



Draft 2012 and 2013 Annual Adaptive Management Report for the Carlsbad Project Water Operations and Water Supply Conservation Environmental Impact Statement



**U.S. Department of the Interior
Bureau of Reclamation**

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Draft 2012 and 2013 Annual Adaptive Management Report for the Carlsbad Project Water Operations and Water Supply Conservation Environmental Impact Statement

Prepared by:

AAO Bureau of Reclamation

Contents Page No.

Introduction	3
Methods	4
Indicator 1: Continuous River Flows	4
Indicator 2: Flow Monitoring at Taiban and Acme Gages	6
Indicator 3: Incoming Flows Available for Bypass	7
Indicator 4: Block Releases	8
Indicator 5: Density for the Pecos Bluntnose Shiner (Shiner)	9
Indicator 6: Presence of the Interior Least Tern (Tern)	12
Indicator 7: Carlsbad Project Water Supply Status	16
Indicator 8: Aquifer Storage and Base Inflows from the Roswell Basin	17
Indicator 9: Decreasing Flow Target at Taiban to Conserve Water Supplies	27
Discussion	28



Cover photograph: Pecos River south of Bottomless Lakes State Park, 9.22.2010 by M. Carra

U.S. Department of the Interior
Bureau of Reclamation
Albuquerque Area Office

Introduction

This report covers the period January 1, 2012, through the end of the calendar year December 31, 2013, as stated in the Carlsbad Project Water Operations and Water Supply Conservation Environmental Impact Statement (EIS), June 1, 2006. This report describes the actual Adaptive Management Plan (AMP) as published in the EIS, including the criteria, triggers, monitoring and responses, then the actions taken this calendar year. The final portion of this report will describe the changes required in the AMP, establishing new procedures for monitoring the results of management action and integrating this new knowledge into future policy and management actions.

Adaptive Management Plan The AMP outlines a procedure for monitoring indicators (which serve as signs or symptoms) and modifying river operations when needed. It is a means to address uncertainty by monitoring EIS targets, identifying actions to be taken for targets that are in jeopardy, and applying lessons learned in the future management of river operations by modifying operations within established parameters.

The AMP was designed to ensure compliance with the Biological Opinion (BiOp) and the Record of Decision (ROD) and EIS, completed August 2006.

Adaptive Management – Carlsbad Project Water Operations: Taiban Constant Alternative

The AMP appropriately addressed the range of alternatives under consideration. Since the Bureau of Reclamation (Reclamation) has identified the Taiban Constant as its preferred alternative and consulted with the U.S. Fish and Wildlife Service (Service) regarding the effects on endangered species, it is meaningful to reformulate an AMP that is focused on the Taiban Constant alternative. In fact, to better determine potential future effects on Pecos bluntnose shiner, it is necessary. Seven objectives were identified for the development of adaptive management guidelines specifically for the Taiban Constant alternative:

1. Develop a monitoring, decision-making, and response program for the long-term management of the Pecos River flows;
2. Identify agency responsibilities for monitoring and response;
3. Conserve populations of the Pecos bluntnose shiner;
4. Conserve the Carlsbad Project water supply;
5. Assure critical habitat remains wetted;
6. Meet flow criteria at the Taiban gage as specified in the EIS, and;
7. Minimize river intermittency in reaches not designated as critical habitat.

The AMP provides structure for making decisions based on changing environmental and hydrological conditions and offers a forum to stakeholders for developing consensus. Communications for the AMP are carried out throughout the year primarily through conference calls among the Pecos River Stakeholder Group and the preparation of the Annual AMP report. Members of the Pecos River Stakeholder Group include the Service, Reclamation, Carlsbad Irrigation District (CID), Ft Sumner Irrigation District (FSID), New Mexico Department of Game and Fish, New Mexico Office of the State Engineer (NMOSE), New Mexico Interstate Stream Commission (NMISC), and the US Army Corps of Engineers (Corps).

Criteria, Triggers, Monitoring, and Response

The core components of the AMP for the Taiban Constant alternative are criteria, triggers, monitoring, and response. These four components are described for the following eight indicators for 2012 and 2013:

- (1) Continuous River Flows
- (2) Flow Monitoring at Taiban and Acme Gages
- (3) Incoming Flows Available for Bypass
- (4) Block Releases
- (5) Density for the Pecos Bluntnose Shiner (Shiner)
- (6) Density for the Interior Least Tern (Tern)
- (7) Carlsbad Project Water Supply Status
- (8) Aquifer storage and base inflows from the Roswell Basin.

