**Middle Rio Grande Endangered Species Act Collaborative Program
Science Work Group Meeting**
15 May 2012 Meeting – 9:00 AM-11:00 AM
Bureau of Reclamation

Actions
- Alison Hutson will contact Teresa (at Dexter) to possibly arrange a presentation/meeting with the ScW work group around the time of one of their facility visits. The requested presentation would focus on the General Fish Health Assessment – what do they do? How often? What is the cost? Etc. (From 4/17/12)

Decisions
- The April 17ᵗʰ, 2012 ScW meeting notes were approved with no changes.

Meeting Summary
- Alison Hutson brought the meeting to order and introductions were made. The agenda was approved with one change: the museum sampling discussion will be tabled for the next ScW meeting.
- The April 17ᵗʰ, 2012 ScW meeting notes were approved with no changes.
- Meeting attendees performed an action item review. All action items were completed with exception to one action item that will be carried over to next month.
- It was shared that larval Rio Grande Silvery Minnow (RGSM) have been found in the Los Lunas Silvery Minnow Refugium (Refugium). This was unexpected as no eggs were found during searches. It's believed that the RGSM spawned in response to the first flood performed at the Refugium. It's believed that the RGSM spawned in the ponds, as they were not observed spawning over the overbank, and larval fish have been found in 3 of the 5 ponds. The larval fish are actively swimming and are estimated to be about a week old. There are no estimates for how many larval fish there are. Alison will be submitting the quarterly report next month. This was unexpected and Interstate Stream Commission is discussing the next steps with the U.S. Fish in Wildlife Service.
- During closed session with no contractors present meeting attendees discussed the RGSM Genetics scope of work. The scope of work was approved by the ScW and forwarded to Reclamation's Contracting Officer.
- Mark Brennan gave a presentation "RGSM Site Analysis: Determination of best river reach to implement next RGSM NEP reintroduction" to update the ScW on 10(j) efforts. The objective of the work that Mark has been doing is to determine the feasibility of conducting a second section 10(j) non-essential experimental population (NEP) reintroduction of RGSM in an unpopulated reach of the Rio Grande River or Pecos River within the historic range of the species. The analysis performed consisted of a review of past analyses of reach potential, an investigation of the current conditions in reaches, an objective analysis of available data, and ranking the best reaches based upon current data. Several levels of analyses were performed to narrow down possible reaches; reach fragmentation, river channel hydrology, river channel morphology, sinuosity, water quality, ecological and other non-environmental (stakeholder, access) factors were considered to narrow down the reaches. The Pecos River below Sumner Dam and the Rio Grande below Amistad were found to be good candidate reaches for reintroduction,

with fairly equal overall values from this technical analysis. The next steps are to propose the two reaches for NEP in National Environmental Policy Act scoping, respond to public/stakeholder input, choose one of these two reaches based upon any new information and scoping responses, and write a rule for this next section 10(j) NEP reintroduction.

- Attendees were asked if there was any interest in or volunteers for ScW Co-Chair. No interest was expressed.
- Due to time constraints the Program Update was tabled for the next ScW meeting.

Next Meeting: June 19th, 2012 at ISC

- Tentative agenda items include: (1) Kevin Buhl presentation;
- Future agenda topics: (1) joint session with HR; (2) future PVA scope(s) for next steps/next work (not expected until summer of 2012); (3) ISC spawning study results

**Middle Rio Grande Endangered Species Act Collaborative Program
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15 May 2012 Meeting – 9:00 AM-11:00 AM
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Meeting Notes

Introductions and Agenda Approval
- Alison Hutson brought the meeting to order and introductions were made.
- The agenda was approved with one change: the museum sampling discussion will be tabled for the next ScW meeting.

Approve April 17ᵗʰ, 2012 ScW meeting notes
Decision: April 17ᵗʰ, 2012 ScW meeting notes were approved with no changes.

