Pacific Herring (*Clupea pallasi*)

Certification Units Considered Under this Species:

- San Francisco Bay gill net

Summary

Pacific herring are found throughout the coastal zone, from northern Baja California, around the rim of the North Pacific Basin, to Korea on the Asian coast. California's herring fisheries occur in the Crescent City Harbor area, Humboldt Bay, Tomales Bay, and San Francisco Bay. Historically the roe-fishery has been a very small export market to Japan; however, in San Francisco Bay herring as fresh fish has been gaining local market interest due to a desire for locally produced seafood. The commercial fishery is one of the few fisheries in California that undergo annual population assessments and subsequent regulatory change. This allows management to integrate new information and set harvest targets on a timely basis. Fishery managers are currently working to develop a fishery model to ensure harvest targets are appropriate and further safeguard the spawning stock so that overfishing does not occur.

Strengths:

- Annual assessments are conducted using fishery independent data
- Conservative annual harvest quotas; set at ≤5% of spawning biomass since 2010
- Strong collaborative working relationship between fishery managers and fishing industry (industry funded the "Herring Research Association" which assists fishery managers)

Weaknesses:

- Assessment methods need to be reviewed to ensure they are appropriate for managing the stock
- No information on retained, bycatch or ETP species
- No information on habitat impacts from the fishery

History of the Fishery in California

Biology of the Species

[From CDFG 2006]: Pacific herring are found throughout the coastal zone (waters of the continental shelf) from northern Baja California on the North American coast, around the rim of the North Pacific Basin and Korea on the Asian coast. In California, herring are found offshore during the spring and summer months foraging in the open ocean. Beginning as early as October and continuing as late as April, schools of adult herring migrate inshore to bays and estuaries to spawn. Schools first appear in the deep water channels of bays to ripen (gonadal maturation) for up to two weeks, then gradually move into shallow areas to spawn. Historically, known spawning areas in California include San Diego Bay, San Luis River, Morro Bay, Elkhorn Slough, San Francisco Bay, Tomales Bay, Bodega Bay, Russian River, Noyo River, Shelter Cove, Humboldt Bay, and Crescent City Harbor. The largest spawning aggregations in California occur in San Francisco and Tomales Bays. Most of these spawning areas are characterized as having reduced salinity, calm and protected waters, and spawning-substrate such as marine vegetation or rocky intertidal areas. Spawning occurs in the intertidal and shallow subtidal zones, when males release milt into the water column.

Fecundity is 226 eggs per gram of body weight, and a large female herring may lay 40,000 to 50,000 eggs. Spawn depth distribution is generally shallower than 30 ft (9 m), but has been found to a depth of 60 ft (18.3 m) in San Francisco Bay. Immediately after spawning the adult herring leave the bay, returning to the open ocean. Embryos (fertilized eggs) hatch in approximately 10 days, depending on temperature and salinity. During the incubation period, embryos are vulnerable to predation by marine birds, fish, and invertebrates. They may also die from desiccation or freezing if exposed during low tidal cycles. Human induced causes of mortality at this stage include smothering caused by suspended sediments from dredging, and toxic anti-fouling agents such as creosote on pier pilings. Herring embryos hatch into larvae, which metamorphose into juvenile herring. The distribution of larval herring in bays and estuaries is not well documented, but juvenile herring in San Francisco Bay are usually found throughout the central portion of the bay by mid-water trawl research vessels. Juveniles typically remain in the bay until summer or early fall, when they migrate to the open ocean.

Herring distribution while in the ocean is not well understood, though Canadian research conducted on herring in Georgia Straight, British Columbia (BC) suggests that 1- and 2-year old herring occupy inshore waters and older herring occupy shelf waters. Some herring reach sexual maturity at age two when they are about 7 in (18 cm) in length; all are sexually mature at age three. California herring can live to 9 years old and reach a maximum length of about 10 in (25 cm). However, it is extremely rare to find fish that are older than 7 years of age.