This report describes the actions taken in the calendar year January 1, 2012, through December 31, 2013, and future recommendations which are in the AMP report for monitoring and river management for CY2012 and CY2013.

Methods -All methods are discussed in detail in the final AMP available on the web site: <http://www.usbr.gov/uc/albuq/library/eis/carlsbad/carlsbad.html>

Indicator 1 - Continuous River Flows

Criteria: During the irrigation season or other periods of time when FSID is entitled to their direct diversion right from the Pecos, water will only be diverted into storage in Sumner and/or Santa Rosa Reservoirs when the following three conditions are all being met:

1. there is available reservoir inflow in excess of FSID's flow entitlement as calculated on a two-week basis by the New Mexico Office of the State Engineer
2. the 35 cfs river flow target at Taiban Gage is being met
3. there is no risk of river intermittency

During the non-irrigation season or other times when FSID is not entitled to utilize their direct diversion right from the Pecos, water will only be diverted into storage in Sumner and/or Santa Rosa Reservoirs when the following two conditions are being met:

1. the 35 cfs river flow target at Taiban Gage is being met
2. there is no risk of river intermittency

Trigger: The river flow trigger is activated when the flow rate measured and reported by USGS at Taiban is 40 cfs or less, or the flow rate measured and reported by USGS at Acme is 10 cfs or less.

Monitoring: River flow and reservoir elevation data are collected electronically every four hours from gage sites and relayed, via satellite links, to US Geological Survey and Army Corps websites. Reclamation staff monitors these sites daily. During the irrigation season, Reclamation holds weekly conference calls. Gage data is collected and recorded on logs and discussed on the calls at the beginning of each week. Participation from all Pecos Stakeholders is encouraged on the weekly

operation management conference calls. These weekly conference call logs are available from Reclamation staff upon request and available online, Reclamation Albuquerque Area Office webpage.

Response: When the trigger is activated by reaching the target point at either gage, Reclamation initiates additional monitoring (i.e. flow measurements, observation flights, video camera observations, or other methods) to establish the accuracy of the gage data. Depending on the accuracy of the data, Reclamation may initiate corrective actions.

If bypass water is available, Reclamation will begin bypassing inflow to target 35 cfs at Taiban and/or keep the river continuous. If bypass water is not available and the Vaughan Conservation pipeline (pipeline) is operational and available for use, Reclamation will order the operation of the pipeline to support flow targets at Taiban and Acme. If bypass water is unavailable and the pipeline is unavailable, Reclamation will release Fish Conversation Pool (FCP) water at a rate needed to avoid intermittency. Reclamation has on-going water leases for artesian groundwater on the Pecos River, which is also used to avoid intermittency.

Actions taken in CY 2012 and CY1013:

During the irrigation season, Reclamation prepared weekly logs of the conference calls. These are available from Reclamation staff upon request. Data provided in the logs are provisional.

Drying occurred between Sumner Dam and Brantley Dam on the Pecos River between July 15 and October 29, 2012. Drying occurred on approximately 54 river miles. The trigger for Indicator 1 was activated on throughout most of the year. A total of two incidents required action in 2012 and four in 2013. During 2013, drying occurred beginning in early May until the flooding rains the second week of September. There were brief periods of continuous flow. Approximately 20 river miles experienced drying.

Action 1: From January 1 through March 17, 2012, Taiban gage measured below 40 cfs. Water was bypassed through Sumner Dam from January 1 through February 13, FSID provided water from February 14 through March 2 per the Forbearance agreement, March 3 through March 16 forbearance water was released supplementing the river. Acme averaged 13 cfs during this time with a minimum flow of 8 cfs. With the supplemental water, Taiban did not drop below 19 cfs and averaged 27 cfs during this time.

Action 2: From April 1 through December 31, 2012, water was released, pumped, and bypassed to supplement flows. Taiban gage measured below 40 cfs for 200 out of 275 days. During this same time Acme was measured below 15 cfs for 217 out of 275 days. Acme flow measured less than 1 cfs for 89 days and averaged 13 cfs over the time period.

