The Strategic Significance of the Chinese Fishing Fleet

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The sheer tonnage of China's sixteen thousand hull fishing fleet and the fleet's illegal, unreported, and unregulated (IUU) practices exert their own gravitational pull for diplomatic, intelligence, military, and economic analysts globally. Contextualizing China's massive fishing fleet within China's grand strategy, identifying the most likely use case for the fleet, and assessing the most dangerous use case suggest the need for updates in the U.S. Department of Defense's role in monitoring and addressing the assessed threats.

Most Likely Course of Action

While security professionals and naval strategists grow suspicious over the staggering number of Chinese fishing vessels, the primary objective of the fishing fleet is to deliver meat to an increasingly affluent Chinese population with a growing appetite for protein.[1] The dietary evolution of China's 1.4 billion citizens and the corresponding increase in imports have shifted global protein markets dramatically over the past decade.[2] Further, the increase in Chinese meat consumption occurred in conjunction with repeated domestic failures in China's land-based agriculture associated with livestock disease, contaminated groundwater, and poor land management practices.[3] China's domestic production has been so overwhelmed by demand that China has uncharacteristically exposed itself to annually increasing trade dependencies such as the 2020 Phase One trade deal with the United States.[4] While protein imports may seem low risk from the U.S. perspective, they represent a major deviation from Maoist philosophies on China as a self-sustaining food producer.

Given the significant and growing protein demand, China's fishing fleet has aggressively overfished all regional seas, earning China the top marks as the world's worst offender of IUU fishing.[5] While China's fishing fleet of over sixteen thousand blue water hulls seems an asset to military analysts, economists may view the need for such a far traveling fleet as an embodied liability. The need for this large open ocean fleet suggests that China may be experiencing a fishery stock collapse in nearby seas.[6] This is of particular concern for China, the world's largest fishing nation.[7] Unlike failed harvests on land, a fishery stock collapse represents a strategic loss as it can take decades or longer to rehabilitate. The United States' own localized fishery collapse in the 1980s in the Aleutian Basin offers a glimpse of what China may be suffering on a broad scale.[8]

After ravaging its local seas, China spread its IUU fishing practices to Africa and Oceania. Open-source reporting from nongovernmental organizations (NGOs) and government agencies thoroughly document China's IUU practices in Western Africa in particular.[9] Many of the countries impacted by these fishing practices partner with China's Belt and Road Initiative (BRI) but quietly face an existential threat from overfishing due to critical nutritional and economic dependencies.[10] Challenges of overfishing present huge, but not immediately obvious, problems. The effects often metastasize within the legitimate economy and destabilize a number of factors like unemployment, tax revenues, and many others. Somalia's past decades of instability offer a glimpse of what can happen when fishing-dependent fragile states suffer from a fisheries collapse.[11]

Regardless of whether neighboring countries welcome China's aggressive and often illegal fishing practices, China will leverage its recently accrued diplomatic heft in international governmental organizations (IGOs) to push past international norms of behavior and weaker regional powers and devastate the fishing economies of its neighbors.[12] China's conflicts with Vietnam on these matters offer a clear example, which will be discussed in greater detail.

Impacts from the Most Likely Course of Action

Diplomatic. China has successfully campaigned against the international legal frameworks governing the sea and undersea for over a decade—particularly in international waters or transition zones between different exclusive economic zones.[13] China's excessive territorial claims in the South China Sea provide an excellent predicate for how China may further challenge legal frameworks governing fisheries. In addition to legal negotiations, China's overt pressure on the neighboring nation's fishing fleet reached new heights in 2020 when a Chinese Coast Guard (CCG) cutter collided with and sank a Vietnamese fishing vessel.[14] The response of international maritime bodies that establish norms for fishing fleets will set precedent for China's next moves in its assertive displays in the region.

Military. The Chinese naval forces include the People's Liberation Army Navy (PLAN), the CCG, and the People's Armed Forces Maritime Militia (PAFMM). The PLAN and the CCG conduct regular patrols, but the PAFMM engages in gray-zone activities near contested features such as Scarborough Bank, the Parasails Islands, and other areas of the South China Sea.[15] Among other tactics, the PAFMM has demonstrated a willingness, ability, and proficiency to band together to form phalanx formations, which disrupt freedom of navigation exercises of U.S. and allied militaries.