April Action Item Review
- **Yvette Paroz will email the ScW Project Report Comment document module password to ScW members.**
  - Complete.
- **Alison Hutson will contact Teresa (at Dexter) to possibly arrange a presentation/meeting with the ScW work group around the time of one of their facility visits. The requested presentation would focus on the General Fish Health Assessment – what do they do? How often? What is the cost? Etc**.
  - This action item has not been completed and will be carried over.
- **Jen Bachus will check with Manuel Ulibarri (from Dexter) to get an update on the possibility of Dexter funding the fecundity study through their own budget. Completed**
  - Complete. The fecundity study will not be funded by the Program. They are awaiting an update from Dexter on whether the study will can be funded through their budget.
- **Stacey Kopitsch will distribute the Monitor RGSM Genetics grant information to ScW members in preparation for tomorrow's (04/18/12) scope development meeting. Completed**
  - Complete.
- **Yvette Paroz will request an inventory of minnow samples and collection information from the museum**.
  - Complete. Yvette has sent a letter to request the minnow samples and collection information. There is paperwork that still needs to be signed to release the samples and then the workgroup can continue discussions.
- **Stacey Kopitsch will contact the Population Viability Analysis (PVA) co-chairs to request an update on where the PVA models are at and potential next steps and needs. This request may be for ½ hour joint session to be included on the May PVA meeting agenda. Completed**
  - Complete. The ScW has been invited to attend the PVA presentation during today's Executive Committee (EC) meeting.

Announcements
- It was shared that larval Rio Grande Silvery Minnow (RGSM) have been found in the Los Lunas Silvery Minnow Refugium (Refugium). This was unexpected as no eggs were found during searches. It's believed that the RGSM spawned in response to the first flood performed at the Refugium. It's believed that the RGSM spawned in the ponds, as they were not observed

spawning over the overbank, and larval fish have been found in 3 of the 5 ponds. The ponds had been sandbagged off from the channel to create one channel and one overbank; however adult RGSM were observed in the ponds. Interstate Stream Commission (ISC) plans to look at the difference in conditions in the ponds and the overbank; one difference is that the ponds are deeper.

- o It was explained that for the first flood the entire habitat was flooded then the flow was reduced so that only the overbank was flooded. The overbank was then searched for eggs and none were found. After that larval fish were observed in the ponds. The larval fish are actively swimming and are estimated to be about a week old. Their only competitors in the Refugium are tadpoles. There are no estimates for how many larval fish there are.
- o ISC has some detailed information on the flooding episode and photos of the Refugium when it was at the flood stage. Alison will be submitting the quarterly report next month.
  - ▪ It was requested that the Population Viability Assessment (PVA) workgroup be included on the quarterly report's distribution list.
- o Adult RGSM have been observed in the ponds again but they do not appear to be staying in the ponds for very long.
- o It was commented that its fascinating how little water is needed for the RGSM to make it over the sandbags. When the sandbags were put in they were frozen and when they settled there was a small amount of water over the tops of the sandbags and the RGSM were able to make it over the sandbags. The RGSM were observed leaving the stream to go into the ponds with no current directing them.
  - ▪ It was commented that it would be interesting to know what the RGSM were using as a cue. The sand bags are not much different from a sandbar.
  - ▪ It was noted that there was no turbidity in the ponds when the RGSM were believed to have spawned; if the RGSM did spawn in the ponds, then they spawned without turbidity.
  - ▪ The ponds were not searched for eggs; there are egg collectors in the channel and the overbank was searched for eggs.
  - ▪ It was explained that since it was not known if the RGSM would spawn in the Refugium the RGSM had never been designated beyond this point. 750 RGSM were stocked into the Refugium with just under 100 being PIT-tagged.
  - ▪ The Refugium has good images of adult RGSM from their DIDSON sonar camera.
    - • It was asked if the DIDSON camera can be used to estimate the number of larval fish.
      - o It's not known if the larval fish are big enough to be identified using the DIDSON; the larval fish may not be distinguishable from debris or background noise.
      - o The first experiment with the DIDSON will be to find the minimum size that fish can be identified at.
- o It was asked if there are enough larval fish to take weekly time series samples to look at growth and development.

