



SUSITNA-WATANA HYDRO

Meeting Notes Wildlife Program Technical Meeting March 7, 2014

- LOCATION:** Alaska Energy Authority Main Office
813 West Northern Lights Blvd., Anchorage, AK 99503
- TIME:** 9:00 AM–12:00 PM (AKST)
- SUBJECT:** Mercury Sampling of Piscivorous Wildlife for Mercury Study 5.7.
- GOAL:** To review study plans and discuss modifications needed to obtain tissue samples for mercury analysis
- ATTENDEES:** **Mark Burch** (ADF&G), **Lori Verbrugge** (USFWS), **Maureen de Zeeuw** (USFWS), **Dara Glass** (CIRI), **Dave Tessler** (ADF&G), **Mike Petrula** (ADF&G), **Betsy McGregor** (AEA), **Brian Lawhead** (ABR), **Terry Schick** (ABR), **Paul Dworjan** (URS), **Jeff Randall** (Solstice)
- ON PHONE:** **Sarah Bullock** (BLM), **Kirby Gilbert** (MWH), **Chuck Sensiba** (Van Ness Feldman)

MAJOR TOPICS AND DISCUSSION POINTS

(SEE PRESENTATIONS ON PROJECT WEB SITE FOR DETAILS, <http://www.susitna-watanahydro.org>)

INTRODUCTION

- The revised schedule for the Integrated Licensing Process (ILP) was reviewed.
- Previous studies have documented the bioaccumulation of mercury following flooding, especially in northern climates.
- For this effort, baseline mercury levels are being looked at for sediment, water, soils, vegetation, resident fish tissue (not anadromous fish), hair and feathers of piscivorous wildlife species.

Aquatic Furbearers (Study 10.11)

- The potential target sample species for the Mercury Study 5.7 are river otter and mink. River otters are a better candidate based on the amount of fish they eat. Mink have broader diets and do not consistently consume as much fish as otters.
- This study involves two components regarding mercury: a literature review and hair sampling.

- The original plan for collecting hair samples was to obtain samples from pelts that had been trapped in the study area by local trappers. River otter pelts need to be sealed by ADF&G, but mink do not. However, no river otters were presented for sealing in 2013 from the study area.
- Because no hair samples were obtained in 2013, the secondary approach described in the RSP Section 10.11 is to deploy nonlethal hair snags (modified cable snares and/or tube traps) in the study area where tracks have been observed. Otters and their tracks were observed incidentally last year in and around the study area. No aerial track surveys were flown last year but are planned in late winter 2014. In suitable locations where otter sign is observed, modified cable snares will be deployed. Hair snags will yield less material for mercury analysis than would pelts, and the probability of capturing otters in hair-snags is low.
- It may be possible to purchase pelts of two mink and one otter obtained by a trapper in the Susitna drainage below Devil Canyon, near Chulitna. These may provide some useful regional data, but the team is aware that mercury levels are likely to be higher in piscivorous wildlife that occur below Devil Canyon because of the much greater occurrence of anadromous fish (which tend to accumulate more mercury in their tissues than do resident freshwater fish) in that portion of the drainage.
- The odds of finding mink tracks in the winter track surveys are much lower than the odds of finding otter tracks because mink do not necessarily travel over the snow and their tracks can be difficult to distinguish from marten tracks.
- Dara Glass (CIRI) suggested that if a trapper is hired for a dedicated trapping effort in the study area, then an attempt should be made to identify a CIRWG shareholder that could conduct the work. She will try to identify someone who may be interested in doing the work. Another option is to hire a trapper that URS has identified as being available for such work.

Eagles and Other Raptors (Study 10.14)

- The potential target species of raptors for the Mercury Study 5.7 are Bald Eagles and Osprey because of their piscivorous diets. Bald Eagle nests were recorded commonly in the study area during the 2012 and 2013 nesting surveys, but no Osprey nests were found and very few Ospreys were seen, being recorded mainly during migration. The plan for acquiring material from raptors was to acquire it from nests after the nesting season ends. ABR has a migratory bird salvage permit that allows feather collection from all species except eagles; to collect eagle feathers ABR would have to be listed as a subpermittee under a USFWS eagle salvage permit, which has not been acquired. Hence, no samples were obtained from piscivorous raptors in 2013.
- Lori Verbrugge (USFWS) offered a contact (Dr. William Bowerman, University of Maryland) for a possible collaborator on the Bald Eagle tissue-sampling effort. He studies toxicology of birds and has an eagle research permit already, which could be amended to include live capture and tissue sampling of the species in Alaska. Lori had informally discussed the possibility of doing this work with Dr. Bowerman recently at the Society of Environmental Toxicology and Chemistry (SETAC) conference. He stated that blood sampling would be preferred over feather sampling. Lori will forward his information to AEA and ABR will contact to Dr. Bowerman to discuss the potential for

him to conduct the work. Dr. Bowerman would likely be able to supply all of the personnel needed for the field sampling effort, which involves climbing nest trees and handling live birds.

