

Middle Rio Grande Endangered Species Act Collaborative Program Science Work Group Meeting

18 September 2012 Meeting – 9:00 AM-11:30 AM

ISC

MEETING SUMMARY

Actions

- Yvette Paroz will omit the duplicate Augmentation and Monitoring project from the ScW project tracking spreadsheet.
- Kelly Oliver-Amy and Yvette Paroz will work with Kevin Buhl on scheduling the estrogenic biomarker presentation for the October ScW meeting; they will also let him know to expect a request for copies of the draft final report.
- The Spawning Periodicity report deadline has been extended so any additional comments can be provided to Yvette Paroz by Friday, September 21st.
- Yvette Paroz will discuss with Jericho Lewis whether or a contract extension is even feasible for the LLSMR.
- If a no-cost contract extension is feasible for the LLSMR Spawning Study, Dana Price and Alison Hutson will inform the CC that ScW supports the no-cost contract extension in hopes of continuing the study for the 3rd year.
- Stacey Kopitsch will forward the most recent version of the RIP Action Plan to ScW members.
- Stacey Kopitsch will set up a doodle poll to determine an additional meeting for ScW to discuss/review the RIP documents (RIP Program Document, RIP Action Plan, and 3rd Party Management Plan).
- Stacey Kopitsch will compile all the existing ScW comments on the RIP Action Plan; the compiled comments will be distributed to ScW members in preparation for the additional meeting.

Ongoing and Continued Actions

- Yvette Paroz will continue to communicate with the museum to express ScW requests to have a “print out” list of what is currently included in the collection, including information on each year, and how they are preserved. If needed, she will organize a meeting with museum staff in order for ScW to express the requests/needs verbally and answer any questions the museum might have. (*from 08/21/12 meeting*)
- Yvette Paroz will make an effort to forward any solicitation notifications to the ScW members as they become available. (*from 08/21/12 meeting*)
- Rick Billings will email the ScW the draft HR planning/objectives document. (*from 07/17/12 meeting*) – *unknown status*; HRW is still working on the document
- Mick Porter will draft a 1-page strawman proposal on a Program-wide research symposium for the ScW work group to review and discuss. (*from 07/17/12 meeting*)
- Alison to contact Teresa on the wild fish health surveys conducted by Dexter and how that could be done in the MRG – further discussion will be had at the next Propagation and Genetics meeting on 08/22/12 (*from 08/21/12 meeting*)

Decisions

- The August 21st, 2012 ScW meeting notes were approved for finalization with no additional changes.
- ScW supports a no-cost contract extension for the LLSMR Spawning Study provided there is an on-site brainstorming session in early 2013 (January of February) to look at additional monitoring (data collection) and/or hypotheses and questions to address.

Meeting Summary

- Dana Price brought the meeting to order and introductions were made. The agenda was approved with the tabling of Item #10 *Updates on RIP 3rd party management recommendations from subcommittee* since the document was distributed much later than expected.
- The August 21st, 2012 ScW meeting notes were approved for finalization with no additional changes.
- Attendees completed a July Action Item review. All but 2 actions were completed as assigned. The remaining 2 actions were ongoing and be carried over until next month.
- Rob Dudley (ASIR) then presented “Spawning Periodicity of Rio Grande Silvery Minnow (1999, 2001-2004, 2006-2012).”
 - This project has a long history going back to 1996; however, 1999 was the first official year of the project. This was initially (1999) a research project but later (2001-2004) included salvage efforts as well.
 - Overall, the 3 key objectives have remained the same through the years:
 - (1) determine the annual timing, duration, and magnitude of the Rio Grande Silvery Minnow (minnow) reproduction;
 - (2) assess differences among sampling years; and
 - (3) examine the relationships between the key variables (discharge, temperature, and spawning magnitude).
 - Objective #4, determine the potential association between spawning magnitude and minnow Catch Per Unit Effort (CPUE) from the Population Monitoring Program was added about 5 years ago once there was enough data to begin exploring the association; and
 - Objective #5, collect data that will aid in the understanding of minnow egg transport within and between the three reaches of the Middle Rio Grande (MRG), was a new objective for 2012 and there has not been the opportunity to explore yet.
 - Minnow egg development rate is temperature sensitive. At 25° C, it generally takes 40 hours for hatching to occur.
 - The initial field study done in 1999 was preliminary research to (1) “get a handle” on the initial research questions and (2) to assess the spatial component (in terms of spawning magnitude differences between the reaches). The data supported the hypothesis that there were differences between the northern and southern sites.
 - The evolution of the project has been driven by many things over the years: (1) the severe drought conditions in 2000-2003 were the primary impetus for initiating a long-term minnow spawning periodicity study; (2) the formation of the MRG Endangered Species Act Collaborative Program (2001), during federal litigation resulted in annual review of the project from a variety of government agencies; (3) an outside review led by five experts (Program Advisory Panel) was convened in 2004 and provided fish sampling recommendations that were incorporated by the Program; (4) the number of sampling reaches was reduced from three in 2006-2008 to two in 2009-2011 and finally to one in 2012 (please note that the reduction of sampling reaches was not an original intention but resulted from funding and timing issues); and (5) improved safety aspects and sample efficiency through modified equipment.
 - The apparatus is now safer in a variety of flows and is more efficient. There is a platform for standing and the egg collectors sit on top. The build and strength of the modified apparatus means it can be placed deeper in the river and farther from the river bank, in the higher velocity areas (even in the thalweg at low flows).
 - There is a modified screen that lets the very fine particulate debris pass through. This is more efficient as more water is sampled (i.e., more fish eggs are captured) and there is less time spent cleaning the screens.