- Before staff realized there were larval fish a second flood had been performed. Some dead RGSM were found with eggs so there is the potential that there will be more larval fish.
- It's not known if there are enough larval fish time series samples and the Refugium is not permitted to take samples. Dexter National Fish Hatchery (Dexter) may be better suited to take samples and they plan to spawn fish this year.
  - Any larval fish received from Dexter are proposed to go into tanks with feed; it would be interesting to collect sample fish from the Refugium as it is a semi-natural simulation. Will the Refugium be allowed to keep the fish?
    - ISC is meeting with the U.S. Fish and Wildlife Service (Service) to discuss the next steps. ISC would like to leave the system as it is and leave the brood stock in the Refugium. ISC will soon be removing some of the sandbags to make the system more integrated. ISC will also be looking at how many of the brood stock survived the spawning season and the number that have retained their PIT tags.
  - ISC also has plans for a food availability gut study and fatty acid analysis in which the Refugium RGSM will be compared to wild RGSM.
  - There are multiple studies that can be considered; however, all studies will need to be discussed with the Service.
  - The next steps will also depend on what the Program wants to use the facility for (augmentation, studies, etc.).
- It was asked if the Refugium could use a kick net to sample the ponds and get crude estimates of larval fish.
  - Two of the ponds could be sampled but one of the ponds has a bunch of plants in the middle and would be difficult to sample.
  - Light traps are also an option for sampling larval fish.
  - Another method that can be used to get an estimate of the number of larval fish is to isolate a pond and use a fixed amount of effort/time to transfer fish to a different space and then repeat this effort consistently over a series of day. If over a period of time the number fish caught in the same amount of effort/time declines then a depletion estimate can be used to get an estimation of the total number of fish in the pond. This is a standard method that is used with Razorback Suckers and Pike Minnow.
- It was noted that survival of PIT-tagged RGSM in the Refugium was better this year than last year. The only difference in stocking between this year and last year was that this year the fish were released into the Refugium earlier; last year the RGSM were not stocked into the Refugium until April and this year the RGSM were stocked in February. This year there was almost 100% survival of PIT-tagged fish compared to last year where only 58 PIT-tagged fish survived.
  - An interesting observation of the adult RGSM behavior was that when the adults were stocked in February they initially scattered but then congregated in a

"hot"spot in the water (i.e., there was something about that area that was preferred); there were 750 fish in an ~ 3ft x 4ft area. When the flood was performed the RGSM then dispersed and did not return to the group.

- It was commented that it would be interesting to perform quadrant analyses to see at what sensitivity level the fish are responding to flow.
- There is detailed velocity data available for different depths and different pumping stations throughout the length of the stream at the Refugium.

RGSM Genetics Monitoring

- During closed session with no contractors present meeting attendees discussed the RGSM Genetics scope of work. The scope of work was approved by the ScW and forwarded to Reclamation's Contracting Officer.

Update on 10(j) efforts

- Mark Brennan gave a presentation "RGSM Site Analysis: Determination of best river reach to implement next RGSM NEP reintroduction" to update the ScW on 10(j) efforts.
  o The objective of the work that Mark has been doing is to determine the feasibility of conducting a second section 10(j) non-essential experimental population (NEP) reintroduction of RGSM in an unpopulated reach of the Rio Grande River or Pecos River within the historic range of the species.
  o In order to find an appropriate location for reintroduction, a series of analyses were used:
    ▪ The first steps were to review past analyses of reach potential. The information in the past analyses was updated and any changes in management of remaining river reaches were incorporated.
    ▪ The environmental conditions for each reach were investigated
      - Hydrology
      - Geomorphology
      - Water quality
      - Ecology

      - *Question:* Are these 4 categories the broad criteria? *Response:* Yes, the presentation will show how the categories are broken down into the parameters that are used in the analyses.
    ▪ To conduct an objective analysis of available data a weighted analysis using a decision matrix was completed. Expert opinion was used to weight the parameters and determine values for the ranges of all conditions.
    ▪ The potential reaches were then ranked based upon current data
  o Decision Matrix Development
    ▪ In developing the decision matrix the best available science was interpreted and updated information from applicable RGSM research (MRG/Big Bend) and changes in river management/policy was incorporated. It was noted that there is no new science that has come out of research on the Big Bend 10(j) NEP.