While in the ocean, adult herring feed on macroplankton such as copepods and euphausiids. Larval and juvenile herring are believed to feed on molluscan larvae and other zooplankton while in bays and estuaries. Herring are a forage species for a diverse group of marine fishes, birds, and mammals. Spawning events in particular provide an opportunity for feeding. As herring move into shallow water to spawn, a feeding frenzy may commence which can last for several days. Gulls, cormorants, pelicans and other marine birds; California and Stellar sea lions, harbor seals, invertebrates and a variety of fishes (including sturgeon in San Francisco Bay) feast on adult herring and embryos.

Commercial Fishery

The herring fishery is primarily a sac-roe fishery in California; however a portion of the annual quota is allocated to the fresh fish fishery and herring eggs on kelp (HEOK) fishery each year. The herring fishery is regulated through a variety of mechanisms, including an annual spawning biomass assessment to set quotas, limited entry permitting, seasonal closures, separation of the fishery into platoons, and gear restrictions (see Harvest Strategy section for more information on gear restrictions).

In recent years a decline in the price of sac-roe has led to a decline in effort. Effort has remained relatively stable over the past five years (Ryan Bartling, personal comm., 2013). Historically there were as many as 400 permits issued to approximately 100 boats, but in recent years this has dropped to approximately 180 permits issued each year to 25-35 vessels (Ryan Bartling, personal comm., 2013; CDFW Commercial License Data 2000-2012[1]). Although herring sac-roe permits are still issued for San Francisco Bay, Humboldt Bay, Tomales Bay, and Crescent City Harbor, the sac-roe fishing effort has only occurred in San Francisco Bay in recent years. This is due to decreased product demand and lower price, which makes fishing effort in the other bays less economically viable (Ryan Bartling, personal comm., 2013). Historically San Francisco Bay has accounted for over 90% of the state landings, even when other bays were actively fished. Total sac-roe landings and quota for San Francisco Bay are in Figure 1.

The other two components of the fishery, the fresh fish fishery and HEOK, are much smaller and receive a minor portion of the annual quota. Currently, the fresh fish fishery season is open for a brief period before the sac-roe fishery opens and for a few of weeks after it closes. The HEOK fishery operates only in San Francisco Bay through the winter months. In general the fresh fish fishery has little to no effort. During the 2012-2013 herring fishing season no fresh fish were landed under this fishery quota (20 tons). The HEOK fishery is highly variable due to a variety of reasons (Ryan Bartling personal comm., 2013). The fishery can receive a much higher price per pound than the sac roe fishery, but is a much riskier investment since there is the possibility of not landing any herring roe. This fishery has a 10 permit limit and vessels in the gillnet fishery have the option to convert their sac-roe permits to a HEOK permit annually. Figure 2 shows landings data for the HEOK fishery. During the 2012-13 season, the fishery landed close to its entire quota of 176 tons (Ryan Bartling personal comm., 2013).

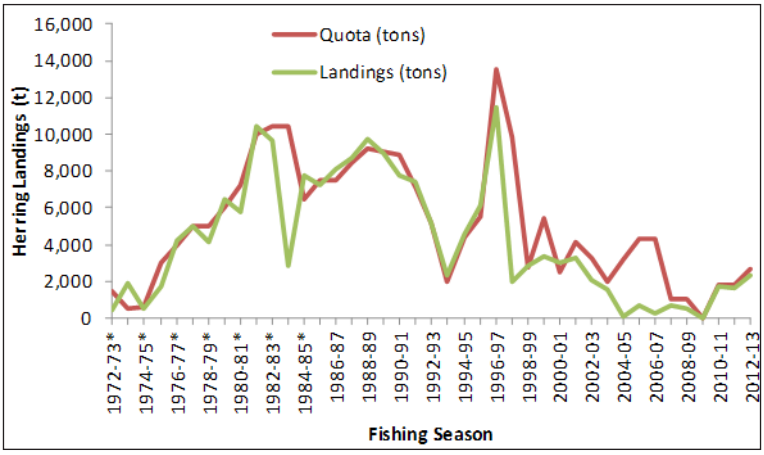

Figure 1. Quotas and landings in tons for the herring sac-roe fishery from 1972 to 2013 (Data from CDFW 2013). *Quotas and landings prior to the 1985-86 season include HEOK and fresh fish allocation and landings.

