

**Middle Rio Grande Endangered Species Act Collaborative Program
Species Water Management Standing Workgroup (SWM)**

07 December 2011 Meeting

9:00am to 12:00pm @ Reclamation (Rio Grande room)

Actions

- Ed Kandl will modify the Groundwater/Surface Water Interaction Project SOW to include the workgroup's changes and email to the SWM work group for review by Tuesday, December 13th. Ed will also talk to Jericho Lewis (Contracting Officer) to find out if it's possible for the SOW deadline to be extended.

Ongoing Actions

- After Reclamation's Draft BA has been completed and made available, then Terina Perez will help Dagmar Llewellyn and Ed Kandl write an activity summary for hydrologic monitoring at habitat restoration sites. (*Ongoing from 3/2*)
- Cyndie Abeyta will create references in her document on the history of the USGS GW/SW Interaction project for documents concerning the project and will put all information on a disc for distribution to SWM members. (*From 3/2*)

Meeting Summary

- Chris Banet brought the meeting to order and introductions were made. Terina Perez announced that she has taken a new position within Bureau of Reclamation (Reclamation) and she will no longer be the Program Management Team (PMT) Liaison for the SWM workgroup. Terina was thanked for the work that she has done as PMT Liaison. It was also announced that the USGS Water-level Data for Albuquerque and Adjacent areas has been released – a hard copy of the publication was passed around.
- Meeting attendees viewed a presentation from Megan Friggens on *The vulnerability of species to climate change in the southwest: terrestrial species of the Middle Rio Grande*. The presentation discussed the results of a case study in the Middle Rio Grande Basin (MRGB) that utilized the System for Assessing Vulnerability of Species (SAVS) climate change tool to assess the vulnerability of 130 species in the MRGB. The SAVS climate change tool looks at a species' habitat, physiology, phenology, and interactions to score it on the anticipated fitness consequences of environmental change. Species that were scored as being most vulnerable to climate change tended to be riparian, migratory, a specialist, have a high reliance on habitat, or limited phenology. The presentation also discussed strategies for managing under climate change, climate change actions for riparian systems, and restoration under climate change.
- Approval of the November 2, 2011 meeting notes was tabled for the January 2012 SWM meeting to allow for additional time for review.
- Meeting attendees performed an action item review. All of the November 2nd action items were completed.
- Meeting attendees then discussed the Groundwater/Surface Water Interaction Project scope of work (SOW). Though the work group has not yet received all of the standard operating procedures from USGS, meeting attendees agreed to complete the SOW the

best they can with the information they have in order to meet the December 16th, 2011 deadline.

- Meeting attendees discussed that because the work group is not sure whether university professors or other researchers have an interest in utilizing the data it will be difficult for the work group to decide which of the sites can be removed and if data collection should continue.
- In order to reduce project costs while keeping all the wells active attendees agreed to continue data download and manual measurements every 6 months at all the sites; however only data from one transect at each of the double transects will be processed, with manual measurements continuing at all wells. This will cover data collection and keep the wells active until the work group can better determine the long term need for data collection. Attendees also agreed that the SOW will not include data analysis. Ed Kandl will modify the Groundwater/Surface Water Interaction Project SOW to include the workgroup's changes and email to the SWM work group for review by Tuesday, December 13th. Ed will also talk to Jericho Lewis (Contracting Officer) to find out if it's possible for the SOW deadline to be extended.
- Attendees also discussed that there is still the potential for Ed Kandl to take over the data collection and processing; however Ed will still need approval from his supervisor.
- Meeting attendees discussed the work group's accomplishments in 2011 and the 2012 Work Plan. The group completed all of the tasks on their 2011 Work Plan except for a couple of tasks that were dependent on other Program deadlines that were pushed back. It was suggested that today's presentation from Megan Friggens be added to the work group's accomplishments. Terina Perez will try to develop the 2011 Accomplishments document and 2012 Work Plan by the end of the week if time and her new responsibilities allow.

