

Science Work Group Meeting
April 17, 2012

Meeting Materials:

Meeting Minutes

Rio Grande Silvery Minnow Data Synthesis Plan

**Middle Rio Grande Endangered Species Act Collaborative Program
Science Workgroup (ScW) Meeting**

17 April 2012 Meeting – 9:00 AM-11:00 AM

COE

Decisions

- The March 20th, 2012 meeting notes were approved for finalization with the incorporation of the changes discussed at the April 17th, 2012 ScW meeting.
- The March 28th, 2012 RGSM Genetics meeting notes were accepted as permanently draft in the current format, complete with comments.
- With no additional comments or objections, ScW accepted the draft data synthesis plan as completed.

Actions

- Yvette Paroz will email the ScW Project Report Comment document module password to ScW members.
- 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.
- 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.
- Stacey Kopitsch will distribute the Monitor RGSM Genetics grant information to ScW members in preparation for tomorrow's (04/18/12) scope development meeting.
- Yvette Paroz will request an inventory of minnow samples and collection information from the museum.
- Stacey Kopitsch will contact the 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

Meeting Summary

- Alison Hutson brought the meeting to order. The agenda was approved with the cancellation of K. Buhl's presentation. The presentation needed to be postponed until the May 15th meeting due to sample delay for the project.
- The March 20th, 2012 meeting notes were approved for finalization with the incorporation of the changes discussed at the April 17th, 2012 ScW meeting.
- The March 28th, 2012 RGSM Genetics meeting notes were accepted as permanently draft in the current format, complete with comments.
- In a brief discussion on the potential interim genetics work for this year, attendees were updated that the CC provided more direction at their last meeting. They acknowledged that a peer review of the genetics program is very important. The contracting office has indicated that the interim genetics work will have to be issued as a contract – it can no longer be funded under a grant. The CC directed that the scope for the interim genetics activities continue, as closely as possible, the Monitor RGSM Genetics efforts until a peer review is completed and informs any potential needed changes. The one addition the CC requested was a “cross-checking” for laboratory validation to be added. The CC also wanted to make sure that it was specifically stated in the scope that publications activities are not covered. The contract can be issued for the first year with 4 options years – this allows for changes to be implemented as information becomes available.

- ScW members will be meeting tomorrow (Wednesday, April 18th) from 1:00pm to 3:00pm at the Service's field office on Osuna to develop the genetics interim scope of work. This is due to the contracting officer by May 31, and needs to be completed before the next CC meeting on May 2.
- Attendees reviewed the February 21st ScW actions. All but one was completed as assigned. The call for volunteers for ScW co-chairs will remain an ongoing action until the positions are filled.
- Attendees reviewed the March 20th ScW actions. All actions were completed as assigned.
- In the announcements it was shared that the Corps will be unable to complete a deviation this year. The March 1 forecast indicated that a deviation might or might not be needed so storage was initiated for a deviation. However, the April 1 forecast was much more dismal than ever expected. No one is sure if it is even possible to store enough for a deviation at this point in time but there may not even be enough baseflow to "ramp up." The Corp began releasing the water (should be done this week) in order to avoid accruing depletions.
 - The expectation is that the maximum, at Central Gage, will be below 1,300 cfs. There was one peak at the end of March 2012 with the runoff and that peak may be the biggest one of the year.
- Attendees then discussed the temperature changes as water flows downstream. It was explained that Cochiti Lake is a moderator of temperature. There are HOBO water temperature data loggers at 3 levels in the lake to collect data on temperature fluctuations in the lake. The water temperature out of the lake tends to track well with the middle probe. HOBO water temperature data loggers have been collecting data at the Rio Grande Nature Center for 3 years now in order to see how temperature translates from Cochiti down river.
 - The Alameda and Cochiti Outlets Works temperature data is on the web. Mick Porter has the Nature Center and Cochiti Lake temperature data.
- 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.
- With no additional comments or objections, ScW accepted the draft data synthesis plan as completed. The accepted document will be provided to the CC/EC.
- In an update on the FY12 Program Budget, it was shared that no new ScW projects have been approved. Population Monitoring will continue this year but the Population Estimation will not.
- In the Program update, it was shared that the EC will be meeting again this Friday (April 20th) for a full day (9:00am to 4:00pm). At their last meeting (April 13th), the EC agreed to "grandfather" existing signatories into the RIP, to keep the same voting structure, and to follow the Program by-laws. They also discussed options for the RIP structure and management. There are 3 main options for RIP management: Federal (specifically the Service), non-federal, or 3rd party. EC members spent some time discussing trust issues.

Recommendations/Suggestions

- Some attendees suggested that ScW members begin to solicit government cost estimates for the interim genetics work in order to have 2 or 3 solid cost estimates available sooner instead of later. The information should be provided to the project COTR (Yvette Paroz).

Next Meeting: May 15th, 2012 from 9:00 AM to 11:30 AM at ISC.

- May tentative agenda topics: (1) K. Buhl presentation; (2) review museum inventory of minnows; (3) Election of ScW co-chairs;
- Future tentative agenda topics: (1) joint session with HR; (2) future PVA scope(s) for next steps/next work (not expected until summer of 2012)

Upcoming Meetings

- Monitor RGSM Genetics Scope Development Meeting: April 18th, 2012 from 1:00pm to 3:00pm at FWS Field Office on Osuna
- EC Meeting: April 20th, 2012 (Friday) from 9:00am to 4:00pm at Reclamation
- ScW Meeting: May 15th, 2012 from 9:00am to 11:30am at ISC;
- Joint ScW/HR Presentation from Reclamation: May 15th, 2012 from 11:30am to 12:30pm at ISC;
- PVA Meeting: Week of May 15th;

**Middle Rio Grande Endangered Species Act Collaborative Program
Science Workgroup (ScW) Meeting**

17 April 2012 Meeting – 9:00 AM-11:00 AM

COE

Meeting Notes

Introductions and Agenda Approval

- Alison Hutson brought the meeting to order and introductions were made.
- The agenda was approved with the cancellation of K. Buhl's presentation. The presentation needed to be postponed until the May 15th meeting due to sample delay for the project.

