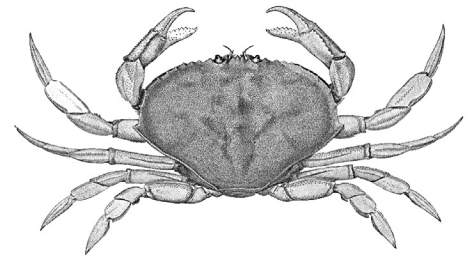


CATCH SHARES IN ACTION

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## **United States Bering Sea and Aleutian Islands Crab Rationalization Program**



### **AUTHORS**

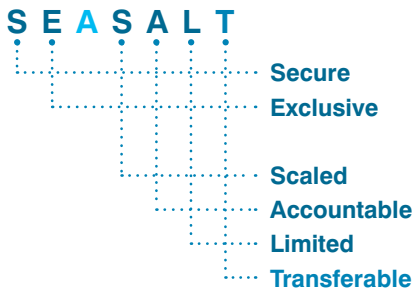
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Karly McIlwain and Jos Hill

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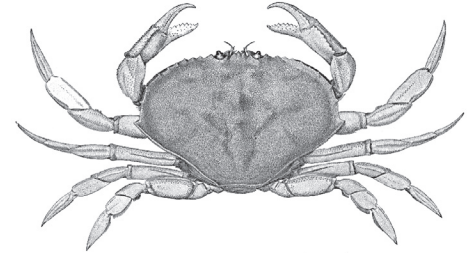
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CATCH SHARES IN ACTION

**United States Bering Sea and Aleutian Islands Crab Rationalization Program**



SPECIAL DESIGN FEATURES



MULTI-SPECIES, INDIVIDUALLY- AND GROUP-ALLOCATED, QUOTA-BASED, TRANSFERABLE

The Bering Sea and Aleutian Islands (BSAI) Crab Rationalization Program (the Rationalization Program) was designed to improve resource conservation, operating efficiency and fishermen’s safety while maintaining participation by remote communities. A number of important features account for the diverse natures of stakeholders and the fishery’s historical importance to many communities. These include: a unique three-pie approach that defines and assigns different types of privileges to vessel owners, crew and processors; an industry-funded, government-operated loan program to assist new entrants and crew; and voluntary Cooperatives that assist in program administration and fishing coordination.

Fishery managers implemented the Rationalization Program in 2005. This catch share program manages five species of crab: red king crab (*Paralithodes camtschaticus*), tanner crab (*Chionoecetes bairdi*), blue king crab (*Paralithodes platypus*), golden king crab (*Lithodes aequispinus*) and snow crab (*Chionoecetes opilio*). The five species are managed as nine distinct stocks. The program allocates individual harvester quota shares and processor quota shares.

The fishing grounds lie off Alaska’s coast in the Bering Sea and Aleutian Islands, in U.S. federal and state waters. Vessels include catcher vessels and catcher-processor vessels ranging in size from 58 to 200 feet. BSAI crab fisheries are lucrative, and fishermen are often among the highest paid fishermen in the country. In 2011, fishermen landed approximately 68 million pounds worth U.S. \$261 million (NOAA Fisheries Service, 2011c). The Bering Sea snow crab and Bristol Bay red king crab are the two most important species in terms of volume landed and value (Abbott et al., 2010).

SYNOPSIS

## Road to a Catch Share

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The BSAI crab fishery began in the 1950s. Although highly lucrative, the fishery has long been characterized by poor weather, fluctuating stock abundance and unsafe conditions. During the 1990s, competition for harvest intensified, resulting in overcapitalization and a race to fish between participants. In 1997, managers restricted entry to the fishery through a Limited License Program (LLP) and implemented season lengths to limit harvests (NPFMC, 2011). These input controls did not resolve the problems, however. Competition intensified and seasons became increasingly shorter. In 2000, the Bristol Bay red king crab fishery was open for only three days. The imprecise nature of using input controls to manage the fishery, coupled with natural stock fluctuations, resulted in inconsistent harvests that were either significantly below, or above, catch limits (Fina et al., 2008). Processors were forced to keep up with the supply by processing landings as quickly as possible, resulting in reduced product quality and unstable, part-time employment opportunities (Fina, 2005). Industry profits declined, fishing conditions became more dangerous and processors began to consolidate (Fina et al., 2010; NPFMC, 2010).

