

Middle Rio Grande Endangered Species Collaborative Program
Habitat Restoration Workgroup Meeting
15 February 2011 –12:30pm - 3:30pm
Interstate Stream Commission

Actions

- Tetra Tech will follow up with Gina Dello Russo on the San Acacia A&R Peer Review synopsis to be re-distributed to HR members. (*continued from 01/18/11 meeting*)
- HR members were asked to read the San Acacia A&R Peer Review synopsis document and highlight areas that should be discussed at future meetings, including suggestions on how the discussions should be framed. (*continued from 01/18/11 meeting*)
- Mary Carlson will email Ondrea Hummel and Anders Lundahl to arrange a visit for potential site locations for the 1,000 acre restored event.
- Ondrea Hummel will send Anders Lundahl and Rick Billings the existing physical system descriptions from the A&Rs.
- Anders Lundahl will create a draft conceptual physical system model or diagram (capturing as much detail as possible but trying to keep it “digestible”) and will distribute to HR members for comment/input/review prior to the March meeting.

Recommendations

- HR attendees recommended the Program expand publicity using FaceBook and Twitter.
- It was suggested that PIO contact Mark Stone, an engineering professor at UNM, for assistance in reaching out to UNM for participation in the 1,000 acres Restored Event.

Meeting Summary

- Rick Billings brought the meeting to order and introductions were made. The agenda was approved with no changes.
- Both the December 14th Joint work group meeting notes and the January 18th, 2011 meeting notes were approved for finalization with no changes.
- All January 18th 2011 action items were completed or continued for the March 2011 meeting.
- The tamarisk beetle discussion was postponed until the March meeting.
- The Public Information and Outreach (PIO) work group co-chairs shared that their work group is planning a celebration event to highlight the 1,000 acres of restored habitat. The timing of this event will coincide with the April congressional recess in order to maximize exposure and media coverage. HR members were asked for suggestions for restoration site locations to host the event. Three restoration sites were suggested as meeting the “convenience” criteria: Tingley Beach, Central Bridge, and the Rio Grande Nature Center. Both the Central Bridge and Nature Center sites are also older so there is more established vegetation. HR members also suggested publicizing the event and other Program work through public and local radio. HR members also supported the idea of involving school kids and recommended those involved in BEMP. It might be possible to arrange monitoring activities to occur on the same day.
 - HR members also suggested there be posters or graphics at the site of the speeches as well as near the river’s edge. Pamphlets were also discussed. Suggested graphics were before and after photos of restoration work, fact sheets, explanation or technique sheets, etc.
 - HR members cautioned that the focus be on both listed species.