Approve the March 20th, 2012 ScW Meeting Notes and March 28th, 2012 ScW RGSM Genetics Meeting Notes

- The March 20th, 2012 meeting notes were approved for finalization with the incorporation of the changes discussed today.
 - R. Dudley did review the Service's comments and edits in the meeting summary; the comments can be deleted.
 - Correct the spelling of "gleam" to "glean" throughout the document;
 - Correct the spelling of "principal" to "principle";
 - Add "ed" to "log-transform" data;
 - ANOVA is the correct statistical term;
 - Correct "transform" to "transformation"
- The March 28th, 2012 RGSM Genetics meeting notes were accepted as permanently draft in the current format, complete with comments.
 - Some members expressed the opinion that to attempt to reconcile the differences would take time away from tasks that are more important. Since this was a "special" work group meeting and not the regular monthly notes, it was suggested that they be kept permanently in draft form with comments and not finalized. There were no objections.
 - The CC provided more direction at their last meeting. They acknowledged that a peer review of the genetics program is very important. The contracting office has indicated that the interim genetics work will have to be issued as a contract – it can no longer be funded under a grant. The contract can be issued for the first year with 4 options years – this allows for changes to be implemented as information becomes available.
 - The CC directed that the scope for the interim genetics activities continue, as closely as possible, the Monitor RGSM Genetics efforts until a peer review is completed and informs any potential needed changes.
 - The one addition the CC requested was a "cross-checking" for laboratory validation to be added. The CC also wanted to make sure that it was specifically stated in the scope that publications activities are not covered.
 - Members cautioned that "not to include publication" needs to be clarified that the Program will not fund the publication process but this does not necessarily prevent the contractor from pursuing publication on their own.
 - Some attendees suggested that ScW members begin to solicit government cost estimates for the interim genetics work in order to have 2 or 3 solid cost estimates available sooner instead of later. Normally the COTR does this work, but if others have information they can provide, it would be greatly appreciated. Any information should be provided to the project COTR (Yvette Paroz).

- ScW members will be meeting tomorrow (April 18th, 2012 from 1:00pm to 3:00pm) to develop the scope of work for the interim genetics monitoring contract. The draft scope will be provided to the CC for their review.

February 21st, 2012 Action Item Review

- ✓ Yvette Paroz will check with Reclamation about providing/assigning a primary ScW member and who could volunteer for the federal co-chair position. – *complete*;
 - Yvette Paroz is the alternate Reclamation member on ScW. It is believed that once Reclamation fills the fish biologist, that person would be assigned as the primary representative. The position should be filled within the month or so.
 - It still has to be determined if this person would/could be the ScW federal co-chair.
- ✓ Mick Porter will check with Justin Reale to determine if he would be able to draft the prioritization process language for inclusion in the draft data synthesis plan– *complete*;
- ✓ Jen Bachus will email the most current version of the draft data synthesis plan (with all tracked changes to date included) to ScW members. – *complete*;
- ✓ Jen Bachus will email T. Turner's and M. Osbourne's genetics publication (article) from the Evolutionary Applications journal to ScW members. – *complete*;
- ✓ Yvette Paroz will work on creating a document module on the ScW password-protected webpage to house all ScW project report review comments and contractor responses. – *complete*;
 - Ali Saenz (Program Assistant) created both. Comments on the population monitoring have been uploaded to the module. Yvette will begin populating the module with older project report review comments when she has the time.

Action: Yvette Paroz will email the ScW Project Report Comment document module password to ScW members.

- Volunteers for the federal and non-federal Science co-chair positions for the upcoming year should let Alison Hutson and Jen Bachus know by the March Science meeting. – *ongoing*;
 - During a call for co-chairs, no one volunteered during the meeting.
 - Because there are no volunteers (and haven't been for several months), Alison has graciously offered to continue as a temporary co-chair for the time being. Jen has offered to assist on an as needed basis only.
 - Attendees discussed rotating some of the duties (such as attending the CC meetings) in order to distribute the co-chair burden in the interim. Rick Billings, as the CC co-chair, can also help keep ScW informed if more representation is needed.
- ✓ Douglas Tave and Jen Bachus will talk to Teresa (from Dexter) at the next Propagation meeting. – *complete*;
 - The purpose of this action was to determine if the Middle Rio Grande (MRG) was part of the ongoing wild fish health studies. The MRG is not currently part of the study, but it could be if funded. The study is a general fish health assessment and would not be minnow specific. However, they probably focus on fish communities as part of the protocol – something from each main family group - so minnow information might be included.
 - They are willing to include the MRG but additional funding would be necessary. It is not known what the additional costs would be.

- Joel Lusk's fish health study is in draft and will hopefully be available soon. This study is mainly focused on the minnow so it might provide more information on any needs and what the Program might want to consider.
- It was suggested that it would be interesting to have someone from the ongoing wild fish health studies to present what they do to the ScW work group. This could be at a regular meeting or via webinar at a scheduled time.
 - Members expressed interest in better understanding the field efforts, the frequency, costs, etc.
- It was suggested that a presentation to the work group (of the fish health study) could be "tacked on" when they are in the area doing assessments at the City of Albuquerque and the Los Lunas Silvery Minnow Refugium.
 - Since their visit is usually 7 to 8 hours per facility, the work group could consider requesting they stay one extra day. The work group could meet in a special session on that day - this would at least offset additional travel costs.

Action: 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.