Action 3: From January 1 through March 13, 2013, Taiban gage measured below 40 cfs. Water was bypassed through Sumner Dam from January 1 through February 12, FSID provided water from February 13 through February 26 per the Forbearance agreement. Acme averaged 13 cfs during this time with a minimum flow of 4 cfs. With the supplemental water, Taiban did not drop below 11 cfs and averaged 23 cfs during this time.

Action 4: During the period of March 24 through July 1, 2013, Taiban was below 40 cfs and/or Acme was below 15 cfs. Taiban had a minimum flow of 9 cfs with an average of 32 cfs. Acme had 43 out

of 100 days below 1 cfs measured and average flow 8 cfs. The river was supplemented with pumped water, fallowing water and forbearance water during this time.

Action 5: From July 1, 2013 through September 9, 2013, Acme measured less than 1 cfs 34 out of 72 days and 56 days less than 15 cfs with an average flow of 38 cfs due to a couple of rain events. Taiban averaged 51 cfs with 28 days less than 40 cfs and a minimum flow of 19 cfs. During this time pumped water, fish conservation pool, fallowing and forbearance water were used to supplement the river.

Action 6: From November 4 through December 31, 2013, Taiban measured less than 40 cfs with an average flow of 36 cfs. Bypassing of water through Sumner Dam was used to supplement flows throughout this period. The average flow measured at Acme during this time was 43 cfs with a minimum flow of 28 cfs.

Reclamation had water lease agreements with five Pecos River pumpers, one of whom is also a Hagerman Irrigation Company irrigator, to lease 1,513 af (consumptive use portion) of surface water rights and 356 af (consumptive use portion) of Hagerman Canal water rights. The land associated with the leased water was fallow. The Hagerman Canal water was pumped directly into the Pecos River. The Vaughan pipeline was built by the State of New Mexico to supplement flows on the Pecos to assist with the needs of the 10-year BO. The outfall structure of this pipeline is located upstream of the USGS Taiban Gage. Maximum output is between 8 and 13 cfs. Reclamation has a 25-year contract for a minimum of 1100 af of water annually. The pipeline provided 1568 af to the Pecos River in 2012 and in 2013.

Indicator 2 - Flow monitoring at Taiban and Acme Gages

Criteria: Correctly operating gages are important to river management. The USGS is responsible for measurement and maintenance of their gages. For Reclamation's Pecos River operations for the shiner, the two most important gages are Taiban and Acme, although other gages are used for operations. These two gages provide data on intermittency and flow targets.

Trigger: The gage trigger is activated when the Taiban or Acme gage is malfunctioning or non-operational.

Monitoring: Monitored gages by independent contractor as well as USGS. Reclamation funds USGS to operate and maintain the gages along the Pecos River. Inoperable gages are reported to the USGS and Reclamation initiates contracted monitoring as necessary to measure gage sites and report all findings immediately.

Response: Have contractor out during these times to manually measure flows as often as necessary until gages are repaired.

Actions taken in CY2012 and CY2013:

Reclamation, in coordination with the Service, intensively monitors the river by the best methods available at the time, including website gage readings, field site verification and measurements, flights to monitor river connectivity, monitoring the video field camera, or other technology as it becomes available.

Three flights over the Pecos to monitor flows were made in the 2012 irrigation season and one in the 2013 irrigation season.

Additionally, Reclamation hosted weekly operation management conference calls throughout the

irrigation season on flows and river operations. The Service was a part of the weekly events and the calls served as a condition of consultation, informing the Service of any necessary corrective actions taken or that were expected to be taken as a result of low flows.

Reclamation requested USGS verify gage readings during the 2012 and 2013 irrigation seasons. These requests were made during the weekly, Monday morning conference calls.

Indicator 3 – Incoming Flows Available for Bypass Criteria: FSID is entitled to the natural river flow up to 100 cfs as measured at the Puerto de Luna gage upstream from Sumner Lake. FSID's entitlement is calculated every 2 weeks based on the NMOSE computations. Reclamation can divert to storage or bypass any inflows in excess of FSID's maximum water right (100cfs). Flow data are obtained from the NMOSE Pecos Water Master in the Roswell district office. Information collected by the NMOSE on flow entering Santa Rosa Reservoir and Sumner Lake, as well as USGS gage data, are used to determine the availability of water for bypasses. This information is used to assess whether there is available Carlsbad Project Supply to bypass through Santa Rosa and Sumner.