As argued previously, the most likely course of action (COA) for the fishing fleet is to continue fishing. However, the large number of fishing vessels offers a ready and distributed platform for signals, acoustic, and imagery collection. If outfitted with basic commercial sensors, the fishing fleet could sustainably scan over 1.2 million nautical miles per day.[16] This collection could occur passively without losing any of the protections of a fishing vessel upon the high seas afforded by the United Nations' Convention on the Law of the Sea. Table 1 (on page 35) provides the outputs of a parametric analysis performed using assumptions about standard fishing vessel maintenance, sensor reliability, and operational patterns.

Previous page: An aerial view of thousands of fishing boats as they berth near Shenjiamen Harbor 1 September 2020 due to Typhoon Maysak, the ninth typhoon of the year in Zhoushan City, east China's Zhejiang Province. (Photo by Imaginechina via Associated Press)

Economic. As with many other manufacturing industries, the Chinese government's subsidization of shipbuilding and sustainment will reorient global markets toward Chinese dependency.[17] The focus of China's investments has been directly aimed at commercial shipping such as oil tankers and container ships, but the capital, liquidity, and favorable regulatory environment provided to the shipbuilding market as a whole generate a positive environment for all classes of ship construction in China. The explosive growth of the Chinese fishing fleet highlights the maritime industry as the latest vector for economic dumping, which will systematically weaken other shipbuilding nations. The accompanying job creation increases the probability the Chinese government will continue its direct support for the shipbuilding industry.

Though U.S. shipyards maintain a qualitative edge at producing and maintaining capital ships such as nuclear-powered submarines and aircraft carriers, they offer no quantitative competition with China in terms of hulls or tonnage. China's status as the world's most prolific low-cost manufacturer secured its position as the world's largest shipbuilding nation (22.3 million gross tons in 2019).[18] As a result of the shipbuilding boom, China's shipbuilding sector has generated staggering progress toward the modernization of the PLAN. The production potential in both the number of hulls and tonnage per hull will remain an important indicator of China's economic and naval competitiveness.[19]

Lastly, China's geographical containment within the first island chain led to its historic orientation as a continental power. However, large maritime industries and a mariner corps to man the blue water fishing fleet will generate maritime depth in seafaring industries that may be needed for a large or protracted maritime conflict.[20]

Table 1. Parametric Analysis of Fishing Fleet in Most Likely Course of Action

Assumptions about each individual ship operating within a fleet	
Average speed of vessel engaged in fishing	8 knots
Average sensor operational availability (at least one of two sensors operating)	90%
Average downtime for sensor maintenance (enables 90% availability of sensors)	20%
Operational tempo per crew (time a rotating crew is deployed at sea/multiple crews assigned each ship to maximize time at sea)	40%
Fuel supply (fishing fleet regarded as a People's Liberation Army strategic priority)	Unconstrained
Model outputs	
Number of available hulls	10,986
Number of available hulls with sensors	6,400
Approximate nautical miles scanned per twenty-four hours	1,228,000

(Table by author. Model output information taken from "Parametric Analysis in Cameo Systems Modeler with ParaMagic Using the Systems Modeling Language," January 2021)

Most Dangerous Course of Action

Based on the above analysis, the majority of China's fishing fleet must remain actively fishing or the population will suffer significant nutrition deprivation. The Chinese Communist Party possesses the means and the will to impose deprivation upon its highly nationalistic population, but the prioritized utilization of the fishing fleet for protein production will increase during any sustained maritime conflict, especially if deteriorating relations with the United States and its allies result in degradation or termination of protein exports to China.

Fishermen sort fish 31 March 2017 on the deck of Chinese fishing boat *Bo Yuan 1* near Conakry, Guinea, Western Africa. The Greenpeace ship *Esperanza* was on tour in West African waters to address the problem of overfishing in the region. (Photo by Pierre Gleizes ©/Greenpeace, https://media.greenpeace.org/C.aspx?VP3=DirectSearch&AID=KWF6MY9JVU1. Used with permission)

In 2019, Brazil, the European Union, United States, Australia, and New Zealand provided over half of China's agricultural imports.[21]