March 20th, 2012 Action Item Review

- ✓ Jason Remshardt will distribute a copy of the March Captive Propagation and Genetics meeting notes to the ScW work group. – *complete*;
- ✓ Stacey Kopitsch will coordinate/organize a meeting for ScW volunteers to discuss the continuation of the genetics monitoring and make recommendations/provide feedback to the CC. – *complete*;
 - ScW is scheduled to meet tomorrow (April 18th) from 1:00pm to 3:00pm at the Service's field office on Osuna to develop the scope of work for the interim genetics monitoring.
- ✓ Jen Bachus and Alison Hutson will elevate the lack of volunteers for the ScW co-chair positions to the PM and CC. – *complete*;
 - The lack of ScW co-chairs has been discussed with both Yvette McKenna (Program Manager) and the CC.
 - It was pointed out that the Program is in such a state of flux right now and no one knows what is going to happen with the work groups during the possible restructuring (consolidation, disbanding, reform, etc.). This means that volunteers will be unlikely.
 - Alison was thanked for continuing as a temporary co-chair.
- ✓ Any additional comments, edits, or feedback on the recent changes to the Draft Data Synthesis Plan (in response to the CC requested edits) are to be provided to Stacey Kopitsch by email no later than April 9th. – *complete*;
 - No additional comments were received; this topic is on today's agenda for discussion.

Announcements

- There will not be a Cochiti Deviation this year.
 - As of the March 1 forecast, it wasn't clear if a deviation would be needed or not. However, the April 1 forecast was much more dismal than the worst-case prediction from March. Based on the predictions, there will not be enough baseflow to ramp up for a successful event. The water that had been stored was subsequently released (should be done this week) in order to avoid accruing depletions.

- Unless something changes, the “peak” in the next few months is expected to be below 1,300 cfs. The runoff peak that occurred at the end of March may turn out to be biggest of the year. If the Rio Chama still comes up, we may see flows approach 2,000 cfs at Otowi.
- There is no MPT meeting schedule for anytime soon since there is no expected work due to low flows.
- The temperature probe at Alameda was recently reestablished; it came back online in March. This probe records the temperature of water coming into Albuquerque. The data can be accessed on the USGS’s website – but look up the Alameda gage (not the near Alameda gage).
 - **Question:** What do we know about the snow melt effects on temperatures through the system and fish cues?
 - **Response:** Cochiti Lake acts as a moderator of temperature. There is a probe at the outlet works. That information is also available on the web. There is 2 years of temperature recordings from HOBOS in the lake at 3 different depths (surface, 7.5m and 15m); these record the temperature fluctuations in the lake. Interestingly, with the appropriate wind conditions, the lake will undergo turnover in the summer. It’s not a “full” turnover but between 7.5 m and 15 m the temperatures will overlap the middle probe. The water temperature out of the lake tends to track well with the middle probe. HOBOS have been running at the Rio Grande Nature Center for 3 years now so there is associated data with how temperature translates from Cochiti down river. By the time water reaches the Alameda gage there is a strong diurnal signal.
 - The Alameda and Cochiti outlet works temperature data is posted on the USGS website; Mick has the Nature Center and Cochiti Lake data.
- ISC is getting ready for the spawning study. It is hoped that the opportunity was not missed due to the early spring. Knowing the potential temperature differences in the river could be valuable information.
 - It was shared that spawning as early as March has been documented but it usually occurs at the end of April to June (based on a decade of data).
 - The fish at the refugium look good - looking gravid.
 - ISC will be exploring the possibility of multiple spawns.
 - It was shared that there was poor survival of tagged fish last year – but that is probably due to the fact that the fish were already gravid when the tagging occurred. This year the tagging went more smoothly and the survival has been much better.
 - Attendees discussed getting hydrophones in place as the refugium flow goes up and down. Unfortunately, the hydrophones are on back order so there could be a timing issue. It might be possible to catch the second flooding at the refugium.
 - The pumps are electrically noisy and could cause interference. Fortunately, these are battery operated. The ambient noise in the water column is probably the bigger concern (at the inlet and sump).
 - Mick will contact the refugium the day the hydrophones are delivered.

Elections for co-chair positions

- 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.

Review/approve changes to draft data synthesis plan

- With no additional comments or objections, ScW accepted the revised draft data synthesis plan as completed.
- The accepted document will be provided to the CC/EC.

Decision: With no additional comments or objections, ScW accepted the draft data synthesis plan as completed.

FY12 Budget Updates

- In an update on the FY12 Program Budget, it was shared that no new ScW projects have been approved. Population Monitoring will continue this year but the Population Estimation will not (it was zeroed out). The Monitor RGSM Genetics interim work also has funding.
 - The fecundity study was zeroed out on the Program's budget but it could still occur under Dexter's budget.
 - The Program was only able to fund the "bare-bones" this year (ex. BO requirements, etc.).
- Due to this being an election year, it is expected that the 2013 budget will be delayed until February. It is assumed that Continuing Resolution (CR) will be in place until the inauguration. Usually no new projects get considered under CR, but on-going projects can generally be funded.
- The Monitor RGSM Genetics interim scope is due to Jericho Lewis (Reclamation contracting officer) by May 31st; it is thus due to the CC a week in advance of their May 2nd meeting).
- *ScW Meeting Schedule*
 - It was suggested that the work group consider an abbreviated meeting schedule since there is no new tasks or direction coming from the CC/EC.
 - It was commented that there may be upcoming tasks (e.g. PVA scope) that are assigned to ScW, as well as upcoming presentations the work group is arranging.
 - The HR work group is going to try to keep meeting over the summer. They intend to work on getting "caught up" - work on prioritizing, project presentations, etc. They might even write a scope or 2 even though it is acknowledged that those scopes may never come to fruition. Without firm direction, HR is trying to address their chartered objectives and do "business as usual."
 - The summer months (May – July) tend to be a busy season for all.
 - If the ScW work group decreases meetings over the summer, the meeting notes could be approved via email.
 - ScW members agreed to keep the monthly meetings as scheduled, but if an agenda is sparse then the meeting can be canceled.
- *Program Restructuring*
 - It is assumed that some profound changes will be experienced with the transition to a Recovery Implementation Program (RIP). There have been discussions of a senior scientist position or science panel.
 - It is unknown what will happen to the existing work groups. Attendees briefly discussed the potential loss of institutional knowledge that might occur with a restructuring.
 - There seems to be some form of technical group(s) proposed under the new structure, so hopefully there will some transitions from the existing technical groups to the new one(s).

Action: 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.

Action: Stacey Kopitsch will distribute the Monitor RGSM Genetics grant information to ScW members in preparation for tomorrow's (04/18/12) scope development meeting.