[1]CDFW commercial fishing license data can be found at: http://www.dfg.ca.gov/licensing/statistics/#Commercial Fishing Licenses & Permits

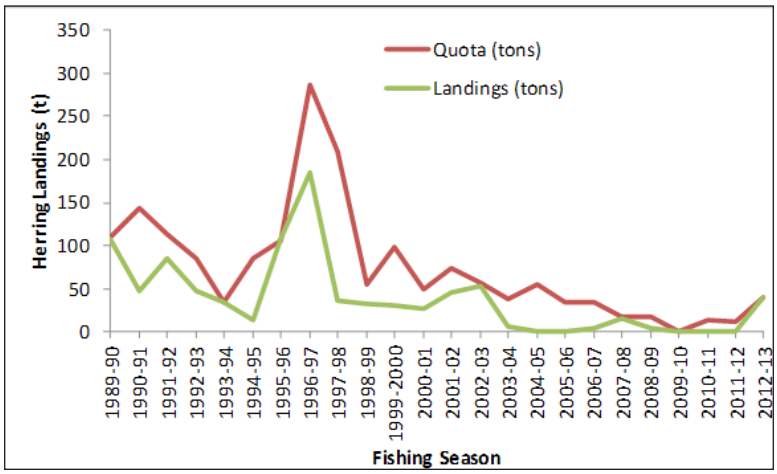

Figure 2. Quotas and landings in tons for the HEOK fishery in San Francisco Bay from 1989 to 2013 (from CDFW 2013).

Recreational Fishery

[Ryan Bartling, personal comm., 2013]: There is limited recreational take of herring during the spawning season only in San Francisco Bay. There is currently no daily bag limit, mostly due to low fishing effort and the amount of available fishing days. Recreational fishers typically use cast-nets to capture herring as they move inshore to spawn around pier pilings and jetties. Herring are typically used for human food or bait for other recreationally caught sport fish. Fishery managers will be looking at this fishery more closely in the future and possibly recommending regulatory changes should they see an effort shift or increased demand for fresh fish.

MSC Principle 1: Resource Sustainability

*Sustainability of the Target Stock

[From CDFW 2013]: The spawning biomass estimate for the 2012-13 season in San Francisco Bay is 79,500 tons, which exceeds the historical average (1979-80 season to present) of 52,000 tons. This is the fourth year of significant increase since the 2008-09 season record low estimate of 4,800 tons (Figure 3). Preliminary age composition data indicates that the increase in spawning biomass was due to a strong recruitment of 3-year old herring to the spawning population. Age 4- and 5-year old herring also continued to persist in the population. The increase in recruitment, returning 4- and 5-year old herring, as well as improved physical condition, is likely due to more favorable biological and environmental conditions, both in estuarine and oceanic ecosystems. DFW and the Fish and Game Commission's (FGC) long-term goals are to maintain healthy herring stocks in California by safeguarding herring as an important forage species; use precautionary principles when setting harvest targets; manage the commercial harvest of herring to achieve a sustainable fishery; maintain and/or restore healthy age structures to stocks; avoid and/or minimize the harvest of two and three-year-old herring, many of which are first-time spawners.

Pacific herring are found from Baja California, all the way up through the North American coast, around the Pacific Rim and down through the coasts of Asia to Japan. Globally (including the

*For California's Sustainable Seafood Program, this category must score an 80 or higher during an MSC assessment.

California stock), Pacific herring experienced a stock collapse, around 1997-98, attributed to El Niño conditions that reduced ocean survival (CDFG 2006; CDFW 2013). Pacific herring stocks are typically defined by the primary spawning grounds and in California there are four separate stocks, San Francisco, Humboldt, Tomales Bay, and Crescent City Harbor. San Francisco Bay has the largest stock.