In the most dangerous COA, China diverts a portion of its large fishing fleet to augment the PAFMM, which systematically floods the contact picture in the Western Pacific during a maritime conflict. Even if unarmed, a flooded contact picture increases the difficulty of U.S.-led intelligence, surveillance, reconnaissance, and targeting (ISR&T) activities. Such an abundance of sentries would increase the difficulty of U.S. counter-ISR&T and offensive maneuvers. Additionally, China's aggressive development of economic basing under the BRI includes fisheries depots.[22] These fishery depots could be used to sustain the fishing fleet and PAFMM. China already deploys its burgeoning private military contractors along the BRI, and these private military contractors could efficiently harden the fishery depots.[23]

From a collateral damage perspective, the presence of large numbers of fishing vessels offers potential liabilities for civilian deaths, which the Chinese would leverage to erode legitimacy of a U.S.-led campaign on the high seas or in China's claimed exclusive economic zones.[24] China would most likely leverage its platform at the United Nations and similar IGOs to amplify its narrative, regardless of whether the fishing vessels engaged in activities that qualified them as legitimate military targets. Even in an extreme scenario where the United States designated all Chinese fishing vessels within an operating area as lawful targets, operational commanders would have to balance the economics of expending exquisite U.S. weapons against small craft in order to preserve ordinance for priority targets.

Should China divert any portion of the fishing fleet for paramilitary activities, the most likely capability upgrades will support expanded ISR&T, overt harassment of U.S.-led naval platforms, or terrorist acts upon the sea.[25] Under the cloak of the fleet's protected status as

fishing vessels, these platforms would inflict maximum harassment in order to maximize intelligence gain.

Lastly, the United States enjoys an undersea advantage that extends deep into the Western Pacific, courtesy of the U.S. submarine fleet.[26] If the fishing fleet was used effectively, China could use it to systematically degrade the acoustic environment that submarines rely on for effective employment. For example, large trawler convoys could saturate the acoustic environment to mask the movement of capital warships over key maritime terrain. Additionally, China has invested heavily in undersea infrastructure to counter the U.S. submarine fleet, and up-fitted fishing vessels could serve as distributed mobile listening stations and augment fixed infrastructure.[27]

What Is the Role of the Joint Force in This Fight?

The Chinese fishing fleet does not currently represent a military threat to the United States, but the PLAN could apply these resources in overt or gray-zone military activities. The following analysis provides a framework for the joint force's resource planning efforts with respect to Chinese fishing fleets and provides context for many of the critical security issues that define the region.

The Chinese fishing fleet problem set has a combination of naval, diplomatic, and commercial elements, but key resource providers like the U.S. Army will be significant stakeholders in developing U.S. military strategy for the region. First, the Army maintains the largest number of uniformed personnel in the Department of Defense (DOD), and effective employment of the Army's human resources over the vast Pacific will be critical. Additionally, the Army's robust liaison channels with partner nations via the Defense Security Cooperation Agency (DSCA) will provide numerous opportunities to effectively channel partner resources.

Recommendations to Counter China's Most Likely Course of Action

Diplomatic. The joint force has the potential to support diplomatic gains in vulnerable areas in Africa, South Asia, and Oceania via effective cooperation with non-DOD agencies. Many U.S. agencies like the U.S. Coast Guard (USCG), National Oceanic and Atmospheric Agency (NOAA), U.S. Fish and Wildlife Service, and others augment the State Department's efforts to combat China's abusive fishing practices. While the DOD's largest footprint traditionally occupies the land domain, programs like the Army's linguistic corps offer a key resource in a region with so many spoken languages. In the context of managing the threats posed by China's fishing fleet, the USCG actively engages with partner nations to combat IUU fishing.[28] However, the USCG, NOAA, and other agencies lack the capacity to train linguists to accompany their large and growing list of bilateral fisheries partners. The Army could meaningfully augment fisheries enforcement teams and facilitate deepening diplomatic relationships with concerned nations. Indonesian, Thai, Malayan, Mandarin, Hindi, Arabic, and West African language expertise will all be critical in this endeavor and could easily convert to more traditional DOD activities on land.