- Dave Tessler (ADF&G) mentioned that Travis Booms (ADF&G, Fairbanks) is conducting a telemetry project on Bald and Golden eagles. His current study area does not include the Project study area, but he may be willing to collect some feathers in the study area if he can deploy some telemetry tags. He has a permit to capture eagles and possibly also to collect blood, and also has a permit to use a rocket net for capture. Dave will speak with Travis about the possibility of coordinating efforts between the studies.
- Subcontractors with specialized skills in bird capture and sampling can be brought onto the Project under Reimbursable Service Agreements (RSAs) by AEA. Lori suggested that any such researchers would want access to the data they collect for publication purposes. Betsy McGregor (AEA) said that data-sharing agreements can be set up, and are currently in place for some of the other studies. The main concern in collaborating with outside researchers is that they need to comply strictly with the schedule because AEA needs their data as part of the ILP, which could be problematic for some lab analyses.

Waterbirds (Study 10.15) and Landbirds/Shorebirds (Study 10.16)

- Waterbird surveys thus far have searched for birds (e.g., adults and broods), rather than looking specifically for nests. The nests are often cryptic and some waterbirds, such as loons and grebes, do not line their nests with feathers, so collection of feathers at nests of those species is not an option. One possibility mentioned in the RSP (Section 10.15) was to collect the remains of waterbirds from Peregrine Falcon nests, but the odds of finding such remains is low and no attempt was made to collect prey remains at falcon nests in 2013.
- Based on a literature review, the list of target piscivorous bird species was reduced to those that had a diet consisting of 40% fish consumption or greater. This review reduced the list to 10 potential target species: Osprey and Bald Eagle (raptors); Common Loon, Red-throated Loon, Common Merganser, Red-breasted Merganser, Red-necked Grebe, Arctic Tern, and Bonaparte's Gull (waterbirds); and Belted Kingfisher (landbirds). Two other potential target species—American Dipper (landbirds), and Spotted Sandpiper (shorebirds)—were eliminated after the literature review.
- Very few kingfishers were seen in or near the study area, and some of those may have been migrating through, rather than being breeders. No kingfisher nest burrows were seen during the ground-based riverine and lacustrine transect surveys or point-count surveys in 2013. Kingfishers would be suitable for tissue sampling because they consume so much fish; however, the budget needed to capture and sample kingfisher tissue could be considerable for a very low yield, in view of the extremely low numbers detected in the study area.
- The Common Loon is another good target species because there is a good body of comparable literature available to understand the effect of the level of bioaccumulation. The Red-throated Loon is another suitable target species, but none nested in the study area near the reservoir inundation zone.

- Dave Tessler (ADF&G) suggested that Dr. David Evers (Biodiversity Research Institute in Maine) may be interested in providing assistance, in view of his extensive experience capturing Common Loons and analyzing mercury and other contaminants in the species. Dave will provide contact information to AEA.
- None of the target species on the reduced list are abundant in the study area and the species whose nests are easiest to find do not line them with feathers, making the probability of feather collection from nests very low. The sample size of tissues collected from any single species will likely be low no matter which approach is taken for material collection.
- Discussion focused on the possibility of conducting live capture and sampling blood for mercury analysis. There is more information in the literature regarding the assessment of mercury from feathers than there is from blood. However, the mercury content in the feathers of adult migratory species may not necessarily represent local foraging conditions in the study area (they will represent levels at the time the feathers were grown, which could be on the wintering grounds). With blood, the timing of ingestion would be known within at least a couple of weeks, increasing the probability that any mercury detected would be from the study area.
- Discussion focused on capturing adult birds vs. sending tree climbers up to lower chicks down from nests. Chicks are easier to capture, but they may not have the levels of bioaccumulation that an adult feeding in the area for years may have. Adults do leave some of their accumulated mercury inside eggs when they lay them. Adults are more difficult to capture using nonlethal methods. A bow trap at the nest may be one way to capture adult Common Loons. Mist nets are another possible option for other species such as ducks.
- For waterbirds such as mergansers, it may be possible to capture broods and attending adults by driving them into nets and sampling the whole brood. This would increase the sample size; however, concerns arose over pseudoreplication in sampling within a brood. If entire broods are captured, the collection methods and data analysis should be clearly explained and intra-brood variation should be clearly differentiated from inter-brood variation.
- Mike Petrula (ADF&G) suggested that it may be possible to use mist-nets to capture mergansers on small streams. However, the majority of streams within the study area are likely not narrow enough in cross section for this approach. John Pearce (USGS) has mist-netted ducks on the Kenai and may have useful suggestions; Mike suggested consulting him on other possible methods of live capture.
- **The list of 10 potential target species for mercury analysis was further reduced during the meeting discussion, based on each species' abundance within the study area and the likelihood of obtaining usable samples. The revised, reduced list agreed to by all participants in the meeting includes 4 species: Bald Eagle, Common Loon, and Red-breasted and Common mergansers.**
- Discussion focused on whether a particular laboratory was preferred to conduct the mercury analyses if other outside researchers were brought on to assist with sample collection. Currently, the analyses are being done at Brooks and Rand in Seattle. The study team will work with the researchers to decide on the best approach for laboratory analyses in each circumstance. If the team decides to have Brooks and Rand

complete all the analyses, chain-of-custody procedures need to be established for delivery of samples from outside researchers.