Trigger: The bypass trigger is activated when it is determined by NMOSE that incoming available flows exceed FSID's senior diversion rights.

Monitoring: The NMOSE measures flows at gage sites along the river for compact accounting purposes. These flows are calculated for FSID's senior water right and the results are faxed to Reclamation's staff on a bi-weekly basis. Flows are then calculated for the amount of water available for bypass through Sumner. If flows are not needed to keep the river continuous, water is diverted to storage for Carlsbad Project Supply.

Response: Make incoming available flows exceeding FSID's senior diversion rights available, as needed, for bypass during these time periods. After the end of FSID's irrigation season on October 31, all Sumner inflows will be made available for bypass for meeting in-stream target flows.

Actions taken in CY2012:

During the period covered by this report, inflows did not exceed FSID's senior diversion right from February 14 through April 23, and June 4 through October 31. Reclamation made three bypasses totaling 7,398 acre-feet (af) during the 2012 calendar year, with 3,110 af bypassed during the irrigation season. Before February 13 and after the end of FSID's irrigation season on October 31, all Sumner inflows were available for meeting instream flow targets.

During the periods when bypasses were not available, water was released from the FCP pool to meet instream flow targets. During the irrigation season 1,000 af of supplemental water was released from the FCP pool. Beginning November 1 Forbearance water was released to meet the flow targets, a total of 2,507 af were released from this pool.

Actions taken in CY2013:

During the period covered by this report, inflows did not exceed FSID's senior diversion right from February 14 through October 7, and October 21 through October 31. Reclamation made two bypasses totaling 1,746 af during the 2013 calendar year, with no bypasses occurring during the irrigation season. Before February 13 and after the end of FSID's irrigation season on October 31, all Sumner inflows were available for meeting instream flow targets. During the periods when bypasses were not available, water was released from the FCP pool to meet instream flow targets. During the irrigation

season 1,000 af of supplemental water was released from the FCP pool. Beginning November 1 Forbearance water was released to meet the flow targets, a total of 2,496 af were released from this pool.

Indicator 4 – Block Releases Criteria: A block release is defined as moving water efficiently from Sumner to Brantley Reservoir for the purpose of irrigation. These block releases are a large quantity of water released within a short timeframe so as to avoid evaporation losses. Block releases also occur between Santa Rosa and Sumner. The frequency and duration of block releases from Sumner will be recorded as they occur and compiled into this annual report. Four key criteria are: (1) block releases will not exceed 15 days; (2) there will be at least 14 days between block releases; and (3) block releases should not occur during the 6-week period centered on August 1; or (4) the cumulative duration of block release from Sumner shall not exceeds 65 days.

Trigger: The block release trigger is activated by at least one of the following four conditions: (1) the 15-day block release duration is exceeded; (2) there is less than 14 days between releases; or (3) a block release is expected in the 6-week period centered on August 1; (4) the cumulative duration of block release from Sumner exceeds 65 days.

Monitoring: Plans for future block releases will be compared to the trigger criteria to determine if trigger criteria will be activated. The start, end and duration of block releases will be measured and recorded based on the flows reported at the USGS gage: Pecos River below Sumner, NM, USGS 08384500.

Response: Coordinate all block releases with CID when flows have dropped below specified levels (Acme 10cfs, Taiban 40cfs) to keep the river continuous and meet CID demand. Notify CID and the Service when release time is exceeded, there is less than 24 days between releases, the release occurs in the inappropriate time or last too long.

Actions taken in CY2012:

None of the triggers occurred in 2012.

One block releases were completed: 3/18/2012 through 3/23/2012 13,390 af

Actions taken in CY2013:

None of the triggers occurred in 2013.

Two block releases were completed:

3/14/2013 through 3/17/2013 10,409 af

9/21/2013 through 10/07/2013 8,109 af

The second block release was to make additional room in Santa Rosa and Sumner for inflows from heavy rainstorms throughout the basin.

Indicator 5 - Density for the Shiner Criteria: The density of the adult shiner, as stated in the BiOp, is based on a two year running average.

Trigger: If fish densities fall to a low level in one year, then this is a warning that next year an action would need to be taken based upon the likely cause of decline (e.g., intermittency).

