

**National Marine Fisheries Service
Pinniped-Fishery Interaction Task Force: Bonneville
March 1 - 2, 2017 Task Force Meeting**

Final Facilitator's Summary

Task Force Members in attendance or on the phone for all or part of the meeting: Daryl Boness, Independent Scientist; Bruce Buckmaster, Lower Columbia River Fisheries; Joyce Casey, U.S. Army Corps of Engineers (Corps); Trevor Conder, National Marine Fisheries Service (NMFS); Bob DeLong, National Marine Fisheries Service (NMFS); Doug Hatch, Columbia River Inter-tribal Fish Commission (CRITFC); Chris Hathaway, Lower Columbia Estuary Partnership (LCEP); Chris Kern, Oregon Department of Fish and Wildlife (ODFW); John Long, Washington Department of Fish and Wildlife (WDFW); Olney "JP" Patt, Confederated Tribes of Warm Springs (CTWS); Dennis Richey, Oregon Anglers; Carl Scheeler, Confederated Tribes of the Umatilla Indian Reservation (CTUIR); Paul Ward, Yakama Nation; Sharon Young, Humane Society of the United States (HSUS).

Resource Advisors: Robert Anderson, NMFS; Laurie Beale, NMFS, Office of General Council (NMFS-OGC); Robin Brown, ODFW; Charles Hudson, CRITFC; Steven Jeffries, WDFW; Sandra Jonker, WDFW; Bob Lessard, CRITFC; Kyle Tidwell, Corps; Bjorn van der Leeuw, Corps; Bryan Wright, ODFW; Chris Yates, NMFS.

Interested parties/others on the phone: David Colpo, Pacific States Marine Fisheries Commission, Mike Goslinger, Marine Mammal Commission; Ninette Jones, Sea Lion Defense Brigade (SLDB); Mike O'Bryant, Columbia Basin Bulletin (CBB).

DS Consulting Facilitation Team: Facilitator, Donna Silverberg; support, Emily Stranz and Nancy Pionk

The following summary captures group discussion and recommendations from the March 1st and 2nd, 2017 Bonneville Pinniped-Fishery Interaction Task Force (Task Force) meeting. The meeting was an opportunity for the Task Force members to review and discuss data, hear public input and deliberate on the questions included in a set of instructions provided by NMFS prior to the meeting.

Brief Overview: All of the Task Force members present agreed that the removal program has not been effective in eliminating the problem interaction. One member of the Task Force suggested that the program should be terminated as not having achieved the statutory goal of Section 120; others noted that removing an individual California Sea Lion (CSL) is effective against that individual, reduce salmonid predation by that individual, and, as there is insufficient data yet to determine the success of the program, it should continue for now, but not without a defined end point if effectiveness cannot be demonstrated. All of the Task Force members contributed to the development of a range of recommendations to be offered to NMFS.

Welcome and Introductions

Facilitator, Donna Silverberg, DS Consulting, welcomed the group and explained that the purpose of the session was to evaluate the effectiveness of the WDFW, ODFW, and Idaho (together referred to as the "states") program to lethal remove individually identifiable predatory California Sea Lions (CSL) in the vicinity of Bonneville Dam. This session was to review the effectiveness of the program over the past five years, 2012-2016.

Donna walked the group through the agenda, noting that the goal of the two-day session was to gather the Task Forces' evaluation of and recommendations for the program. She noted that DS Consulting would provide both a summary of the session and a report of the Task Forces' recommendations, with the intention of noting the range of input, as per NMFS' request.

Robert Anderson, NMFS, thanked the group for meeting to provide NMFS with their review and views of the program. He noted that three Task Force seats recently became vacant. In order to maintain an equitable balance, NMFS is looking to back-fill these vacancies. The continuation of the Task Force depends on whether the Task Force determines if the program has eliminated the problem interaction or not. If implementation was effective, the Task Force shall so advise the Secretary, and the Secretary shall disband the Task Force. If the Task Force determines that implementation has been ineffective at eliminating the problem interaction, then the Task Force shall recommend additional actions. He noted that the recently vacant positions are two "knowledgeable independent scientists" and the representative of the Oregon Zoo.

Robert continued that, moving forward, if NMFS were to ask the Task Force to make a recommendation regarding the approval or denial of *future* applications, applicants and decision makers (representatives from the states and Department of Commerce), would be asked NOT to participate in voting to approve or disapprove the states' application. Task Force members from the states and Department of Commerce were permitted to provide recommendations and vote during this meeting. No other changes to Task Force activities were proposed.

Purpose of Reconvening the Task Force in 2017

Robert thanked the Task Force for their continued participation in the Pinniped Fisheries Interaction Task Force, noting that the purpose of this meeting was to evaluate the program following the report of the full five years of the permit's implementation and assess if it has been effective in eliminating the problem interaction. The prior task force meeting in 2016 was only able to review 4 years of data. This review and evaluation is required under the Section 120(c)(5) of the Marine Mammal Protection Act (MMPS), which states that:

After implementation of an approved application, the Pinniped-Fishery Interaction Task Force [(Task Force)] shall evaluate the effectiveness of the permitted intentional lethal taking or alternative actions implemented. If implementation was ineffective in eliminating the problem interaction, the Task Force shall recommend additional actions. If the implementation was effective, the Task Force shall so advise the Secretary, and the Secretary shall disband the Task Force.