Program Update

- *Executive Committee (EC) Update*
 - A major portion of the last EC was deciding to “grandfather” in existing signatories into the RIP and to follow the existing by-laws. The EC also discussed the possible RIP management options - federal, non-federal, and 3rd party, or a possible rotation between 2 or more of the options. The executives talked about trust and communication issues. There are so many moving pieces with the work on the BAs/BO, Long-term Plan, Program Document, RIP Action Plan, etc. The deadline is to have a new BO by the end of February 2013. The EC has yet to make an official “vote” on whether or not to move forward as a RIP even though there was agreement in Taos.
 - A 3rd party lead is still funded with federal dollars and it seems to be the most complicated option at this time. The Service leads a lot of the RIPs but other members have expressed trust issues.
 - The by-laws limit the EC to 20 seats (there are currently 16) so there are 4 seats open.
 - May was the original deadline for the Program Document, RIP Action Plan, and EC decisions.
 - **Question:** What happens if the new BO has to come out and doesn't include a RIP? How would a RIP ever fit then?
 - **Response:** The BO will come out regardless of other factors. The Program is trying to find the structure and governance that everyone can agree with and have some comfort with. But no one really knows how everything will fit together if the RIP is not in place before the BO is issued.
 - The EC will be meeting again for a full day on Friday, April 20th, 2012.
- *Coordination Committee (CC) Update*
 - Please see the above meeting notes; the CC updates were shared during the agenda discussions.

Future Meeting Agenda Topics

- Several potential future agenda topics had been previously identified: (1) joint session with HR; (2) future PVA scope(s) for next steps/next work (not expected until summer of 2012); (3) discussion on increasing the museum sample size (preservation of the October collection) including the objectives, benefits, status of current collection, etc.;
 - *Joint Session with HR:* Regarding the suggested joint session with HR, it was shared that the monthly co-chair meetings were not continued after the first one. A joint session would be valuable but probably not until after some of the Program changes have played out.
 - *Museum Sample Size:* This topic was suggested in response to the age and growth study to have more specimens preserved for additional studies. In 2004-2005 all samples were preserved but now only the incidental mortalities and larval samples are preserved. For example, having more specimens could inform any changes in age distribution following several bad years.
 - It was shared that ISC couldn't get **mortem** fish into the museum - they didn't have the shelf space.
 - It was suggested that a second repository be set up but it was cautioned that it would be work and would cost the Program.
 - It was commented there would need to be a clear purpose and need for additional samples.

- Another suggestion was to request an inventory of what the museum has. It would be good to know what the museum is getting each year.

Action: Yvette Paroz will request an inventory of minnow samples and collection information from the museum.

- *PVA Scope:* A while back, it was identified that a scope of work for the next steps in the PVA process might be needed. At the time, the expected timeframe was this summer.
 - Attendees discussed concerns about how information was routed – ScW is the standing, approved work group. PVA is an ad hoc work group through ScW. There are generally several ScW members who are able to attend the PVA meetings. However, no one from PVA comes to the ScW meetings even though they have been invited numerous times and the ScW has a standing monthly meeting.
 - The RAMAS model is due in June or July. At one of their last meetings, Dr. Goodman was asked to make his deliverables available on the same time-frame.
 - The PVA work group still needs to agree on the consensus data set – in order to do repeatable analyses. There is mark recapture data that the PVA is working to acquire. The effects of augmentation can't be estimated unless it is known how many fish were captured.

Action: Stacey Kopitsch will contact the 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

Next Meeting: May 15th, 2012 from 9:00 AM to 11:30 AM at ISC.

- May tentative agenda topics: (1) K. Buhl presentation; (2) review museum inventory of minnows; (3) Election of ScW co-chairs;
- Future tentative agenda topics: (1) joint session with HR; (2) future PVA scope(s) for next steps/next work (not expected until summer of 2012)

Upcoming Meetings

- Monitor RGSM Genetics Scope Development Meeting: April 18th, 2012 from 1:00pm to 3:00pm at FWS Field Office on Osuna
- EC Meeting: April 20th, 2012 (Friday) from 9:00am to 4:00pm at Reclamation
- ScW Meeting: May 15th, 2012 from 9:00am to 11:30am at ISC;
- Joint ScW/HR Presentation from Reclamation: May 15th, 2012 from 11:30am to 12:30pm at ISC;
- PVA Meeting: Week of May 15th;

Science Work Group
April 17th, 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
4	Jen Bachus	USFWS	761-4714	jennifer_bachus@fws.gov	P
5	Yvette Paroz	Reclamation	462-3581	yparoz@usbr.gov	P
6	Rick Billings	ABCWUA	796-2527	rbillings@abcwua.org	P
7	Douglas Tave	ISC	841-5202	douglas.tave@state.nm.us	A
8	Rebecca Houtman	COA	248-8514	rhoutman@cabq.gov	P
9	Mick Porter	USACE	342-3264	michael.d.porter@usace.army.mil	P
10	Marta Wood	Tetra Tech	259-6098	marta.wood@tetrattech.com	O – note taker

RGSM Data Synthesis Plan

Developed for the MRGESCP Coordination Committee (CC) by the Science Workgroup (ScW).

April 17, 2012

Background

In August of 2010, the MRGESCP contracted with an external panel of experts to perform a peer review of the requirement to implement fish passage at the San Acacia diversion dam. Specifically, the peer review panel was directed to answer the following question, “Based on current data and information, is the requirement to implement fish passage at the San Acacia diversion dam (SADD) for Rio Grande silvery minnow (silvery minnow) based on sound science?”

In February of 2011, the peer review report was finalized, and the external panel concluded that:

(1) There appears to have been no synthesis of the results from many different studies into a single comprehensive documentation of what factors appear to be having major detrimental effects on the silvery minnow.

(2) The likelihood of significant use of a fish passage structure at SADD and the resultant benefit to the abundance and genetic diversity of silvery minnow is uncertain at best and may be low.