Significant negative social outcomes also occurred. The short seasons forced fishermen to operate in dangerous weather conditions and the fishery became one of the deadliest in the country, with a total of 80 fatalities occurring between 1991 and 2005 (Fina et al., 2008). The then-dangerous nature of the crab fisheries was popularized through the Discovery Channel show, *The Deadliest Catch* (Discovery Channel, 2011).

In response to these failures, Congress directed fishery managers to develop a management plan that would end the race to fish. With goals of addressing biological and economic issues while minimizing impacts on dependent Alaskan communities, managers identified catch shares as the best solution. They designed the Rationalization Program to address the needs of the many stakeholders (Fina, 2005). Despite a nationwide moratorium on implementing new catch share programs between 1996 and 2004, the Rationalization Program was adopted by Congress and implemented on January 1, 2005, coupled with an industry-funded vessel buyback program that reduced the fleet size by 25 vessels (Fina, 2005).

## Performance

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Eight years since its launch, the Rationalization Program has improved the fishery in many ways and is meeting biological, social and economic goals for the program. The Bering Sea snow crab stock has been rebuilt and the status of crab stocks has improved (NOAA Fisheries Service, 2011a). Fishing jobs have transitioned to safer, more stable positions with higher seasonal wages and safety has dramatically improved for fishing crews (Abbott et al., 2010; Fina et al., 2010). Additionally, special design features have benefited remote communities including an increase in deliveries to shore-based processors (E. Poulsen, Alaska Bering Sea Crabbers, personal communication, 2011).

## STEP 1 IN ACTION

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### Define Program Goals

The BSAI Crab Rationalization Program was designed to meet the legal requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) regarding stock sustainability and ecological, economic and social goals. Biological goals prescribed in the National Standards (NS) One, Three and Nine of the MSA (16 U.S.C. 1851) are as follows:

NS1 - Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

NS3 - To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

NS9 - Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

Managers and stakeholders also identified a number of fishery-specific biological, economic and social goals for the catch share program, including meeting specific biological targets and creating economic benefits for vessel owners, crew and remote communities dependent upon crab processing (Fina, 2005). Specific goals for the fishery include:

- Enhanced resource conservation;
- Improved economic efficiency;
- Increased safety for fishermen; and,
- Regional stability and equity (Federal Register, 2005).

These goals are reflected in the Rationalization Program, which designates and assigns harvester and processor shares, provides incentives for Cooperative formation and includes crew in the initial allocation process (Fina, 2005).

## STEP 2 IN ACTION

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### Define and Quantify the Available Resource

The BSAI crab fishery includes nine separate stocks of five crab species: red king crab (*Paralithodes camtschaticus*), blue king crab (*P. platypus*), golden (or brown) king crab (*Lithodes aequispimus*), tanner crab (*Chionoecetes bairdi*) and snow crab (*C. opilio*). Each of the crab stocks is defined by an area and a species. Stock designations were developed in pre-existing management structures laid out in the BSAI Crab Fishery Management Plan (NPFMC, 2011).

Catch limits are established for each stock based on scientific recommendations (Fina et al., 2008; NPFMC, 2011) and set at levels to maintain or rebuild stocks, if needed. BSAI crab stocks experience fluctuations in population size from year to year that are attributed to dynamic environmental conditions, previous harvests and bycatch from other fisheries (NPFMC, 2011). The Bering Sea tanner crab and Pribilof Island blue king crab stocks were overfished prior to program implementation (Bowers et al., 2005). The snow crab stock was determined to be overfished in the early 2000s and has since been rebuilt (Bowers et al., 2005). Discarded crabs have a high survival rate, and participants are permitted to discard crab without a charge against quota holdings. However, dead discards are incorporated into the determination of future catch limits, and efforts are made within the industry to minimize discard mortality (Fina et al., 2010).

