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File: 2013 07 25 LTR Bush_Evarts Comments on Flathead lake DEIS

July 29, 2013

Les Evarts
Fisheries Program Manager
Confederated Salish and Kootenai Tribes
Natural Resources Department
P.O. Box 278
Pablo, MT 59855

Dear Mr. Evarts:

Attached are official comments of the U.S. Fish and Wildlife Service (FWS) regarding the Draft Environmental Impact Statement (DEIS) titled: *Proposed Strategies to Benefit Native Species by Reducing the Abundance of Lake Trout in Flathead Lake, Montana.*

Our comments include two pages of general observations and our conclusions, backed by a more comprehensive set of technical comments on the specifics of the document itself. If you have additional questions or comments related to this issue, please contact either Wade Fredenberg (406) 758-6872, or Tim Bodurtha (406) 758-6882, in our Kalispell suboffice. Thank you for the opportunity to comment.

Sincerely,

Jodi L. Bush
Field Supervisor

cc: Montana Fish, Wildlife and Parks, Helena (Attn: Jeff Hagener, Director)
U.S. Fish and Wildlife Service, Bull Trout Coordinator (Attn: Brian Kelly, Boise)

GENERAL COMMENTS

FWS appreciates the opportunity to comment. Once a decision is made to go forward with a chosen alternative (or some combination), we will work closely with the Confederated Salish and Kootenai Tribes (CSKT) to ensure that implementation is consistent with the goals of bull trout recovery under the Endangered Species Act of 1973 (ESA).

For the past 13 years, FWS has consistently and clearly advocated for lake trout reduction in Flathead Lake. We agree with the DEIS conclusions that the lake trout population has not declined and as a result there continue to be concerns regarding native species recovery. Furthermore, there is strong scientific support for the conclusion that the greater Flathead bull trout metapopulation (including lakes in Glacier National Park and the Swan drainage) has declined over the past 15 years. This is due, in part, to the failure to reduce lake trout in Flathead Lake. In a letter to the Flathead Reservation Fish and Wildlife Board dated October 7, 2000, David Wiseman (FWS representative on the Joint Board) stated that the FWS did not support adoption of the Co-Management Plan as it was up for consideration at that time, noting: "In our estimation this plan falls far short of the standard needed to ensure recovery of native bull trout and westslope cutthroat trout in the ecosystem." He further noted: the Co-Management Plan "... fails to consider the impacts of status quo management of Flathead Lake on the entire interconnected Flathead ecosystem, including the river and the numerous bull trout lakes upstream and downstream that are being increasingly compromised by invasion of lake trout..."

The FWS continued to express many of these same reservations during the process of conducting a mid-term evaluation of the Co-Management Plan. We reiterated that position in a letter, dated December 14, 2006, from Steve Kallin (FWS representative on the Joint Board) to the Co-Managers and Board, that stated: "It is apparent from the presentation and interpretation of the data, that the security and resiliency of the lake trout population is several orders of magnitude greater than that of the native fish species, a situation that causes us great concern." Much of the scientific support that is expertly presented in this latest DEIS reaffirms that position. In 2006, FWS proposed that hard targets for lake trout removal should be set and that if the recreational fishers failed to meet those targets, then the slack be made up by other methods such as directed netting. The suppression alternatives presented within the DEIS embrace that strategy and we continue to support the development and application of science that led to this conclusion.

The FWS supports Alternative(s) C and D or some combination of the two, which would begin to achieve the reduction the lake trout population that we have been consistently advocating. Given the goals and objectives that the DEIS presents, as well as the concurrent goals and objectives of bull trout recovery, neither the no action alternative (Alternative A), nor Alternative B, which would reduce the numbers of lake trout over age 8 by 25% but allow the total lake trout population to continue to increase, are acceptable to the FWS. We note that analysis in the DEIS shows that if implementation of Alternative B were carried out over a period of years it would further stockpile up to eight year-classes of juvenile lake trout. Should implementation of Alternative B fail to result in meaningful increases in bull trout, then it would further delay and complicate any future implementation of a more aggressive reduction plan.

As the following technical comments illustrate, there remain areas of scientific and technical uncertainty. The FWS believes much of the potential impact to bull trout from by-catch in a lake trout suppression program can be successfully mitigated by an adaptive approach to implementation. After an alternative is selected, FWS will be available to assist you in the development of the implementation plan.