Development of nontraditional partnerships with agencies like the U.S. Fish and Wildlife Service, U.S. Department of Agriculture, USCG, and NOAA will require sustained effort, since these organizations may not be accustomed to the DOD's sometimes overwhelming business and operational practices.[29] However, these agencies' specific knowledge will provide increased insights into the calculations of China's fishing fleet and which of the joint force resources will provide the greatest relevance to any contingency.[30]

Information. China's overfishing and manipulation of fishing markets offer opportunities for U.S.-led information campaigns against the Chinese and opportunities to attract new partners, allies, and "silent partners" in the Western Pacific. U.S. efforts could include both overt and covert exploitation of these tensions.[31] Where legal authorities permit, the military services' public affairs, civil affairs, and information operation units may exercise their capabilities to influence the global view of Chinese fishing practices. For example, amplifying the open reports of the Food and Agriculture Organization of the United Nations offers effective methods of raising awareness of China's abuses at

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sea.[32] Additionally, and perhaps more importantly, the joint force could collaborate with private analysis firms like FishSpektrum to provide objective information to the international community about Chinese fishing practices and abuse of international maritime protocol.[33] Partnerships with third-party outlets would provide objective perspectives distanced from a U.S. speaker, which serves a strategic purpose in a time of strained Sino-U.S. relations.

Military. The U.S. military is actively involved in security cooperation relationships with countries concerned over fisheries, but the United States often lacks effective marketing for its efforts in the region. For example, Operational Northern Pacific Guard and the Maritime Oceania Security Initiative expend U.S. military resources on protection of fisheries for small nations in the Pacific, but the United States spends comparatively little to ensure the local populations of partner nations understand the security and value the United States delivers to their economy.[34] In comparison, China accompanies any contributions to partner nations with public ceremony, physical monuments, and contractually required statements of support for flagship programs like the BRI.

The DSCA offers a key vector for the Army to contribute resources toward mitigating the threat posed by the Chinese fishing fleet. The DSCA's consistent presence and effective branding offers an excellent pairing for the military services to apply resources toward interoperability training for disaster response and humanitarian assistance. Perhaps most importantly, DSCA provides an integrated channel for all the contributing services and agencies engaged against China's abusive fishing practices. In the past, the United States sometimes lacked a coordinated approach to building partner capacity, so many U.S. agencies offering resources intermittently contacted single representatives of underresourced partner nations. Not only does this appear disorganized to would-be partners, but it also increases the cost of receiving aid from the United States. The DSCA's approach toward tailoring assistance packages for the needs of each nation offers the DOD an effective partner in placing resources at the point of need.

Table 2. Priority Intelligence Requirements for the Chinese Fishing Fleet

Priority intelligence requirements	
1	Identify logistical hubs that sustain the Chinese fishing fleet (e.g., at-sea refueling ships and fishery bases)
2	Assess the overall fuel demand of the Chinese fishing fleet relative to capacity of distributed logistical hubs
3	Identify primary points of fishery off-load to Chinese food processors
4	Analyze disputes between Chinese vessels (the People's Liberation Army Navy, Chinese Coast Guard, People's Armed Forces Maritime Militia, or fishing vessel) and any non-Chinese fishing vessel (e.g., Vietnam)

(Table by author)

Economic. In the realm of economics, the joint force should seek to illuminate the negative consequences of Chinese economic practices in all diplomatic, information, and military activities. Efforts should seek to inform partner nations about the risks of Chinese debt-book diplomacy that frequently recur within the BRI. The joint force should leverage the support of NGOs for this critical objective. NGOs like the Pew Charitable Trust specialize in counter-IUU fishing.[35] These NGOs often retain local representatives that maintain longstanding relationships with local government leaders, which avoids the perception that the United States pushes a colonialist or political agenda. IGOs like the World Bank also offer another meaningful path for influence on counter-IUU fishing.[36]

Recommendations to Counter China's Most Dangerous Course of Action

In addition to the above actions, the joint force may need to apply military capabilities and resources to address the most dangerous COA for the Chinese fishing fleet.

Excerpt from "China's Monster Fishing Fleet"

By Christopher Pala

Foreign Policy · 30 November 2020

https://foreignpolicy.com/2020/11/30/china-beijing-fishing-africa-north-korea-south-china-sea/

"On August 5, 2017, China complied with a United Nations decision and formally imposed sanctions on North Korea, including a ban on seafood exports. Seafood, particularly squid, is one of North Korea's few significant foreign-exchange earners, and the sanctions were expected to increase the pressure on the regime.