Next Meeting- January 4th, 2012 at BIA from 10:00 AM to 12:00 PM

- Tentative agenda items to include: 1) approve 11/2/11 and 12/7/11 meeting notes; 2) Discuss changing meeting frequency to every other month;

**Middle Rio Grande Endangered Species Act Collaborative Program
Species Water Management Standing Workgroup (SWM)**

07 December 2011 Meeting

9:00am to 12:00pm @ Reclamation (Rio Grande room)

Meeting Notes

Introductions & Announcements

- Chris Banet brought the meeting to order and introductions were made.
- Terina Perez announced that she has taken a new position within Bureau of Reclamation (Reclamation) and she will no longer be the Program Management Team (PMT) Liaison for the SWM workgroup. It is not yet known who will be the new PMT Liaison to the SWM work group.
 - Terina was thanked for the work that she has done as PMT Liaison.
- Rick Billings notified meeting attendees that the USGS Water-level Data for Albuquerque and Adjacent areas has been released – a hard copy of the publication was passed around.

Agenda Approval

- There were no changes to the agenda.

Presentation: The vulnerability of species to climate change in the southwest: terrestrial species of the Middle Rio Grande

- Meeting attendees viewed a presentation from Megan Friggens on *The vulnerability of species to climate change in the southwest: terrestrial species of the Middle Rio Grande*. The presentation discussed the results of a case study in the Middle Rio Grande Basin (MRGB) that utilized the System for Assessing Vulnerability of Species (SAVS) climate change tool to assess the vulnerability of 130 species in the MRGB. *For specific details please see the actual presentation materials.*
 - Megan first recognized her co-authors Deborah M. Finch, Karen E. Bagne, Sharon J. Coe, and David L. Hawksworth and expressed that the group has been honored to be able to conduct this assessment.
 - The presentation explained that climate change is a huge issue for conservationists because not only is it making a difficult situation even worse (i.e. increased fires) but uncertainties with complex species interactions and a lack of knowledge are huge barriers to conservation plans. There is also uncertainty with respect to the effects of climate change: whether models are projecting accurately and how species will respond to the effects of climate change.
 - In a description of the project history it was explained that in 2009, in response to huge interest to develop assessment tools to help managers address climate change in species conservation plans, the RMRS Assessment Tool (A SAVS climate change tool), was developed. The RMRS Assessment Tool is a web-based tool that helps managers determine if species will be susceptible to changes brought about by climate change.

- 4 case studies with associated reports have been completed and their results are planned to be developed into General Technical Reports (GTRs). The case studies were done in the Middle Rio Grande (New Mexico), Coronado National Forest (Arizona), and (Barry Goldwater/Fort Huachuca (Arizona); the methods and results for the MRGB case study will be presented today.
 - The pilot RMRS Assessment Tool used in the MRGB case study is a questionnaire of 28 multiple-choice questions that relate to a trait or criteria that is an important predictor of species response to climate variations, namely whether the species is expected to decline or increase as a result of various climate changes. The RMRS Assessment Tool is focused on terrestrial vertebrates/semi-aquatic vertebrates. The questions were developed from a thorough look at research and what is known about the physiological limitations of terrestrial vertebrates. The RMRS Assessment Tool scores the species on a scale of -20 to +20; a higher score means that the species is expected to have a greater vulnerability to changes and a negative score means that the species is expected to be more resilient to changes. Though a species may have resilience this does not mean that the population will thrive or that it won't have any major issues. The tool also helps the user to calculate an uncertainty score based on how much is known about a species and whether there is an adequate amount of data available.
 - It was emphasized that the tool is area specific and if a species has a wide range (i.e. a bear) analyzing the species in the other areas it resides in would give the user different scores.
 - In addition to the overall score, the tool also provides a categorical score on a scale of -5 to +5 for each of 4 categories (habitat, physiology, phenology, and interaction) assessed by the tool. The categorical score is helpful in looking at common themes in groups of species; for example, the least vulnerable species may have an increase in habitat.
 - Habitat – shifts or loss of associated habitat and/or elements, migratory habitats, and dispersal ability;
 - The tool considers the density of vegetation, layer of vegetation (canopy), and whether a species has different breeding and non-breeding habitats.
 - Physiology – temperature/moisture thresholds, exposure to extreme weather, food storage capacity, tolerance to disturbances;
 - The tool also considers the longevity of the species; some studies indicate that species that live longer than 5 years would probably be more likely to survive and reproduce as drought periods tend to last about 5 years.
 - Phenology – reproductions time to outside cues (temp., precip., insect emergence), number of reproductive events per year; and
 - Interactions – predator/prey/competitor changes, specialization, parasite or pathogen infections.
 - For the MRGB project it was determined that the Bosque area from below Cochiti to just above Elephant Butte with a 4 km buffer zone on either side of the river to include habitat would be the defined area.