Monitoring: Fish monitoring done monthly, year round at specified sites.

Response: Reclamation will give both CID and FSID as much advance notice as possible when there is potential for changes in water operations to benefit the Shiner.

Actions taken in CY2012 and CY2013:

Reclamation continues to monitor flows under the 2006 10-year BO operating the Carlsbad Project with a target flow of 35 cfs at the Taiban Gage and to keep the river continuous in order to conserve the federally protected shiner. The purpose of the project was to meet the contracted irrigation needs of the Carlsbad Project, to avoid hindering New Mexico delivery requirements to Texas, and to establish partnerships in the basin. Due to water shortages in both 2012 and 2013 and predicted drying, Reclamation worked with USFWS to best manage the water available for maintaining shiner habitat. Low flow conditions were present in 2012 and 2013 and drying did occur.

Reclamation received an annual update on the status of the shiner from the US Fish and Wildlife Service (USFWS). In 2012 and 2013, shiner population density, and relative abundance sharply decreased relative to the previous years (Figure 1). Per the 10-year BO, take is exceeded if density falls below a two-year catch-rate mean of 3.5 shiner per 100 m² in Trimester 1 (January-April), and 8 shiners per 100 m² in Trimester 3 (September-December) for years after 2010. In 2013, catch-rates during Trimester 3 fell below the prescribed density thresholds set by the 10-year BO (Table 1). Shiner catch rates were above the BO thresholds for Trimester 1. **Error! Reference source not found.**

Table 1. Pecos bluntnose shiner two year mean population density with standard error, and number of samples (N) for 2006 to 2013. Two-year running average was calculated from site means for the year stated and preceding year (for example in 2006, by calculating mean from all sites for trimester one in 2005 and 2006; same for trimester three).

Year	Trimester one PBS/100 m ²	Trimester three PBS/100 m ²	Any trimester 2008
2006	3.5 (± 0.75 SE, N = 48)	5.3 (± 0.90 SE, N = 48)	> 2.7 (2.5)
2007	5.0 (± 0.8 SE, N = 53)	9.8 (± 1.8 SE, N = 50)	> 4.0 (2.5)
2008	7.2 (± 1.3 SE, N= 62)	14.3 (± 4.5 SE, N= 59)	> 9.8 (2.5)
2009	11.9 (± 1.9 SE, N= 64)	17.4 (± 3.8 SE, N= 73)	> 15.2 (2.5)
2010	13.1 (±2.1 SE, N = 75)	21.0 (± 2.2 SE, N = 82)	> 12.3 (2.5)
2011	18.4 (± 2.2 SE N = 58)	21.3 (± 2.6 SE N = 81)	> 18.4 (2.5)
2012	21.6 (± 5.1SE N = 55)	14.7 (± 3.0 SE N = 62)	NA
2013	11.25 (± 5.4SE N = 47)	5.0 (±1.3SE N = 46)	NA