Currently, stock status in California is assessed annually only in San Francisco Bay. These spawning biomass surveys are used to set the quota for the herring fishery for the next season. The other fishing areas historically underwent annual assessments but were discontinued due to no fishing effort and staff reductions. Not much is known about the species during the open ocean phase so DFW uses spawning biomass estimates when they enter San Francisco Bay to assess the population (Figure 3). In 2003, a peer review of herring fishery management recommended that a harvest rate in the range of 10-15% would be sustainable and that a lower level would provide a desirable target for stock rebuilding. Since 2010, DFW has recommended harvest targets for Pacific herring at 5% or below the most current spawning biomass estimate, as a conservation safeguard. Actual harvest rates by the commercial fishery have equaled less than four percent of the total spawning biomass since the 2003-04 season and have equaled 10 percent or less of the spawning biomass since the 1979-80 season. An estimate of the unexploited spawning biomass has not been produced; however a formal stock assessment is currently being developed by the Centre for Environment, Fisheries and Aquaculture Science (Cefas; Ryan Bartling personal comm., 2013).

The quota is set annually by the FGC based on recommendations by DFW. Like other short-lived coastal pelagic species, Pacific herring abundance fluctuates widely due to variable recruitment, making annual population assessments necessary for effective management. This allows DFW and the FGC to integrate new information into management of the fishery on a timely basis. For example, in 2008-2009 the herring population fell to a new low of 4,800 tons and DFW recommended no take for the 2009-2010 season (CDFW 2013). When recommending a quota to the FGC, DFW takes into consideration not only the modeling results of the spawning biomass estimates, but other factors such as ocean and bay conditions, age structure, growth rates, strength of individual year-classes, and predicted size of incoming year classes (recruitment) (CDFW 2013).

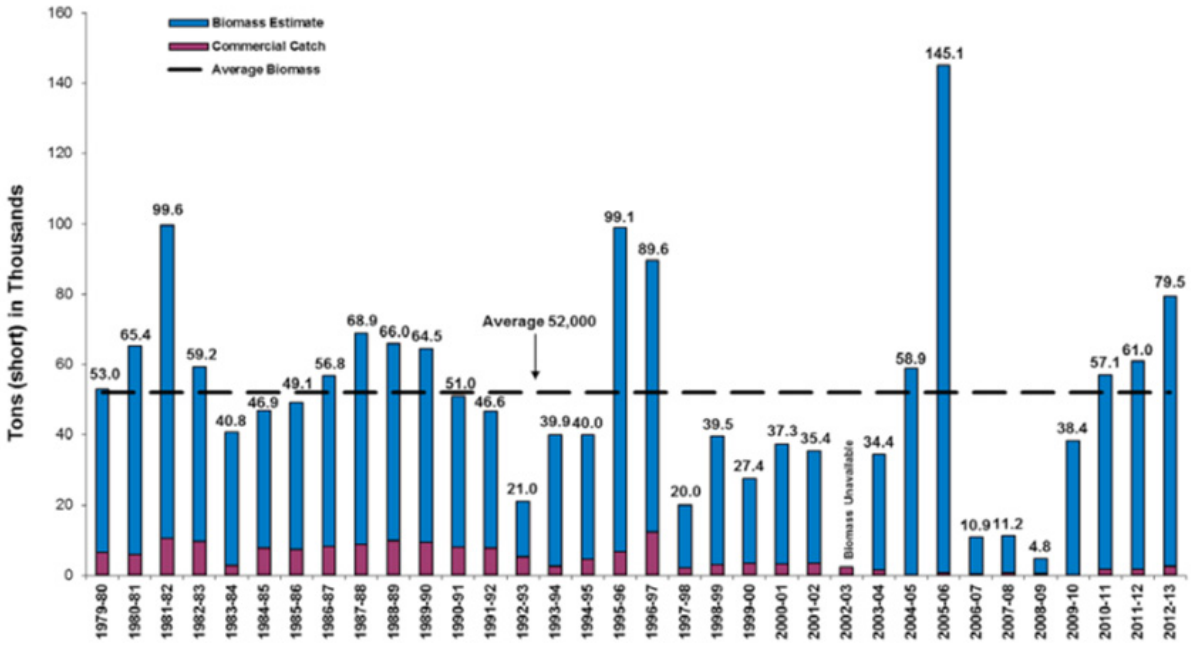

Figure 3. San Francisco Bay spawning biomass estimates and commercial catch (from CDFW 2013).