"But just a few weeks after the ban came into effect, hundreds of squid-fishing vessels left Chinese waters and rounded the southern tip of South Korea. They entered North Korea's 200 nautical-mile exclusive economic zone (EEZ), nearly doubling the number of Chinese fishing vessels operating there from 557 to 907, according a recent Global Fishing Watch report that tracked data from four different satellite systems. Even as China publicly claimed that is was complying with sanctions, many of the Chinese vessels continued to make trips to North Korea and back, including several round trips each year during both 2018 and 2019, said Jaeyoon Park, one of the report's lead authors.

"The Chinese fleet, made up of squid jiggers and pair trawlers, scooped up a staggering amount of squid—equal to almost as much as the entire squid catch in Japanese and South Korean waters combined over the same period, the report estimated. The Chinese decimated the squid population off North Korea to such a degree that Japanese and South Korean fishers saw their own take of the usually plentiful, migratory species plummet."

A Chinese fishing vessel equipped with an array of lights that are meant to attract squid at night is anchored in South Korean waters. (Photo courtesy of South Korean Fisheries Agency/ Ulleung Island)

In any large-scale conflict with China, the U.S.-led campaign plan will seek to counter Chinese anti-access/area denial investments with the types of technologies and operational concepts associated with Joint All Domain Command and Control and service-related initiatives such as the U.S. Air Force's All-Domain Battle Management System, the U.S. Army's Project Convergence, the U.S. Marine Corps' Expeditionary Advanced Base Operations, and the U.S. Navy's Project Overmatch.[37] As detailed above, the Chinese fishing fleets could meaningfully complicate the United States' high-end capabilities through overt means (e.g., ISR&T) or through masking movement of military formations. The large number of fishing hulls and unclear lawful target status challenge resources and the standard rules of engagement, so planners should prioritize disabling logistical hubs for fishing fleet sustainment. For example, degrading at-sea refueling operations of the fishing fleet would limit the effective range of fishing vessels. Table 2 (on page 38) provides a recommended list of priority intelligence requirements associated with the Chinese fishing fleet.

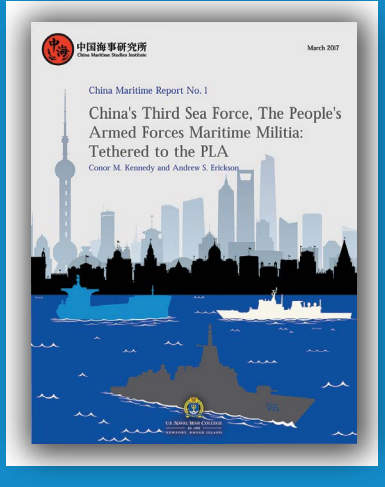
Should the U.S.-led effort require denying, degrading, or destroying any portion of the Chinese fishing fleet or logistical enterprise, the United States must prepare the supporting narrative and rules of engagement. Regardless of facts on the ground, China's legal strategy will likely accuse the United States of engaging in unrestricted warfare.[38] The joint force's vast experience in low-intensity conflict over the past two decades offer the opportunity to augment the Navy's experience in this area. Similar to navigating a convoy through a dense urban environment, a war in the Western Pacific will transit the densest maritime traffic scheme on the planet.[39]

The United States will need cooperative assets such as advanced capability naval platforms, sensors, and weapons in any envisioned conflict in order to disable high-end vessels like Chinese destroyers. However, fishing vessels engaged in paramilitary activities and supporting land-based logistical hubs provide manageable contacts for ground-based forces and partner nations to address with lower-cost munitions. This division of labor would increase efficiency and provide more effective weapon-target pairing.

The DOD should place a key emphasis on developing military interoperability with Indian Armed Forces.[40] Geopolitical analysis routinely emphasizes the importance of India's role in defining the probability of success for any sustained maritime conflict with China. India offers key terrain in the diplomatic, intelligence, military, and economic domains. Diplomatically, India has the best chance of championing the plight of developing nations suffering from Chinese abusive fishing practices. From an intelligence perspective, India's long coastline across the world's busiest maritime trading routes ensure that all commercial and military maritime traffic is within the range of shore-based, intelligence gathering capabilities. With respect to the military, India's partnership in preserving freedom of the seas and observance of international fisheries will be critical in upholding legitimate commerce should the United States become embroiled in maritime conflict.

