring. With a lack of data, agencies have difficulty enforcing their policies, or even understanding who the key perpetrators are, which reinforces IUUF.



Main feedback loop in Central America



USAID's  
Oceans and  
Fisheries  
Partnership

in Asia is a good model to support **traceability, fisheries management,** and inclusive development in the fisheries sector, and private sector partnerships to address IUUF.

# Possible Programming Actions

## TURN VICIOUS CYCLES INTO VIRTUOUS ONES

Because of the key role artisanal fishers play in Central American waters, building their **capacity** to fish legally and report their catch can reduce overfishing and have a positive impact on livelihoods and overall fishery health. Also, improving fishers' **reporting** would improve enforcement and help identify where entrenched IUUF is happening.

Investing directly in **enforcement** could also help reduce IUUF directly, but experts suggest that care should be taken to ensure that enforcement measures do not disproportionately target small-scale fishers or punish illegal livelihoods without replacing them with legal alternatives. While analysis suggests that addressing livelihoods alone would be unlikely to transform the system, livelihood support could improve enforcement impacts.

## MONITOR KEY INDICATORS OF SYSTEM CHANGE

As is the case in the Caribbean, monitoring data related to domestic industrial fleets' and artisanal fishers' **legal fishing revenue** could reveal the status of IUUF in the area. Moreover, understanding the **prevalence of each illegal practice** in a given country or fishery would help governments hone regulations and policies appropriately and build political will to protect domestic fisheries.

[+]

OceanMind has partnered with Conservation International since 2016 to provide satellite monitoring and surveillance in the Eastern Tropical Pacific, in particular supporting **enforcement** with the Costa Rican Coast Guard.

## FILL KNOWLEDGE GAPS

In this region, little is quantitatively known about **IUUF** itself, such as who is participating in IUUF, to what extent, where, and how. USAID’s tracking of metrics across the region could constitute a knowledge base upon which regional collaboration could be built.

## PARTNER WITH KEY ORGANIZATIONS

**Table 3:** Organizations working on suggested intervention points in Central American fisheries.

ORGANIZATION(S)	MODEL OR SUCCESS STORY	SUGGESTED INTERVENTION		
		Artisanal Fishers' Capacity	Reporting	Enforcement
<a href="#">Organización del Sector Pesquero y Acuicola del Istmo Centroamericano</a> (OSPESCA, the fisheries branch of SICA)	OSPESCA supports management of the fisheries and aquaculture sector in Central America and participates regularly in events and data collection on IUUF in the region.		✓	✓
<a href="#">Rare</a>	<a href="#">Fish Forever</a> in the Mesoamerican Reef works with fishing communities and municipal governments to build and strengthen coastal fisheries management across the Caribbean coasts of Honduras and Guatemala.	✓		✓
	<a href="#">OurFish</a> is an app designed by Rare with community partners. It facilitates easy collection and consolidation of artisanal fisher catch data to improve understanding of fishing markets and fisheries and of the economic scale and impacts of artisanal fishing. The app is used in Honduras and Belize, as well as in Myanmar, and is being piloted in Indonesia.	✓	✓	
<a href="#">Packard Foundation</a>	The Packard Foundation works on a variety of programs supporting fisheries management in <a href="#">Mexico</a> . For example, Packard contributed to the certification of Fair Trade shrimp fishers in the state of Sinaloa (pg. 3).	✓		