- A technical working group made of people with knowledge of reaches in the Pecos River and Rio Grande River was formed to assist in gathering information.
- The challenges faced in developing the decision matrix include inequitable data within and between reaches and determining the best parameters for comparison.
- Parameters
  - The environmental parameters fall into 3 groups: habitat, water quality, ecology.
  - Determining the non-environmental parameters is ongoing and includes public scoping/stakeholder input. The public scoping hasn't been completed yet and the non-environmental parameters will be tweaked as feedback from National Environmental Policy Act (NEPA) is received.
- Ranking criteria was then developed for each parameter to establish the appropriate metrics. The ranking was completed using expert opinion and the parameters were ranked based on having the highest or lowest value towards species needs.
  - Several levels of analysis were performed to narrow down possible reaches.
    - The first level of analysis served to reject reaches <100 miles and reject reaches with poor hydrology. Mark looked at recent studies on drift retention of eggs and larval fish; drift retention is important to keep the species in one reach. A reach less than 100 miles wouldn't have the best potential to host a self-sustaining population.
      - 4 reaches were eliminated for being <100 miles
        - Pecos River: Santa Rosa-Sumner (<50 miles) and Brantley-Red Bluff (~60 miles).
        - Rio Grande River: Elephant Butte-Caballo (<20 miles) and Velarde-Cochiti (~50 miles).
      - 1 reach was eliminated for having no history of perennial flow/connectivity;
        - Rio Grande River: Caballo – Presidio (>100 days disconnect/year).
    - The second level of analysis assessed the four remaining reaches in 2 assessments.
      - 4 remaining reaches:
        - Pecos River: Sumner-Brantley (225 miles) and Red Bluff-Rio Grande (340 miles)
        - Rio Grande River: Amistad-Falcon (255 miles) and Falcon-Gulf of Mexico (276 miles)
      - The analysis then looked at the area between reservoir pools and obstructions in the reaches.
    - The third level of analysis assessed fragmentation in the reaches and determined the longest functional section in the reaches. As barriers can become problematic for fish passage, the analysis also looked for the longest functional sections without any barriers.
      - The longest function sections for each river:

- o Pecos River: Sumner-Brantley (210 miles) (below Ft. Sumner; NM) and Red Bluff-Rio Grande (228 miles) (below Iraan, TX)
- o Rio Grande River: Amistad-Falcon (143 miles)(below IBWC weir to Falcon reservoir); and Falcon-Gulf of Mexico (105 miles) (Falcon dam to Anzalduas diversion dam)
  - ▪ The final level of analysis consisted of completing the decision matrix and running sensitivity analyses.
- o The presentation included examples of the multiple sensitivity analysis. It was noted that there was not a lot of available information on tributary effects so this parameter was not included in the analysis. The weights in the analysis were based on expert opinion.
- o As part of the analyses reach fragmentation, river channel hydrology, river channel morphology, sinuosity, water quality, ecological and other non-environmental factors were considered to narrow down the reaches.
  - ▪ Reach fragmentation
    - The analysis looked for weirs, dams or any other obstructions that might prevent fish passage.
    - All four of the reaches fragmented to some degree. There were no known natural blockages.
  - ▪ River channel hydrology
    - The hydrology analysis looked at the average monthly discharge rates calculated from daily discharge gage data. The analysis also considered the minimum/maximum discharge rates from the daily data.
    - It was a challenge to find continuous hydrology data as not all of the reaches had the same amount of monitoring stations and not all of the stations were monitoring at all times.
    - The hydrology analysis was used to determine: if the reach was perennial or not; the extent of low flow/drying; and the timing and duration of pulses.
    - The purpose of the analysis was to look for reaches that have some semblance of regularity in hydrologic flow and that also have a spring or mid-summer pulse.
  - ▪ River channel morphology
    - The intent of the morphology analysis was to look at floodplain connectivity, overbanking, and nursery habitat. There were no morphological models available so several efforts were made to get an understanding of the morphology in the 4 reaches.
      - o The first effort used width:depth ratios. There was not a lot of available width and depth information from the agencies managing these reaches, including the U.S. Geological Survey (USGS)/ International Boundary and Water Commission (IBWC) gage data. Width:depth ratios were also found to not be effective for sand bed river systems since they are not stable enough to respond favorably to this type of analysis.