TECHNICAL COMMENTS

Issue 1: Scientifically, the goals expressed in the DEIS cannot be achieved unless Alternative C or D is adopted.

Executive Summary – Quick Facts – Page i – First Paragraph: *"We define benefits to native trout as increasing the population sizes of bull trout and westslope cutthroat trout to levels that could ultimately sustain harvest."*

DEIS – Page 10 – Desired Future Condition – paragraph 2: *"The desired future condition would include: (1) a reduced role for lake trout…… (2) the restoration of at least 50% of the population levels of westslope cutthroat and bull trout lost since the population of lake trout greatly expanded in the 1980's……"*

FWS COMMENT: The two statements above appear to be in conflict. An increase in the populations of native fish to 1980's levels, as the Bull Trout Recovery Plan advocates, could result in a potential for limited harvest. However an intermediate step of providing a legal catch and release fishery for bull trout is more attainable and would likely need to be achieved and maintained for a period of time before any harvest could be considered. The restoration of 50% of the bull trout lost since the 1980's would seem to indicate a goal of roughly half the Recovery Plan level, and is not sufficient to support future bull trout harvest.

Issue 2: Adult Bull Trout Populations in Flathead Lake are likely overestimated using current methodology.

Executive Summary – Bull Trout – Affected Environment – Page xi – First Paragraph: *"The total abundance of adult bull trout in the interconnected Flathead system is now about 3,000."* Following paragraph: *"These populations are indicative of subpopulations at risk…… stochastic extinction is a foreseeable threat. Gillnet catches and creel surveys, which are focused on Flathead Lake, show even more dramatic declines than redd counts in the river system. The losses of bull trout to predation by lake trout are estimated to be at least 19,000 bull trout annually, equating to over half the lowest estimated annual production of bull trout outmigrants." "Further declines or even perpetuation of the status quo precludes attainment of recovery objectives for the crucially important Flathead Lake core area."*

DEIS – Page 61 – Abundance and Extinction Risk: Similar to above, citing Weaver (2010) as the source of the abundance estimate, based on expansion of redd counts. Further: *"Estimates of adult bull trout abundance using the same method have ranged from a high of 8,100 fish in 1982 to a low of 1,300 in 1996 (Weaver 2010)."*

DEIS – Page 65 – 2nd Paragraph: *"In addition to redd counts, changes in bull trout abundance over time are monitored using standardized gillnetting during spring in five fixed locations (Deleray et al. 1999). Average catches have decreased 86% from 2.2 in the early 1980s to 0.3 bull trout per net over the last ten years (Weaver et al. 2006) (Figure 3.26)."*

FWS COMMENT: The FWS believes the methodology cited by Weaver (2010) for converting redd counts to adult populations is flawed and needs to be modified to more accurately reflect the best available science. This standard methodology was developed (appropriately so, at the time) by biologists working on the Flathead system in the early 1980's and has been the standard in use since that time. The methodology involves expanding the index redd counts by factors to account for basinwide totals in uncounted streams, includes upward adjustment of 10% to account for missed redds, and assumes 3.2 adults per redd and alternate year spawning is the standard, based on 1980's era empirical information. Multiple assumptions, implicit in the method, result in the generation of a liberal rather than conservative estimate of adult population size. The FWS believes this approach needs to be modified to reflect the most current scientific information and as used in the DEIS is inconsistent with the conservation of a threatened species, for the following reasons:

- First, in using the standard formula, redd counts are inflated 10% basinwide to account for missed redds. There is no corresponding deflation to account for false or partial redds or other structural areas (such as washes or beaver digs) that may be inaccurately classified as redds.
- Second, Al-Chokhachy and Budy (2005) recommended 2.68 adults per redd as a standard conversion, based on multiple data sets. Amongst the range of values reported in the literature, the 3.2 used on Flathead Lake is on the high end. Downs et al (2006) empirically derived an identical value of 3.2 adults/redd on Lake Pend Oreille. But, the 1980's value for the Flathead was derived using relatively crude methods (chicken wire, box traps and redd counts) and has not been corroborated by more refined or current methods such as picket weirs, marked fish and PIT-tag readers. Additionally, bull trout demographics such as sex, age and size structure of the Flathead Lake spawning population today may be markedly different than they were in the 1980's, with a potentially higher percentage of larger and more experienced female spawners than were present under a 1980's scenario that included extensive sportfish harvest of bull trout. There may also be a greater and growing proportion of fluvial spawners. Consequently, we believe there is a need for a contemporary study to corroborate that the 3.2 value is still relevant, or in the alternative we should default to a more conservative expansion factor such as the 2.68 developed by Al-Chokhachy and Budy (2005).
- Third, in the 1980's era in which the expansion methodology was developed, angler harvest of bull trout remained open. In 1981-1982, a creel survey estimated harvest of