- These modifications allow for longer-term sampling in high water velocities. It is conceivable that overnight sampling could be attempted if the apparatus was properly anchored to the bank and protected from larger debris.
- Sample duration has been fairly constant for the life of the project at 4 to 6 hours per day. The average number of samples is 50 samples per day, although there is variation. The volume of water sampled ranged from 50,000 to 150,000 m³ (for a single year). The CPUE of drifting eggs was calculated as:
 - the total number of eggs collected • volume of water samples • 100
- The daily water temperatures means were as low at 15° C and as high as 30° C (for the sampling period in 2012). As the river dries, there is greater spread between the mean and the maximum.
- The spring runoff occurred early in 2012 (April) but the project sampling didn't begin until May 1st. It is unknown what the fish response was to the early peak even with the cooler temperatures. Almost nothing happened after the May spawning pulse.
- The USGS gauges provide the discharge volume in the river at the time of sampling on any given day. And This allows us to compare the volume of water that was actually sampled to what *could have been* sampled.
 - In a sampling period of 6 hours, the volume of water sampled is often less than 1% of the total water in the river. While there are depth, velocity, and other variables that affect the egg transport estimate, this illustrates that a lot of eggs are in the river after a spawning event and many of them are transported downstream.
- In an attempt to determine “big” differences between the years, the egg densities were log-transformed (and standardized for discharge) at the San Marcial site over time.
 - Interestingly, 2002 was a “horrible” year for the minnow but there were still a significant amount of eggs. Statistically, there are spawning differences among the years. The spawning magnitude is not the same every year. Unfortunately, the daily egg catch variation limits our ability to “dig deeper” into the pair-wise annual comparisons.
 - No matter the year, there is always an amount of spawning that is not vastly different from other years (when discharge is accounted for).
- In an attempt to determine the relationship between the spawning event and population monitoring CPUE, the log-transformed egg densities were compared to the CPUE for the San Marcial site from 2002 to 2012. It turns out that there is a poor relationship between the July and October CPUE and the spawning event. The slightly negative relationship is intriguing.
 - One speculation on the negative trend is that the eggs are being transported downstream more efficiently in lower flow years since the flow remains in the channel.
- The minnow tend to show a strong spawning response when there is a notable (100%, 200% or 300%) increase in flow discharges compared to the few previous days. For example, the fish response is strong when the flows “jump” from 500 cfs to 1,500 cfs within a few days.
 - When the flow is “maintained” at 1,000 cfs or more for a significant period of time (3 to 4 weeks), the minnow will actually spawn over an extended period of time (ex. 2007). The minnow basically spread the reproductive effort over a month's period. Comparatively, in 2012 there was a concentrated spawning spike in April and then a sharp drop off that followed the tail of the hydrograph (recession).
 - In a summary of the annual regression analyses, the R² values were the highest (i.e., significant response) in years when mean discharge was really low. In the high flow years (2009, 2010, 2007) there is much less response (i.e., not significant).
- In summary:

- Analysis of reproductive output revealed a significant difference among mean values of annual catch rate over the period of record;
- The July and October CPUE values for minnow in the San Acacia Reach yielded non-significant relationships with the spring spawning magnitude;
- A comparison between log-transformed egg catch rate and the percentage increase in mean daily discharge two days prior to egg collection yielded a highly significant relationship. This relationship was most predictive for years with low flow;
- Despite the seemingly large number of minnow propagules transported downstream, years with elevated and extended spring runoff conditions appear to create the favorable habitat conditions required for the successful recruitment of early life stages of minnow
- *Spawning Periodicity Report Suggestions:* (1) include a couple of the modified equipment photos in the project report appendices; (2) experiment with different types of “trash collection bags” on the platforms to deal with the trees and debris; and (3) include discussion from the literature that even with more data, in general, other researchers also document poor relationships between spawning effort and population response.
- There were no announcements other than the news that 2 beavers tried to set up “home” at the Los Lunas Silvery Minnow Refugium (LLSMR) facility.
- There is still no non-federal nomination for ScW co-chair. This will remain an agenda item until filled.
- There was no Propagation Meeting update. Jason Remshardt, who had been the chair and note taker for the propagation meetings, has taken a new job and moved out of state. Updates will be provided when available.
- Alison Hutson then presented on the “lessons learned” from the LLSMR spawning study.
 - This was Year 2 of a 3 year study with the objectives of determining if and where minnow might preferentially spawn and determine any spawning needs or conditions that could inform management on the river.
 - There was no successful spawn in the first year of the study (2011) most likely due to the unfortunate timing of events. The brood fish stocking and tagging did not occur until April when the fish were already gravid. It is speculated that the high mortality is due to the stress of tagging while gravid.
 - There was a successful spawning event in 2012. The brood fish were stocked and tagged early (before they were gravid) and the survival was 99 out of 100.
 - The first flooding event was initiated on April 24th. It is recognized that this is earlier, but the intent had been to “match” the situation of the river. While eggs were never caught in the egg collectors, larval fish were found in the 3 of the “areas” including 2 ponds.
 - After the first week-long flood, the flow was lowered but areas were kept wet in the case that spawning was successful (i.e., did not want to dry any eggs or larvae). The second flooding occurred 10 to 12 days after the first flood. At that time, larval fish were observed in 3 ponds but primarily Pond 5 which is the smallest. Interestingly, the fish moved out of the ponds when the second flood receded. and they didn’t return to the ponds until the water level had been held constant and they were free swimming.
- *Summary of accomplishments:*
 - The equipment is up and fully functional;
 - Minnow were captured on the DIDSON; although it is unknown how this information can be used at this time;
 - Minnow moved through the area during the duration of the study; and