## STEP 3 IN ACTION

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### Define Eligible Participants

This program has a number of unique eligibility characteristics to meet the goals of regional stability and equity. The program allocates long-term privileges to both individuals and groups. Allocation to individuals is made through a “three-pie” system that includes: (1) harvesting quota shares to eligible vessel owners; (2) harvesting quota shares to eligible crew; and (3) processing quota shares to eligible processors. Eligible harvesting participants include vessel owners with a history of crab landings and crew with a history of participation. Shore-based processors with a history of processing crab are eligible to receive processor quota. Additional rules require eligible vessel owners to land a certain portion of their annual allocations to processors. The program also provides a specific annual allocation to West Alaskan fishing communities participating in the Community Development Quota (CDQ) and to Adak, Alaska, a remote community in the Aleutian Islands that is reliant on commercial fishing and processing. (See Step 4 below for a more detailed description of the different types of quota).

The catch share program was designed to promote the formation of Cooperatives among participants to improve the economic efficiency of the fleet. Cooperatives may form voluntarily with a minimum of four harvester quota shareholders. Individuals are free to change their Cooperative membership from year to year or may choose to fish independently. Cooperatives are not allocated long-term quota shares directly; rather, Cooperative members assign their annual allocation to the Cooperative for that year and then work with other Cooperative members to ensure appropriate harvest.

The program design includes concentration caps to limit ownership of long-term quota shares by both vessel owners and crew, the annual catch by any one vessel, as well as processor holdings. The caps are set at differing levels to achieve the dual goals of economic efficiency and regional stability and equity. Vessel concentration caps differ across the nine crab stocks, ranging from 1-10%. Crew share concentration caps also differ across the fisheries, ranging from 2-20% of the total crew shares. Vessels that are not part of Cooperatives are restricted to fishing between 2% and 20% of the total shares. Shore-based processor share holdings are limited to 30% of the processor quota pool on a fishery basis. Cooperatives are not subject to concentration caps (Fina, 2005).

New harvesting entrants can participate in the catch share program by buying or leasing shares. To be eligible, an individual must obtain a license, which requires U.S. citizenship and at least 150 days of sea time in U.S.

commercial fisheries in a harvesting capacity. Companies are also eligible to purchase quota if an individual within the company is eligible and holds 20% or more of an ownership position in the company.

Additionally, to aid crew and captains in purchasing quota, a government-operated program provides low-interest loans for up to 80% of the quota purchase price. The loan program is funded through a cost recovery fee charged to participants in the catch share program (NOAA Fisheries Service, 2011a). Eligible borrowers are captains and crew with quota share holdings below a fishery-specific threshold that ranges between 0.1% and 1% of total quota share (Fina et al., 2010).

New processors can enter the fishery by purchasing or leasing processor quota shares, or by purchasing crab harvested under the “unrestricted shares” classes, a type of share that is can be delivered to any processor (Fina et al., 2008).

## STEP 4 IN ACTION

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### Define the Privilege

Privileges are quota-based. They were designed to recognize the investments that crew and captains made in the fishery, and to maintain the relative structure of deliveries to remote communities. One of the hallmarks of this program is the multiple types of privileges that are defined and allocated for vessel owners, crew, processors and communities. Different classes of quota exist within many of these categories.

There are three types of long-term privileges:

1. Quota Shares (QS) were granted indefinitely to eligible catcher vessels, catcher-processor vessels and crew.
2. Processor Quota (PQ) was granted indefinitely to eligible shore-based processors.
3. Community Development Quota (CDQ) was granted to 65 eligible West Alaskan fishing communities and the community of Adak.

The CDQ is managed independently of the Rationalization Program and is not subject to regional landing requirements, although CDQ groups are required to deliver at least 25% of the allocations to shoreside processors.