1,090 adult bull trout from the lake and another 1,330 adult (mostly pre-spawn) bull trout from the river. Even though in some later analyses these estimates were considered high, it's still likely that well over one thousand pre-spawn adult bull trout were being removed from the population annually. Using the same expansion factors, either redd counts of that era were underestimates of the total adult population relative to today or, in the alternative, today's counts are by necessity overestimates. This may partially explain why redd counts have not declined as precipitously as the 86% decline seen in gillnet catch in the lake (see further discussion later in this document).

- Fourth, and clearly the most significant of these four issues, is the presumption of alternate year spawning. At the time observations were made in the late 1970's and early 1980's, there were limited tagging and tracking tools to make direct determinations, so alternative methods based on gillnet catch in the lake were used as a crude measure. At best, this was an admittedly rough calculation (see Leathe and Graham 1982) that has never been critically examined or tested. In recent years, with the advent of radio telemetry and refinement of the use of weirs and PIT tags, a much broader assessment of spawning patterns in migratory bull trout throughout the West has emerged. These findings generally indicate a range of 70-90% repeat spawning for migratory populations as typical. Unless better evidence (or rationale) exists to support the alternate year spawning hypothesis in Flathead Lake, the FWS recommends adopting the science from surrounding systems and assumption of 70-90% annual spawning of adfluvial bull trout in the Flathead system. This is the best science available on this subject.

In summary, the method described by Weaver (2010) to translate redd counts to adult population numbers incorporates multiple assumptions, most of which likely bias the total adult bull trout population estimate to the high side. The DEIS contends that this is irrelevant, so long as application of the method has been consistent, because trend is more important than absolute numbers. However, in this DEIS, where bycatch is a huge issue and achievement of secure levels, genetic standards and recovery goals loom large, accurate estimates of the adult bull trout population baseline are important.

Issue 3: Concern has been expressed about increased Mysis populations leading to algal blooms.

Executive Summary – Invertebrates – Environmental consequences –page xiii – last paragraph: *"Reducing lake trout numbers would likely cause Mysis numbers to increase, cascading to decreases in zooplankton and increases in phytoplankton, although the changes are not predicted to be large. The likely changes do not exceed densities measured in Flathead Lake since 1986."*

FWS COMMENT: Under Alt. B the projected Mysis increase ranges from the current 45/m^2 up to 51/m^2; under Alt. C up to 81/m^2; and under Alt. D up to 130/m^2. None of these changes are outside the ranges of observed variability in the recent past and as such we do not see cause for the elevated concern being expressed regarding algal blooms as a consequence of increased densities of Mysis. Other Flathead Valley lakes and Lake Pend Oreille all support higher Mysis

densities than Flathead Lake, sometimes many times higher, without algal blooms being prevalent.

Issue 4: Monitoring may not be adequate.

DEIS – Monitoring and Adaptive Management – Page 10: *"If monitoring indicates that success is not being achieved, primarily in the form of increases in native fish numbers, and further that the potential success is low, the suppression activity would be terminated."*

FWS COMMENT: Information regarding monitoring and adaptive management in the DEIS is vague. While we understand that adaptive management is being employed, definite checkpoints (10 years, 25 years?) and hard targets would be useful in determining whether the management is successful. The Flathead watershed is a very big system and inadequate monitoring will lead to continuing controversy and misinterpretation and misrepresentation. As part of any implementation plan, the FWS will require an adequate level of monitoring of bull trout response, bycatch issues, and angler catch rates.

Issue 5: Bull Trout Bycatch.

DEIS – Mitigation Measures – page32 (bottom) -33 (top): *"Under all the alternatives, bull trout mortality would be limited to the levels identified in predetermined bycatch tables....."*

DEIS – pages 51-55 – Tables 3.3, 3.5, and 3.7 – Indicate bull trout bycatch mortality from gillnetting under Alternatives B, C, and D would be 58, 175, and 304 fish respectively.

