

**From:** [Thomas, Sue](#)  
**To:** [BrownScott, Jennifer](#)  
**Subject:** Re: FYI: Comments re: JST avian monitoring plan  
**Date:** Monday, May 17, 2021 12:37:51 PM

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Thanks for sharing Jennifer. And thanks also for keeping me in the loop. I really appreciate it.

Sue

Sue Thomas  
Wildlife Biologist  
Washington Maritime NWRC  
360 457 8451

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**From:** BrownScott, Jennifer <jennifer\_brownScott@fws.gov>  
**Sent:** Monday, May 17, 2021 10:13 AM  
**To:** Sollmann, Lorenz <lorenz\_sollmann@fws.gov>; Thomas, Sue <sue\_thomas@fws.gov>  
**Subject:** FYI: Comments re: JST avian monitoring plan

The email below is provided for your situational awareness. I deleted the attachments from this email to reduce the size of the message, but they were attached to the original.

Hope you are having a marvelous Monday.

-jennifer

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Jennifer Brown-Scott  
Project Leader  
Washington Maritime National Wildlife Refuge Complex  
715 Holgerson Road  
Sequim, WA 98382  
(360) 457-8451

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**From:** BrownScott, Jennifer  
**Sent:** Monday, May 17, 2021 10:10 AM  
**To:** Sissi Bruch <sbruch@jamestowntribe.org>; Elizabeth Tobin <etobin@jamestowntribe.org>; Hansi Hals <hhals@jamestowntribe.org>  
**Cc:** Kilbride, kilb <kevin\_kilbride@fws.gov>; Loverti, Vanessa <vanessa\_loverti@fws.gov>  
**Subject:** Draft Avian Monitoring Plan

Thank you for the opportunity to provide comments/recommendations related to monitoring impacts from commercial aquaculture operations proposed on the DNR Use Easement tidelands within the boundary of Dungeness National Wildlife Refuge. To reduce duplication, we have consolidated WA Maritime NWRC, Region 1 Inventory and Monitoring Program and R1 Migratory Bird Program comments/recommendations related to the JST draft avian monitoring plan below:

Given the uncertainty of disturbance outcomes, importance of the area for migrating and wintering shorebirds and waterfowl, and the high interest in understanding potential impacts, a robust sampling scheme providing data for statistical analysis would be the most appropriate monitoring/study design. During meetings with your team we discussed how the lack of baseline data and difficulty in identifying adequate replicate/control plots renders many monitoring approaches ineffectual. We continue to recommend a BACI design assessing effects (disturbance) to migratory birds at the level of the lease area itself (rather than within small sampling units) as the appropriate monitoring method to generate statistically defensible conclusions. It is our understanding from group discussion that Jamestown S'Klallam Tribe's intent to initiate oyster farming operations this summer, and other management constraints, have resulted in selection of a non-BACI designed monitoring plan. Although not recommended due to data analysis and interpretation limitations, we would provide the following comments/suggestions if a non-BACI design is chosen:

The monitoring approach detailed in the draft avian monitoring plan is not likely to provide data appropriate for statistical analysis or allow scientifically defensible conclusions related to shorebird and waterfowl disturbance from commercial aquaculture activities in this location. The statistical approach identified in the draft plan (ANOVA) requires independence of treatment plots, and homogeneous and normally distributed variance for control and treatment data. Given all treatment plots need to be located within a distance of farming activities where disturbance effects may occur, we are concerned there may not be the ability to create the independence required for ANOVA. Control plots would not be comparable to treatment plots given the unique, transitional nature of the lease area. Additionally, many zero data points are likely to be collected (no birds seen) due to the small size of the sampling units (approximately 150 ft in width), which would not provide a normal distribution. Given these site and study design limitations, it is unlikely that ANOVA could be used to analyze collected data.

Assessment of disturbance effects to all migratory birds in and around the lease (e.g., within flushing distance of the lease) would provide an anecdotal representation of potential effects on and adjacent to the lease are compared with focusing on focal species within small sampling units. These effects should include changes to foraging behavior (e.g., pause in feeding, gear avoidance) in addition to those listed in the monitoring plan. Consider conducting area counting of birds (shorebirds and waterfowl), where these counts would be partitioned by strata (eelgrass, mudflats, and 5-acre farmed plot) in the 50-acre lease area with a buffer based upon flight disturbance distance.

We do not recommend monitoring only target species due to the difficulty in identifying birds to species, especially at night. Targeting a limited number of species could create a zero data point,

even if disturbance to birds was occurring at the site. If an approach is approved that allows only monitoring of target species, then western sandpiper and dunlin are more appropriate species than least sandpiper.

Observation should be performed by an experienced neutral third party at frequencies adequately representing the possible impact of aquaculture activities that likely vary by season, throughout individual months, and over time. More frequent data collection is needed to better capture this variability and cumulative impacts of human disturbance. Information collection should also capture disturbance from predators (e.g., eagles) or other sources (e.g., refuge visitors). Feasibility and accuracy of performing observations at night using different approaches should be examined to determine the monitoring limitations. This is particularly important because farm operations during the most sensitive time periods will likely take place at night, due to the association with low tide cycles.

The monitoring plan should describe key assumptions associated with the sampling design, the level of accuracy and precision of the data collected, and sources of error (sampling and non-sampling) associated with the methodology for data collection. One or more sampling objectives describing the bias and precision for the survey would provide transparency regarding limitations of data interpretation and use. results mean and how they can be interpreted and used.

The attached references (Mori et al., 2001; Owens 1977; and Smit & Visser 1993) appear to provide greater maximum flushing/disturbance distances than those listed in the draft plan.

If we can provide any further assistance or clarification of our comments, please do not hesitate to reach out.

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Jennifer Brown-Scott  
Project Leader  
Washington Maritime National Wildlife Refuge Complex  
715 Holgerson Road  
Sequim, WA 98382  
(360) 457-8451

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