- Of the 130 species assessed there were 9 amphibians, 44 birds, 38 mammals, and 30 reptiles.
 - 5 of the 9 amphibians were vulnerable to climate change with the Northern Leopard Frog being the most vulnerable (+9.9) and the Plains Spadefoot being the most resilient (-2.1).
 - The species that are most vulnerable tended to have a high reliance on habitat and need moisture to move. Though the other amphibian species also need moisture some of them have dry non-breeding habitats.
 - The vulnerable species also do not have multiple reproduction periods and require for ponds to last about 6 weeks.
 - The resilient species tended to have invasive species characteristics (i.e. breed year long, eat everything). Though the resilient species are likely to do better as the habitat becomes drier they still need moisture.
 - Major vulnerabilities of amphibians include: Habitat loss, increased crowding (disease and predation consequences, impact on developmental rates), dispersal limited (moist environments, rainy periods).
 - Major resiliencies include: Ectotherms (low metabolic needs), morphological variations (carnivorous larvae), and they can use hibernation and aestivation to escape harsh conditions.
 - 26 (51%) of the 44 bird species assessed were found to be vulnerable to climate change with the most vulnerable species being the Southwestern Willow Flycatcher (flycatcher; 11.5) and the most resilient species being the Greater Roadrunner (-4.4).
 - The majority of the resilient species are projected to have increased habitat.
 - It was pointed out that there is a clear distinction between the migrant and non-migrant species with the non-migrant species being less impacted by the changing conditions.
 - It was also pointed out that some of the species like the flycatcher and the swallow specialize on aquatic insects and many studies predict that aquatic insect numbers will decline in the future.
 - Major vulnerabilities include: riparian dependant species were most vulnerable (SWFL, WYC, Common Yellowthroat), heat or drought sensitivities, phenology, migratory, tree cavity nesters.
 - Major resiliencies include: habitat generalists, multiple clutches, flexible life histories, good dispersal ability.
 - More than 50% of the 38 mammals assessed were found to be vulnerable to climate change with the most vulnerable species being the New Mexican Jumping Mouse (jumping mouse) (7.1) and the most resilient species being the Crawford's or Desert Shrew (-2.9).
 - It was noted that some of the mammals have large ranges and reside in other locations besides the MRG so their scores would be

different if their entire range was assessed (i.e. Mountain Lion, Black bear).

- Large mammals tend to be at a high risk.
 - Assessing the bats was challenging because there is not a lot of information available.
 - Major vulnerabilities include: reliance on water or dense vegetation associated with the Bosque, limited breeding capacity, life cycle influenced by climate (hibernation, ovulations).
 - Major resiliencies include: associated with scrub or desert habitat (Jackrabbit, desert shrew), opportunistic breeding, capacity to store food/fat/water for long periods.
- Of the 30 reptiles assessed there was clearly a group that were vulnerable as a lot of reptiles need water and moist habitats for egg laying though some species are more associated with a scrub habitat. The Great Plains Skink was the most vulnerable (6.9) and the Desert Grassland Whiptail was the least vulnerable (-2.7).
- The turtles are interesting because they use habitat for basking and reproduction so they will be sensitive to water loss. Though turtles do have some flexibility with reproduction, the sex ratio of clutches is determined by temperature; with increasing temperatures unless there are microsites its likely there will be an increase in male turtles.
 - A recent study shows that some lizard extinctions are due to warming trends which limit lizard activity during critical breeding periods. The lizard in the study had two periods in the day where it could be active and as temperatures have increased one of the periods was lost. In the spring when the lizard is reproducing they didn't have enough time to get food and reproduce. Though lizard species are suited for desert conditions a lot of these species are living at their limit right now.
 - Major vulnerabilities include: riparian associates, inactive during high heat, food specialist, temperature determined sex ratios, limited breeding periods.
 - Major resiliencies include: ectotherms, aestivation, some are long lived and can travel long distances.
- Based on the assessment if the researchers had to pick, the “losers” would be:
- Amphibians;
 - Amphibians will suffer from overcrowding due to loss of habitat; this will make them more susceptible to disease.
 - SWFL;
 - Loss of habitat will be drastic to the SWFL.
 - Yellow billed Cuckoo;
 - Large mammals (Black Bear, Mountain Lion);
 - The loss of habitat will hit large mammals hard.
 - Jumping Mouse, Tawny bellied cotton rat;
 - Hoary Bat;