DEIS – By-catch and Benefit-Risk Analysis – pages 67-68-69: *"total by-catch mortality is (163 under Alt. A, 221 under Alt. B, 338 under Alt. C, and 467 under Alt. D), the bulk of which would be subadults. This bycatch represents about (0.6% under Alt. A, 0.9% under Alt. B, 1.4% under Alt. C, and 2% under Alt. D) of the 1+ bull trout population and about (5% under Alt. A, 7% under Alt. B, 10% under Alt. C, and 15% under Alt. D) of the current adult bull trout population."*

FWS COMMENT: Accurate estimates of the population size of adult bull trout are important and should be conservatively derived (see above: Issue 2). The FWS must analyze by-catch limitations and develop Terms and Conditions for any biological opinion or permit under which the project may proceed. Unlike similar lake trout suppression projects being implemented in Swan Lake, Quartz Lake, and Lake Pend Oreille, the Flathead Lake bull trout local populations are considerably less robust than they were historically and so by-catch will be an area of critical focus in the implementation plans and of intense monitoring going forward. Additionally, the DEIS does not adequately analyze the cumulative impacts of bull trout mortality beyond Flathead Lake in the Flathead River system due to angler hooking mortality (both unintentional and poaching), spawning mortality, and other factors. The lake cannot be separated from its upstream habitat in considering recovery actions for a migratory bull trout population. While

these issues may be extraneous currently, we identify them here to insure they are addressed during development of any future implementation strategy.

Issue 6: Decoupling of Lake and River Impacts to Bull Trout.

DEIS – page 67 – 2nd Paragraph – Bycatch and Benefit-Risk Analysis: *"Angling during general harvest results in bycatch mortality of 55 bull trout, and Mack Days fishing contest account for bycatch mortality of 108 bull trout (Table 3.1 and Appendix 5). The total bycatch mortality is 163 individuals, the bulk of which would be sub-adults. This bycatch represents about 0.6% of the age 1+ bull trout population and about 5% of the current adult bull trout population."*

DEIS – page 113 –paragraph 3 – Affected Environment – Flathead River: Evaluation of most recent creel survey of the main-stem Flathead River (Deleray 2004), indicating: *".... 87% of angler catches were non-native species."*

FWS COMMENT: As we discussed under Issue 5, while it is important to characterize impacts of the proposed action, FWS believes it is misleading to compare estimated mortality rates to juvenile and adult bull trout populations when they represent only an unknown portion of the total mortality. A strong, stage-based demographic modeling effort would include multiple sources of mortality and analyze the correlation amongst them. Compensatory mortality is a different issue than mortality that is additive. This is a further example of the decoupling of lake and river impacts. Saving bull trout from in-lake predation will not translate to population increases if, for example, pike predation in the lower river offsets those gains. We recommend mortality comparisons not be made without stronger empirical or modeling support.

Issue 7: Modeling Validity.

DEIS – Predation by Lake Trout - Page 46 –

FWS COMMENT: In this discussion, a closer examination of the Lake Pend Oreille (LPO) effort makes a powerful case in support of population modeling. In the LPO case, population models were developed as suppression actions were being initiated, then the actions were implemented and adequate data are being consistently gathered to update the models and verify the anticipated population responses. The DEIS should include more detailed discussion of the Lake Pend Oreille effort, as it is the best and most relevant example to compare to what is being proposed in Flathead Lake. Monitoring and evaluation strategies similar to the LPO model should be closely adhered to in development of any Flathead Lake implementation plan.

Issue 8: Climate Change.

Page 121, paragraph 3-4, Climate Change: *"Benefits to native fishes resulting from reduced predation by lake trout will probably be partially offset by the detrimental effects of climate change." "The cumulative effects of climate change, when combined with predation by lake*

trout, represent a substantial long-term threat to westslope cutthroat trout and bull trout populations in the Flathead system."