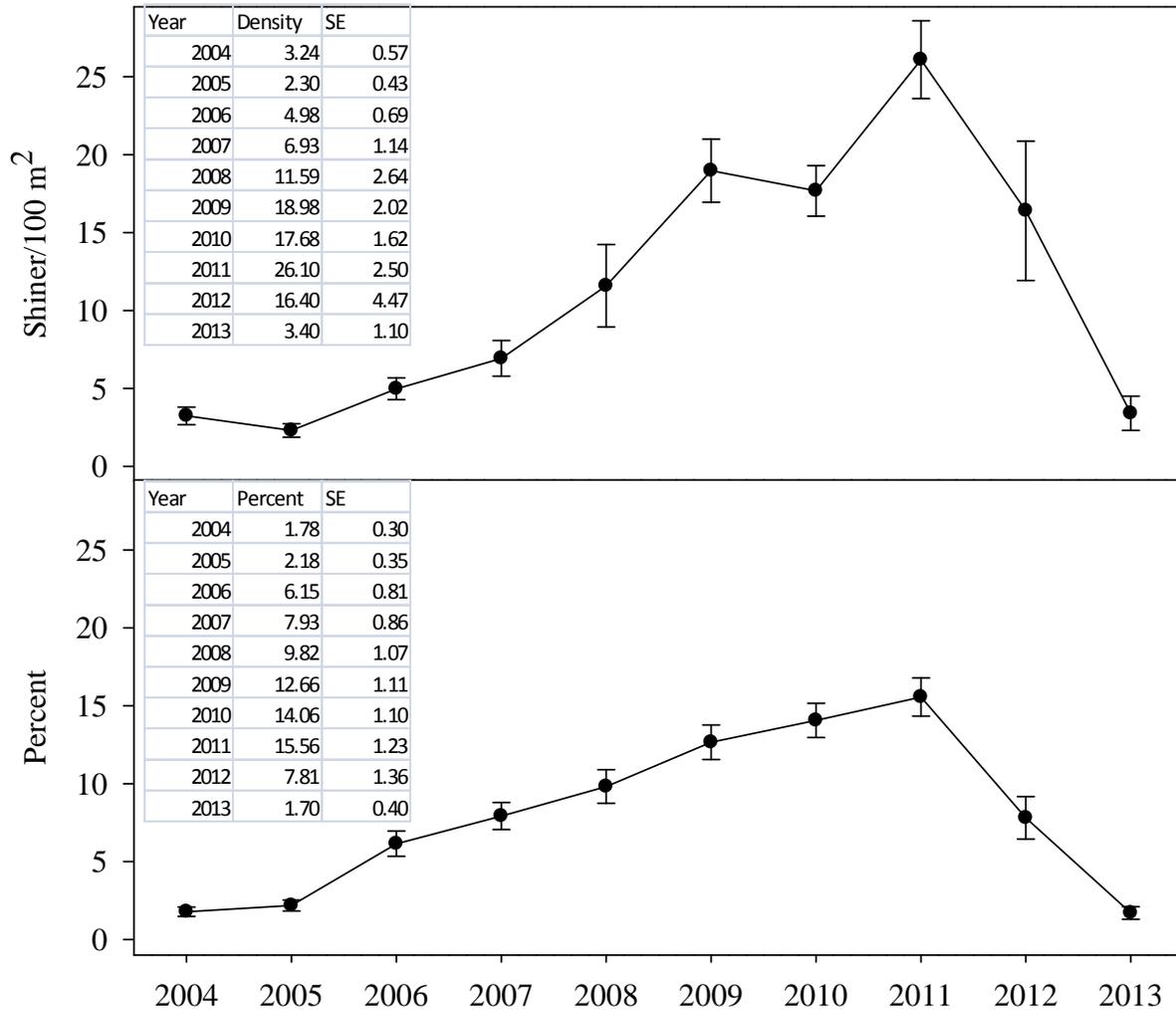


Figure 1. Pecos bluntnose shiner annual population density (top) and percent abundance (bottom), \pm one standard error, for years 2004 through 2013, Pecos River, New Mexico.

Pecos River Restoration

Under the 2006 Biological Opinion, Reclamation also agreed to “assist in the completion of ongoing habitat improvement projects on the Pecos River and to restore 1-1.5 miles of quality habitat within the Farmlands reach by 2009 and another 1-1.5 miles by 2014.” In 2009, Reclamation funded and completed a channel restoration project that reconnected Oxbow 4 at Bitter Lake National Wildlife Refuge (BLNWR) to the mainstem.

The second habitat improvement project is located at Bureau of Land Management (BLM) Overflow Wetlands Area of Critical Environmental Concern, south of the BLNWR restoration project. Lands in the project area are managed by the Roswell Field Office of the BLM, the NM State Land Office, and private landowners. According to the 2006 Biological Opinion, activities

that restore and optimize the interaction of river channel and floodplain habitats with available flows will be most successful in mitigating the observed displacement of the shiner eggs and in providing a variety of channel conditions favorable to the different life stages of the shiner. Restoration activities for the 2nd project included removal of non-native vegetation, and lowering and contouring river banks, and smaller bank excavation sites. The first phase of the project was completed in 2013, and the second phase will be constructed in 2014.

Indicator 6 - Density of the Interior Least Tern (Tern) Criteria: The density of the adult interior least tern and activities at created nesting habitat sites.

Trigger: Nesting terns in the conservation pool of Brantley Reservoir

Monitoring: Monitor lake levels and water delivery plans to assess the potential for impact to nesting terns.