NMFS called the Task Force together again to determine the effectiveness and recommend additional actions that could be implemented now and within the existing framework of the June 28, 2016, Letter of Authorization (LOA). With this in mind, recommendations that the Task Force thinks would improve the effectiveness of the program, but do not fit within the existing LOA framework (e.g., recommendations that are research-dependent or would seek to amend the LOA), will be taken into consideration by NMFS decision makers, however, will require further agency evaluation regarding feasibility of implementation.

Overview of Task Force Assignment

Robert explained that, in evaluating the effectiveness of the lethal removal program, NMFS asked the Task Force to work together to develop recommendations that document the points of consensus reached by the group, as well as alternate points of view if consensus is not reached. NMFS requested that Task Force recommendations fairly reflect the full range of opinion of the group, acknowledging differences of opinion and including minority views with its recommendations. To enhance this process, NMFS provided a professional facilitator to manage the meetings of the Task Force, document Task Force deliberations, and assist the group in assembling its recommendations. NMFS also requested that the Task Force recommend additional actions that might be implemented now and within the existing framework of the June 28, 2016, LOA.

Prior to the session, NMFS provided the Task Force a summary information document titled, *Effectiveness Review of Marine Mammal Protection Act Section 120 Implementation under 2012 Letter of Authorization to Washington, Oregon, and Idaho, February 2017*. The report presented relevant information and data from the past five years, as well as the information requested by the Task Force at their May 31, 2016 meeting. Additional review materials provided to the Task Force included:

- *Epidemiological models to control the spread of information in marine mammals*, Schakner, et al., 2016.
- *Field Report: 2016 Pinniped Research and Management Activities at Bonneville Dam*, Brown, et al, 2016.
- *Final report and recommendations of the MMPA Section 120 Pinniped Fisheries Interaction Task Force: Columbia River – 3-year Review and Evaluation*, NMFS, 2010.
- *NMFS Report on Consideration of Statutory Factors in Section 120 of the Marine Mammal Protection Act*, NMFS, 2012.
- *Population specific migration timing effects on route survival of Chinook salmon through a variable lower river corridor*, Sorel, et al., 2017.

NMFS requested that the Task Force review the available information and consider the following questions as it determines whether the program was effective and any additional recommended actions to the lethal removal program:

- (1) Is the current lethal removal program effectively reducing pinniped predation on at-risk salmonids? If not, what changes do you recommend?
- (2) Does non-lethal hazing appear to be an effective aid in reducing sea lion predation on salmonids in the area? Should non-lethal efforts be modified (increased, reduced, or re-directed) to improve effectiveness?
- (3) Do the criteria in the authorization for identifying predatory sea lions remain appropriate? If not, how could these criteria be modified to improve effectiveness?
- (4) Are there other terms and conditions of authorization or aspects of the states' implementation of the removal activities that limit effectiveness of the permitted lethal removals? If so, what changes are recommended?

Once the Task Force completes its deliberations and submits its recommendations, NMFS will determine a course of action informed by the Task Force recommendations.

MARCH 1, 2017: TASK FORCE DELIBERATIONS

Status of the Population

NMFS Marine mammal expert Bob DeLong, provided an update on the status of the CSL. He noted that the West Coast population is currently within the range of Optimum Sustainable Population (OSP), which is a population goal set by the Marine Mammal Protection Act. Given the status, this lethal removal program is not likely to have a biologically significant impact on the West Coast CSL population.

Has the Lethal Removal Program Eliminated the Problem Interaction?

Robert Anderson stated that, with regard to the effectiveness criteria, NMFS' perspective is that the lethal removal program has been effective in removing some of the predatory pinnipeds which are having a significant negative impact on the decline or recovery of salmonid fishery stocks¹. However, NMFS also acknowledges that while the lethal removal program has been effective at reducing the impact of pinniped predation on at-risk salmonid fishery stocks, it has not eliminated the problem interaction. He pointed out that the LOA speaks to "elimination of the problem interaction" as well as "continuing to reduce the impact of pinnipeds on at-risk salmonids". As of March 1, 2017, the States had removed 166 animals, including 106 lethal removals, since 2013 (two in 2013; 15 in 2014; 30 in 2015; and 59 in 2016). The program is permitted to remove 92 per year, thus the program has not yet been implemented in full. Robert continued that in 2012 NMFS eliminated from the LOA the "1% per year criteria" for predation (NMFS Report of Statutory Factors, March 2012), and instead suggested the Task Force look at the "number of salmonids killed annually by percentage of passage". In this case, the trend over the last five years shows a relatively steep increase in predation.

The Task Force responded to NMFS' question about the efficacy of the current lethal removal program. None of the Task Force members found that the lethal removal program had eliminated the problem interaction. All Task Force members acknowledged that killing an individual CSL does eliminate that individual's impact on salmonids. However, one Task Force member believes that the program should terminate on the basis of its failure to eliminate predation in the eight years since its 2008 inception, , additionally, it does not appear that the program will ever eliminate predation as intended by Section 120 of the MMPA. Another member expressed an interest in determining whether a fully implemented program (taking the full 92 CSLs authorized for removal) could be capable of eliminating the problem interaction; if not, then the program should be terminated. This individual was skeptical that additional removals, even to the maximum allowed, will eliminate the problem. Other members felt that, given the constraints of the program, it has been successful enough and should be continued.