- Rick Billings then handed out a copy of the FLO-2D activity summary that he helped update for the SWM work group. Since the document is an activity summary for inclusion in the LTP and not being written for a scope of work yet, HR members did not have any suggested changes during the meeting. However, there was discussion on the fact that there are 2 different models for 2 different areas of the system (floodplain versus in-channel). There is also a scale issue. There is recent Lydar data available that could be used to visually map out inundation for bars and islands but this effort would have to be done quickly before the features change too much.
- The discussion of the HR SOW and contracts in general was held in closed session; please contact a meeting attendee for details.
- The review of “uncertainties” of the Adaptive Management Plan item was omitted from the agenda as it was discussed at the MPT and the majority of members attended both. For details, please refer to the MPT notes dated 02/15/11.
- In the Program Updates, it was shared that comments on the adaptive management uncertainties are due February 28th. Comments on the adaptive management plan working draft are due February 22nd. It was also shared that the work group’s website passwords have been changed.
- In the PVA update, it was shared that comments and edits are being sought on the Hypothesis, Considerations, and Ideas handout. Dr. Goodman has presented his data analysis several times and there is a 1,000/2,000 cfs threshold affect that needs to be better understood (below this threshold there will be little to no recruitment, but above this threshold recruitment appears to be closely related to available habitat). The PVA group has begun exploring the very complex but important issues with the in-channel habitat. This is important to the HR group in terms of better understanding how habitat supports the minnow.
 - Attendees discussed how the PVA models might be integrated into the adaptive management process. It is not known at this time how the PVAs, LTP, and recovery plans will integrate with the adaptive management plan or how all of those will be incorporated with the biological opinion. Attendees expressed concerns that there are 2 PVA models that are each looking at different parameters. One specific concern is that the model outputs are expected to be different or even conflicting. Which of the models will get incorporated into the adaptive management process? If there are conflicting results, which one will be used to guide management actions? The first version of the functional models debut at the next PVA meeting on March 29th, 2011.
- The remainder of the meeting was spent discussing HR goals, roles, and direction. Several HR members suggested the work group describe the conceptual physical system of the Middle Rio Grande (and even include the inputs and outputs from tributaries, Colorado, Texas, etc. as the physical system is not constrained by the Program’s boundaries and a holistic approach is needed to inform management decisions). The intent was to be able to provide the adaptive management contractors with a more appropriate system description that what they currently have and to be able to find the “common denominator” for all Program work. Knowing and agreeing on the physical system would also lend itself to justification and guidance for all restoration work.
 - There was some tentative agreement on 3 main system “components”:
 - Physical components – hydrology and geomorphology;
 - Biological components – biology, ecology, biotic food sources
 - Land use components –
 - All these components interact and influence the others. The work group agreed to continue these discussions at the March meeting and in the mean time will pull existing descriptions from the A&R reports as a place to start.

Next Meeting: March 15th, 2011 from 12:30pm to 3:30pm at ISC

- Tentative Agenda items include: (1) San Acacia A&R Peer Review synopsis discussion; (2) Robert Padilla's presentation on Sedimentation Transport Modeling; (3) conceptual physical system model discussions; (4) Tamarisk Beetle Presentation;
- Future Agenda Items:
 - Unknown – System-wide Trend Analysis using current data
 - What can be gleaned from the last 5 years of monitoring data in terms of area (not reach) trends (narrowing here, perched islands there, aggrading here, etc.) in order to arrive at a predictably in terms of areas (moving toward isolated bars, channel incision) for restoration recommendations. All the “tools” will need to be organized in advance – pictures, organizing the GIS information layers, etc.

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Meeting Minutes

Introductions and Changes to Proposed Agenda

- Rick Billings brought the meeting to order and introductions were made around the table. The agenda was approved with no changes.

Approve January 18th, 2011 Meeting Minutes

- The January 18th, 2011 HRW meeting notes were approved with no changes.

Approve December 14th, 2010 Meeting Minutes

- The December 14th, 2011 joint work group meeting notes were approved with no changes.

January 18th, 2010 HR Action Item Review

- Tetra Tech will follow up with Gina Dello Russo on the San Acacia A&R Peer Review synopsis to be re-distributed to HR members. – *ongoing; will be completed for the March 2010 meeting*
- HR members were asked to read the San Acacia A&R Peer Review synopsis document and highlight areas that should be discussed at future meetings, including suggestions on how the discussions should be framed. – *pending/ongoing; will be completed for the March 2010 meeting*
- ✓ Gina Dello Russo will review the Snake River system-wide analysis example provided by Colin Lee. – *complete;*
- ✓ Anders Lundahl and Gina Dello Russo will put together a review template/list of questions for work group members to contemplate while reviewing the San Acacia A&R Peer Review synopsis. – *complete;*
 - The San Acacia A&R peer review synopsis will be discussed at the March meeting. The ‘uncertainties’ that were identified in the report could potentially be appropriate for adaptive management.
- ✓ Rick Billings and Anders Lundahl will provide another Program deliverable synopsis for the February meetings as the San Acacia A&R Peer Review synopsis will be postponed until the March meeting. – *complete; the FLO2D activity summary will be discussed later in today’s meeting;*
 - Anders shared that he created a map by extracting and combining all the FLO2D information from all of the A&R’s; the map is large at 16 mb but he offered to print copies for anyone interested. The next step is convert the shape files from the A&Rs into the same color code used in the FLO2D map for easy comparison. However, the shape file list is extensive and will take a while to sort through.
- ✓ Rick Billings will follow up with Monika Mann to obtain copies of the September 22nd HR workshop documentation. – *complete;*
- ✓ Rick Billings will write up a summary of the HR project prioritization from today’s discussions complete with work group responses/recommendations and will distribute the summary to the work group members for feedback. – *complete;*