- Minnow moved onto the overbank area.
- *Summary of Lesson's Learned:*
 - Minnow spawned in response to the April 24th flood;
 - Turbidity is not a requirement for spawning; the added benefits with increase turbidity are not known but turbidity is not essential;
 - Larval fish “moved with” or “followed” the water when it was brought down (approximately 15 days after spawn);
 - The original study plan was successful as indicated by the spawning in 2012;
 - The minnow are growing well: the young of year were 59mm by the end of July.
- Discussion of the draft RIP documents was postponed until a separate meeting can be set up to facilitate work group review.
- Review of the draft project justification/priority template will be initiated over email to make sure there are no major suggested changes (since the CC is already using it). Official work group approval can be documented in the October meeting notes.
- In a brief Program Update, it was shared that the EC will be meeting this Thursday (09/20/12). Agenda items include FY13 budget concerns/guidance and possible alternatives to a 3rd Party RIP management. The CC met earlier in September to discuss the FY13 budget. It currently appears that 1/3 of the FY13 budget would be needed to fund the 3rd Party Management and other administrative costs. It is expected that the FY13 budget will be as low as \$1.5 million.

Next Meeting: September 18th, 2012 from 9:00am to 11:30am at ISC

- Tentative agenda items include: (1) continued discussion of draft RIP documents – if necessary/appropriate; (2) Kevin Buhl’s estrogenic biomarker presentation?; (3) election of ScW co-chair (ongoing item until filled); (4) tentative field trip ideas and dates (ongoing item); (5) Research Symposium 1-page document review; (6) official approval of the draft project justification/priority template;
- November/December agenda items: (1) ISC spawning study results presentation; (2) MPT presentation or update on the monitoring efforts
- Future agenda topics: (1) future PVA scope(s) for next steps/next work (not expected until summer of 2012);
- Agenda items for consideration: (1) the work group consider developing and instituting a process where by one of the Program staff has copies of everything so that it can be imported to the database (for draft and old SOWs).

Important Dates/Events:

- September 20th from 9:00am to 1:00pm – EC meeting
- October 16th from 11:00am to 12:00pm – joint presentation: Darryl Eidson’s Sediment Study
- ~~November 6th, 7th, and 8th – tentative dates for the CPUE Methodologies and Metrics workshop;~~ the workshop has been postponed until February 2013
- November 13th – ScW meeting (rescheduled to accommodate the Thanksgiving holiday)
- November 13th from 11:00am to 12:00pm – joint presentation: Climate Change in the MRG basin;

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Meeting Notes

Introductions and Agenda Approval

- Dana Price brought the meeting to order and introductions were made.
- The agenda was approved with the tabling of Item #10 *Updates on RIP 3rd party management recommendations from subcommittee* since the document was distributed much later than expected.

Approval of the August 21st, 2012 ScW meeting notes

- The August 21st, 2012 ScW meeting notes were approved for finalization with no additional changes.

August 21st, 2012 ScW Action Item Review

- Yvette Paroz will continue to communicate with the museum to express ScW requests to have a “print out” list of what is currently included in the collection, including information on each year, and how they are preserved. If needed, she will organize a meeting with museum staff in order for ScW to express the requests/needs verbally and answer any questions the museum might have. – *ongoing*;
- Yvette Paroz will make an effort to forward any solicitation notifications to the ScW members as they become available. – *ongoing*;
- ✓ Yvette Paroz will check on the “duplicated” projects (*RGSM Augmentation and Monitoring* and *Continue RGSM Augmentation and Monitoring*) and update/clarify the project tracking spreadsheet as necessary. – *complete*;
 - Yvette confirmed that these 2 projects are indeed just duplicates.

Action: Yvette Paroz will omit the duplicate Augmentation and Monitoring project from the ScW project tracking spreadsheet.

- ✓ Kelly Oliver-Amy will follow up with Gary Dean for the dates/information on the *Eval. Estrogenic BioMarker/Water Toxicity* contract. – *complete*;
 - Gary told Kelly that he had been given the contract from another COTR so he didn’t know the exact due dates. There is a progress report from last November. Gary said he would be requesting the draft final for ScW to review. The contract is expired but ScW can review the report and have Kevin present in October and then the work will be concluded and the file closed out.

Action: Kelly Oliver-Amy and Yvette Paroz will work with Kevin Buhl on scheduling the estrogenic biomarker presentation for the October ScW meeting.