Evaluating the Effectiveness and Additional Actions for Lethal Removal Program

Task Force members reviewed data and discussed the four questions posed by NMFS in order to evaluate the effectiveness of the program. The following summarizes the Task Forces' discussion and recommendations. As noted above, the full range of recommendations discussed are condensed and

¹ Based on modelling, the hypothetical number of salmonids required for the 166 California sea lions that were removed ranged from 14,329 to 38,795 fish (95 percent CI of 24,466 fish).

included in this summary and inclusion of a recommendation does not signify group consensus on it. Additional detail on the final recommendations is available in the final Pinniped Interaction Task Force 2017 Report.

Task Force Responses to NMFS' Question 1: *Is the current lethal removal program effectively reducing pinniped predation on at-risk salmonids? If not, what changes do you recommend?*

Some Task Force members, pointing to trends in total predation, did not think that the current lethal removal program was effectively reducing pinniped predation on at-risk salmonids. Others thought that it was not effective in eliminating the problem; however, it was effective in reducing predation relative to what it would be absent the program. It was noted that it is difficult to produce data to accurately reflect predation throughout the river system and the effect of the removal program on salmonid populations; however, some thought that based on the number of CSLs using the Columbia River system, it does not appear that the program is reducing CSL presence or reducing estimates of salmon taken.

Task Force members agreed that removing an individual CSL eliminates that individual animal's impact on salmonids. However, one task force member noted that the data on the total number of sea lions at the dam, continued addition of new animals to the list of animals approved for lethal taking, and trend in annual predation rates indicate that other sea lions take the place of the animal that was removed. It was noted that the individual residence time at Bonneville Dam has decreased from 2013-2016, and the less time an animal is at the dam, the fewer fish that individual is seen to eat per individual. However, the percentage of the salmonid run seen eaten in 2016 was higher than in the past. One Task Force member suggested considering the absolute number of fish CSL have taken, after the data is effort-corrected with the observation hours, because observation hours vary greatly from year to year and the percentage of run is a poor measure of CSL impact because it is affected by many variables, not just CSL and correlates poorly with number of pinnipeds at the dam..

A task force member noted the 2016 data suggested the efficiency of the process for approving the removal of CSLs increased. This is believed due to process changes at NMFS, which resulted in more frequent updates to the removal list, which in turn resulted in the States removing more animals: an all-time high of 59 CSLs removed in 2016. Some saw this as demonstrating increased effectiveness of the removal program, believing there were fewer CSLs at the dam to eat salmonids. Others pointed to the data showing that the overall trend in numbers of CSLs at the dam was not declining. The exact number of animals at the dam is not known; there are many unmarked animals in the river and there is regular movement of animals between the mouth of the river and the dam. Moreover, if you correct for observation effort, the minimum estimated number of CSL (based on marked animals) is not lower in 2016 than 2015; observation effort was substantially lower in 2016.

The group explored the concept of recruitment and replacement: if one animal is removed does another take its place at the dam? In regards to replacement, one marine mammal expert did not think that the carrying capacity at the dam has been reached yet and there is sufficient food supply to support more CSLs at the dam. But another marine mammal expert felt that the spatial situation and behavior of CSL might constrained the number of CSL that could be peak predators at choice spots at the dam. CSL managers at the dam have seen new animals; however, they do not think there is a reserve of animals waiting to move in after others are lethally removed. It was suggested that the total number of CSL at Bonneville is lowered due to the removal program, but because it is an open system and more CSL will continue to come upriver, they will add to those already present and not removed. Data shows that if a

CSL is removed, it will be replaced; however, not as a result of a removal-replacement dynamic. The influx of sea lions over the past 4 years is largely due to nutrient, temperature and food resource shifts in the California Current ecosystem, El Niño and other marine anomaly effects, availability of food at the dam, and the large CSL population at the mouth of the river. However, some members expressed the perspective that, absent removals, the influx of new animals would create additive pressures in terms of higher abundance of CSLs and higher overall predation. The factors that are controlling the presences of CSLs at the dam are not related to the removal activities. Instead, the dynamic of the situation has changed over the years due to changes in the number and age of CSLs, environmental conditions, and run size of salmon as a food source, making each year's scenario different.

Task Force members asked whether there might be a deterrent effect if the removal method were visible to other CSLs. The marine mammal experts explained that there is no evidence to support the idea that the animals would learn from and be deterred by seeing others killed or dead. They noted that the sound of a shot may cause animals to leave the area for a short time, however, no long term behavioral changes could be expected.

The Task Force discussed CSL predation efficiency, wondering whether there are animals that are more efficient predators and thus should be prioritized for removal, or if predation efficiency increases over time? NMFS noted that all of the CSLs at the dam are males, and the majority of males that have been on the list and lethally removed have been between 8 and 12 years old. CSL managers at the dam did not think that predation efficiency increases overtime unless an animal finds the fish ladder, in which case they may be able to eat more salmon in a shorter amount of time. Also, observers have seen individuals and groups of younger CSL temporarily visit the dam, but may not consume salmonids due to competition with older more experienced hunters.