Discussion: Tamarisk Beetle – Postponed to next month

- The tamarisk (salt cedar) beetle presentation was postponed until the March meeting due to scheduling conflicts of the presenters.

Habitat Restoration 1,000 Acres Event

- Mary Carlson and Julie Maas, co-chairs of the Public Information and Outreach (PIO) work group explained that PIO is planning a large event to celebrate all the restoration work completed in the Middle Rio Grande (MRG). The original target was to celebrate 1,000 acres but that goal has already been surpassed and is closer to 1,300 acres. It has been several years since the “Million Minnow” release and the restoration activities represent the next milestone to capitalize on. As this “1,000 acre Restored” event is for the public and the media, the location needs to be easily accessible and preferably in the Albuquerque area (for maximum participation). To accommodate the congressional schedule, the event will most likely occur in the last 2 weeks of April. It was acknowledged that it would be ideal to have the restored site inundated at the time of the event and that April is early for the runoff but the forecasts are not optimistic for later in the spring either. PIO is seeking input and suggestions on possible restoration sites for the event location.
 - In light of the upcoming BAs and consultation, now is a great time to highlight the restoration successes and raise the public awareness about the positive activities that have been occurring over the last few years.
- HR members were asked to consider parking needs, close facilities, and limited walking when suggesting possible locations.
 - Three restoration sites were suggested as meeting the “convenience” criteria: Tingley Beach, Central Bridge, and the Rio Grande Nature Center.
 - Both the Central Bridge and Nature Center sites are also older so there is more established vegetation. Some of the activities could be set up in the parking lot of the Nature Center. The Program’s last Open House was hosted there.
 - The Central Bridge site inundates at relatively low flow – 1,500 cfs.
 - Tingley has restrooms and a snack bar. There is also the opportunity for attendees to walk to the bridge as well as up and down stream to see multiple projects by multiple agencies.
- HR members suggested there be posters, displays, and brochures with before and after photos. The posters could have labeling over-printed on the photos to describe the work and techniques used. There could also be photos of the site before and during inundation (which may not be present during the event). There could be graphs on minnow monitoring, statistics, utilization of sites, life-history relating to habitat, etc. It was also suggested that an overall map of the Rio Grande could be displayed to highlight as many of the restoration projects as possible – to document how the 1,000 acres was achieved.
 - It was suggested that there be 2 sets of posters/displays - at the site of the speeches as well as near the river’s edge. Attendees could take pamphlets with condensed information on self-guided tours or hikes to the river.
 - It is really important to capture the “before and after” or the actual site visit may not mean much to participants. It could only help with the “before”, “during”, and “after” perspective so that attendees better understand “what will be” as time passes.
 - It was suggested that there be a focus on the habitat as defined at different levels of flows. It would be interesting to calculate (and display) the number of acres inundated *now* compared to what would have been if not restored.
- Congressional delegation will have an opportunity to speak – so depending on the chosen location, chairs and tent(s) will have to be provided. To maximum media coverage, it would be great to have congressional members participate in a pole planting or some other restoration activity.
- HR members also suggested publicizing the event and other Program work through public and local radio; this would be a great way to talk about what has been accomplished and to promote the event

itself. HR members also talked how using the radio could expand the outreach program. It was also suggested that PIO consider using Facebook and/or Twitter.