(3) Uncertainties surrounding species recovery have not been resolved to the extent that this project can be undertaken with confidence that it will provide the desired benefit to silvery minnow.

At the March 29, 2011 Executive Committee (EC) meeting, members of the peer review panel prioritized their list of recommendations, with data synthesis being the first action that the MRGESCP should pursue. Specifically, the panel recommended that the MRGESCP synthesize results from the considerable literature on the minnow to document what factors have “major detrimental effects” on the species. At this same meeting, the EC directed the CC to have discussions on the synthesis of all existing data and to brainstorm how to accomplish the actual synthesis work.

In response to the peer review panel’s prioritized list of recommendations, the Bureau of Reclamation drafted a separate document to further define and explain the peer review panel’s list. Seven recommended activities for implementing fish passage at SADD were listed, the first being: “Synthesize results from the considerable literature on silvery minnow to document what factors have major (detrimental) effects on the species.”

At the April 13, 2011 CC meeting, all workgroups were requested to review the peer review recommendations in the context of their proposed activities for the Long Term Plan (LTP), and to provide a summary report back to the CC that addressed: (1) where the fish passage recommendations might fit into the LTP; (2) if any of their current/future LTP activities would help address the recommended actions; (3) how the recommendations might impact the work group activity prioritizations; (4) if any current/future activity could be easily modified or updated to address the recommendations; and (5) any recommendations the work group might have on how to effectively and efficiently address the “synthesis of data” issue.

At the June 21, 2011 ScW meeting, this task was completed and provided the following response back to the CC:

For Recommendation #1 (synthesize literature), the Science workgroup recommends not addressing this issue until the Program’s database is available as a tool and starting point. Then

ScW recommends a joint effort between ScW, HR, and PVA to organize the concepts for review and to establish “categories” that could be synthesized in 1-5 page documents. Attendees discussed that even with this “phased” approach each of the steps would be labor and time intensive. There is also a concern about finding volunteers willing to participate.

At the August 3, 2011 CC meeting, the ScW was tasked with taking the lead on the synthesis of data/literature and using the categories from the ISC’s submittal for the 5-year minnow review and the existing LTP to develop a **plan** for the synthesis of literature/data. This document represents this **draft** plan provided to the CC.

Categories for Synthesis

The synthesis of information on the silvery minnow covers a range of topics that can be grouped into different categories. These categories tie back to the categories in the Long Term Plan (LTP) and are relevant to management decisions in the Middle Rio Grande. The categories presented here are recommended by the ScW for this synthesis task and have been developed within ScW, accounting for similar content that could be addressed in the same synthesis task. These follow the guidance received from the CC (see August 3, September 7, and October 5, 2011 Coordination Committee minutes) to use the categories from the LTP and ISC’s submittal for the 5-year status review of the minnow as a starting point. The prioritization process is described in detail below, after which the categories are listed in their priority order as recommended by the ScW.

Prioritization Process

The ScW responded to CC direction and developed this draft Data Synthesis Plan over a series of monthly meetings starting in August 2011 and continuing through February 2012. Regarding the process followed for prioritization of categories, the following summary is provided and comes from the official ScW meeting minutes capturing these discussions (see the minutes posted on the Program website at www.mrgesa.com):

August 16, 2011 – The ScW received the request from CC to use the ISC’s submittal for the 5-year minnow review and the existing LTP categories to develop a plan for the synthesis of literature/data on the minnow. Work group members discussed selecting a synthesis category/topic to use as a pilot exercise for how the synthesis could be conducted. The ScW then brainstormed potential categories for a pilot synthesis exercise; it was agreed that Water Quality Management might be a good topic, in part because this would be relatively easy to do.

September 20, 2011 – The ScW was updated that the CC has also decided that the synthesis of water quality data (a ScW recommended activity) be included in the data synthesis task. Meeting attendees received a document of potential categories developed from categories used in the LTP and the ISC’s submittal for the Service’s 5-year Status Review, which followed the CC request for this task. ScW members agreed and decided to recommend that synthesis of water quality should be the first category to be addressed as a SOW has already been developed and in the meantime the ScW can further review the potential categories and develop a plan for the synthesis. The ScW also requested from the CC more information on what the plan for synthesis of minnow literature/data should contain.

October 13, 2011 – Additional information from the CC was provided back to the ScW on this task. The CC directed ScW to rank/prioritize the list of categories, keeping in mind those that might inform the

consultation and organize them into groups that could potentially be handled by the same contractor. The CC also requested a link to threats identified in the recovery plan. The CC also stated the synthesis follow the format of the Water Quality Synthesis SOW already developed. The ScW discussed how the categories should still be easily linked to the Long-term Plan (LTP), but that a table could be added that links those categories to the corresponding threats from the recovery plan (CC direction). Attendees then reviewed and discussed the draft categories that were developed from the LTP, Recovery Plans, and ISC's 5-yr review submission. The ScW considered any categories that were related or pulled from the same sources of information so that those could be grouped together for the same contractor. Categories that were distinct were kept separate (e.g., predator/non-native control), and topics that were linked were grouped together in the same overall category ("management"). The ScW considered prioritization based on following the LTP prioritization, ease of completion, and which ones inform the consultation (per CC direction). The ScW also considered that several categories were large enough that subcategories could be issued as individual "tasks."

December 6, 2011 – At this meeting it was restated that the October 2011 ScW meeting covered the development and prioritization of categories for the synthesis plan following guidance from the CC and what the ScW thought was appropriate. Further review of the draft plan was conducted at the December meeting and afterward in preparation for the January ScW meeting.

January 17, 2012 – The ScW reviewed the draft Data Synthesis Plan during the meeting, including all suggested edits received since the December meeting. The ScW discussed as a group and agreed upon editorial and wording changes to the document and approved the plan for submittal to the CC as a draft for consideration.