The annual allocation units for harvesting quotas (Quota Shares) are defined as Individual Fishing Quota (IFQ) and are allocated to vessel owners and to crew. There are four categories of IFQ quotas, including:

1. Catcher Vessel Class A IFQ
2. Catcher Vessel Class B IFQ
3. Crew Class C IFQ
4. Catcher Processor IFQ

The four categories were allocated to particular eligible participants and specified landing location requirements:

- Catcher Vessel Class A IFQ was allocated to former LLP license holders. Class A IFQ is associated with one of the regions throughout the Bering Sea and harvests must be delivered to a processor that holds IPQ within that region.

- Catcher Vessel Class B IFQ was allocated to former LLP license holders and allows delivery to any processor of choice.
- Crew Class C IFQ was allocated to only eligible captains and crewmembers and allows delivery to any processor of choice.
- Catcher Processor IFQ was allocated to eligible catcher-processor LLP license holders.

Each season, catcher vessel quota is allocated as 90% Class A IFQ and 10% Class B IFQ. Class A shares are intended to protect processing communities by ensuring continued supply of crab, while Class B shares are intended to provide harvesters with additional market leverage for negotiating prices. The 90%:10% division is intended to ensure that harvesters and processors, as well as remote communities, benefit from the catch share.

IFQ shares are defined as a percentage of the annual catch limit. However, 10% of the total allowable catch (TAC) for each of the nine crab stocks is allocated to the CDQ program. The community of Adak is not a CDQ community, but is allocated 10% of the TAC for one crab fishery in the Aleutian Islands based on historical participation. After CDQ deductions, bycatch allowances for other BSAI fisheries are subtracted. The remaining allocations are then split among Rationalization Program participants (Fina, 2005).

The second type of annual allocation privilege, Individual Processor Quota (IPQ), is allocated to eligible processors and requires harvesters with Class A IFQ to deliver a specified quantity of catch to processors (Fina et al., 2010). These shares are regionally designated based on the location and quantity of shareholder landings during a specified qualifying period that varies by fishery (Fina, 2005).

The program allows both permanent and temporary transferability of Quota Shares and all IFQ categories, respectively. To receive shares through a transfer, individuals must be active in one of the nine crab fisheries for the prior year (Fina et al., 2010). NOAA Fisheries administers quota transfers between Cooperatives, while trades within each Cooperative are administered internally under the Cooperative's bylaws, which hold participants accountable to their collective catch limit (Fina, 2005). To further incentivize internal cooperation, fishermen who are not members of a Cooperative were not permitted to trade shares with Cooperative members for the first five years of the Rationalization Program (Fina et al., 2008).

Processor Quota Share and Individual Processor Quota are transferable to all eligible participants as long as the buyer does not hold more than 30% of the total IPQ in a fishery. However, trading of processor quota was prohibited for the first two years of the program. This was intended as a community protection measure to prevent changes in delivery patterns to individual communities (Fina, 2005). In addition, a right of first refusal to acquire any processor quota associated with a community was granted to remote communities and CDQ groups with historical dependence on the crab industry.

## STEP 5 IN ACTION

### Assign the Privilege

The allocation process included many stakeholders and was primarily based on historical participation in the crab fisheries. The Restricted Access Management (RAM) Division of the National Marine Fisheries Service



(NMFS) determined the eligibility of participants using catch records, including landing reports and fish tickets. Shares were granted prior to the start of the Rationalization Program.

Three types of participants were eligible for initial allocation of quota shares and processor quota: vessel owners, crew and processors. To be eligible, vessel owners must have held a Limited License Program (LLP) license and participated in the crab fisheries over a series of seasons specific to each crab stock. To be eligible for initial allocation of crew shares, captains and crew were required to prove historical participation by providing evidence of landings, either through Alaska Department of Fish and Game fish tickets or an affidavit from a vessel owner (Fina, 2005). Processors with a history of receiving crab are eligible to hold Processor Quota Shares (PQS). At the start of the program, 27 catcher-processor vessels, 294 catcher vessels, 30 processors and 200 captains qualified for quota share in the catch share program (Fina, 2005). Of the total quota pool available to the fishery, 97% was allocated to catcher vessels and catcher-processors, and 3% to crew (Fina et al., 2010).