- ✓ The Monitoring Plan Team (MPT) is requesting volunteers to help with the fall monitoring (assumed to start soon). Please contact Ondrea Hummel if you are interested in participating in the field work. – *completed*;
 - Ondrea indicated that the MPT has all the folks they expected to need; however, if any is interested they can still get involved.

- ✓ Jen Bachus will develop a draft project justification template for ScW member review at the September meeting. – *complete*;
 - Jen had a draft template developed within days of the assignment. Copies were distributed via email. The CC began using it immediately – even though ScW hasn't officially reviewed or recommended approval/use.
 - It was suggested that work group members review this document template on their own and communications/comments/edits can be addressed via email. Then an "official" recommendation/approval can be documented at the October meeting.
- ✓ Rick Billings will elevate the scheduling concerns for the tentative CPUE workshop. Minnow tagging and stocking usually occurs within the same timeframe. If they overlap, this may preclude key agency individuals from participating in one or the other. – *complete*;
 - Rick updated the work group that the CPUE workshop has been delayed until February 2013 due to changes in personnel at the Service, contracting issues, and timing concerns with the desert fisheries council meeting (in Death Valley) and PIT tagging.
- ✓ Stacey Kopitsch will forward the DBMS survey poll on the database training registration to ScW members. – *completed*;
- ✓ Kelly Oliver-Amy and Yvette Paroz will work with Kevin Buhl on scheduling the estrogenic biomarker presentation. *Note: which the work group asked to reschedule due to another presentation at the September meeting.* – *complete*; please see new action specifying the October meeting
 - Kelly will also let Kevin know to expect a request from ScW for copies of the draft final report.

ASIR spawning monitoring presentation

ASIR spawning monitoring presentation

- Rob Dudley (ASIR) then presented "Spawning Periodicity of Rio Grande Silvery Minnow (1999, 2001-2004, 2006-2012)." *Please refer to the actual presentation for additional details and graphs.*
 - This project has a long history going back to 1996; however, 1999 was the first official year of the project. This was initially (1999) a research project but later (2001-2004) included salvage efforts as well.
- *Objectives:*
 - Overall, the 3 key objectives have remained the same through the years:
 - (1) determine the annual timing, duration, and magnitude of the Rio Grande Silvery Minnow (minnow) reproduction;
 - (2) assess differences among sampling years; and
 - (3) examine the relationships between the key variables (discharge, temperature, and spawning magnitude).
 - Objective #4, determine the potential association between spawning magnitude and minnow Catch Per Unit Effort (CPUE) from the Population Monitoring Program was added about 5 years ago once there was enough data to begin exploring the association (to see if there are any "linkages" between the studies); and
 - Objective #5, collect data that will aid in the understanding of minnow egg transport within and between the three reaches of the Middle Rio Grande (MRG), was a new objective for 2012 but there has not been the opportunity to explore this yet since only one site was sampled in 2012.

- *Eggs & Development*
 - Unlike other fish, the minnow eggs have quite a bit of space between the embryo and external surface (chorion) of the egg. The eggs also don't "stick" - they drift. This is a unique and interesting stage in their life history.
 - Minnow egg development rate is temperature sensitive. At 25° C, it generally takes 40 hours for hatching to occur. However, there is variation (from 35 hours to 51 hours at 25° C within a given temperature and between different temperatures. These hatching temperatures were identified in a study where the temperatures were held constant. In most cases, it takes several days for hatching to occur.
- *Initial field study in 1999*
 - The initial field study was done in 1999. This preliminary research was to (1) "get a handle" on the initial research questions and (2) to assess the spatial component (in terms of spawning magnitude differences between the reaches). There were 9 sites throughout the MRG that were monitored from March 30th to June 30th (for 3 solid months of data). The data supported the hypothesis that there were differences between the northern and southern sites (e.g., eggs were spawned a little bit earlier in the southern regions compared to the northern sites).
- *Key factors that drove recent project evolution and methodology*
 - The evolution of the project has been driven by many things over the years:
 - (1) the severe drought conditions in 2000-2003 were the primary impetus for initiating a long-term minnow spawning periodicity study;
 - (2) the formation of the MRG Endangered Species Act Collaborative Program (2001), during federal litigation resulted in annual review of the project from a variety of government agencies;
 - (3) an outside review led by five experts (Program Advisory Panel) was convened in 2004 and provided fish sampling recommendations that were incorporated by the Program;
 - (4) the number of sampling reaches was reduced from three in 2006-2008 to two in 2009-2011 and finally to one in 2012 (please note that the reduction of sampling reaches was not an original intention but resulted from funding and timing issues); and
 - (5) improved safety aspects and sample efficiency through modified equipment.
- *Study Map areas, reaches, sites*
 - Only one site remained part of the study for 2012 – the San Marcial site.
 - One current thought is that eggs collected here really wouldn't be affecting the population since they are "so far south" and still drifting as live eggs. They are too far south to be impacted by salvage.
 - The eggs tend to "cruise" through this area due to channelization.
- *Seasonal discharge in the Rio Grande in 2011 and 2012 at USGS gauging stations*
 - There was not as much water in the downstream sites in April through June, but the overall "shape" of the hydrograph is mostly preserved; it is the magnitude that changes.
 - 2012 had an early April spike that trailed off. There might have been some potential spawning events later downstream.
- *Traditional field sampling methods*
 - Sample duration has been fairly constant for the life of the project at 4 to 6 hours per day. The average number of samples is 50 samples per day, although there is variation. The

volume of water sampled ranged from 50,000 to 150,000 m³ (for a single year). The CPUE of drifting eggs was calculated as:

- the total number of eggs collected • volume of water samples • 100
 - Catch rate was standardized based on mean daily discharge. This was done to correct for the density:
 - In years where flows are high, even if the number of eggs in the system is the same as when flows low, there is much less water for the eggs to be passed in.
- *Modified field sampling equipment*
 - The apparatus is now safer in a variety of flows and is more efficient. There is a platform for standing and the egg collectors sit on top. The build and strength of the modified apparatus means it can be placed deeper in the river and farther from the river bank, in the higher velocity areas (even in the thalweg at low flows).
 - There are certain logistical safety concerns that have to be addressed and dealt with in terms of the placement of the equipment.
 - There is a modified screen that lets the very fine particulate debris pass through. This is more efficient as more water is sampled (i.e., more fish eggs are captured) and there is less time spent cleaning the screens.
 - These modifications allow for longer-term sampling in high water velocities. It is conceivable that overnight sampling could be attempted if the apparatus was properly anchored to the bank and protected from larger debris.
 - *Daily Water Temperatures (mean, minimum, and maximum) and mean daily discharge at San Marcial in 2012*
 - The daily water temperatures means were as low at 15° C and as high as 30° C (for the sampling period in 2012).
 - As the river dries, there is greater spread between the mean and the extremes (minimum/maximum temperature).
 - *Mean Daily Discharge, Egg Catch Rate, and Temperature for San Marcial in 2012*
 - The spring runoff occurred early in 2012 (April) but the project sampling didn't begin until May 1st. It is unknown what the fish response was to the early peak even with the cooler temperatures.
 - This is one of those situations where it would have been beneficial to have started the study earlier in order to catch the early runoff peak.
 - Almost no spawning happened after the May spawning pulse.
 - *Volume of Water Sampled*
 - The USGS gauges provide the discharge volume in the river at the time of sampling on any given day. And this allows us to compare the volume of water that was actually sampled to what *could have been* sampled.
 - In a sampling period of 6 hours, the volume of water sampled is often less than 1% of the total water in the river. While there are depth, velocity, and other variables that affect the egg transport estimate, this illustrates that a lot of eggs are in the river after a spawning event and many of them are transported downstream.
 - *Log-transformed egg densities (standardized for discharge) at the San Marcial site over time*
 - In an attempt to determine “big” differences between the years, the egg densities were log-transformed (and standardized for discharge) at the San Marcial site over time.

- Interestingly, 2002 was a “horrible” year for the minnow but there were still a significant amount of eggs. (*This indicates that spawning probably occurred on one or 2 particular days with some minor regular background spawning*).
 - In 2004, there was quite a bit less spawning.
 - Statistically, there are spawning differences among the years. The spawning magnitude is not the same every year. Unfortunately, the daily egg catch variation limits our ability to “dig deeper” into the pair-wise annual comparisons.
 - No matter the year, there is always an amount of spawning that is not vastly different from other years (when discharge is accounted for).
 - *Please note that 2001 wasn’t standardized in the same way using the volumetric determination of the number of eggs versus real counts; and there was no sampling in 2005.
- *Log-transformed egg densities and Oct CPUE values at the San Marcial site over the period of record*
 - In an attempt to determine the relationship between the spawning event and population monitoring CPUE, the log-transformed egg densities were compared to the CPUE for the San Marcial site from 2002 to 2012.
 - It turns out that there is a poor relationship between the July and October CPUE and the spawning event. Almost no variation is explained in this relationship and there is a negative trend.
 - The slightly negative relationship is intriguing.
 - One speculation on the negative trend is that the eggs are being transported downstream more efficiently in lower flow years since the flow remains in the channel.
 - Based on the literature, this is not a surprising observation. There aren’t any really good long-term studies of other pelagic spawners for the spawning intensity. A good relationship to the October CPUE would not really be expected since so much time has passed from the spawning to the monitoring. A lot could happen to change the ecological conditions and affect the mortality. Also, the importance of drifting eggs at the downstream portion of their range (in terms of relating to October CPUE) is questionable.
 - *Regression Analysis for RGSM mean log October catch rates and hydraulic variables*
 - When there are higher discharges, we get cleaner ecological responses that explain nearly 75% of the variation. The response improves as the duration increases.
 - Remember, however, that a “lot of eggs” does not necessarily translate to a “lot of fish.”
 - *Contour Plot of discharge, water temperature, and egg densities at San Marcial*
 - The highest intensity of spawning (red) occurs at water temperatures between 19° and 23° C at a discharge around 500 cfs and then again at 2000 cfs.
 - It is interesting to note that some spawning can occur at low temperatures (~15° C) but usually only at higher flows of 1,500 to 2,500 cfs. This is something to keep in mind when the spring peak occurs early (in April).
 - *Regression analysis of log-transformed egg densities and mean daily discharge*
 - The minnow tend to show a strong spawning response when there is a notable (100%, 200% or 300%) increase in flow discharges compared to the few previous days. For example, the fish response is strong when the flows “jump” from 500 cfs to 1,500 cfs within a few days.
 - When the flow is “maintained” at 1,000 cfs or more for a significant period of time (3 to 4 weeks), the minnow will actually spawn over an extended period of time (e.g.,

2007). The minnow basically spread the reproductive effort over a month's period. Comparatively, in 2012 there was a concentrated spawning spike in April and then a sharp drop off that followed the tail of the hydrograph (recession).