February 21, 2012 – Following approval of the draft plan at the February 1, 2012 CC meeting, pending specific edits the CC requested, the ScW revisited the draft Data Synthesis Plan at its February meeting and discussed the basis for the workgroup's prioritization of categories for synthesis. Because there had been a question raised at the CC about water quality being on the list of prioritized categories, and water quality has been on the list since the beginning, the ScW restated the basis for this category as the first task in the synthesis effort as follows (see also Appendix B which provides background for the water quality synthesis):

1. The water quality data synthesis work was mostly done; the SOW had been completed already; it would be the easiest topic to address;
2. The water quality data synthesis task should be relatively "quick and easy;" there would not be a large amount of funding or time needed. This is in-line with the decreasing budgets;
3. Because it should be relatively "quick and easy," the water quality data synthesis would provide the experience that could be used to modify/revise/refine the synthesis plan or scopes of work for the other categories, which are larger and expected to take more time and money;
4. The water quality data synthesis would satisfy a requirement in the 2003 BiOp; and
5. The water quality data synthesis would show action toward the EC directive to synthesize existing data in response to the San Acacia Diversion Dam (SADD) Fish Passage Peer Review recommendations.

The list of categories and their priorities are as follows:

Priority 1: Water Quality

- This SOW is completed by ScW and submitted to Reclamation for processing
- Fish Kill/Catastrophic events is a sub-objective.

Priority 2a: Silvery Minnow Life History and Biology

- Age and Growth
- Juvenile Production
- Survival)
- Movement
- Foraging and Food
- Reproduction

Priority 2b: Management ¹

- Physical Habitat Restoration and Monitoring
- Water Management (Habitats)
- Augmentation and Salvage

Priority 3: Predator/Non-Native Control

Priority 4: Disease Occurrence/Risk/Fish Health

In addition, each category for this synthesis task also informs recovery actions that help address threats to the species (i.e., factors that have “major detrimental effects” on the species) and which contribute to meeting recovery criteria. These linkages between recovery actions, threats, and recovery criteria are identified in the 2010 RGSM Recovery Plan (see Table 2 *Threats Tracking Table* in that plan). This content from the recovery plan was incorporated into the table provided in Appendix A, which (1) provides the list of categories for synthesis, (2) ranks those in terms of priority for completion, and (3) cross-references the LTP and how the synthesis of information by each category can inform how threats to the minnow are being addressed and contributions made to recovery.

It is expected that the results of this data synthesis task will be helpful for the Program to evaluate the state of knowledge in these areas, understand progress made to-date, and identify information gaps that could be addressed in future studies. The results of this synthesis task will be useful for multiple activities of the Program, including potential use in PVA modeling and Adaptive Management.

Recommended Approach for Fulfilling Synthesis Task

After reviewing the scope and scale of this task, it is the recommendation of ScW that this should be accomplished by contracting out the synthesis effort of past information. Once this initial effort is completed, future efforts to incorporate new information as it becomes available may be smaller in scale, and this contracting approach could be revisited (e.g., to consider if accomplishing updates within the Program and through the workgroups if feasible).

Standard Content for Each Synthesis Topic SOW

To ensure consistency of this data synthesis effort across the various categories, which may be conducted in separate efforts, this section contains standard or consistent requirements that should be included in each Statement of Work (SOW) that goes out for funding. This content reflects direction from the CC on what it would like to see result from this task, in addition to input by ScW. This content

¹ As the “Management” category is so large, this effort has been given a priority “2b” so that it can begin concurrently with the “Minnow Life History/Biology” category (priority “2a”).

is included in the first topic for synthesis (water quality SOW), and should also be included in other synthesis SOWs.

- The Contractor shall compile and evaluate all data taken during studies in the MRG that include *[insert topic and parameters related to topic]*.
- This will include, but is not limited to, all Program funded projects where *[insert topic]* data are collected.
- Only existing data and information are to be evaluated during this project, no new field or laboratory data are to be collected.

Compilations shall include identifying the study or project during which data were collected, when and where collected. This includes developing a spreadsheet that incorporates hyperlinks to where the data are referenced, with digital copies of the information required to be provided to the Contractor. As data are reviewed and documented, the hyperlinked spreadsheet should also contain hyperlinks to information required to populate the DBMS.

- A comparison of these *[insert topic]* data is required, including what was learned from each study or project and *[enter specifics of comparisons needed for this topic; for example on Water Quality this was "by reach, by site, by time of year, and by flows"]*.
- After the synthesis and evaluation of these data/parameters, the contractor shall analyze the potential significance of these data/parameters for the Rio Grande silvery minnow, from a *[enter specific focus if needed]* perspective as indicated by the data. Confidence in this analysis shall be described, including any limitations on data interpretation.
- The evaluation should analyze the strengths, weaknesses, opportunities, and threats of the available data in the context of tracking and managing *[insert topic]*, especially for the Rio Grande silvery minnow. This process should assist with focusing the review and future studies on *[enter topic]*.
- Objectives:
 - Synthesize past data on *[enter topic]*, in a timeline sequence and format comparable to other *[enter topic]* syntheses (for example, the water quality synthesis referred to Paul and Meyers 2001)².
 - As data are acquired, work with the Program to migrate data sets into the Database Management System (DBMS) . This includes coordination with the DBMS effort with regard to developing how data are gathered and input into the DBMS so that it does not have to be reformatted post-contract, and determining how the data will be incorporated into the contracting process and migrated into the DBMS for future use.
 - Identify any data gaps and need for additional assessments on *[enter topic]*.
 - Identify any relationships between studies. How have the results of one study informed another?

² Paul, M. J. and J. L. Meyer. 2001. Streams in the Urban Landscape. *Annual Review of Ecology and Systematics* 32:333-365.

- Identify areas of agreement and areas where there is lack of consensus.
 - Determine whether the studies addressed or informed any of the identified threats in the Rio Grande silvery minnow recovery plan, and if so to what extent.
 - Determine [*enter in specific objective based on that topic for synthesis. For example, the water quality synthesis states “Determine what physical water quality parameters (temp, DO, pH, salinity, and potential contaminants of concern) exist at all flows, in each reach of the MRG, in various habitat types, and at various times of the year.”*]
 - Data validation (Option Year, depending on results of synthesis)
 - Data analysis (Option Year, depending on results of synthesis)
- These objectives above cover the evaluation and review of [*enter topic*] studies and other [*enter topic*] data collected and reported by several entities, inside and outside the Program.