- Turtles.
- The “winners” would be:
 - Brownheaded cowbird (cowbird);
 - Cowbirds will benefit from many of the effects of climate change. As the habitat opens up it will be easier for the cowbird to find hosts nests.
 - Housefinch;
 - Mourning Dove;
 - European Starling;
 - American Bullfrog?
 - Though the American Bullfrog is a generalist it still needs the riparian habitat and its projected that this type of habitat will decrease.
- Additional monitoring is needed to learn more about the insect responses as many species, especially bats, need insects. Thermal sensitivities are also largely unknown. More information on breeding success in alternative habitats is also needed because though species have their strongly associated habitat they also go to alternative habitats and it’s not known if they are able to succeed in those alternate habitats. The effects of fire and invasive species could also use additional monitoring.
- Questions:
 - It was commented that the predicted “winners” and “losers” are similar to the “winners” and “losers” of urbanization.
 - The “winning” species are very versatile; they have been less affected by changes associated with humans.
 - *Question:* Have you guys given any thought to having the results reviewed by experts, for example a bat expert? *Response:* The tool was developed for managers and experts and their feedback would be appreciated; however the group does understand that a review of the tool would be very labor intensive. The group would also like to integrate spatial data into the tool and would like to host assessment workshops where experts could work through the data.
 - *Comment:* Other than the jumping mouse and the tiny belly cotton rat, the other mammal species are not endemic to the Bosque; they seem to be generalists in that they include other habitats as part of their ranges so the Bosque may not be as important to them. It was questioned whether it is valid to include generalists in the assessment as they live in other areas. *Response:* The study makes an effort to focus on species that need the Bosque to survive. It is a valid point that some of the mammals have other habitats and if the whole range of those species were to be assessed then their scores would be different. But, for example, with black bears if there is concern with keeping them in the Bosque then the effects of climate change indicate that there won’t be a huge bear population in the Bosque in the future. Also by including generalists in the analysis you can see if there is a generalist species that might have a major unforeseen sensitivity.

- Megan and her co-authors also reviewed existing climate change adaptation literature and used the assessment results to identify species and riparian specific actions. The major points of the literature include putting reserves in places that are not likely to suffer from catastrophic fire or other disasters.
 - Strategies for managing species under climate change include:
 - Reducing impacts of other threats (habitat fragmentation/conversion, pollution, exotic species)
 - Protecting key ecosystem features (corridors, keystone species, etc.)
 - Designing resilient reserves (location, replicates)
 - Restoration and creation of threatened habitats
 - Focus on landscape level management plans
 - Monitor indicator species to understand impacts and improve understanding of future impacts
 - Provide information and technical assistance to managers in a timely manner
 - Recognize global climate change as factor in conservation and when projecting future conditions incorporate climate change into plans; optimize sectoral responses to climate change.
- There is concern that some of the existing recovery and restoration plans in the MRGB do not discuss climate change in detail though climate will have huge impacts on species within the MRGB and will exacerbate ongoing effects from disturbance, management activities and water use.
- Recommended climate change actions include:
 - Maintaining or enhancing early succession vegetation;
 - Ensuring connectivity between summer and winter ranges for big game species;
 - Planting riparian vegetation;
 - Increasing the use of swales, stormwater detention ponds or natural stream corridors;
 - Creating artificial wetlands;
 - Ensuring adequate environmental flow through using conjunctive groundwater/surface water management.
- The flycatcher has a detailed recovery plan with lots of relevant information on climate change. Turtles also have lots of microhabitat management plans to help ensure there are both male and female turtles. Carnivores and ungulates need fire management and landscape level planning. Most of the plans discuss restoring and preserving habitat.
- Keeping future conditions in mind while planning restoration is important. For example, willow habitat should not be created if it can't be ensured that the river will continue to flow in the area. Phenology should also be considered and activities should be timed to avoid the nesting season. The timing of species hibernation and the utilization of ponds in the area should also be considered in the area to be restored. Nesting activities should also be reviewed periodically as the periods of bird nesting could change.