➤ **Task Force Recommendations to Improve Effectiveness of Reducing Predation on At-Risk Salmonids**

Some members thought that increasing the number of individual CSLs on the list of animals approved for removal could allow for increases in removal and thus a decrease in predation. It was suggested that relaxing the requirements for adding animals to the list would be helpful in increasing the number of CSL approved for removal. These relaxed requirements might include: decreasing the number of required observation days of individual animals, eliminating the requirement for individual marking, or changing language in the LOA to state that animals need to be seen eating salmon in the area OR be present in the area for a certain number of days (instead of having to meet both criterion as currently required). Managers at the dam noted that it is difficult to meet both tests: individually identifying an animal over a certain number of days AND proving that he was eating fish, and as a result, more time is required to meet these criteria; this is made more difficult with the recent reduction of staff and observation hours. It was noted that cameras have been installed and a qualitative sampling method was developed, both of which have been helpful in reducing the crew's workload, while enhancing efficiency. The managers thought that considering a specific 'number of days' criteria in lieu of visible 'salmonid consumption' would make the program easier for them to implement. The group was reminded that the MMPA Section 120 requires animals be 'individually identifiable' and that NMFS would consider whether Task Force recommendations are within legal boundaries of the MMPA and LOA issued under Section 120. It was noted that, depending on NMFS' amendment of the current LOA and statutory requirements, NMFS may need to amend decision documents as warranted. A Task Force member noted that additional public comment may be necessary for NMFS to meet NEPA requirements. (Note: Further detail of Task Force

discussion and recommendations regarding changing criteria for identifying individuals is provided under *Task Force Response to Question 3* (page 10)).

Currently, the LOA permits the States to lethally remove 92 CSL annually; however, the program has never been fully implemented to achieve that level. The Task Force discussed whether adding more animals to the list would have an impact on increasing the number removed. It was suggested, that despite the recent increase in animals removed in 2016, the removal of CSL is not limited by the number on the list, instead, it is limited by staffing and equipment resources. The States are operating the traps 2-3 days a week from April 1 through the 3rd week of May; with the current resources, there is no capacity to do more. It was suggested that if additional resources could be provided to expand the crews for trapping and observation, expand the technology/equipment used to identify individuals, and/or increase observation equipment and mobility, including adding observers to ships travelling up river to get estimates of predation below the dam, then the program might be more successful. It was noted that it would be difficult to expand the observation area and still utilize the same sampling method; that any expansion beyond the area covered in the LOA would likely require an amendment to the current LOA. Alternatively, it was suggested that if the program cannot be adequately implemented with the resources available, and thus sufficient numbers of CSL cannot be removed, then the program should be terminated as ineffective. The program is expensive and stressful to implement, and it is still uncertain whether increasing the number removed to the maximum permitted take would be effective, or if it would make any difference.

The group discussed the breadth of actions under MMPA Section 120 to meet the needs of the removal program at Bonneville (in light of the size of the area and number of CSLs present). Some members suggested that Section 120 may not be the best vehicle to achieve the managers' goals and suggested considering whether removal of sea lions under MMPA Section 109 might instead be worth pursuing. Managers noted that Section 109 likely would require even more resources to support implementation and would be a lengthy process to get in place.

The Task Force also considered focusing efforts on protecting the salmon runs earlier in the season, because the most at-risk salmonid runs are earlier and NMFS stated they are hit hardest by CSL predation. A background paper by Sorel et al (Population-specific migration timing affects en route survival of Chinook salmon through variable lower-river corridor) reports a 22% reduction in survival in 2013-2015 relative to a baseline period of 1998-2012 of the early migrating spring chinook apparently due to predation; however, not all are ESA listed. Further, this impact may be predominantly from Steller Sea Lions, since 2013, as CSLs arrive at the dam from April 5 to May 23rd, after the earliest part of the spring Chinook migration. Over the years, much of the early returning portion of the run has been removed by predation and currently, the mean run time is May 1st. It was noted that, when assessed at the Evolutionarily Significant Unit (ESU) level, NMFS has reported to Congress that the listed spring run salmon stocks are either stable or increasing (relative to their abundance at the time of listing, and last status review, and based on an averaging period, e.g., 10-year rolling average). However, NMFS reported that when assessed by the Major Population Group (MPG), the early stocks are some of the most vulnerable. It was suggested that the States should try to remove as many animals as possible early in the season to relieve predation on early migrating stocks.

NMFS noted that the increase of CSL at Bonneville corresponds to a dramatic increase in CSL at downriver cities in Oregon. The CSL are hauling out at piers and breakwaters in the cities of Rainier and

Astoria the increase in CSL in the river constrains the ability to limit the number of CSLs who can venture to the dam upstream. If animals are provided haul-out areas in the lower river there will be more in the river and consequently at the dam. It was suggested that NMFS should work with cities to discourage hauling out at piers and marinas as a way to help reduce possible recruitment of CSLs at the dam.

It was also noted that a handful of CSL have successfully made it upstream of Bonneville and are trapped in the Bonneville reservoir and eating salmon year round. Due to the circumstances upstream of the dam, it is difficult to trap and mark these CSLs, or to observe them eating salmon. A member asked if these CSL might be automatically added to the removal list, regardless of whether or not they are observed eating salmon, since the presumption is they are eating salmon in the reservoir? Concern was expressed that it would be “scope creep” to include these animals on the removal list without observing them eating salmon. Some, but not all of these animals, are branded or otherwise individually identifiable by scars or markings. The MMPA Section 120 requires that CSLs be “individually identifiable” prior to lethal removal and the LOA stipulates that their predation be observed at Bonneville Dam. It was suggested that the unusual location in the river system might be used to fulfill the criteria of “individually identifiable” or that temporary markers, such as paintballs might be used to help identify them. To ease concerns over the difficulty marking the CSLs, they could be marked when they haul-out at upstream marinas. Managers thought that it would be difficult to mark the animals because they have 30 miles of river upstream of the dam and they only infrequently actually see the CSLs haul-out when marking tools are readily available, making success of this idea seem unlikely. Additionally, there was concern that 3-5 CSLs above the dam are not enough of an aggregation to have the required “significant negative impact” to the at-risk species, not all of which are listed spring run salmon. Another option was proposed for addressing sea lions which had gotten through the lock and above the dam. A task force member suggested that managers consider trapping and detaining these CSLs who were not on the lethal take list for the duration of the salmon run season, then releasing them down river once the run has passed. One example explored was to use an old navigation lock, trap the CSLs and store them in the lock (or somewhere outside of the river system for a period of time), and then release them. It was noted that this idea would require that the animals be cared for and fed while being detained as this action would trigger requirements of the Animal Welfare Act. In addition, time in the area might lead the animals to fix on the site, causing them not to leave the vicinity of the dam and thus, additional management issues when released.