- It was suggested that PIO contact Mark Stone, an engineering professor at UNM, for assistance in reaching out to UNM for participation in the 1,000 acres Restored Event.
- The PIO co-chairs shared that at the Millionth Minnow Release event they held a button design contest to engage school children and would like to do something similar for this event. Involving school kids diversifies the community involvement and makes for better media coverage.
 - HR members supported the idea of involving school kids and recommended those involved in BEMP. Other possible groups to include were the Natural Heritage of NM and Hawks Aloft.
 - There are BEMP monitoring sites around Tingley and north of the Central Bridge; it might be possible to arrange monitoring activities to occur on the same day.
 - The City of Albuquerque (COA) also has an educational program.
 - One challenge with including school kids is the transportation; it costs to provide the buses for transportation. However, BEMP has a “school-on-wheels” program and the Open Space has also helped with donations for transportation in the past.

Action: Mary Carlson will email Ondrea Hummel and Anders Lundahl to arrange a visit for potential site locations for the 1,000 acre restored event.

- HR members cautioned that the focus be on both listed species.
- PIO co-chairs thanked the HR work group for their input and encouraged continued interaction between the groups. PIO is here to support the Program and all the work groups – HR members were encouraged to think of PIO for their publicity and outreach needs.

FLO-2D Activity summary

- Rick Billings then handed out a copy of the FLO-2D activity summary that he helped update for the SWM work group.
 - It was commented that the fact of the matter is that there are 2 different models that provide different outputs for 2 different areas of the system. One provides information on the floodplain inundation while the other is useful in determining the in-channel inundation of bars and islands (HECRAS). It is acknowledged that it is not an ideal situation. In an example, it was shared that for the Isleta Phase II, there was an intensive process of grouping the various elevations from HECRAS together to understand the inundation relationships for the bars for a range of flows. There might also be a scale issue – the cell size of FLO2D is too big but it can be used to look at surface water elevation.
 - The in-channel habitat availability is poorly known. Lydar might be one way to address how to gain more resolution. There is recent Lydar data available that could be used to visually map out inundation for bars and islands but this effort would have to be done quickly before the features change too much.
 - The descriptions of minnow habitat are incomplete. The in-channel HECRAS examines the water surface elevation as it relates to topography but the missing element is the velocity component. Neither model addressed the velocity component.
 - There needs to be better understanding of the in-channel habitat available at specific flows, (i.e., what “habitat units” are present for different flow levels) and how those habitat units support the most recent cohort.
- Since the document is an activity summary for inclusion in the LTP and not being written for a scope of work yet, HR members did not have any suggested changes during today’s meeting. However, it was agreed that more discussion might be warranted if the project moves forward in the future.

Discussion of HR SOW and contracts in general (with Jericho Lewis)

- This discussion was held in closed session; please contact a meeting attendee for details.

Review of “uncertainties” of the Adaptive Management Plan

- The HR work group decided to omit this agenda item as it was discussed at the MPT meeting earlier today and the majority of members attended both. Please refer to the MPT notes dated 02/15/11 for details of that discussion.

Announcements (all)

- It was announced that the Habitat Restoration Plan (2004) is being made available in hard copy for anyone interested.
- Comments on the work draft Adaptive Management Plan are due February 22nd, 2010. Comments on the adaptive management uncertainties are due February 28th, 2010.

Program Update

- The work group’s website login has been changed. The new login ID is: WorkGroup and the new password is: cooperate
- Robert Padilla has requested agenda time at the March meeting to present on Sedimentation Transport Modeling for Upstream of Elephant Butte Reservoir from (1) 2000 to 2010 conditions under drought and (2) 2010-2019 forecasting out for possible hydrology. PDF papers were attached to the email distributed earlier.