Action Item Review

- November Action Items
 - ✓ Page Pegram will resend the list of SWM work group questions for USGS to Terina Perez. Terina Perez and Ed Kandl will talk to Jericho to see if he has heard back from USGS and inform him of the workgroups questions. After Terina and Ed talk to Jericho the SWM work group may schedule a conference call to work on the SOW.
 - Complete. An update was sent to the SWM work group that the work group's questions for USGS were sent to Jericho and that Jericho is waiting for a response and one more deliverable from Nathan Myers.
 - The work group discussed that though they received broad procedures for data download and collection from Nathan they did not receive procedures that were specific to the Groundwater/Surface Water Interaction Project. Project specific procedures were not a part of the original Scope of Work (SOW) however they were requested at the meeting with USGS.
 - One possibility is that it may just be assumed that the standard procedures were followed for the project and there may not be a separate procedure.
 - Ed Kandl agreed to take the lead in resolving the ongoing issues with USGS for the SOW.
 - ✓ Ed Kandl will ask Jeff Worthington if flagging transducer data that varies significantly from manual measurements is a part of USGS procedure.
 - If there is a huge diversion in the data then attempts are made to try to correct the data by looking at the doubled transect or manual measurements but if the data is too questionable then it is disregarded. There have not been any significant diversions or huge drifts from the manual measurements.
 - ✓ Terina Perez and Tetra Tech will verify with Cyndie Abeyta that Megan Friggens will still be presenting at the December 7th, 2011 SWM meeting.
 - Complete.

Discuss *Groundwater/Surface Water Interaction Project SOW*

- Since SOWs for new funding for FY12 are due on December 16th and the work group has not received all the requested information from USGS they agreed to complete the SOW as best as they can.
 - The most current SOW that the work group has does not include the modifications that the group wanted to make including cutting the number of wells in half.
 - Some work group members expressed hesitancy in cutting the number of wells because there is not much more time involved with downloading data at the double transects as you are already at the site for one of the transects. Data downloading takes about 15 minutes at each data logger with the bulk of the time being consumed in data processing and analysis.
 - Ed explained that when he sat with USGS to observe the data processing he observed that the bulk of the time was spent in getting the ASCII files

into the USGS system – this step would be shortened if a contractor took over the project because they would not be utilizing the USGS system.

- One suggestion was to leave analysis of the data out of the SOW as this could be done by whoever will be using the data.
- It was one opinion that the work group needs to refer back to the original questions of the project and if those questions have been answered and there are no additional questions then data collection should be discontinued.
- The work group was reminded that the URGWOM Tech Team, who are the only known users of the data, had said that they only need the single transect data so currently the data is not being utilized on the same level that it is being collected.
- Another concern with discontinuing data collection is that a future project might benefit from having data on that level of detail – this would especially be a concern if the wells were plugged and abandoned.
 - One option to keep the wells active is to continue to do manual measurements at all the wells and remove the data loggers from one of each of the doubled transects.
 - Work group members were in agreement that at the very least manual measurements should be continued at each site; at the very least to keep the wells active.
- Ed notified the workgroup that now that he has accompanied USGS to the field and knows how much time is involved with the project that this is something that he would be capable of doing; however Ed will still need approval from his supervisor.
- One difficulty in writing a SOW is that it's not known if there are research staff or Master's degree students who have an interest in using the data. There could also be the potential for a student who is utilizing the data to take over the data collection.
 - It was suggested that the work group talk to researchers at UNM, NMSU, and NM Tech to see what the interest is in the data.
 - It was pointed out that the work group still needs to discuss the long term need for the data collection and whether there is any project that will benefit from the data especially in consideration of the budget. There is also the issue of the costs involved with abandoning and plugging wells – the group will need to compare this to the cost of keeping the wells active at minimal cost.
 - Since water agreements are being discussed by the EC there may be some need or question that comes out of those discussions that this data may be able to answer.
- Attendees discussed that the length of time between downloads affects the amount of time it takes to download data; the longer between downloads the longer data download takes. Ed recommended that download occur every 6 months.
- It was suggested that the SOW include data collection and maintenance to keep the data collection going for FY12, or 1 to 4 years to leave it open, to give the work group time to talk to researchers and determine the long term need for data collection.