In regards to more research, it was noted that there might be animals which are not susceptible to trapping or are hard to capture and may be having a large impact on salmonids. It was suggested that more research be done to address the presence and behavioral ecology of “trap-shy” animals and their impact on listed salmon runs.

Task Force Responses to NMFS’ Question 2: Does non-lethal hazing appear to be an effective aid in reducing sea lion predation on salmonids in the area? Should non-lethal efforts be modified (increased, reduced, or re-directed) to improve effectiveness?

The group acknowledged that, in the 2010 *Final report and recommendations of the MMPA Section 120 Pinniped Fisheries Interaction Task Force*, the Task Force found that the hazing efforts were ineffective; however, hazing remains a requirement of the LOA.

Managers at the dam provided a brief history and update of the hazing program: They explained that hazing is conducted both from boats and at the dam near the fish ladder. Boat hazing is conducted with

two hazers in one boat, within the BRZ and tailrace area. For the first four years, the hazing program was a more concerted effort to deter an animal through chasing far downstream and using many more seal bombs and cracker shells. Now, the efforts are more modest, and consist of continued cracker shells and “seal bombs” to try to encourage an animal to go a short distance downstream. The agencies are reporting that the hazing has an immediate impact of deterring the CSL, however, within 30 minutes after hazing the CSL often returns.

➤ **Task Force Recommendations for Modifying Non-Lethal Efforts to Reduce Predation**

The Task Force briefly discussed hazing and generated recommendations for NMFS to consider:

- One option was to terminate the hazing program altogether, however, this suggestion was later amended to limit hazing at the fish ladder.
 - Again, it was noted that the current LOA and Section 120 of the MMPA requires non-lethal deterrents be used unsuccessfully prior to listing a CSL for removal, so eliminating that criterion would require a change to the LOA and may be in conflict with MMPA mandates.

Some Task Force members felt that the at-dam hazing near the fish ladder was effective, as it deters CSL from congregating at the ladder and taking fish as they pass.

- It was suggested that the at-dam hazing near the fish ladder be increased or maintained.
- It was also suggested that a time sequencing analysis could provide more information on the short-term impacts of hazing efforts.
- Another option generated was to consider testing the Raytheon Active Denial Ray Gun on CSLs. This is an experimental ray gun that emits a 95ghz ray of energy and makes the subject feel like it is burning up. It was speculated that the gun would only impact the animal when it comes to the surface of the water, however, it was later noted that the gun has not been tested in water and thus it is uncertain how it will operate with CSL and fish in the river. Additionally, it was noted that there are humans and communication systems operating at the dam that would need to be considered prior to use of such a tool. One member suggested that use of such a device could require a special permit for experimental use.

Public Comment

Members of the public were invited to speak following this portion of the Task Force’s deliberations. Below are the themes raised during public comment, additional commentary is in Appendix F of the final Pinniped Fishery Interaction Task Force 2017 report, as provided by the commenter.

- **Ninette Jones, Sea Lion Defense Brigade:** Ninette explained that she was commenting on behalf of both the CSL and the wild salmon. She shared the following concerns, thoughts, and recommendations:
 - CSL are a part of a larger ecosystem and provide important an biological function. Their role in the system is being undervalued, as they provide function as predators as well as creating food sources for other animals via their fecal matter. She pointed to trends which show decreases in plant plankton where these predator species are heavily hunted.
 - Other factors have a greater impact on salmon runs, such as dams and hatchery fish. In regards to dams, one key piece is that they limit river flow, thus slowing the movement of out-migrating salmon smolts. As out-migration is delayed, predation increases. She noted that this predation is not all CSL predation, but also includes non-native, predatory fish species that are found in the river.

- This stretch of river and the estuary is within the historical range of the CSL. Also, historically, they were found eating lamprey, not salmonids.
- The impact of the CSL on wild salmon does not warrant the resources being spent to control the population. This is an expensive program to operate and detrimental to the CSL and the role that they fill in the ecosystem.
- Recent decisions to increase sport fishing and purse seining in the Columbia have a bigger impact on the salmon runs than CSL predation.
- Ninette suggested exploring options that will benefit both CSL and salmonids, she offered:
 - Invest in fish screens and culverts: there are 72,000 unscreened water diversions and culverts in Oregon and Washington that could be fixed to help save salmon.
 - Invest in toxic remediation and pollution controls, for instance, glyphosate found in the Columbia impacts salmonid reproduction.
 - Improve water quality to meet EPA temperature standards.
 - Improve forest management to eliminate clear-cuts and the subsequent impact to water quality and fish habitat.
- **Mark Sorel, Ocean Associate Incorporated, Contractor with NMFS NW Science Center:** Mark explained that he has worked on timing of salmon populations and the impacts of CSL at the Bonneville. He shared the following concerns, thoughts, and recommendations:
 - Preliminary results from survival studies underway are suggesting low salmon survival rates and increased rates of predation occurring within the 1.2 mile reach downstream of the dam. This suggests there is more predation happening than is being observed at the dam.
 - Mark suggested that additional study is needed on downstream predation, specifically the predator-prey interaction, how it is influenced by the climate in the region, how the dam is being operated, etc.