Evaluation against MSC Component 1.1: Sustainability of Target Stock

Performance Indicators	Rating	Justification
1.1.1 Stock Status		Managed to prevent recruitment overfishing; stock has been increasing in recent years
1.1.2 Reference Points*		Conservative reference points are used (5% of spawning biomass); although it is unclear what the unexploited spawning biomass level is
1.1.3 Stock rebuilding		Not triggered

*For an LTL species, MSC states that the default TRP should be 75% of the unexploited spawning biomass level.

Harvest Strategy (Management)

DFW has managed the commercial Pacific herring sac-roe fishery in San Francisco Bay since the opening in 1972. DFW's biological and enforcement staff have worked closely with the fishing industry throughout this period to provide for a sustainable and orderly fishery. This has been achieved through annual population assessments, California Environmental Quality Act review, evolving regulatory changes (fishery regulations) and oversight by the FGC.
The FGC has regulatory responsibility for management of this fishery with DFW providing recommendations and managing the fishery directly. This management structure allows the stock to be managed closely since the population can vary greatly due to annual recruitment success. The spawning biomass is assessed each year and is used along with other biological and environmental data to set quotas for the fishery. The fishery is also managed by seasonal closures that are set every year, gear restrictions such as a minimum mesh size of 2 inches,

and a limited entry (LE) permit system. The fishery is only open in state waters; open ocean fishing was prohibited in 2009. See Section 3.2: Fishery Specific Management System for more information.

Evaluation against MSC Component 1.2: Harvest Strategy

Performance Indicators	Rating	Justification
1.2.1 Harvest Strategy		Annual assessments, conservative harvest measures, annual quota, gear restrictions, seasonal closures, and LE permits.
1.2.2 Harvest Control Rules and Tools		Annual quotas are responsive to the state of the stock, several restrictions in place to limit harvest
1.2.3 Information/Monitoring		Not much information is available on their life history in the ocean or the actual size of the stock.
1.2.4 Assessment of Stock Status		There is an annual assessment, but it is not clear if the method accurately assesses the size of the stock.

MSC Principle 2: Environment

Retained Catch

[Ryan Bartling, personal comm., 2013]: We do not currently have retained catch data for this fishery, although it may be accessible by analyzing landings receipts for the commercial fishery.

Evaluation against MSC Component 2.1: Retained Catch

Performance Indicators	Rating	Justification
2.1.1 Outcome		No data publicly available on catch of retained species
2.1.2 Management		No data publicly available on catch of retained species
2.1.3 Information		No data publicly available on catch of retained species

Bycatch

[Ryan Bartling, personal comm., 2013]: The gill net gear specified in regulations specifically targets Pacific herring based on a minimum mesh size and maximum overall net length. Based on the DFW commercial sampling data and staff observations, there is very little incidental take of non-target species. By-catch is typically limited to Jacksmelt (Atherinops californiensis) and sardines (Sardinops sagax); however, these species do not frequent areas targeted by the commercial herring fleet during the winter months and incidence as by-catch is minimal.

Evaluation against MSC Component 2.1: Bycatch

Performance Indicators	Rating	Justification
2.2.1 Outcome		No data publicly available on bycatch species, however internal DFW data shows bycatch is likely minimal
2.2.2 Management		No data publicly available; Sardine are federally managed with annual stock assessments; Jacksmelt are not actively managed
2.2.3 Information		No data publicly available; more information is needed on bycatch amounts and species

*Endangered, Threatened, & Protected Species

[Ryan Bartling, personal comm., 2013]: We do not currently have data for this fishery. Current harvest targets allow 95 percent or more of the spawning stock to remain available as forage for a variety of species which should minimize potential impacts to ETPs.