Shareholders apply annually to RAM to receive IFQ or IPQ. If a shareholder is part of a voluntary Cooperative, then the Cooperative will file a Cooperative harvest agreement prior to the start of the fishing season and will be allocated their members' annual IFQ. Fishermen must join a Cooperative for a minimum of one year, but as mentioned above, they are permitted to change Cooperatives between seasons or apply to RAM to fish their IFQ independently in subsequent years (Fina et al., 2008).

An appeals process enables license holders to request a review of their allocation. This process is run through the NMFS Office of Administrative Appeals, which separates the appeal process from the initial allocation decision.

## STEP 6 IN ACTION

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### Develop Administrative Systems

The Crab Rationalization Program is a well-administered program with a sophisticated system to ensure accurate catch accounting and efficient monitoring and enforcement. RAM administers the Rationalization Program and uses online systems to determine participants' eligibility, allocate IFQ, process Cooperative applications and quota share transfers and conduct other related activities.

Cooperatives are held accountable through internal bylaws and agreements. The distribution of IFQ within Cooperatives is based upon the amount of quota share holdings a member brings into the Cooperative. This method ensures all members have a stake in both the benefits and costs of the Cooperative. Many Cooperatives hire business managers to coordinate the fleet deliveries with processors and this has generally worked well to increase efficiencies for both sectors. Over the course of the Rationalization Program, an increasing number of Cooperatives have begun to manage quota centrally, rather than allowing individual members to arrange the harvests of their shares. This strategy has further contributed to efficiency (Fina et al., 2010).

The use of harvester and processor quota has helped with quota accounting and deters underreporting. The program requires 100% on-board observer coverage on catcher-processor vessels and between 20-50% coverage on catcher vessels to account for catch (Fina, 2011). Observers document the catch and the sizes of crabs harvested, and send data to the Alaska Department of Fish and Game.

All vessels are fitted with a Vessel Monitoring System to ensure compliance with landing requirements and to collect spatial data on fishing effort (Alaska Bering Sea Crabbers, 2011). In addition, all crab catch retained aboard catcher-processor vessels is required to be weighed on a NMFS-approved, motion-compensated scale. Dockside monitoring also occurs. Shoreside processing plants are required to have approved Crab Monitoring Plans that detail how a plant will ensure all crab are sorted and weighed within view of NMFS-authorized personnel. In addition, pre-trip inspections and off-loading monitoring occur (NPFMC, 2011). Participants use eLandings, an interagency electronic reporting system to track commercial fishery landings and to debit catch quota from IFQ accounts. These reports must be submitted within six hours after an offload ends.

Cooperatives manage quota for their members and coordinate deliveries. Cooperatives operate as “flow through” entities, which means that members retain the right to fish the annual IFQ they bring to the Cooperative, and pay an annual fee in return for Cooperative services. Intra-Cooperative trades are not reported to managers (Fina et al., 2007). Managers have benefited from Cooperative operations and harvesting oversight as it has reduced administrative costs (E. Poulsen, Alaska Bering Sea Crabbers, personal communication, 2011).

Cost recovery is used to cover the cost of management and enforcement arising from the Rationalization Program. Based on U.S. law, a cap of 3% of ex-vessel profits is used towards program costs. The cost of program implementation was \$4,270,881 in its first year, of which more than 70% was met by the cost recovery program. By 2009, the implementation costs were reduced to \$3,099,991 because of efficiency gains realized by managers and participants. These costs were fully met by the cost recovery program (Fina et al., 2010).

## STEP 7 IN ACTION

### Assess Performance and Innovate

The North Pacific Marine Fishery Council (NPMFC) implemented a comprehensive review process that assesses the Rationalization Program’s ecological, economic and social performance in 18-month periods (Fina, 2005). This includes an annual Economic Data Reporting (EDR) system that is used to help managers assess program impacts and develop appropriate amendments (Fina et al., 2010). The EDR collects historical data prior to and after the implementation of the program to provide a comparison for assessing changes in the crab fisheries (Abbott et al., 2010). The reporting system found that overall, the Rationalization Program is meeting its goals (Fina et al., 2010), and findings have also been used to make design improvements (NOAA Fisheries Service, 2011b).