- Another option to help cut costs would be to continue to download data at all sites but only process the data from one of the transects at each double transect – the data for the other transect can be processed later if it is needed as part of another project.
- There is also the issue that manual measurements would only give 2 data sets per year as opposed to the continuous data set provided by the logger. The question is whether it is worth the extra time to have a more complete data set.
- In order to reduce project costs while keeping all the wells active attendees agreed to continue data download and manual measurements every 6 months at all the sites; however only data loggers at one transect at each of the double transects will be maintained with manual measurements continuing at all wells. This will cover data collection and keep the wells active until the work group can better determine the long term need for data collection. Attendees also agreed that the SOW will not include data analysis.
 - The work group will need to determine which of the transects at each double transect should be maintained but it's not believed that that level of detail will need to be included in the SOW and that it will be sufficient just to say that one of the transects will be maintained.

Action: Ed Kandl will modify the Groundwater/Surface Water Interaction Project SOW to include the workgroup's changes and email to the SWM work group for review by Tuesday, December 13th. Ed will also talk to Jericho Lewis (Contracting Officer) to find out if it's possible for the SOW deadline to be extended.

Discuss workgroup accomplishments for 2011 and 2012 Annual Work Plan

- Meeting attendees discussed the work group's accomplishments in 2011 and the 2012 Work Plan.
 - The group completed all of the tasks on their 2011 Work Plan except for a couple of tasks that were dependent on other Program deadlines that were pushed back.
 - Attendees discussed that one of the tasks on the 2011 Work Plan was to review the work group Charter and though the work group did review the Charter they decided to postpone making any changes until they knew more about Program restructuring and whether the Charter would still be needed.
 - It was suggested that today's presentation from Megan Friggens be added to the work group's accomplishments.
 - Terina Perez will try to develop the 2011 Accomplishments document and 2012 Work Plan by the end of the week if time and her new responsibilities allow.

Program Update

- The Program update will be distributed to the work group via email. *The Program update was distributed to the SWM work group on 12/8/2011.*

Agency Updates

- There were no agency updates.

Next Meeting- January 4th, 2012 at BIA from 10:00 AM to 12:00 PM

**Species Water Management Work Group
7 December 2011 Meeting Attendees**

Name	POSITION	AFFILIATION	PHONE NUMBER	EMAIL ADDRESS	PRIMARY, ALTERNATE, OTHER
Page Pegram	SWM Member	ISC	383-4041	page.pegram@state.nm.us	P
Terina Perez	PMT Member	Reclamation	462-3614	tlperez@usbr.gov	O
Chris Banet	SWM Member	BIA	505-563-3403	Christopher.banet@bia.gov	P – Co-Chair

- Tentative agenda items to include: 1) approve 11/2/11 and 12/7/11 meeting notes; 2) Discuss changing meeting frequency to every other month;

Ed Kandl	SWM Member	Reclamation	462-3586	ekandl@usbr.gov	P
Hilary Brinegar via phone	SWM Member	NMDA	575-646- 2642	hbrinegar@nmda.nmsu.edu	P
Megan Friggens	Presenter	USFS – RMRS	724-3670	Meganfriggens @fs.fed.us	O
Mike Bogan		Corrales BAD	259-3532	mbogan@unm.edu	O
Ariane Pinson		USACE	343-6281	Ariane.pinson@usace.army.mil	O
Rick Carpenter		City of Santa Fe	955-4206	rcarpenter@santafenm.gov	O
Janet Bair		USFWS	248-6492	Janet_bair@fws.gov	O
Paul Barrett		USFWS	248-6281	Paul_barrett@fws.gov	O
Joel Lusk		USDI – FWS- NMES	761-4709	Joel_lusk@fws.gov	O
Maceo Martinet		USFWS	761-4752	Maceo_martinet@fws.gov	O
Melinda Benson		UNM	239-9949	hbenson@unm.edu	O
Rick Billings	SWM Member	ABCWUA	796-2527	rbillings@abcwua.org	P
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Peter Wilkinson		ISC	827-5801	Peter.wilkinson@state.nm.us	O
Cyndie Abeyta	SWM Member	USFWS	761-4738	Cyndie_abeyta@fws.gov	P
Christine Sanchez	Admin Support	Tetra Tech	881-3283 ext. 139	christine.sanchez@tetrattech.com	O