See *Synthesis of Water Quality Data in the Middle Rio Grande in Relation to the Rio Grande Silvery Minnow SOW*. Use similar process for each synthesis topic. This includes part 4.0 Tasks, involving a meeting with Program representatives, including Science Workgroup to discuss (a) the project to date at the second quarterly report, and (b) the draft report once issued.

Appendix A. This table lists the categories for data synthesis, their priority for completion, their applicable LTP sections, and how the data categories address the threats specified in the silvery minnow recovery plan and contribute to recovery.

Data Category	Priority for Synthesis	LTP Section	Recovery Action	Recovery Plan Threats Addressed
<p>Water Quality</p> <ul style="list-style-type: none"> • WQ Issues with Biological Significance <ul style="list-style-type: none"> ○ Temperature ○ Dissolved oxygen (DO) ○ pH ○ Salinity/conductivity ○ Suspended sediment ○ Toxics ○ Nutrients ○ Bed sediment chemistry • What is Known About Effects of the Above on RGSM and also RGSM Prey Species • Fish Kills from Catastrophic Events – e.g., spills or fires 	1	7.5	<p>1.4 Determine water quality</p> <p>1.4 Understand water quality effects</p>	<p>Water pollutants</p> <ul style="list-style-type: none"> • Poor water quality caused by agriculture and urbanization in the Rio Grande basin, especially during low flows and storm events <p>No protection of habitat under State law</p> <p>Inability to acquire instream water rights for the benefit of fish and wildlife</p>
<p>Silvery Minnow Life History and Biology</p> <ul style="list-style-type: none"> • Age and Growth <ul style="list-style-type: none"> ○ Age distribution ○ Improved age determination • Juvenile Production • Survival • Movement <ul style="list-style-type: none"> ○ Egg and larvae movement ○ Juvenile and adult movement • Foraging and Food <ul style="list-style-type: none"> ○ Foraging habits ○ Availability of food resources • Reproduction <ul style="list-style-type: none"> ○ Spawning flows ○ Habitat use during spawning (floodplain, channel) ○ Larval habitats ○ YOY habitats 	2(a)	7.6	<p>1.1 Investigate biological factors</p> <p>1.2 Understand habitat needs</p>	<p>Dewatering and diversion</p> <ul style="list-style-type: none"> • Annual dewatering of a large percentage of the species' habitat • Risk of two consecutive below-average flow years, which can affect short-lived species • Increase in non-native and exotic fish species • Entrainment of eggs and young-of-year in diversion structures • Fragmented habitat <p>Water impoundment</p> <ul style="list-style-type: none"> • Altered flow regimes • Prevention of overbank flooding • Trapped nutrients • Altered sediment transport regimes • Prolonged summer base flows • Reduced food supply • Altered preferred habitat

				<ul style="list-style-type: none"> • Prevention of species' dispersal • Creation of reservoirs and altered flow regimes that favor non-native fish species that may compete with or prey upon the species • Stored spring runoff and summer inflow, which would normally cause flooding • Reduced flows, which may limit the amount of preferred habitat and limit dispersal of the species • Lack of suitable habitat for young-of-year • Fragmented habitat <p>River modification</p> <ul style="list-style-type: none"> • Confined flood flows • Trapped sediment • Establishment of stabilizing vegetation • Elimination of meanders, oxbows and other components of historic aquatic habitat • Replacement of preferred sand and silt substrate with gravel and cobble • Reduction of floodplain areas where young can develop • Geomorphological changes to the river channel <p>Reduced population numbers and loss of genetic diversity</p> <p>Introduction and subsequent competition from non-native fish</p>
<p>Management</p> <ul style="list-style-type: none"> • Physical Habitat Restoration and Monitoring <ul style="list-style-type: none"> ○ Identify habitat requirements of RGSM ○ Habitat restoration – persistence 	2(b) ³	7.1, 7.2, 7.4, 7.6	<p>1.2 Understand habitat needs</p> <p>1.3 Continue genetic studies</p>	<p>Dewatering and diversion</p> <ul style="list-style-type: none"> • Annual dewatering of a large percentage of the species' habitat • Risk of two consecutive below-average flow years, which can affect short-lived species • Increase in non-native and exotic fish species

³ As the "Management" category is so large, this effort has been given a priority "2b" so that it can begin concurrently with the "Minnow Life History/Biology" category (priority "2a").