Summary of Day 1 Task Force Deliberations

To summarize the efforts of the day, Donna noted the Task Forces' conclusion that current lethal removal program has not eliminated the problem interaction between pinnipeds and salmon. The program is eliminating the predation by single individuals removed but not overall predation, i.e, estimates of salmon consumed do not correlate with number of CSL removed; however, many members offered suggestions of more that could be done. Regarding hazing: she heard the Task Force generally agree that hazing has not been effective, with the exception of hazing at the fish ladder, which provides a short-term, targeted reduction of predation. The Task Force brainstormed a number of potential recommendations to consider for improvement of the program, which the DS Consulting team will compile for further discussion tomorrow.

MARCH 2, 2017: TASK FORCE DELIBERATIONS

Task Force Responses to NMFS' Question 3: *Do the criteria in the authorization for identifying predatory sea lions remain appropriate? If not, how could these criteria be modified to improve effectiveness?*

Robert Anderson reminded the Task Force of the criteria for adding CSL to the removal list as stated in the 2016 LOA. He stated that the CSL must be an individually identifiable, predatory CSL that is having a significant negative impact on ESA listed salmonids and:

- a) have been observed eating salmonids at the Bonneville Dam, in the “observation area” below the dam, in the fish ladders, or above the dam, between January 1 and May 31 of any year;
- b) have been observed at Bonneville Dam on a total of any 5 days (consecutive days, days within a single season, or days over multiple years) between January 1 and May 31 of any year; and
- c) are sited at Bonneville Dam after they have been subjected to active non-lethal deterrence.

The group clarified that under the current LOA, all of these stipulations need to be met in order for a CSL to be added to the removal list. In regards to identifying an animal as an individual, it was noted that this is something of a legal interpretation, which requires that the animal is distinguishable from others on any given day, year, or location. In the past, identification has been achieved using human-made and natural markings, such as alpha-numeric brands, applied brands, tags, and scars.

➤ **Task Force Recommendations for Modifying Individual Identification Criteria**

Task Force members discussed whether there are additional methods for identifying individual CSLs that would meet the MMPA statutory requirements. There was discussion as to whether behavioral characteristics are sufficient as identifiers. It was suggested that, although not legally prohibited, behavioral characteristics may be difficult to describe and prove sufficient over time for identifying the individual. In addition to behavior, Task Force members brainstormed potential ways to identify individual CSLs, including: size criteria, location at or above the dam, and installing PIT or radio tags in the CSLs.

For CSLs that have managed to re-locate above the dam, the managers said the current criteria make it difficult for these animals to be listed except under the conditions of the LOA. Moreover, managers considered it too difficult to mark or observe them eating salmon above the dam (unless they have already been marked or observed elsewhere).

- One idea suggested was to relax the “individually identifiable” criteria or develop separate criteria to allow animals above the dam to be added to the list without individual markings or observation of salmonid predation.
- Scat analysis was mentioned as an option for proving that the CSLs above the dam are eating salmonids.
- Additionally, it was noted that sometimes these animals haul-out at marinas above the dam and could be marked at that point. Efforts to mark animals during haul-out could be increased and prioritized.
- Managers also noted that there were only 3-5 animals above the Dam at this point.

In regards to using PIT or radio tags to identify individual CSLs, the group discussed that if this strategy is employed in sea lions, installing detection arrays at the mouth of the traps or other locations could confirm identification. PIT tags were also discussed as a way to verify that the animals had consumed salmonids; for instance, if a PIT were detected inside of the CSL, then it could be analyzed to see if it was an adult salmon or smolt. The efficacy of this method would depend on the thickness of the animals’ blubber: if it is too thick, the PIT will not be detected.

The Task Force discussed the criteria of ‘days observed’, noting that data indicate that the mean time an individually identifiable CSL is at the dam is five days. By the time the observers see an animal five times; the animal likely will be leaving the area. Additionally, survey staff reported that it is difficult to observe the animals five times because staff observation time continues to decrease due to budget constraints. In order to increase the number of CSLs listed for removal task force members suggested:

- Decreasing the number of days of observation required from five to three.
- The number of observation days selected (whether it is 1, 3, 5 or whatever) needs to be informed by data, not chosen arbitrarily. One idea was to use data to determine the probability that a CSL was observed eating salmon as a function of how long (number of days) it had been seen at the dam. For example, if there was a high probability (e.g., 85-90%) that an animal there for three days would be seen eating salmon then you might consider relaxing the threshold from 5 to 3.

CSL field managers noted that one of the most significant limiting factors for adding CSLs to the removal list has been the ability of the observers to actually see an animal eat a salmonid. The current observation protocol puts observers in fixed locations around the dam. Increasing the ability of the observers to observe the CSL would likely increase the number of animals on the removal list. Task force members suggested:

- Increasing the number of observers, as well as their mobility around the dam.
- Currently, the observers are USACE and USDA staff; however, NMFS could ask the States and Tribes’ staff to assist with observation.