Evaluation against MSC Component 2.3: Endangered, Threatened & Protected Species

Performance Indicators	Rating	Justification
2.3.1 Outcome		No data publicly available on ETP species
2.3.2 Management		No data publicly available on ETP species
2.3.3 Information		No data publicly available on ETP species

Habitat

[Ryan Bartling, personal comm., 2013]: The Pacific herring fishery uses set gillnets which are weighted and anchored to the bottom, thus depending on the substrate, they can impact habitat. Most herring fishing areas in San Francisco Bay are mud bottom, however DFW staff acknowledges there is potential for impacts to subtidal vegetation due to anchoring and lead line chaffing on benthic habitat. Eelgrass (*Zostera marina*) and red algae (*Gracilaria sp.*) are commonly found in San Francisco Bay and could be removed or disturbed during fishing operations. Historically, most fishing occurs in areas that do not contain eelgrass and, as a result, potential disturbance would be minimal. Disturbance to Gracilaria would also be negligible due to its growth characteristics. It does not attach to benthic substrate and is subject to water and tidal movement in many areas of the bay. The small size of the current fishery, however, likely limits overall habitat impact (CDFW 2013).

*For California's Sustainable Seafood Program, this category must score an 80 or higher during an MSC assessment.

Evaluation against MSC Component 2.4: Habitat

MSC Performance Indicators	Rating	Justification
2.4.1 Outcome		Unlikely that irreversible harm is caused because the fishery is small, but more data is needed to properly assess
2.4.2 Management		Limited entry permits and seasonal closures likely help limit habitat impacts
2.4.3 Information		No information is available on the risk posed to habitat types by the fishery

Ecosystem

Herring are an integral component to a healthy functioning marine ecosystem, making up a large portion of the diet of marine organisms from California to Alaska. Herring are a low-trophic level species that play an important role in sustaining a wide array of other species and maintaining the wider ecosystem. [CDFW 2013]: As a key forage species, low biomass levels of herring could impact important recreational and commercial species as well as threatened and endangered fish, marine mammals, and sea birds that rely upon them as a food source. Changes in abundance and age structure of a forage species such as herring and variability in the size and timing of herring spawn events can lead to changes in the abundances and behaviors of the variety of organisms that depend on herring and their eggs for food. Additionally, variability in large-scale oceanic conditions such as coastal upwelling and the El Nino Southern Oscillation cycle can affect both the timing of spawn events and recruitment success.

In general the fishery in California is strictly regulated to avoid overfishing of this species. One of the management objectives is to "Safeguard herring as an important forage species for all living resources of marine and estuarine ecosystems that utilize herring as a food source (CDFW 2013)."

Evaluation against MSC Component 2.5: Ecosystem

Performance Indicators	Rating	Justification
2.5.1 Outcome		Herring are considered a low trophic level species; however, the fishery is conservatively managed and it is unlikely the fishery causes serious harm to the ecosystem
2.5.2 Management		The fishery is managed conservatively; need more information to determine if current strategy has been effective
2.5.3 Information		Not enough information to understand impacts on habitat, bycatch, retained and ETP species.

MSC Principle 3: Management System

Governance and Policy

This fishery is regulated by the California Fish and Game Commission and managed by the California Department of Fish and Wildlife (DFW). It is subject to and managed under all relevant US federal laws as well as California state regulations pertaining to fisheries management. DFW works closely with constituent advisory groups to carefully design and evaluate restricted access plans for submission to the Commission. The Commission conducts hearings for public input. The restricted access plan is then returned for any necessary revision to DFW and advisory groups before returning to the Commission for a final decision.