Economically, the United States and China compete for the status of India's largest trade partner.[41] However,

In response to growing concern regarding the emerging role of China's maritime militia as a sea force that had been involved in a series of international incidents aimed at intimidating China's regional neighbors and obstructing free transit through the South China Sea, the U.S. Naval War College prepared a short study titled *China's Third Sea Force, The People's Armed Forces Maritime Militia: Tethered to the PLA*. Published in 2017, this report outlines the structure, command and control, and strategic role of this force within Chinese overall geopolitical and military strategy. It seeks to clarify the maritime militia's exact identity, organization, and connection as a reserve force that supports the objectives of the People's Liberation Army. U.S. military decision-makers should be aware of the role the Chinese maritime militia and that of the expanding Chinese civilian fishing fleet that is also increasingly used as an instrument of coercion, intimidation, and attempted normalization of territorial claims. To view this study, visit https://digital-commons.usnwc.edu/cmsi-maritime-reports/1/.



Twelve Chinese fishing boats are banded together with ropes 21 December 2010 to try to thwart an attempt by a South Korean coast guard ship to stop their alleged illegal fishing in the Yellow Sea off the coast of South Korea. (Photo by Park Young-Chul, Agence France-Press)

India's consistently positive trade balance with the United States earns it a more favorable perception than India's consistently negative trade balance with China. In a future conflict, reinforcing cooperation with India offers a key pathway to fortify the region, and early effort by the joint force in this line of effort will provide strategic advantage.

Conclusion

The number of hulls and overall tonnage of China's fishing fleet should qualify it as a modern marvel, and military planners should monitor its use closely. Across the spectrum of conflict, the fishing fleet will most likely support its primary mission of protein harvest. However, Chinese planners could divert a relatively small percentage of these fishing vessels for paramilitary activity in the most dangerous COA to great effect. Below the threshold of conflict, the military services can play critical roles in suppressing the harmful activities of China's abusive fishing fleet. In doing so, the DOD will establish and mature key relationships with nontraditional federal agencies, partner nations, NGOs, and IGOs that will deliver decisive effects should Sino-U.S. tensions rise above the threshold for armed conflict. ■

Notes

1. "How Is China Feeding Its Population of 1.4 Billion?," China Power, updated 26 August 2020, accessed 25 January 2021, https://chinapower.csis.org/china-food-security/.

2. Paul Westcott and Ronald Trostle, *USDA Agricultural Projections to 2023* (Washington, DC: U.S. Department of Agriculture [USDA], 2014), 38–42, accessed 2 February 2021, https://www.ers.usda.gov/publications/pub-details/?pubid=37751.

3. David Stanway and Niu Shuping, "In China, Food Scares Put Mao's Self-Sufficiency Goal at Risk," Reuters, accessed 21 January 2021, https://www.reuters.com/article/us-china-pollution-rice/in-china-food-scares-put-maos-self-sufficiency-goal-at-risk-idUSBRE94L17J20130522.

4. "USDA and USTR Announce Continued Progress on Implementation of U.S.-China Phase One Agreement," USDA Press, 24 March 2020, accessed 21 January 2021, https://www.usda.gov/media/press-releases/2020/03/24/usda-and-ustr-announce-continued-progress-implementation-us-china.

5. Graeme Macfadyen et al., *The Illegal, Unreported and Unregulated Fishing Index* (Geneva: Poseidon Aquatic Resource Management Limited and the Global Initiative Against Transnational Organized Crime, 2019), 27.

6. Miren Gutierrez et al., *China's Distant-Water Fishing Fleet: Scale, Impact and Governance* (London: Overseas Development Institute, 2020), 9.

7. Marie-Caroline Badjeck et al., *The Vulnerability of Fishing-Dependent Economies to Disasters*, Food and Agriculture Organization of the United Nations (FAO) Fisheries and Aquaculture Circular No. 1081 (Rome: FAO, 2013), 15.

8. Kevin M. Bailey, "An Empty Donut Hole: The Great Collapse of a North American Fishery," *Ecology and Society* 16, no. 2 (2011).

9. Alfonso Daniels et al., *Western Africa's Missing Fish: The Impacts of Illegal, Unreported and Unregulated Fishing and Under-Reporting Catches by Foreign Fleets* (London: Overseas Development Institute, 2016), accessed 21 January 2021, https://www.odi.org/publications/10459-western-africas-missing-fish-impacts-illegal-unreported-and-unregulated-fishing-and-under-reporting.