PVA Update

- The PVA work group has a list of hypotheses that they would like edited and prioritized (see the Questions, Hypotheses, and Considerations for the PVA process document – emailed on 02/11/11). Currently there is a small group that has volunteered to review the list: Peter Wilkinson, Rick Billings, Mick Porter, Jason Remshardt, and Rich Valdez. HR members were encouraged to participate as well.
- In a brief PVA meeting review, it was shared that Dr. Goodman has provided several presentations on his Fortran PVA model work. His data analysis has identified an interesting flow threshold affect around 1,000 to 2,000 cfs (below this threshold there will be little to no recruitment, but above this threshold recruitment appears to be closely related to available habitat). More needs to be known about what is going on at this flow level and what it means.
 - The PVA group has begun exploring the very complex but important issues with the in-channel habitat. The same small group (Mick, Rick, Jason, Peter) have had a few discussions and a planning meeting on how to move forward on this topic. This is important to the HR group in terms of better understanding how habitat supports the minnow including seasonal variability.
- **Question:** How will the PVA models fit in/with the adaptive management plan?
 - **Response:** It is not really known at this point. But a lot depends on the intended questions for the PVA to predict outputs. The PVA models could run different scenarios whose outputs could be used to change management approaches.
 - Models should be used to answer complex questions and provide simpler results that can be used to help inform management on changes that could be made. It should be an iterative process of influencing actions from predicted outcomes while monitoring the hypotheses indicates if the prediction was correct or if the approach needs to be changed again. The monitoring data should be fed back into the model for a continuum.
 - One strength of the PVA is the ability to help determine the relationships or correlations between flows and fish population numbers or population response. What flows are sufficient

to support the population? The models can also inform management actions (ex. Cochiti Deviation) by testing the action first and then having monitoring data/results put back into the PVA. PVA should be seen as a valuable component to the adaptive management process as well as the consultation process.

- The PVA models debut at the March 29th PVA meeting.
- While it is unclear exactly how the adaptive management will interface with the BO, it was clear that the Service intends to consider all the available tools including the PVA models and adaptive management plans.
 - It may be that the Long-term Plan (LTP), adaptive management plan, and PVA models are all interrelated/interconnected. But it is also not known what happens if any one of them falters/fails.
- **Question:** Since there are 2 PVA models, which model gets incorporated into the adaptive management plan?
 - **Response:** Service has already indicated preference for the RAMAS model; it is assumed that preference won't be abandoned. Dr. Goodman's Fortran model was brought for comparison purposes.
 - Each model is using different parameters. It is very likely that there will be conflicting outputs. However, there can only be one "answer" to inform the management actions.
 - The model outcomes will be different – there will need to be discussions on model utilization and interfacing.
 - Going back to the original question, how can we successfully approach adaptive management if we don't know which PVA model is going to be used?
 - Once the contractor writes the adaptive management plan and the Program "approves" it, who will be responsible for the operation or implementation? It is assumed that there will be a Program component and maybe a component for each of the federal action agencies.

HR Roles, Goals, and direction

- Several HR members have recently been discussing how habitat restoration or habitat management is (or should be) defined within the Program. What is the future of HR? What does the work group want to champion? It has been suggested that the work group develop a conceptual model of the MRG that could be included in the adaptive management plan and provide justifications for future HR work.
 - The adaptive management contractors proposed a conceptual physical model that included 5 lines of geomorphologic processes (sediment size was in same category!). The work group could wait for the adaptive management contractor to address all the comments/concerns with this or HR members could put together a conceptual model themselves. The HRW perspective of the conceptual physical model needs to be captured on paper in order to supply it for inclusion in the adaptive management plan.
 - The conceptual physical model needn't be (and shouldn't be) a big spaghetti diagram and the hope was this discussion and model design could begin today.
 - If adaptive management and restoration are done correctly they should both be on the same page. Some basic questions are: (1) what is the system?; (2) what are the components?; (3) what are the inputs?; (4) how do are components measured/monitored?; (5) how are inputs measured/monitored?; and (6) what aspects can the Program actually manage?
 - At a fundamental level, the Program can manage water, the species, and sediment. The Program can assist with research and monitoring efforts, but those are the 3 categories that can be adaptively managed.