Task Force Responses to NMFS’ Question 4: *Are there other terms and conditions of authorization or aspects of the states’ implementation of the removal activities that limit effectiveness of the permitted lethal removals? If so, what changes are recommended?*

The Task Force explored ideas around the existing Terms and Conditions in the LOA and potential for improving implementation. Some task force members discussed the option of increasing lethal removal efforts using firearms. This method of removal is already permitted in the LOA. It was noted that using firearms to kill CSL has raised safety and public relation concerns in the past. Furthermore, there are implementation constraints that significantly limit the tool; for instance, in order to remove the CSLs using a rifle or shotgun, there needs to be a safety officer present, as well as a Biologist. In past meetings, the Corps had suggested that it might also need to ask the visiting public to leave the Dam. The animal would first have to be identified and it would have to be safe to fire the firearm. Additionally, after the animal is shot, it would be difficult to retrieve the carcass, potentially adding to public concerns if shot sea lions are found.

Although outside of the purview of the Task Force, one member mentioned the increasing impact of Steller sea lions. The Steller sea lion population below Bonneville has reached approximately the same numbers of CSL in 2006, which is when the states’ first applied for permission for removal of CSLs. Regardless of CSL removal efforts, resolving the problem interaction will not be effective if Steller sea lion presence continues to increase.

➤ **Task Force Recommendations for Modifying the Terms and Conditions**

Task force members acknowledged NOAA’s increased speed and efficiency in updating the removal list; however, one question was whether there might be additional process efficiencies that could be implemented. Some, including the states, thought that the process was streamlined as much as possible

and that in order to maintain accuracy in identifying predatory sea lions, it should not be further expedited.

- It was suggested that the revised, more efficient, process to update the list be formalized, and that NMFS should continue to make the process as efficient as possible.

The group revisited the criteria for adding animals to the removal list and a majority suggested:

- Amending the criteria to remove the stipulation of days of residence time and, instead, only require that a CSL be seen eating a salmonid.
- Changing the LOA language to state that a CSL needs to be seen eating a salmonid OR be in the area for a certain number of days. Currently the LOA states that both predation **and** residence criteria need to be met in order for an animal to be added to the list.
 - Note that some Task Force members were not comfortable with making optional the requirement for specific number of days of observation, as there are CSL that visit the area and may not consume salmon. (i.e., these members wished the language to continue to say “and” rather than “or.”)

In the States’ report, they suggested that an increase in funding for the program would help increase the effectiveness. The Task Force did not address this recommendation due to limited information and time, however, it was noted that the current funding climate is challenging and there may be other priorities for funds.

- It was suggested that NMFS look to increase support of the program, wherever possible.

Task Force Recommendations for NMFS

In evaluating the effectiveness of the lethal removal program, NMFS asked the Task Force to work together to develop recommendations that document the points of consensus reached by the group as well as the full range of opinion and alternate points of view when consensus was not reached. The following list of recommendations stems from ideas generated during Task Force deliberations and was established as the list that would be provided to NMFS. The recommendations below do not signal Task Force consensus, instead the following list represents the range of ideas expressed by Task Force members. **Where consensus was reached it is noted, in all other suggested recommendations there was no consensus reached.** Not all recommendations discussed were “voted on” by the Task Force. Additionally, the member from the Humane Society of the United States (HSUS) expressed concern for the program as a whole, stating that the task force itself had already agreed that, to date, the program has not been effective in achieving the statutory goal of eliminating the predation, and suggested that NMFS and the states should terminate it.

Recommendations on NMFS question 1: Is the current lethal removal program effectively reducing pinniped predation on at-risk salmonids? If not, what changes do you recommend?

1. Consider changing current criteria for identifying animals for removal to one or more of the following:
 - Individually identifiable and have been seen eating salmon, or have been observed in the area for X days.
 - Reduce the requirement of number of days that an individual CSL is seen present at the dam.

- Use data to analyze the probability of consumption of at-risk salmonids based on how many days an animal has been in the area, in order to determine the appropriate number of days of observation needed.
 - Reduce the number of days of observation from 5 to 2 or 3, regardless of a probability analysis.
- With regard to sea lions above the dam, instead of requiring individual identification of CSL above the dam, automatically add them to the removal list, regardless of whether or not they are observed eating at-risk salmonids. Inclusion on the removal list would be automatic for CSLs above the dam due to the presumption that they are eating at-risk salmonids when trapped above the dam.
 - In this instance, consider “relaxing” the criteria for “individually identifiable”. For instance, add a CSL to the removal list if it is upstream of the Bonneville Dam, regardless of whether the animal is observed eating a salmon.
 - Consider increasing efforts to mark these animals, even temporarily, for instance when they haul-out at marinas or elsewhere.
 - Where possible use scat analysis to determine if salmon have been consumed by animals above the dam.
2. Prioritize removing as many animals in the early season as possible in order to protect ESA-listed early migrating runs, whose conservation status appears more in question .
 3. Agencies do whatever is needed to expedite approval of lethal removal.
 - If unable to process lethal removal in an efficient, streamlined manner, such that the goals of the program as originally delineated cannot be met, then stop the program.
 - Consider using Section 109 or other parts of the MMPA that may be more appropriate to the stated goal.
 4. Consider/clarify criteria and a time-certain at which NMFS will say that it is/is not possible to remove the maximum number of CSLs permitted by the LOA, and the program is/is not working. [Note: A NMFS Task Force member did not believe that the program could be terminated due to the impacts on at-risk salmonids.]
 - Recommend a sunset date to end the program if there are not sufficient resources to implement it fully. [Note: NMFS noted that the sunset date is built into the LOA, unless the States apply for another LOA].
 5. Recommend that funding be provided to the States for a second removal crew to increase probability of achieving the take numbers allowed.
 6. Consider sea lion detention for unidentified sea lions captured in traps above the dam. For example, hold them in the navigation lock (or nearby) and keep them there until May.
 7. Consider/assess and analyze whether there are trap shy animals and what their associated impacts to the population might be: are there components of the population that are trap shy and then are difficult to re-catch that may be impacting predation?
 8. In order to help limit the pool of animals available for recruitment and replacement at the dam, work with cities (Astoria, Rainer, others?) to discourage hauling-out at the piers and other locations downriver or along the coast. *{No disagreement with this suggestion, however, there was not a consensus check.}*
 9. Determine how to improve estimates of the predation happening outside the current observation zone below the dam.
 - Place observers on ships as they travel upriver.
 - Use State and tribal agency staff as observers in addition to USACE. Explore other mobile observation (drones, portable platforms, etc.)