10. David Dollar, *Understanding China's Belt and Road Infrastructure Projects in Africa* (Washington, DC: The Brookings Institution, Domains of Strategic Competition, 2019), 4, accessed 3 February 2021, https://www.brookings.edu/research/understanding-chinas-belt-and-road-infrastructure-projects-in-africa/.

11. Samantha D. Farquhar, "When Overfishing Leads to Terrorism: The Case of Somalia," *World Affairs: The Journal of International Issues* 21, no. 2 (2017): 68–77.

12. Matthew Sedacca, "China Has Fished Itself Out of Its Own Waters, So Chinese Fishermen Are Now Sticking Their Rods in Other Nations' Seas," Quartz, 4 April 2017, accessed 21 January 2021, https://qz.com/948980/china-has-fished-itself-out-of-its-own-waters-so-chinese-fishermen-are-now-sticking-their-rods-in-other-nations-seas/.

13. Dean Cheng, *Winning Without Fighting*, Backgrounder No. 2692 (Washington, DC: The Heritage Foundation, 2012), 1, accessed 3 February 2021, https://www.heritage.org/asia/report/winning-without-fighting-chinese-legal-warfare.

14. John Grady, "Veneer of China's Charm Offensive Cracked by Vietnamese Fishing Boat Incident," U.S. Naval Institute News, 9 April 2020, accessed 21 January 2021, https://news.usni.org/2020/04/09/veneer-of-chinas-charm-offensive-cracked-by-vietnamese-fishing-boat-incident.

15. Derek Grossman and Logan Ma, "A Short History of China's Fishing Militia and What It May Tell Us," *The RAND Blog* (blog), 6 April 2020, accessed 21 January 2021, https://www.rand.org/blog/2020/04/a-short-history-of-chinas-fishing-militia-and-what.html.

16. James Landreth, "Parametric Analysis in Cameo Systems Modeler with ParaMagic Using the Systems Modeling Language" (unpublished data, January 2021), SysML v1.5.

17. Jude Blanchette et al., "Hidden Harbors: China's State-Backed Shipping Industry," Center for Strategic and International Studies, 8 July 2020, accessed 2 February 2021, https://www.csis.org/analysis/hidden-harbors-chinas-state-backed-shipping-industry.

18. "Largest Shipbuilding Nations Based on Gross Tonnage 2019," Statista, 20 January 2021, accessed 20 January 2021, https://www.statista.com/statistics/263895/shipbuilding-nations-worldwide-by-cgt.

19. *Report to the U.S. Congress on Global Export Credit Competition* (Washington, DC: Export-Import Bank of the United States 2019), 48.

20. Andrew Erickson and Conor Kennedy, *China's Maritime Militia* (CNA, 2016), 28, accessed 2 February 2021, https://www.cna.org/cna_files/pdf/chinas-maritime-militia.pdf.

21. Hui Jiang, "China: Evolving Demand in the World's Largest Agricultural Import Market," USDA, accessed 1 February 2021, https://www.fas.usda.gov/data/china-evolving-demand-world-s-largest-agricultural-import-market.

22. Anthony Bergin and Jeffrey Wall, "China's Deal with PNG Will Deplete Fishing Stock and Pose Border Risk," *The Sydney Morning Herald* (website), 23 December 2020, accessed 21 January 2021, https://www.smh.com.au/national/china-s-deal-with-png-will-deplete-fishing-stock-and-pose-border-risk-20201223-p56pqs.html.

23. Alessandro Arduino, "China's Private Army: Protecting the New Silk Road," The Diplomat, 20 March 2018, accessed 21 January 2021, https://thediplomat.com/2018/03/chinas-private-army-protecting-the-new-silk-road/.

24. Third United Nations Convention on the Law of the Sea, "Article 116," *United Nations Convention on the Law of the Sea*, 10 December 1982, accessed 2 February 2021, https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf.

25. Gregory Poling, "China's Hidden Navy," *Foreign Policy* (website), 25 June 2019, accessed 21 January 2021, https://foreignpolicy.com/2019/06/25/chinas-secret-navy-spratlys-southchinasea-chinesenavy-maritimemilitia/.