- The decreasing flows on tail of the hydrograph do not trigger a fish response.
 - In a summary of the annual regression analyses, the R^2 values were the highest (i.e., significant response) in years when mean discharge was really low. In the high flow years (2009, 2010, 2007) there is much less response (i.e., not significant).
 - *Please remember that this information is for the San Marcial site, so it is unknown where exactly they are coming from and it is possible that the eggs have been traveling at least 2 days before hatching.
 - It would be interesting to study if a flow spike in July would trigger another spawning event or are the fish done by then? Unfortunately, we have not had the perfect year to test hypotheses and “manipulate” the flows to assist the research.
- *Summary of regression analysis*
 - In a summary of the annual regression analyses, the R^2 values were the highest (i.e., significant response) in years when mean discharge was really low. In the high flow years (2009, 2010, 2007) there is much less response (i.e., not significant).
- *Summary*
 - Analysis of reproductive output revealed a significant difference among mean values of annual catch rate over the period of record;
 - The July and October CPUE values for minnow in the San Acacia Reach yielded non-significant relationships with the spring spawning magnitude;
 - A comparison between log-transformed egg catch rate and the percentage increase in mean daily discharge two days prior to egg collection yielded a highly significant relationship. This relationship was most predictive for years with low flow;
 - Despite the seemingly large number of minnow propagules transported downstream, years with elevated and extended spring runoff conditions appear to create the favorable habitat conditions required for the successful recruitment of early life stages of minnow
 - The annual population monitoring final reports are available at the following website: <http://www.asirllc.com/>
- *Research observations based on past results*
 - Spatial extent of study: Sampling in all three river reaches (minimally) allows for a much more robust statistical analysis of spawning characteristics, intra-annual comparisons, spawning cues, relationships with population monitoring trends, and potential insight to egg transport dynamics.
 - Intensity of sampling: Sampling during all days of the week and for about six hours a day helps to ensure a reasonable estimate of daily egg catch rate. Ideally, sampling would occur 12–24 hours a day at each of the study sites (i.e., using modified field sampling equipment).
 - Overnight sampling might be possible with the modified equipment, but there are safety concerns with higher flows and logistics to consider when catching eggs for such an extended period of time (e.g., how to break up 12 or 24 hours into 2 or 3 hour “segments”)
 - Duration of study: Based on the variable nature of past discharge patterns and water temperatures, the vast majority of spawning activity is expected to occur from about 15 April to 30 June in all of the study reaches combined.
 - Ideally, it would be informative to try to capture a larger range – from the early spawning and any response to late spring flows – since we don't really know the

impact of the early April spawns or late summer responses. It has been observed that even if there is a late spawning, it does not do much to really support the cohort (not bi-modal).

- *Questions:*

- **Question:** Has the impact of floodplain spawning been considered in this analysis? There are good observations of minnow eggs in the floodplain and minnows using the floodplain to spawn.

- **Response:** The floodplain could be important for both the spawning location and where the eggs “end up.” As far as regarding the egg transport question, the floodplain could impact the retention of the eggs early after spawning. In higher flow years, we could expect more eggs to move downstream unless effectively hatched and/or retained in the floodplain.

- In 1999, egg collectors were set up at the base of the south boundary of the Bosque del Apache (BDA). The river overbanked and flooded out into the cotton woods. There were much fewer eggs coming out of this area (at the southern end) because it was acting like a biologic filter to keep the fish from transporting. It would not be surprising if lots of larval fish were found in that area as well. While the floodplain potentially makes a huge difference in the transport of the eggs, it must be available and the water/fish must have a way to effectively get back into the river prior to the end of inundation. This might help explain the counter-intuitive situation of having a lot of eggs captured (in the channel) in low flow years maybe because they aren’t retained as effectively as in higher flow years.
- It was suggested that ASIR consider experiment with different types of trash bags at the platforms to deal with the trees and debris. This might help extend the sampling time without extending the work effort needed.
- In order to extend the sampling duration (from 6 to 12 or 24 hours) there are some logistics that would have to be worked out. There is always a potential risk to the equipment, especially if un-manned. There is also a time resolution issue with the need to determine how to “break the sample” into multiple segments/sections in order to analyze? This could be done with staff but that is not cost effective. Maybe a rotating drum of some kind to collect samples on a set timeframe and then rotates open again to continue sampling thus allowing for a 24 hour sample that is broken up into increments.

- Rob was thanked for his time and presentation.

- *Spawning Periodicity Report Suggestions:* (1) include a couple of the modified equipment photos in the project report appendices; (2) experiment with different types of “trash collection bags” on the platforms to deal with the trees and debris; and (3) include discussion from the literature that even with more data, in general, other researchers also document poor relationships between spawning effort and population response.

Action: The Spawning Periodicity report deadline has been extended so any additional comments can be provided to Yvette Paroz by Friday, September 21st.