<ul style="list-style-type: none"> ○ of restored sites ○ Habitat restoration performance – monitoring results ● Water Management (Habitats) <ul style="list-style-type: none"> ○ Effects of intermittency (localized channel drying) on RGSM ○ Effects of spring peak flow management on RGSM (e.g. spawning) ○ Water management flexibilities to meet endangered species needs ○ Effects of winter flow management on RGSM ● Augmentation and Salvage <ul style="list-style-type: none"> ○ Monitoring <ul style="list-style-type: none"> ▪ Population trends and estimation ○ Captive propagation of RGSM ○ Augmentation of RGSM ○ Reintroduction of RGSM (10j) ○ RGSM genetics 			<p>2.1 Modify habitats</p> <p>2.2 Provide suitable habitat using water management strategies</p> <p>2.3 Develop habitat-enhancing water management strategies for reintroduction areas</p> <p>3.1 Continue captive propagation</p> <p>3.3 Conduct reintroductions</p> <p>4.1 Develop interim workplans</p> <p>4.2 Continue long-term monitoring</p> <p>4.3 Utilize independent peer review</p>	<ul style="list-style-type: none"> ● Entrainment of eggs and young-of-year in diversion structures ● Fragmented habitat <p>Water impoundment</p> <ul style="list-style-type: none"> ● Altered flow regimes ● Prevention of overbank flooding ● Trapped nutrients ● Altered sediment transport regimes ● Prolonged summer base flows ● Reduced food supply ● Altered preferred habitat ● Prevention of species' dispersal ● Creation of reservoirs and altered flow regimes that favor non-native fish species that may compete with or prey upon the species ● Stored spring runoff and summer inflow, which would normally cause flooding ● Reduced flows, which may limit the amount of preferred habitat and limit dispersal of the species ● Lack of suitable habitat for young-of-year ● Fragmented habitat <p>River modification</p> <ul style="list-style-type: none"> ● Confined flood flows ● Trapped sediment ● Establishment of stabilizing vegetation ● Elimination of meanders, oxbows and other components of historic aquatic habitat ● Replacement of preferred sand and silt substrate with gravel and cobble ● Reduction of floodplain areas where young can develop ● Geomorphological changes to the river channel <p>Reduced population numbers and loss of genetic diversity</p>
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				Introduction and subsequent competition from non-native fish
Predator/Non-Native Control <ul style="list-style-type: none"> • Predation on RGSM • Competition with RGSM • Hybridization with RGSM • Management of Non-Native Species Potentially Affecting RGSM (e.g. Asian clams, carp) 	3	7.3	1.5 Understand interactions with other fish species 1.6 Understand threats from congeners 1.7 Understand predation by other species	Predation by non-native fishes, as well as birds and mammals Competition for space and food with non-native fish Inadequate regulations to restrict the use of bait fish, illegal use of bait fish, introduction on non-natives via bait bucket, introduction of disease or parasites by importation of bait fish Reduced population numbers and potential loss of genetic diversity Introduction and subsequent competition from non-native fish
Disease – Occurrence and Risk (e.g., hemorrhagic septicemia) <ul style="list-style-type: none"> • RGSM health investigations • Disease/health concerns with other MRG species 	4	7.6	1.5 Understand interactions with other fish species 4.2 Continue long-term monitoring	Disease <ul style="list-style-type: none"> • Risk of stress and disease when RGSM are confined to pools during periods of low flows • Increased risk of stress-induced disease outbreaks possibly exacerbated when high levels of pollutants or other stresses are present

Appendix B. Summary of the Water Quality Data Synthesis Project

Effects to water quality in the Rio Grande due to urbanization and agriculture has been identified by the U.S. Fish and Wildlife Service (Service) as a contributing factor to the decline of the Rio Grande silvery minnow (*Hybognathus amarus*; RGSM) (U.S. Fish and Wildlife Service 2010). Bestgen and Platania (1991) have also suggested that poor water quality in the Rio Grande near Albuquerque may affect RGSM populations, especially during low flow periods, as low numbers of the species are found there.

Urbanization and agriculture alter the hydrology, water chemistry, water quality, channel geomorphology, organic matter, fish and aquatic invertebrate assemblages, algae, and natural processes within aquatic ecosystems (Paul and Meyer 2001, Meyer et al. 2005, Walsh et al. 2005). Agriculture is also a major contributor of non-point source pollution to surface waters (Moore et al. 2005, Bernot et al. 2006). Several studies have been undertaken in the past to assess water quality impacts in the Middle Rio Grande (MRG), focusing on chemical analyses and toxicity studies (metals, hydrocarbons, pesticides, PCBs, pharmaceuticals, and other constituents of potential concern) and fish health. The existing chemical and physical water quality data for the MRG and related information is extensive, and determining exact deleterious compounds or synergistic impacts is difficult. Marcus et al. (2010) completed an ecological risk assessment to assess; 1) the growth, survival, and reproduction of RGSM and 2) the general health of the aquatic community in the MRG. The ecological risk assessment focused on chemical data collected by the Service (15,624 analytical results) and from the Upper Rio Grande Water Operations Study (250,000 plus analytical results). This ecological risk assessment used conservative species specific benchmarks to determine if exposure affected RGSM and the aquatic community. Marcus et al. (2010) found there to be no consistently high-risk patterns for individual potential contaminants of concern (PCOCs) in the MRG. Many PCOCs are thought to be naturally occurring, and elevated due to natural sources. The results of this risk assessment do not support the conclusion that PCOCs are primary factors that contribute to the decline of RGSM.

The physical water quality of the MRG has been degraded due to land use change and urbanization. Dissolved Oxygen (DO) levels have long been taken as indicators of the health of a water body (Keefer et al. 1979). DO in lotic systems is usually high, uptake from the atmosphere is high and the diurnal variation is high (coupled to photosynthesis, respiration, and decomposition) (Wetzel 2001). Dissolved oxygen sags from stormwater point discharges (Van Horn 2008; DBS&A 2009) and resulting fish kills (Lusk 2004) have been documented in the MRG. Sediment conveyed during large stormwater events can increase turbidity, and bed disturbance can limit the photic zone and aquatic plant production (Paul and Meyer 2001). It is estimated that 1.5×10^6 kilograms (kg) per year (3.4×10^6 pounds per year) of sediment and other solids are discharged into the Rio Grande (U.S. Fish and Wildlife Service 2011). Temperature change has also been observed in urban streams (Paul and Meyer 2001). Though native fish in the southwest have evolved to tolerate dynamic temperature regimes (Matthews et al. 2000), increased water temperature has been identified as a potential stressor to RGSM.

Basic physical parameters of water quality (temperature, oxygen saturation, pH, salinity, total suspended sediment, and turbidity) may be more indicative of environmental conditions important to the RGSM. Currently, physical water quality parameters such as temperature, DO, pH, and salinity are evaluated in the field as part of a number of separate studies and activities, including salvage operations, population monitoring, and habitat effectiveness monitoring. Thus, the water quality data synthesis should be focused on physical water quality parameters such as temperature, dissolved oxygen, and suspended sediments.

Specific time periods of concern identified by the Service (2010) are during low flows and stormwater discharge events. A large percentage of the flow in the MRG consists of municipal and agricultural discharge (U.S. Fish and Wildlife Service 2010). The evaluation of past water quality data during these periods would be useful to identify if any of these parameters are limiting factors to the RGSM population in the MRG, and to help direct how we can best manage the RGSM population in the MRG. Understanding and analyzing the water quality parameters in the MRG, and how they relate to the health and survival of the RGSM, will improve water management schemes and habitat restoration goals that are supportive of various RGSM life stages.

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