Evaluation against MSC Component 3.1: Governance and Policy

Performance Indicators	Rating	Justification
3.1.1 Legal and/or Customary Framework		FGC and DFW manage the fishery within an effective framework for delivering sustainable fisheries
3.1.2 Consultation, Roles and responsibilities		Roles and responsibilities are clearly laid out; FGC meetings are open to the public and to public comments
3.1.3 Long-term Objectives		Magnuson-Stevens Act, Marine Life Management Act
3.1.4 Incentives for Sustainable Fishing		Magnuson-Stevens Act, Marine Life Management Act

Fishery Specific Management System

DFW has managed the commercial Pacific herring sac-roe fishery in San Francisco Bay since the opening in 1972. The fishery is managed through annual population assessments, California Environmental Quality Act review, evolving regulatory changes (fishery regulations) and oversight by the FGC. The FGC has regulatory responsibility for management of this fishery with DFW providing recommendations and managing the fishery directly. This management structure allows the stock to be managed closely since the population can vary greatly due to annual recruitment success.

[From Ryan Bartling, personal comm., 2013]: In San Francisco Bay, once the quota is set based on the previous seasons spawning biomass estimate, it is allocated between sac-roe, fresh fish, and HEOK. It is then further subdivided by platoons in the sac-roe fishery that fish on alternating weeks. Fishermen can own permits in both platoons; the division of the fishery was created when the fishery was much more active and there was a need to organize the large participation. Historically over 400 permits were issued and 100 vessels actively participated in the fishery. In recent years DFW has issued approximately 180 permits with only 25-35 vessels actively participating. The quotas for Tomales Bay, Humboldt Bay and Crescent City Harbor area are currently set to not exceed 350 tons, 60 tons, and 30 tons, respectively. No commercial fishing activity has taken place in Tomales Bay since 2007, in Humboldt Bay since 2005 and in Crescent City Harbor since 2002. For the 2012-2013 season, Tomales Bay had 10 permit

renewals and Humboldt Bay and Crescent City Harbor had four renewals.

The fishery is also managed by seasonal closures that are set every year, gear restrictions such as a minimum mesh size of 2 inches, and a limited entry (LE) permit system. The fishery is only open in state waters; open ocean fishing was prohibited in 2009. Management objectives for the herring fishery include:

- Safeguard herring as an important forage species for all living resources of marine and estuarine ecosystems that utilize herring as a food source
- Use precautionary principles when setting harvest targets
- Manage the commercial harvest of herring to achieve a sustainable fishery
- To the extent possible, maintain and/or restore healthy age structures to stocks
- Avoid and/or minimize the harvest of two and three-year-old herring, many of which are first-time spawners
- Set commercial harvest targets that conserve sufficient herring to support recreational take

Enforcement of fishing regulations is conducted in state waters by CDFW's Law Enforcement Division. Additionally tools such as port sampling, landing receipts, logbooks, and observer coverage are used to monitor catch and ensure vessels have the correct permits for the catch they are landing. Violators are prosecuted under the law. There is no evidence of systemic non-compliance.

Evaluation against MSC Component 3.2: Fishery Specific Management System

Performance Indicators	Rating	Justification
3.2.1 Fishery Specific Objectives		Mgmt objectives are listed in CDFW (2013), however they do not address retained, bycatch and ETP species or habitat impacts.
3.2.2 Decision-making Processes		DFW provides recommendations that are vetted through the FGC
3.2.3 Compliance & Enforcement		An enforcement system exists and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.
3.2.4 Research Plan		Annual research plans are developed by DFW but are internal; can be obtained if requested
3.2.5 Management Performance Evaluation		There is annual monitoring and evaluation of the stock, however it is unclear how often assessment methods are evaluated.

California Specific Requirements

The California voluntary sustainable seafood program requires fisheries seeking certification to meet California specific standards in addition to the standards and requirements of the Marine Stewardship Council (MSC) sustainable fisheries certification program. These include:

1. Higher scores (80 instead of 60) for two performance indicators (PI) of the MSC program: "Stock Status" (PI 1.1.1) and "By-catch of Endangered, Threatened, or Protected (ETP) Species" (PI 2.3.1). These two PIs are highlighted in the report.