FWS COMMENT: The Flathead watershed produces an abundance of water and is colder and less likely to be impacted by projected climate change scenarios over the next decade or two than other bull trout core areas across the rest of Montana and within the U.S. range of the species. The greatest concern for the Flathead in the near future is probably not an increase in stream temperatures, but rather the potential for increasing frequency of winter floods and rain-on-snow events. As a threat, the near-term and ongoing impacts of lake trout and other nonnative species far exceed longer-term concerns related to climate change. However, as the DEIS indicated, the long-term prospects for bull trout in the face of climate change are not likely positive; we agree. One very real impact of climate change is the emphasis it places on bull trout recovery in the Flathead Lake core area, given the relatively greater impacts to the Clark Fork basin and elsewhere across the species range.

Issue 9: Alternative B

DEIS – pages 51-53: *"Simulation modeling indicates that a harvest of 84,000 lake trout would produce an annual mortality rate of 29%, which is not sufficient to reduce total lake trout numbers (age 1-30) relative to the status quo. The size structure of the lake trout population would change very little except for those fish age 8 and older."*

DEIS – page 51 paragraph 4 – Direct and Indirect Effects: *"If we assume that angling (general and Mack Days) will achieve a harvest of 70,000 lake trout, then an additional 14,000 lake trout could be harvested by netting (10,000 by gillnetting and 4,000 by trapnetting). This approach would require an estimated 65,000 feet of gillnet and 80 trap-days...."*

DEIS – page 67 paragraph 5 – Direct and Indirect Effects: *"Bioenergetics modeling indicates that Alternative B would reduce predation on bull trout by 65% over the long term (>50 years). This reduction is expected to facilitate a 65% recovery of the population lost since lake trout expanded in the 1980's, equating to 3,274 more adult bull trout (appendix 9)".*

DEIS – page 67 paragraph 7 – Bycatch and Benefit-Risk Analysis: *"Over the long term (>50 years), provided that the bull trout population persists over the next 50 years, adult bull trout are predicted to increase by 3,274 adults."*

FWS COMMENT: The implementation of Alternative B would not, in our opinion, accomplish the DEIS intended goals of supporting a significant increase in the population of bull trout and native westslope cutthroat trout. As indicated in the DEIS, the total lake trout population would actually increase, with all of that increase incorporated in age classes 1-8. If competitive interaction between juvenile lake trout and juvenile bull trout is a currently undocumented and unquantified driver of bull trout suppression, then an expanded lake trout population could actually worsen the existing status of bull trout. Importantly, those impacts would not necessarily be documented. Furthermore, if Alternative B were implemented and later found to

be inadequate, even larger numbers of juvenile lake trout in age classes 1-8 would accrue, making the inevitable suppression at higher levels even more costly and time-consuming in the future, with consequently greater potential impacts to bull trout. With a current population level of substantially more than one million lake trout, the added suppression of 14,000 fish (roughly 1% or less) proposed in Alternative B seems inconsequential.

The greater than 50 year time frame described in the DEIS exceeds 10 bull trout generations and is beyond the reasonably foreseeable future. We question whether it's appropriate to plan for and speculate that far into the future – which would be essentially equivalent to forecasting today's circumstances from a vantage point of 1963. As the DEIS notes, there is considerable stochastic and demographic risk in play and it is unlikely that benefits taking greater than 50 years to accrue would ever be realized.

We are also skeptical of the 1:1 equivalency portrayed by the analysis in the DEIS. Assuming that all bull trout saved from predation translate directly into population increase (e.g., 65% reduction in predation translates to a 65% increase in the population) is not supported by the science. Furthermore this presumes the baseline starting level of 3,000 is accurate, a premise that the FWS disagrees with (see response to Issue 2). The FWS recommends that a more refined stage-based demographic population model be completed in order to better capture the interacting forms of compensatory and non-compensatory mortality and areas of uncertainty.

Issue 10: Alternative C.

DEIS – page 53 paragraph 3 – Direct and Indirect Effects: *"If we assume that angling (general and Mack Days) will achieve a harvest of 70,000 lake trout, then an additional 42,000 lake trout could be harvested by netting (32,000 by gillnetting and 10,000 by trapnetting). This approach would require an estimated 227,500 feet of gillnet and 200 trap-days...."*

DEIS – page 53, paragraph 4 – Direct and Indirect Effects: *"In the short term (< 5years), the total abundance of lake trout would decrease very little, with greater decreases for older age classes. The reduced abundance of lake trout would reduce intra-specific competition, thereby increasing growth and body condition and decrease age at maturity."* (Repeated for Alt. D below).