26. Chief of Naval Operations (CNO), *CNO NAVPLAN* (Washington, DC: U.S. Navy, 2021), 11, accessed 2 February 2021, https://media.defense.gov/2021/Jan/11/2002562551/-1/-1/1/CNO%20NAVPLAN%202021%20-%20FINAL.PDF.

27. Ewen Levick, "China's 'Underwater Great Wall,'" The Maritime Executive, 18 June 2018, accessed 21 January 2021, https://www.maritime-executive.com/editorials/china-s-underwater-great-wall.

28. Karl L. Schultz, *Illegal, Unreported, and Unregulated Fishing Strategic Outlook* (Washington, DC: U.S. Coast Guard, September 2020), 30, accessed 2 February 2021, https://www.uscg.mil/Portals/0/Images/iuu/IUU_Strategic_Outlook_2020_FINAL.pdf.

29. "Presidential Task Force on Combating IUU Fishing and Seafood Fraud," National Oceanic and Atmospheric Agency Fisheries, 2014, accessed 2 February 2021, https://www.iuufishing.noaa.gov/RecommendationsandActions/RECOMMENDATION8.aspx.

30. Trevor Phillips-Levine, Dylan Phillips-Levine, and Walker Mills, "Leveraging NGOs and Volunteerism for Maritime Surveillance against IUU Fishing," Center for International Maritime Security, 20 October 2020, accessed 21 January 2021, http://cimsec.org/leveraging-ngos-and-volunteerism-for-maritime-surveillance-against-iuu-fishing/46166.

31. Blake Earle, "US-China Fight over Fishing Is Really about World Domination," The Conversation, 21 September 2020, accessed 21 January 2021, https://theconversation.com/us-china-fight-over-fishing-is-really-about-world-domination-145977.

32. "Fishery and Aquaculture Country Profiles: The People's Republic of China," FAO, accessed 21 January 2021, http://www.fao.org/fishery/facp/CHN/en.

33. Roberto Bregazzi, *Domino Effects of Cumulative Bias and Erroneous Data in Fisheries Big-Data Mapping Models* (Madrid: FishSpektrum, May 2017), 48, accessed 2 February 2021, https://www.oceanactionhub.org/fishspektrum-latest-report-domino-effects-cumulative-bias-and-erroneous-data-fisheries-big-data.

34. U.S. Coast Guard District 14 Hawaii Pacific, "Coast Guard, Navy Complete Joint Oceania Maritime Security Initiative Patrol in Pacific Ocean," U.S. Indo-Pacific Command, 1 May 2018, accessed 21 January 2021, https://www.pacom.mil/Media/News/News-Article-View/Article/1509299/coast-guard-navy-complete-joint-oceania-maritime-security-initiative-patrol-in/.

35. "Ending Illegal Fishing," The Pew Charitable Trusts, accessed 21 January 2021, https://www.pewtrusts.org/en/projects/ending-illegal-fishing-project.

36. "Blue Economy," The World Bank, accessed 21 January 2021, https://www.worldbank.org/en/topic/oceans-fisheries-and-coastal-eonomies#2.

37. Jen Judson, "Inside Project Convergence: How the U.S. Army Is Preparing for War in the Next Decade," Defense News, 10 September 2020, accessed 26 January 2021, https://www.defensenews.com/smr/defense-news-conference/2020/09/10/army-conducting-digital-louisiana-maneuvers-in-arizona-desert/.

38. Adam R. Pearlman, "Chinese Lawfare," The Federalist Society, 19 May 2020, accessed 21 January 2021, https://fedsoc.org/commentary/fedsoc-blog/chinese-lawfare.

39. "How Much Trade Transits the South China Sea?," China Power, updated 25 January 2021, accessed 26 January 2021, https://chinapower.csis.org/much-trade-transits-south-china-sea/.

40. *Indo-Pacific Strategy Report* (Washington, DC: U.S. Department of Defense, 2019), 33, accessed 2 February 2021, https://media.defense.gov/2019/Jul/01/2002152311/-1/-1/1/DEPARTMENT-OF-DEFENSE-INDO-PACIFIC-STRATEGY-REPORT-2019.PDF.

41. "India Trade Balance, Exports and Imports by Country 2018," World Integrated Trade Solution, accessed 25 January 2021, https://wits.worldbank.org/CountryProfile/en/Country/IND/Year/2018/TradeFlow/EXPIMP/Partner/by-country.