- For bird and mammal tissues, the current analytical approach being used may need to be modified to account for small sample quantities. Field teams should be encouraged to provide any sample they can obtain, however, regardless of how small the quantity.
- Discussion focused next on possibly expanding the size of the study area. It was suggested that the upstream area above the reservoir may be more representative of conditions in the reservoir inundation zone than would areas farther downstream. However, if the dam is constructed and mercury is detected in the inundation zone, it obviously would be best to have sampled the actual area before construction.
- Maureen de Zeeuw (USFWS) said that it would be good to know if the inundation zone could provide new migratory staging habitat or foraging areas for local breeding birds and, if so, how will this affect bird use of the area and exposure to mercury. It was agreed that making this sort of prediction will be difficult and largely speculative. Maureen suggested that, for this reason, a second year of studying migration using the radar may be helpful, but she will consider the question further.

Mercury Assessment and Potential for Bioaccumulation (Study 5.7)

- Paul Dworjan (URS) described some of the sampling approaches and media being sampled for this study.
- Sampling of vegetation and soils is focused inside the inundation zone.
- Water samples are being collected along the entire length of the Susitna River mainstem and within side channels.
- Discussion followed on whether invertebrates would be sampled for mercury. Currently they are not in the study plan. Lori Verbrugge said USFWS had asked that invertebrates be included and still would like to see that done. Dave Tessler suggested that odonate larvae (dragonflies) would be good to sample because they eat other invertebrates and fish. However, the literature does not contain much information to understand the meaning of various levels of mercury in invertebrates and at what levels do they become a cause for concern as far as bioaccumulation. Paul will consult with Rob Plotnikoff (Tetra Tech) to discuss the potential of opportunistically collecting invertebrates. Other teams, such as the various fish study teams, should be able to easily sample for invertebrates while they are conducting their work.
- The River Productivity team is currently sampling macroinvertebrates to study species composition, but they are not going as far upriver as the reservoir zone.
- Discussion focused next on the possibility of including insectivorous birds in the sampling plan. Because insectivorous fish have already been sampled, it was decided not to include insectivorous birds because that trophic level was already being studied, and the study request for wildlife specifically mentioned examining mercury levels in piscivorous wildlife.
- Land access to Cook Inlet Regional Working Group (CIRWG) lands is still in negotiation. Areas that are not on CIRWG lands will be sampled in 2014. Although some studies may not occur until 2015, it is preferable to conduct them in 2014 in case the sampling plans are not successful and need to be adjusted further.

- In the Final ISR filing on June 3, 2014, mercury lab results obtained thus far will be presented in an appendix.
- Resident fish species were sampled in 2013 for mercury analysis. Some of the species sampled include longnose sucker, Dolly Varden, sculpin, two species of whitefish, grayling, burbot, and a single humpback whitefish. Seven to 16 individuals of each fish species were collected, with the exception of the single humpback whitefish. The team did not locate sticklebacks.
- In 2012, lake trout were sampled in Sally Lake. The team did not resample Sally Lake in 2013.
- The 2013 data do not show much variability in mercury levels in fish between sampled lakes. The mean concentration from the study area was 247 ng/g, which is about half the mean level reported statewide by the Alaska Department of Environmental Conservation (ADEC). There are some differences in the species of fish collected and the number of fish collected between the sampling conducted by ADEC and the study team. The results from the study area were within the ADEC expected range, but were distributed toward the lower end of the range.
- The burbot captured had lower levels than burbot sampled by ADEC, but the individuals captured were all between 4-5 years old, which may have affected the results (burbot are not as piscivorous at that age and older individuals may have higher concentrations).
- For fish from which otoliths were not collected, size-at-age information will be obtained from the literature to determine their approximate ages.
- Fillets were sampled from each fish and livers were also sampled from burbot. The levels of mercury concentration between the fillets and the livers were similar. The team also tested for other heavy metals including arsenic and lead in burbot.

ACTION ITEMS

Action Items	Responsibility
Send AEA the contact information for Bill Bowerman at the University of Maryland.	Lori Verbrugge, USFWS
Send AEA the contact information for Dave Evers at the Biodiversity Research Institute.	Dave Tessler, ADFG
Speak with Travis Booms (ADF&G, Fairbanks) to see if he is interested in expanding his Bald and Golden Eagle telemetry study to include the Project study area to opportunistically capture Bald Eagles for tissue collection and mercury analysis.	Dave Tessler, ADFG
Identify CIRWG shareholder(s) that may be interested in conducting trapping of river otter and/or mink in the study area for the mercury study.	Dara Glass, CIRI
Contact Bill Bowerman and Dave Evers about possible collaboration on the mercury study.	Brian Lawhead, ABR
Research techniques surrounding the capture of Red-breasted and Common mergansers; e.g., speak with John Pearce (USGS) about possible capture methods.	Brian Lawhead, ABR