- Anything the work group brainstorms today can be added to or subtracted from later. Remember, in a collaborative of this size, if there are any disagreements at the management level, the process is to go back to the last step of agreement and that is where the actions will be driven. Too many inputs could make for poor outputs. How do the “in-the-weeds” questions fit into adaptive management? There needs to be an agreed upon understanding of the physical system before the HR component can be agreed to.
 - It was commented that some members would like to start referring to habitat restoration as “habitat management.”
- Part of developing a conceptual physical model will include clarifications and agreement on definitions. For example, what is “the system” that is managed today? Is it just the area between the levees? What about the tributaries (which are inside the Program boundaries)?
 - Because the physical system is not limited by the Program boundaries, it was suggested that the tributaries and all other inputs (water flow from upstream, sediment from arroyos and tributaries, climatic factors, etc.) and outputs be considered in the conceptual model. The argument is that informed management decisions can’t be made without a holistic approach.
 - The historic picture needs to be compared to the current status of the system to guide what needs to be done and inform what the “big picture” of the system could look like. The “goal” needs to be clearly articulated if there is any hope of reaching it.
- While the Program may not be able to manage all these itself, the elements of the system included:
 - The area between the levees and the Rio Grande;
 - The tributaries;
 - The physical system above Cochiti;
 - The physical system above the state line;
 - The physical system below Elephant Butte.
- Issues that will need to be addressed included:
 - The federal/non-federal/private land issues which can be a constraint that need to be addressed;
 - Impacts of Cochiti Dam (inputs besides water coming through, nutrients trapped in the water, etc.);
 - The issue of scale – temporal, spatial, processes. For example, the geomorphology of the channel not the same as the geomorphology in the floodplain
- There were 2 physical inputs suggested:
 - Hydrology; and
 - Geomorphology.
 - Attendees then discussed whether or not biology and ecology would be considered evolved from the hydrology and geomorphology as the basic primary drivers of the productivity in the system.
 - Attendees also discussed that nutrients, while measureable, could probably not be considered a strictly biological input. At the fundamental level, nutrients are not biology – they are chemical. There is a lot that needs to be understood about how nutrients relates to the species.

- The physical system is a “snap shot” in time (at least for between the levees) - the topography, discharge, amount of nutrients, numbers of minnow, etc. The hydrology and geomorphology are continually processes compared to that “instant” in time.
- The system is not what it used to be but what processes are needed to re-stabilize the species?
- Attendees suggested that besides the physical component, there is a biotic component and a landscape component.
 - The landscape component - in terms of relationship with system and surrounding area – is not directly captured in the geomorphology component. Land uses drive other inputs into the system. The interactions and relationships between wetlands or riparian systems to the surrounding land use needs to be considered in the model. In an example, it was shared back in the 1800s there was heavy grazing which resulted in heavy rates of sediment influx into the system. The building of the levees and the urban development has changed the land use and has now affected the availability of groundwater to recharge the system (which determines if a reach is gaining or losing). The levees have preventing the river from meandering.
 - In the A&Rs, landscape is discussed as background information but not necessarily in terms of how it influences the character of the reaches.
- After discussion, attendees suggested there be 2 main components to the system: the biotic component (comprised of the biology, ecology) and the abiotic (comprised of the hydrology and geomorphology).
 - Over time, the riparian vegetation develops as a response to the 2 abiotic factors. For example, how often a land surface inundates will determine the types of vegetation established. In simple terms, the hydrology and geomorphology drive the type and shape of the vegetation. However, some attendees added that seeds and nutrients are the actual platform for vegetation growth.
 - Climate is a bigger issue and could be represented annually as “weather.” The weather dictates water availability which in turn impacts the vegetation and sedimentation. Climate leads to water which determines the hydrology of the system for any given year. Runoff is a function of duration, magnitude, and land use.
 - It was acknowledged that the system is very complex and each component directly affects the other components (i.e., in a diagram there would be double-arrows between the hydrology, geomorphology, and vegetation). For example, vegetation impacts the hydrology and geomorphology through roughness, temperature - in terms of water quality, armors the bank, etc.
 - The hydrology piece includes: (1) frequency of flows at different discharges; (2) flows mixed with the physiography to get to depth, velocity, extent, duration; and the (3) duration and magnitude of runoff. The geomorphology piece includes: (1) the transport of sediments throughout the system - suspended load transport, bed load transport; and (2) the formation of different features. The biotic component is intertwined with species composition and structure and the features that influence food availability and habitat. The physical system can be measured but it is the biological piece that is difficult to measure.
 - All 3 of these have to be put together to define what the minnow habitat is and what it looks like.