DEIS – page 68 paragraph 5 – Bycatch and Benefit-Risk Analysis: *"Over the long term (>50 years), provided that the bull trout population persists, adult bull trout are predicted to increase by 4,184 adults."*

FWS COMMENTS: The FWS notes that an important advantage of Alternative C, over Alternative B, is that the total lake trout population would be expected to decrease. If implementation of Alternative C turned out to be inadequate, then at least the starting point for more intensive measures would be reduced. Unlike Alternative B, we further believe that the additional removal of 42,000 lake trout under Alternative C is substantive enough to empirically test benefits to bull trout with some measure of confidence, presuming the bycatch issue is

adequately handled. As noted previously, the greater than 50 year projected timeframe will be difficult to measure (FWS recommends at most a 25 year timeframe, with 10 year reevaluation) and modeling of bull trout response would be beneficial. The 1:1 equivalency issue, also described in our comments under Alt. B, contributes to the finding in the DEIS that the increment of benefit to bull trout amongst Alternatives B, C, and D is minimal. The DEIS predicts a long-term increase of 3,274 bull trout under Alt. B, but only 4,184 (28% greater) under Alt. C, and 4,650 (42% greater) under Alt. D. Those projections highly uncertain, for the reasons we discussed here and previously.

There is one additional important point that emerges in the analysis of Alt. C: the DEIS conclusion that: "*... reduced abundance of lake trout would reduce intra-specific competition, thereby increasing growth and body condition and decrease age at maturity.*" This is important for two reasons. First, there are beneficial tradeoffs to anglers related to faster-growing, more robust, less toxic (lower mercury bioaccumulation) lake trout. Anglers are typically more attuned to weight than length in trophy trout, so some of the loss of older lake trout could be offset by more robust weights of shorter trophy fish. It's not clear that the DEIS accounts for this change.

Second, and more importantly, lake trout trophic interaction seems to cause direct competition with bull trout for the same ecological niche (see e.g., Meeuwig et al. 2011), perhaps explaining in part why lake trout expansion has such a correlated effect on bull trout reduction. The FWS believes high lake trout levels could also lead to intense intraspecific competition in the lake environment, resulting in decreased growth and body condition as well as increased age at maturity in bull trout as well as lake trout. We are currently examining some of these parameters in Swan Lake (see e.g., Guy et al. 2011). For now, interspecific competition remains an area of concern and at a minimum the reduction of lake trout populations to at least a level where the condition of individual lake trout approaches regional averages seems like a protective measure for health and growth of bull trout as well. The physiological stress associated with poor growth and condition could be one of the factors leading to emigration by lake trout from the lake environment and could contribute to vagrancy and roaming of Flathead lake trout, further jeopardizing other lakes in the Flathead and Clark Fork ecosystem. The FWS recommends lake trout and bull trout condition factor be closely monitored during the implementation of any suppression alternative.

Issue 11: Alternative D

DEIS – page 55 paragraph 3 – Direct and Indirect Effects: "*If we assume that angling (general and Mack Days) will achieve a harvest of 70,000 lake trout, then an additional 73,000 lake trout could be harvested by netting (63,000 by gillnetting and 10,000 by trapnetting). This approach would require an estimated 420,000 feet of gillnet and 200 trap-days....*"

DEIS – page 69 paragraph 4 – Bycatch and Benefit-Risk Analysis: "*Over the long term (>50 years), provided that the bull trout population persists, adult bull trout are predicted to increase by 4,650 adults.*"

FWS COMMENTS: Most of the points made by the FWS under the discussion of Alternative C also apply to Alt. D. The FWS believes this alternative offers the best chance to fully test the impact of lake trout on the native fish in the ecosystem, presuming by-catch issues can be managed. The greatest chance of restoring fisheries for native trout and of meeting bull trout recovery plan goals would be realized by implementing the level of lake trout reduction proposed in Alt. D.

Issue 12: Appendix 5 – Bounty

Potential – page 10, paragraph 4:

FWS COMMENTS: While acknowledging the possible benefits of a bounty, the discussion in the DEIS largely dismisses a bounty system approach, citing it as counterproductive and drawing participation away from Mack Days. While this may be true under some formats, the discussion fails to truly consider creative alternative approaches that could be employed with bounties and consequently may understate the relative benefits of enlisting greater angler support (vs. the currently highly negative public reaction associated with netting).