Announcements

- There were no announcements other than the news that 2 beavers tried to set up “home” at the Los Lunas Silvery Minnow Refugium (LLSMR) facility.

Election of ScW Co-Chair

- There is still no non-federal nomination for ScW co-chair. This will remain an agenda item until filled.
- If no one else volunteers before she returns from maternity leave in December, the work group will consider asking Brooke Wyman to confirm with her agency that she could fill the position.

Propagation Meeting Updates

- There was no Propagation Meeting update. Jason Remshardt, who had been the chair and note taker for the propagation meetings, has taken a new job and moved. Updates will be provided when available.
- Manuel Ulibarri (Dexter) is expected to be the lead for the Service and Weston Furr (Fisheries Office) is expected to be the lead for the fisheries department.
- Thomas Archdeacon is expected to be the lead for the Program and the main point of contact.

Los Lunas Silvery Minnow Refugium Spawning Study “Lessons Learned” presentation

- This was Year 2 of a 3 year study with the objectives of determining if and where minnow might preferentially spawn and determine any spawning needs or conditions that could inform management on the river.
 - There was no successful spawn in the first year of the study (2011) most likely due to the unfortunate timing of events. The brood fish stocking and tagging did not occur until April when the fish were already gravid. It is speculated that the high mortality is due to the stress of tagging while gravid.
 - There was a successful spawning event in 2012. The brood fish were stocked and tagged early (before they were gravid) and the survival was 99 out of 100.
- The first flooding event was initiated on April 24th. It is recognized that this is earlier than normally occurs in “the wild”, but the intent had been to “match” the situation of the river.
 - Pond 1 was filled and “plugged” in order to aid in creating the necessary volume of water for the flood and avoid a potential lag or “up and down flow” situation.
 - The velocities in ponds and overbank were 0. The fish seemed to seek out the tag readers as shelter and sat underneath them. This resulted in hundreds of hit per tag. Having the fish in the bagged-off ponds was not anticipated.
 - While eggs were never caught in the egg collectors, larval fish were found in the 3 of the ponds.
- After the first week-long flood, the flow was lowered but areas were kept wet in the case that spawning was successful (i.e., did not want to dry any eggs or larvae).
 - The second flooding occurred 10 to 12 days after the first flood. At that time, larval fish were observed in 3 of the ponds but primarily Pond 5 which is the smallest. Interestingly, the fish moved out of the ponds when the second flood receded. And they didn’t return to the ponds until the water level had been held constant and they were free swimming.
- *Summary of accomplishments:*
 - The equipment is up and fully functional;
 - Minnow were captured on the DIDSON; although it is unknown how this information can be used at this time;
 - Minnow moved through the area during the duration of the study; and
 - Minnow moved onto the overbank area – there is PIT tag hits in all areas as well as visual confirmation.

- *Summary of Lesson's Learned:*
 - Minnow spawned in response to the April 24th flood;
 - Turbidity is not a requirement for spawning; the added benefits with increase turbidity are not known but turbidity is not essential;
 - Larval fish “moved with” or “followed” the water when it was brought down (approximately 15 days after spawn);
 - The original study plan was successful as indicated by the spawning in 2012;
 - The minnow are growing well: the young of year were 59mm by the end of July.
 - In 2011, time constraints were placed on the study to do permitting requirements
 - fish stocked late
 - fish were gravid when pit tagged
 - More details and “numbers” won't be known until sampling occurs next month

- *Conclusions*
 - The LLSMR is very interested in repeating the study for the 3rd and final year. Feedback on specific issues, hypotheses, and/or questions that the study could help to address is welcomed. Also, suggestions to improve the study (ex. use of light traps) are also welcomed.
 - The fish are growing really fast. Last year, survival was impacted by dragonfly predation. It will be interesting to understand the survival for this year. At least in observation, the fish had a “jump” on the dragonflies this year. If the facility is going to continue to operate as it currently does (i.e., receiving fish from other facilities) there will be a need to address the timing with dragonfly predation.

- *Questions*
 - **Question:** If given the opportunity to complete the final study year, what do you recommend doing differently?
 - **Response:** It would probably be recommended to set the study up the same way, but move the PIT tag readers to get more representation on where the fish are actually going. And it would probably be recommended to adjust the monitoring. The ponds were sand-bagged off and minnow presence was not anticipated there. Include monitoring of the ponds and the overbank (which is not deep at approximately 8 inches). This monitoring could also help identify the quality of the ponds and the movement in and out of those ponds. Based on observations, most of the adults are “hanging out” in the ponds while the juveniles are moving about.
 - It might also be interesting to study a possible fall replication of spawning – would the minnow spawn again in the fall if it were to flood? How quickly can the larvae move off the overbank?
 - The 3rd year is not currently expected to be funded. The contract with Reclamation would have to be extended in order to use the funds that are left. The contract expires in February. Staff time is not paid for by this contract but people are needed to move sandbags and help with the harvest. Due to permitting, SWCA staff has been used in the past. The biggest cost is the labor.
 - This should be a no-cost time extension contract modification. However, the contract had been extended once already so it is unknown if another extension could be granted. The CC would have to see the value in completing a replication.