- o The second effort used river bank complexity. Cross bank widths were used to look at the variance of the widths over each reach to look potential overbanking and flooding. This effort was very time consuming and was abandoned.
- o The final effort used National Wetland Inventory (NWI) data for channel habitat. Thalweg centered main channel acreage for all reaches was interpreted using aerial photography and used as a reference to map out low, seasonally flooded areas. The ratio of seasonally flooded acreage to main channel acreage was used as an index to compare between reaches. The NWI data was consistent across all 4 reaches and was the effort used for this analysis.
- ▪ Sinuosity
  - • Sinuosity is a good index of river function. ArcGIS was used to determine channel length and straight line length to determine the channel to straight-line ratio as an index.
- ▪ Water quality
  - • The most current five-years of continuous data for each reach were used; the data was not all from the same source and the five-year timeline varied between reaches. Not all of the water quality parameters were equally monitored so the analysis focused on the most monitored parameters: water temperature, salinity/conductivity, dissolved oxygen, standard pH, and total nitrogen/ammonia. The average values for each parameter across the five-year period were used as the metrics. The highest and lowest daily values from each entire five-year period were used to determine if known thresholds were exceeded and to assess the level of threat from the level and duration of those exceeded values.
  - • *Question:* Was golden algae considered? *Response:* Yes. Golden algae blooms are known to associate with water temperature and salinity. It was used as a parameter based on the number of blooms.
- ▪ Other non-environmental factors include: stakeholder/scoping input, urban/agricultural growth (based on IBWC/USGS projections), Federal land inclusion, and access for stocking and monitoring.
  - • Currently, hypothetical values based on historical reaction to these types of issues are being used for stakeholder input. Once the public scoping is completed the true parameters may affect the decision.
- o Results:
  - ▪ The presentation included examples of the charts for ranking variable and valuation criteria for habitat, water quality, ecological factors, and non-environmental factors.
    - • It was noted that the tributary effects fell out because it was difficult to obtain consistent data for comparison.

- It was also noted that there was not an equitable amount of data on turbidity to make a comparison across the 4 reaches.

- *Question*: Are those summer temperatures (in regard to water quality chart)? *Response*: The temperatures were averaged over the entire year. The highest and lowest temperatures were also taken into consideration.

  - An example of the results of the sensitivity analyses was also included in the presentation. The analyses underwent multiple iterations with different weightings.
    - The Rio Grande River Amistad reach and the Pecos River Sumner reach were determined to be good candidates.

  o Next steps:
    - Currently Mark is waiting for the Service's Regional Director's response to the proposed reaches.

  o *Question*: Did you do principal components analysis to sort out more specific parameters? *Response*: No, there was not equity of data between the four reaches; this was the biggest issue in the analyses.

Election of ScW Co-Chairs
  o With no volunteers at the meeting, the election of ScW co-chairs will be carried over to the May meeting. This will be standing agenda item until the positions are filled.

Program Update
- Due to time constraints the Program Update was tabled for the next ScW meeting.

Next Meeting: June 19ᵗʰ, 2012 at ISC
- Tentative agenda items include: (1) Kevin Buhl presentation;
- Future agenda topics: (1) joint session with HR; (2) future PVA scope(s) for next steps/next work (not expected until summer of 2012); (3) ISC spawning study results

Science Work Group
May 15ᵗʰ, 2012 Meeting Attendees

	NAME	AFFILIATION	PHONE NUMBER	EMAIL ADDRESS	Primary, Alternate, Other
1	Stacey Kopitsch	USFWS	761-4737	stacey_kopitsch@FWS.gov	A - PMT
2	Alison Hutson	ISC	841-5201	alison.hutson@state.nm.us	P – Temp Co-chair
3	Dana Price	USACE	342-3378	dana.m.price@usace.army.mil	A
5	Yvette Paroz	Reclamation	462-3581	yparoz@usbr.gov	P
6	Brooke Wyman	MRGCD	247-0234	brooke@mrgcd.us	P
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17	Rich Valdez	SWCA/ISC	435-752-9606	valdezra@aol.com	O
18	Kim Ward	COA	848-7174	kward@cabq.gov	A
19	Jason Remshardt	USFWS	342-9900	jason_remshardt@fws.gov	O
20	Christine Sanchez	Tetra Tech	881-3188 ext. 139	christine.sanchez@tetratech.com	O – note taker