The FWS recommends that the DEIS more fully consider and weigh the advantages to an expanded bounty program. There are some advantages to a direct bounty system. Some advantages of bounty programs are that funds are typically not expended unless directly proportional levels of target species removal are achieved; the by-catch issues, while not eliminated, would at least be minimized; and as the Lake Pend Oreille experience has shown, the public would likely support expanded bounties. Of course, the administrative aspects and legal hurdles require consideration. The FWS has urged the Co-Managers in the past, and would urge the DEIS to consider a hybrid Mack Days/Bounty approach. Under this approach Mack Days would be held as it regularly is. Then, at the end of Mack Days, the top tier of anglers (perhaps 25 or 50 fishermen?) would be qualified to participate in a directed bounty system. This would preserve (and possibly even intensify) the Mack Days competition and would qualify only the best anglers to participate in the bounty program. For those top tier anglers, the agencies would issue them credentials to continue bringing in lake trout for a set period (6 months, a year?) at a set price (e.g., $5 each). Since the top Mack Days anglers already catch most of the fish (e.g., in the Spring 2013 Mack Days, the top 25 anglers caught 16,065 fish, or 57% of the total), this type of approach could work for removing and additional up to 20,000 fish to the take. It would also be far more palatable to the public, with much lower bycatch, than the limited use of gillnets under alternative B.

Issue 13: Appendix 5 – Gillnetting.

Potential and Bycatch – pages 14-15: *"When our experimental goal has been to sample the highest density of lake trout possible, we have captured 15 lake trout per 100 feet of net (CSKT files)."*

Page 15 – paragraph 1: *"In Swan lake, where bull trout densities are much higher and lake trout densities much lower than in Flathead Lake, the bycatch of bull trout during experimental netting in 2010 was one bull trout to every 33.5 lake trout caught (Rosenthal 2011)."*

Page 15- paragraph 2: *"If we estimate that a targeted program would be 50% more effective at avoiding bull trout than our current random netting, which includes known bull trout locations, then we would capture one bull trout to every 120 lake trout."*

FWS COMMENTS: Comparisons amongst waters and the use of lake trout:bull trout ratios have the potential to be misinterpreted or misapplied. In lakes where bull trout numbers are higher and/or the lake is smaller or shallower, avoiding bull trout with gillnets is more complicated. In addition, timing and location are important. In four years (2009-2012) of suppression netting to capture juvenile lake trout in Swan Lake, the total bull trout bycatch has been very stable (212-238 fish annually) but lake trout:bull trout ratios have fluctuated widely, from 21.9 to 47.3 to 21.8 to 45.5 over the 4 years. In Swan Lake, bull trout bycatch associated with deepwater suppression netting has ranged from 0.11 bull trout / 100 feet of net to 0.07/100 ft and has declined over the years due to similar catch being spread over annually increasing effort. The FWS recommends that the DEIS evaluate the use of a straightforward CPUE index rather than lake trout:bull trout ratios. This is the best metric to assess the bull trout bycatch.

Issue 14: Appendix 5 – Trapnetting.

Potential and Bycatch – pages 17-18: DEIS – Alternatives considered but eliminated – Reduce lake trout using mostly trapnets rather than gillnets: *".....because it takes considerable time to become efficient with trapnets, we decided it was not feasible to rely on them to harvest the targeted numbers of lake trout.....will likely be maximized in the future....."*

FWS COMMENTS: Trapnets are a potentially valuable tool in the arsenal, especially if they can be located in lake trout travel corridors. The DEIS does not emphasize the importance of understanding lake trout movement patterns in the lake and the timing of those movements. We believe a strong research effort using hydroacoustic tags and monitoring would be extremely beneficial in setting trapnets where they would be the most effective. For example, it's likely that seasonal movement of lake trout through the "narrows" occurs over a very concentrated period of time in the spring and fall and trapnets could be extremely effective if fished properly at that location. Similar opportunities may occur around Big Arm. Lake trout movement patterns are predictable and repetitive in response to water temperatures, forage concentrations, and spawning. As trapnetting has not been used in Flathead Lake in the past, a huge increase in the future efficiency of both gillnetting and trapnetting could be garnered by establishing a better understanding of contemporary lake trout movement patterns within the lake. The FWS recommends that trapnets be experimentally employed as an immediate component of any suppression alternative.

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