- *Work Group Discussion regarding the Continuation of the LLSMR Spawning Study (closed session)*

- After contractors stepped out, the work group discussed possible recommendations for continuing the LLSMR Spawning Study for the 3rd and final year.
- It was clarified that a contract extension, if feasible, would not require additional funds. Since the project was funded with prior-year money, if the project is “deobligated” then the money most likely “goes away.” This means it would not be returned to the Program to use elsewhere (i.e., not continuing the spawning study will not help the FY13 Program budget.
- Please contact a work group member who was in attendance for additional details.

Action: Yvette Paroz will discuss with Jericho Lewis whether or a contract extension is even feasible for the LLSMR.

Action: If a no-cost contract extension is feasible for the LLSMR Spawning Study, Dana Price and Alison Hutson will inform the CC that ScW supports the no-cost contract extension in hopes of continuing the study for the 3rd year.

Decision: ScW supports a no-cost contract extension for the LLSMR Spawning Study provided there is an on-site brainstorming session in early 2013 (January of February) to look at additional monitoring (data collection) and/or hypotheses and questions to address.

Discussion of draft RIP documents

- Discussion of the draft RIP documents was postponed until a separate meeting can be set up to facilitate work group review.
- The newest draft of the documents is date September 15th, 2012.
- It was suggested that: (1) the comments to date be compiled and consolidated and then provided to work group members in preparation for the meeting; and (2) have work group members list the 3 to 5 biggest issues for discussion in order to facilitate the meeting.
- It was also suggested that the work group consider having an entirely separate meeting to review and comment on the proposed organizational chart for the RIP.

Action: Stacey Kopitsch will forward the most recent version of the RIP Action Plan to ScW members.

Action: Stacey Kopitsch will set up a doodle poll to determine an additional meeting for ScW to discuss/review the RIP documents (RIP Program Document, RIP Action Plan, and 3rd Party Management Plan).

Action: Stacey Kopitsch will compile all the existing ScW comments on the RIP Action Plan; the compiled comments will be distributed to ScW members in preparation for the additional meeting.

Updates on RIP 3rd party management recommendations from subcommittee

- Postponed until the October ScW meeting.

Review of draft project justification/priority template

- Review of the draft project justification/priority template will be initiated over email to make sure there are no major suggested changes (since the CC is already using it). Official work group approval can be documented in the October meeting notes.

Tentative list of field trip ideas and dates

- This will remain a standing agenda item.

Program Update

- *EC update:*
 - The EC is scheduled to meet this Thursday, August 23rd from 9:00am to 1:00pm at Reclamation. This will be a “regular business” meeting. Tentative agenda items include: (1) FY13 budget concerns/guidance and possible alternatives to a 3rd Party RIP management.

- The CC is elevating the FY13 budget to the EC and presenting cost estimates/alternatives on the 3 key personnel (Executive Director, Science Coordinator, administrative support).
- *CC update:*
 - The CC met earlier in September to discuss the FY13 budget. It currently appears that 1/3 of the FY13 budget would be needed to fund the 3rd Party Management and other administrative costs. It is expected that the FY13 budget will be as low as \$1.5 million. Agenda items include.

Next Meeting: September 18th, 2012 from 9:00am to 11:30am at ISC

- Tentative agenda items include: (1) continued discussion of draft RIP documents – if necessary/appropriate; (2) Kevin Buhl’s estrogenic biomarker presentation?; (3) election of ScW co-chair (ongoing item until filled); (4) tentative field trip ideas and dates (ongoing item); (5) Research Symposium 1-page document review; (6) official approval of the draft project justification/priority template;
- November/December agenda items: (1) ISC spawning study results presentation; (2) MPT presentation or update on the monitoring efforts
- Future agenda topics: (1) future PVA scope(s) for next steps/next work (not expected until summer of 2012);
- Agenda items for consideration: (1) the work group consider developing and instituting a process where by one of the Program staff has copies of everything so that it can be imported to the database (for draft and old SOWs).

Important Dates/Events:

- September 20th from 9:00am to 1:00pm – EC meeting
- October 16th from 11:00am to 12:00pm – joint presentation: Darryl Eidson’s Sediment Study
- ~~November 6th, 7th, and 8th – tentative dates for the CPUE Methodologies and Metrics workshop;~~ the workshop has been postponed until February 2013
- November 13th – ScW meeting (rescheduled to accommodate the Thanksgiving holiday)
- November 13th from 11:00am to 12:00pm – joint presentation: Climate Change in the MRG basin;

**Science Work Group
September 18th, 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	P
4	Rick Billings	ABCWUA	796-2527	rbillings@abcwua.org	P
5	Kelly Oliver-Amy	Reclamation	462-3552	koliver-amy@usbr.gov	P
6	Douglas Tave	ISC	841-5202	douglas.tave@state.nm.us	A
7	Rebecca Houtman	COA	248-8514	rhoutman@cabq.gov	P
8	Rob Dudley	ASIR/UNM (contractor)	247-9337	Robert_dudley@asirllc.com	O
9	Kirk Patten	NMDGF	476-8103	Kirk.patten@state.nm.us	P
10	Mick Porter	USACE	342-3264	Michael.d.porter@usace.army.mil	A
11	Yvette Paroz	Reclamation	462-3581	yparoz@usbr.gov	P
12	Marta Wood	Tetra Tech	259-6098	marta.wood@tetrattech.com	O – note taker