- Transects can be used to determine size and structure of vegetation, but it was pointed out that “habitat” is a human construct and there is a lack of agreement about what it really is.
- It will be important to identify the externalities and areas in which the Program might have some control or influence on. This is needed for an adequate/complete system understanding for the adaptive management process. For example, individual agencies might have some control over land use, but the Program itself does not.
- Returning to the habitat discussion, attendees were asked “what is habitat?” and “what are the major components of habitat?”
 - One suggested definition of habitat was “utilization by some organism.”
 - Another suggested definition of habitat was – where an organism shelters, eats, reproduces, and lives.
 - Regarding the life history components of the minnow, it was suggested that habitat could be defined as needed by the species through the life cycle - spawning, nursery, young of year, residential, refugial, and maintenance habitat. Or the different elements could be looked at in terms of immigration, reproduction, and death rates and how the habitat features influence those variables. (The “upside” of examining habitat this way is that these variables and percentages could go directly into the PVA modeling).
 - Each habitat definition would have to include specific criteria for age class. While something similar could be done for the flycatcher (in terms of looking at measurable habitat characteristics such as relative humidity, stand heights, etc., there needs to be a single conceptual model for both species since neither are living independently of the other. The habitat can start to diverge but the physical model should be identical.
- There are other physical models out there that have been developed before and should be considered. But the Program should have “our model” with “our consensus” that frames the management activities and monitoring. HRW should have a conceptual physical model on which the decisions and activities are based.

Action: Anders Lundahl will create a draft conceptual physical system model or diagram (capturing as much detail as possible but trying to keep it “digestible”) and will distribute to HR members for comment/input/review prior to the March meeting.

- The Program’s management pieces were identified as:
 - Water - which leads to geomorphological processes;
 - Species - augmentation, propagation, salvage; and
 - Some attendees stated that in the simplest terms, water and geomorphology equals habitat and that inundation does not necessarily translate into good habitat.
- At this point in the discussion, the HRW co-chair asked attendees if this was the direction that the work group wanted to continue.
 - Those in agreement with continuing to develop a conceptual physical model of the system cited the need for something solid to refer to in decisions and justifications.

- Since the A&R reports begin to cover the larger system issues, it was suggested designing the conceptual model springboard from the work that was already done.
 - The adaptive management plan will need to include the physical conceptual model and a habitat restoration model (components, monitoring, techniques) to make sure there is synergy between the adaptive management and habitat restoration processes.

Action: Ondrea Hummel will send Anders Lundahl and Rick Billings the existing physical system descriptions from the A&Rs.

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**Habitat Restoration Work Group Meeting
15 February 2011 Meeting Attendees**

NAME	POSITION	AFFILIATION	PHONE NUMBER	EMAIL ADDRESS
Rick Billings	HR Chair	ABCWUA	796-2527	rbillings@abcwua.org
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Anders Lundahl	HR Member	ISC	383-4047	anders.lundahl@state.nm.us
Peter Wilkinson	HR Member	ISC	827-5801	peter.wilkinson@usace.army.mil
Jericho Lewis	Contracting Officer	Reclamation	462-3622	jlewis@usbr.gov
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Ondrea Hummel	HR Member	Corps	342-3375	ondrea.c.hummel@usace.army.mil
Brian Bader	Contractor	SWCA	255-2225	bbader@swca.com
Rebecca Christy	Back-up Note Taker	GenQuest	459-9671	rchristyromero@hotmail.com
Marta Wood	Admin support	Tetra Tech, EMI	259-6098	marta.wood@tetrattech.com