



Meeting Minutes

As approved by the Edwards Aquifer Habitat Conservation Plan (EAHCP) Program Manager and Science Committee, the Comal Springs Riffle Beetle (CSRБ) Work Group was formed to provide input on a specific set of questions concerning management of the CSRБ as part of implementation of the EAHCP. An online meeting of this Work Group for the EAHCP occurred **May 27th, 2022, at 2p.m. on Microsoft Teams.**

1. Call to order--Establish that all Work Group members are present – 2:00pm. *All members present, excluding David Britton.*
2. Public Comment. – *No comment from the public.*
3. Discussion on the study design for the CSRБ distribution and abundance survey in Landa Lake.

Dr. Ely Kosnicki from BIO-WEST presented over modifications to the proposed methods for the CSRБ distribution and abundance survey. These revisions were based upon additional research and method testing since the December 2021 CSRБ work group meeting. Below are the proposed revisions.

Field sampling procedures:

Landa Lake will be divided into four subpopulations and 50 randomly selected sites and 30 biomonitoring sites will be separated proportionally to the number of springs found in each subpopulation for a total of 80 sites. The use of the 30 biomonitoring sites is a new adjustment to the methods. The justification is to minimize the amount of disturbance to the CSRБ population in Landa Lake.

Dr. Kosnicki has also been ground truthing the randomly selected cotton lure locations to ensure that the sites have springs flowing. Therefore, some sites might be relocated to have spring flow at each lure location. To measure flow, they will do an area flow measurement to get a better idea of flow coming from each spring location.

Dr. Kosnicki discussed lure efficacy by looking to assess the number of beetles a micro area. He would do this by placing five lures in a location and could do this repeatedly to see if there is any consistency. Conrad Lamon asked about locations and Dr. Kosnicki mentioned most sites are at spring tagged locations but there are some springs that do not have tags because they are not along margin habitats and in deeper water. They will use GPS to go to the same

location as well as some type of marker. Conrad suggested using distance between sites to look at spatial variability to relate that to the micro lure efficacy study. Chad Norris mentioned that the spring database has distances between tagged springs so if tags are missing, so spring sites can still be located. Chad Norris suggested to use markers in the deeper spring locations that do not have tags. Conrad would like the deeper spring locations to be added to the on-going CSRB database.

Statistical Analysis methods:

Dr. Kosnicki discussed issues with using an N mixture model due to the life history of the CSRB. Therefore, he suggested to use General linear mixed (GLM) models. Kyle Sullivan, also employed with BIO-WEST, discussed GLM models and what metrics would be used in the models. They will complete exploratory models to refine statistical models and variables. Conrad suggested to add error distributions into the variables in the predictive model as well. They will fit and validate the models by running diagnostics and will complete uncertainty checks and then provide model interpretation. Nathan Bendik asked how GLM solve the problem of the N-mixture model? Andy Royle from USGS mentioned that the problem with N-mixture models in this population is true replication that he believes is not possible with this species and the method of collection. The GLM does not need the replication, which is the advantage of these models. N-mixture models are also sensitive to over dispersion whereas GLM does not have the same number of issues.

With the change in analysis, Dr. Kosnicki proposed two different sampling schedules:

Sample A: Four sampling events over 11-month period between Sept 2022 and end Aug 23

Sample B: Four sampling events based on biomonitoring schedule so Sept 2022 through May 2024

Chad Furl asked if there would be a substantial difference in analysis? Dr. Kosnicki said if sampling is too close, then there may be an effect but if they were further apart, you have less of a chance of collecting the same individuals. A discussion for sampling schedule A versus B was made among CSRB work group members. Andy Royle mentioned one benefit of having sampling schedule A, it could lead to better performance of a potential N-mixture but if we are going with GLMs, then there is no need for schedule A. Chad Norris suggests schedule B would be the better option since it gives you more time to sample and less impact by using biomonitoring sampling locations. Chad Furl brought up the questions about whether sampling should be completed under stable flows instead of sampling during drought conditions. Tom Arsuffi suggested sampling occurs with spring variability and Chad Norris suggested the same to look at how flows effect CSRB distribution. After discussion, the selection was to go with schedule Sample B that would follow biomonitoring sampling schedule.

Another discussion question brought up by Chad Furl was the number of beetles collected at a time per lure that will be used as part of the EA Refugia genetic study that is occurring concurrently with the CSRB population survey. Given that we are going with Sample Schedule B, Tom Arsuffi suggested collecting 25% on lures with eight or less. Kathrine Bockrath, lead

EA Refugia biologist, would like four beetles per lure to adequately compare genetics and two beetles could be collected at a time but ideally, all four beetles would be collected at one time. Some validation will be completed prior to this fall to get a clearer idea of how many beetles are needed at one time.

4. Questions from the public. – *No questions from the public.*
5. *Adjourned at 3:30pm.*