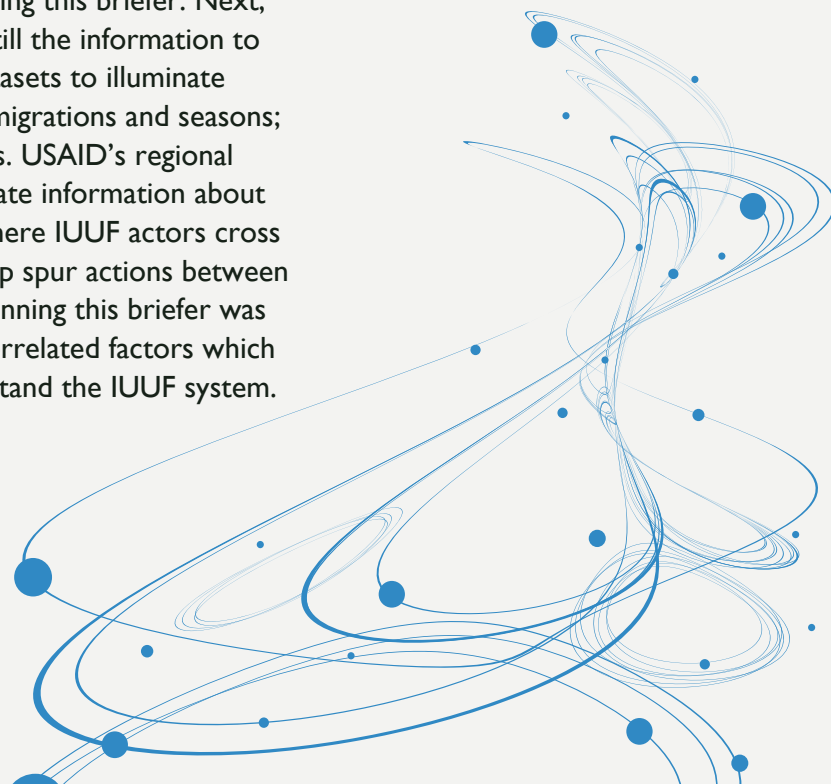
# Regional Approaches to Address IUUF



Systems analysis demonstrates that the Pacific Coast of South America, the Caribbean, and the two coasts of Central America experience IUUF differently and exhibit distinct patterns. Thus, USAID bilateral Missions can use the analysis specific to their area and issues to inform which of several approaches they might take to address IUUF and its impacts on their host countries. The systems analysis also found similarities across the geographies that suggest opportunities for USAID to leverage regional Missions and the LAC Bureau in expanding the knowledge base, supporting regional collaboration and learning, and partnering with global and regional partners to expand the scale and impacts of USAID investments.

## **EXPAND THE KNOWLEDGE BASE**

LAC/RSD demonstrated thought leadership by convening the IUUF conversations informing this brief. Next, LAC/RSD could develop and strengthen systems to monitor regional and global data, distill the information to inform strategic decisions, target information for key national partners, and aggregate datasets to illuminate regional impacts. Data sources could include: DWF and domestic fleet movements; fish migrations and seasons; catch landings, markets, and pricing; and economic and social impacts of IUUF at all scales. USAID's regional Missions are also critical to expanding the knowledge base; they can collect and disseminate information about IUUF activities and impacts within or between sub-regions. In particular, documenting where IUUF actors cross national boundaries, sell catch, and exploit weaknesses in regional coordination could help spur actions between neighbors to address a common threat. As noted on page 6, the systems analysis underpinning this brief was limited by the resources available; USAID and others should continue to explore the interrelated factors which influence IUUF across the region and strengthen the models by which we seek to understand the IUUF system.







## SUPPORT REGIONAL COLLABORATION AND LEARNING

USAID could also contribute to a regional community of practice, convening relevant actors to gather, synthesize, and share lessons about which strategic approaches work well in what conditions and disseminating those lessons in a variety of products. Additional conversations with regional IUUF experts and stakeholders are strongly recommended to vet, clarify, deepen, and revise the systems analysis and associated recommendations informing this briefer. Regularly updating the systems maps would hone the analysis and elucidate how the IUUF systems are shifting over time: better data build more accurate models, which then yield more targeted and effective recommendations. Regional Missions are uniquely placed to convene coordination conversations and develop information sharing among bordering countries. Regional Missions could also engage bilateral Missions to bring key national actors to the table to address regional concerns. Finally, regional Missions can share lessons learned about IUUF and efforts to address it with bilateral Missions and regional and national governments.

## PARTNER FOR IMPACT

In the LAC region, as around the globe, time is running out to halt IUUF before global fisheries are damaged beyond recovery. Gathering, analyzing, and sharing the information from the expert roundtables and literature review is only the first step to improve the health and future outlook of marine ecosystems and coastal communities. Building a broader understanding of IUUF in the region and sharing lessons about what strategic approaches work are the critical next steps needed to ensure the sustainable development of coastal LAC countries. The last step is to develop partnerships with stakeholders from all sectors with the expertise, authority, and scale to act effectively to halt IUUF. In addition to current and past international partners, such as [Global Fishing Watch](#) and the [Food and Agriculture Organization of the United Nations](#) (FAO), the roundtables and literature review uncovered a number of global and regional organizations and partnerships which USAID can join, leverage, and expand to address IUUF in LAC:

-  The [Sustainable Fisheries Partnership](#) engages retailers, brands, and foodservice companies to drive actions through their seafood supply chains to rebuild depleted fish stocks, reduce the environmental impacts of fishing and fish farming, protect ocean biodiversity, address social issues in fishing, and advance economic opportunities for fishers and their communities worldwide with success stories in [Mexico](#) and [Peru](#).
-  The [International Seafood Sustainability Foundation](#) brings together industry, scientists, and conservationists together to better manage Tuna fisheries worldwide.
-  Certification systems, like that of the [Marine Stewardship Council](#), can help fishers get access to better markets and ensure that the right incentives exist for standards to be followed. They also help raise awareness of fisheries challenges and increase global demand for sustainable seafood.
-  Companies and non-profits, such as [OceanMind](#), [Skylight](#), and [HawkEye 360](#) are developing remote tracking systems and other technologies to aid in finding, understanding, and addressing IUUF.

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