2. Additional independent scientific review: The OPC Science Advisory Team will be engaged in the certification process through early consultation in reviewing minimum eligibility criteria, and review of the MSC-required pre-assessments and full assessments. The reviews will be conducted in addition to MSC's peer review, thus bringing additional credibility, transparency, and independence to California's certification process.

3. Additional traceability components: The California program will develop a unique barcode for California certified sustainable fish. This barcode can be either scanned by a smart-phone or linked to a website that will reveal additional information about the fishery, and information about toxicity when available

Recommendations

[Ryan Bartling, personal comm., 2013]: DFW is currently proposing a change to existing regulations to allow the commercial take of herring for both the sac-roe and fresh fish market fisheries under one quota and one season. This would mean the fresh fishery season and quota would be moved into the sac-roe fishery and all fish landed during the regular herring season could be sold for sac-roe or fresh fish purposes. At this time, the fresh fish fishery operates outside of the sac-roe fishery season. However, herring are very difficult to catch during non-spawning season. Historically the Pacific herring commercial fishery has primarily harvested sac-roe for export to other countries. However, DFW has noted an increase in demand in the Bay area for locally caught fresh herring. This anecdotal evidence (a Pacific Herring festival and the appearance of fresh herring on restaurant menus) leads DFW to believe that herring caught during the sac-roe season are being sold whole (as it normally is), but that purchasers are using the herring locally. DFW is recommending that the Commission amend regulations to make fresh fish available during what has historically been the sac-roe season by the gill-net fleet. This change is also being proposed in response to public requests to provide increased fishing opportunities for the higher value fresh fish market.

The growing demand for locally caught Pacific herring could benefit OPC's program since there would be a larger incentive for the fishery to participate if consumers were interested in supporting sustainable California seafood. Generally the herring fishing industry has supported conservation safeguards proposed by DFW managers and they would also likely support efforts for a sustainable labeling program through MSC certification.

Additionally, there has been growing interest in the HEOK fishery. At this point in time, the fishery is very small (limited to 10 permits) and is managed by one operator. However, it is presumed that this fishery is sustainable since it does not remove adult fish from the population. If this portion of the fishery does grow in the future, it may be useful to either include it in a certification of the whole fishery, or try to better understand the fishery impacts for management purposes.

References

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Appendix A

MSC Assessment Tree			Pacific Herring
			Gill net
Principle	**Component**	**Performance Indicator**	**SF Bay**
Principle 1: Health of Fish Stock	Outcome	1.1.1: Stock status	
		1.1.2: Reference points	
		1.1.3: Stock rebuilding	*Did not assess*
	Harvest Strategy (Management)	1.2.1: Harvest strategy	
		1.2.2: Harvest control rules	
		1.2.3: Info/ monitoring	
		1.2.4: Stock assessment	
Principle 2: Impact on Ecosystem	Retained species	2.1.1: Status	
		2.1.2: Mgmt strategy	
		2.1.3: Information	
	By-catch species	2.2.1: Status	
		2.2.2: Mgmt strategy	
		2.2.3: Info	
	ETP species	2.3.1: Status	
		2.3.2: Mgmt strategy	
		2.3.3: Info	
	Habitats	2.4.1: Status	
		2.4.2: Mgmt strategy	
		2.4.3: Info	
	Ecosystem	2.5.1: Status	
		2.5.2: Mgmt strategy	
		2.5.3: Info	
Principle 3: Management System	Governance & Policy	3.1.1: Legal framework	
		3.1.2: Consultation, roles, and responsibilities	
		3.1.3: Long term objectives	
		3.1.4: Incentives for sustainable fishing	
	Fishery Specific Mgmt System	3.2.1: Fishery specific objectives	
		3.2.2: Decision making process	
		3.2.3: Compliance & enforcement	
		3.2.4: Research plan	
		3.2.5: Management performance evaluation	