Recommendations on NMFS question 2: Does non-lethal hazing appear to be an effective aid in reducing sea lion predation on salmonids in the area? Should non-lethal efforts be modified (increased, reduced, or re-directed) to improve effectiveness?

1. Drop the requirement for hazing prior to adding an animal to the list for removal. [Note: NMFS clarified that under the current LOA hazing is required prior to adding a CSL to the removal list.]
2. Discontinue in river hazing and while maintaining and increasing at-dam hazing. *{Consensus of the group for these suggestions}*
 - Specifically maintain hazing near the fish ladder.
 - Increase hazing near the fish ladder, where the highest concentration of predation is occurring.
3. Consider a time sequencing analysis of hazing efforts to determine short-term impacts on predation.
4. Explore other non-lethal alternatives, as tools arise.
 - Consider hazing with Raytheon Active Denial Ray Gun.
5. Consider adding other methods of lethal removal as part of the hazing effort, including shotguns. Note: recognize that there are safety and implementation challenges with using fire arms.
6. Consider using the historical approach of leaving a dead carcass in area for sea lions to see and deter them.

Recommendations on NMFS question 3: Do the criteria in the authorization for identifying predatory sea lions remain appropriate? If not, how could these criteria be modified to improve effectiveness?

1. Consider changing current criteria for identifying animals for removal (See recommendation #1 under NMFS Question 1 in which the majority supported making the “and” in the criteria into an “or”).
2. Consider implementation of additional measures to mark and identify individual CSLs when appropriately and scientifically implemented.
 - Use temporary marking techniques, such as paint balls.
 - Explore the use of PIT tag, or other potential methods for tagging (radio acoustic, satellite) to mark animals and add detection arrays at traps or other locations in order to better understand predation. *{All Task Force Members present supported this recommendation.}*
 - Increase observation staff’s capacity to observe from multiple locations, also increase the mobility of the observation crew. *{All Task Force members present supported this recommendation; however, HSUS noted that, considering NMFS’ budget constraints, they do not see that as a good use of limited funds.}*

Recommendations on NMFS question 4: Are there other terms and conditions of authorization or aspects of the states' implementation of the removal activities that limit effectiveness of the permitted lethal removals? If so, what changes are recommended?

Some, but not all, task force members supported several of these considerations:

1. Consider changing current criteria for identifying animals for removal (See recommendation #1 under NMFS Question 1).
2. Consider whether the Terms and Conditions could be enhanced by formalizing the notion that the agency be as efficient as possible in processing requests for removal.
3. There may be a need in the near future to address the increase of Steller Sea Lions in the system; as CSLs are reduced at the dam, Steller Sea Lion presence may increase which will not resolve the overall issue of predation on listed runs unless addressed.
 - There are other factors affecting mortality rates of salmon, some of which may not be being addressed and need to be; however, they are out of the purview of this group.

Summary of Day 2 Task Force Deliberations and Closing

To close the session, Donna summarized the day's conversations. She noted that the Task Force explored potential changes to the criteria for listing for predatory CSLs for lethal removal. Discussions focused on ideas for how to better identify individuals, amend observation requirements, use alternative methods of marking, and potential increases in staffing and resources. Additionally, the Task Force reviewed a preliminary list of recommendations, eliminating consideration of some, reaching consensus on some and agreeing to disagree on others.

Donna confirmed the drafting and editing process for both the session summary and official Task Force report:

- An initial draft of the summary will be provided to the Task Force by March 13th; edits are to be provided to DS Consulting by March 20th; followed by a final summary back to the Task Force on March 24th.
- An initial draft of the report to NMFS will be provided to the Task Force by March 22nd; edits are to be provided to DS Consulting by April 6th; followed by a final report being sent to NMFS and the Task Force by April 15th.

Robert thanked Task Force members and participants for taking the time to provide their input as NMFS considers the effectiveness of, and any modifications to, the removal program. Donna thanked the participants for providing thoughtful opinions on a difficult subject and adjourned the meeting.

Facilitator's Note: This meeting summary was written by the facilitation team at DS Consulting. Task Force members were given the opportunity to review an initial draft, and their edits were included in a 'near final' draft. The near final draft was sent again for final review and refinements. Five (5) of the Task Force members responded to one or both drafts with edits and/or approval for the report. All edits have been merged by the facilitation team into this final summary.

Final version respectfully submitted this 14th of April, 2017.

*Donna Silverberg
Owner, DS Consulting*