The length of the fishing season has drastically increased by more than 40% in the Bristol Bay snow crab fishery and by more than 25% in the Bristol Bay red crab fishery (NPFMC, 2007a). As the seasons have extended, managers have gained much more certainty around annual harvests and the handling of catch has improved. As a result, fewer dead crab are landed at the dock. Fishermen have increased their catch-per-unit-effort (CPUE), as they have the time to soak their crab pots for longer periods (Fina et al., 2010) and to target the most productive fishing grounds (E. Poulsen, Alaska Bering Sea Crabbers, personal communication, 2011).

A number of social changes have occurred under the new management. Fishing safety has improved, and the number of annual fishing fatalities has declined. Employment has transitioned from many part-time jobs to

fewer positions that are full-time. Remaining jobs are more stable and have higher seasonal wages (Abbott et al., 2010; Fina et al., 2010). Allocation of crew quota has provided long-standing captains and crew with an equity stake in the fishery. Implementation of a loan program in 2011 provides access to capital for eligible crew to invest in additional quota (NOAA Fisheries Service, 2011c). Community protection measures have succeeded to limit redistribution of landings away from historical processing plants in remote communities, which are heavily invested in crab fisheries (Fina et al., 2010; NPFMC, 2010).

Most stakeholders agree that the Rationalization Program is a significant improvement in overall management and performance (Fina et al., 2007). However, program implementation did result in a change in distribution of work in the fishery. When the crab fishery was under a shortened race for fish, some crew could participate as a way to supplement their income from other fisheries. Now that the crab season is lengthened, fewer such opportunities are available (NPFMC, 2010). Although the average annual crew income has increased substantially under the Rationalization Program, the proportion of gross revenues has decreased, with a larger proportion of gross revenue now provided to vessel owners (NPFMC, 2010). While the catch share has successfully halted a longer-term economic decline, the distribution of privileges and fleet consolidation has been a debated issue (NPFMC, 2010). In practice, the vessel buyback and lack of vessel-use caps within Cooperatives has allowed consolidation. While this was a primary goal of the program, some have expressed concern over the outcome. NPFMC reviewed the situation to determine if Cooperative vessel caps would enable increased employment opportunities in the fisheries. However, because the crab stocks fluctuate so widely between years, the agency concluded a cap to be impractical. Fishery managers determined the no-cap policy should be maintained to enable the efficiency goals intended by the Rationalization Program (NPFMC, 2007b).

In addition to meeting program goals, a number of co-management innovations have occurred through the Rationalization Program. To encourage crew investment in the fishery, the Alaska Bering Sea Crabbers, a harvester alliance that represents all BSAI crab fisheries, recently proposed a preferential right of first offer to eligible crew: 10% of crab quota when it becomes available for sale. This voluntary program will enable crew to purchase quota in smaller and more affordable units (ABSC, 2011). Another innovation is the voluntary adoption of a pricing structure that prevents differentiation for shell quality and thereby eliminates the incentive for selective harvesting (Fina et al., 2010).

Cooperative formation was incentivized in this program and has benefited fishermen by increasing information availability and sharing for harvesters and processors, a stark contrast to the intense competition and conflicting interests of seasons past (Fina et al., 2010). Processors benefit from the Cooperative through increased efficiency in delivery coordination, which can help to reduce queues and reduce gaps between deliveries. Managers also benefit from reduced administration costs, as harvesting oversight is delegated to the Cooperative (E. Poulsen, Alaska Bering Sea Crabbers, personal communication, 2011). Within the first year of the program, 19 voluntary Cooperatives were created. By year five, the Cooperatives had merged into 11 separate entities (NPFMC, 2010). Cooperatives have an important role in the price negotiations with processors. They work with each other to ensure price information is shared with price arbitrators. Harvesters have historically acted collectively to negotiate a price with processors prior to the start of the fishing season (Fina et al., 2007).

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