Response: Assess potential for take; coordinate with CID and other interested parties on water management to help prevent inundation of nests and/or young. If all other options are exhausted, consider moving nests to avoid rising water. If take is anticipated, coordinate in advance with the Service.

Actions taken in CY2012 and CY2013:

In 2012, several terns were observed from May 31st through July 21st, however no courtship behavior suggesting pairing or nesting was observed (see table below for survey results). Given there were no irrigation block releases during breeding season this drought year, there was an abundance of nesting habitat and ideal Reservoir conditions for nesting.

Date	Adult	Sub-adult	Immature	Nests* [eggs]
31 May 2012	3	0	0	0
6 June 2012	1	0	0	0
12 June 2012	2	0	0	0
19/20 June 2012	5	0	0	0
2/3 July 2012	5	0	0	0
12/13 July 2012	3	0	0	0
20/21 July 2012	1	0	0	0
2012 Total *	20	0	0	0

- Total numbers of terns observed are intended to be an index of tern usage at Brantley

Reservoir, given similar survey efforts on an annual basis (i.e. weekly surveys), not an absolute count of individuals.

In 2013, several terns were documented during various surveys over the entire breeding season. It is assumed that several of these terns were likely the same individuals. Although all tern sightings were documented (see table below), only those exhibiting courtship and/or nesting behavior were considered pairs.

Date	Adult	Sub-adult	Immature	Nests* [eggs]
May 23/24 2013	1	0	0	-
May 30/31 2013	1	0	0	-
June 6/7 2013	2	0	0	-
June 16/17 2013	0	0	0	-
June 21/22 2013	4	0	0	0
July 1/2 2013	12	0	0	0
July 12/13 2013	16	0	0	0
July 19/20 2013	20	0	0	1 [2]
July 21 2013	3	0	0	1 [2]
July 23/34 2013	24	0	0	1 [2]
July 25/26 2013	4	0	0	1 [2]
July 31/August 1 2013	10	7	0	1 [2]**
August 5/6	2	4	0	1 [2]
August 14/15 2013	0	0	0	0
2013 Total ***	99	11	0	1

* Only nests containing eggs were considered active nests. Empty scrapes were not tallied in the total.

** Nest abandoned for unknown reason.

*** Total numbers of terns observed are intended to be an index of tern usage at Brantley Reservoir, given similar survey efforts on an annual basis (i.e. weekly surveys), not an absolute count of individuals.

A total of 99 adult terns and 11 sub-adults were observed over the course of the breeding season. On several occasions, eight or more adult terns were observed and several instances of either courtship or copulation were recorded. Based on these observations it was concluded that up to four breeding pairs were present at Brantley Lake during 2013. However, only two nests were located; one had apparently been depredated and the other contained two eggs and was subsequently abandoned. As the nests were not active concurrently, it is unknown if the nests were from two different pairs or an initial nest and re-nest of the same pair. Had the abandoned nest actually fledged chicks, the young would not have been flight-ready until late August or even

early September which is well outside the typical breeding period in our study area. Details of the nest monitoring effort are outlined in the table below.

Date	Nest activity
7/19/13	Active nest with 2 eggs located in center of tern activity. Adults incubating. Area wet from recent rains. Close to water's edge (approx. 100 ft and 1 vertical foot above water level) but no danger of inundation since upstream releases are not scheduled.
7/20/13	Nest still being incubated.
7/21/13	Adults incubating. Cordoned off nest site with "Area closed" signs and caution tape.
7/23/13	Adults incubating and signs/caution tape still in place.
7/24/13	Eggs still in nest but no incubation observed. Adults still present and agitated.
7/25/13	Eggs still in nest and terns present but not defensive near nest site.
7/26/13	Eggs and terns present but no incubation.
7/31/13	Eggs present but no activity at nest. Likely abandoned.
8/1/13	Eggs present but no activity at nest.
8/5/13	Eggs still present but have not been moved since 8/1 visit (based on photos). Confirmed nest abandoned.
8/6/13	No activity at nest.

As a means of protecting nesting sites once nests had been located, the entire nesting area at the end of the gravel point was cordoned off with caution tape and "Area Closed" signs (see picture below). This was done to prevent human access (either vehicular or on foot) and unnecessary disturbance to nesting birds. To our knowledge, no vehicles accessed the site once it had been cordoned off. The caution tape and signs were removed once all nesting efforts had terminated.



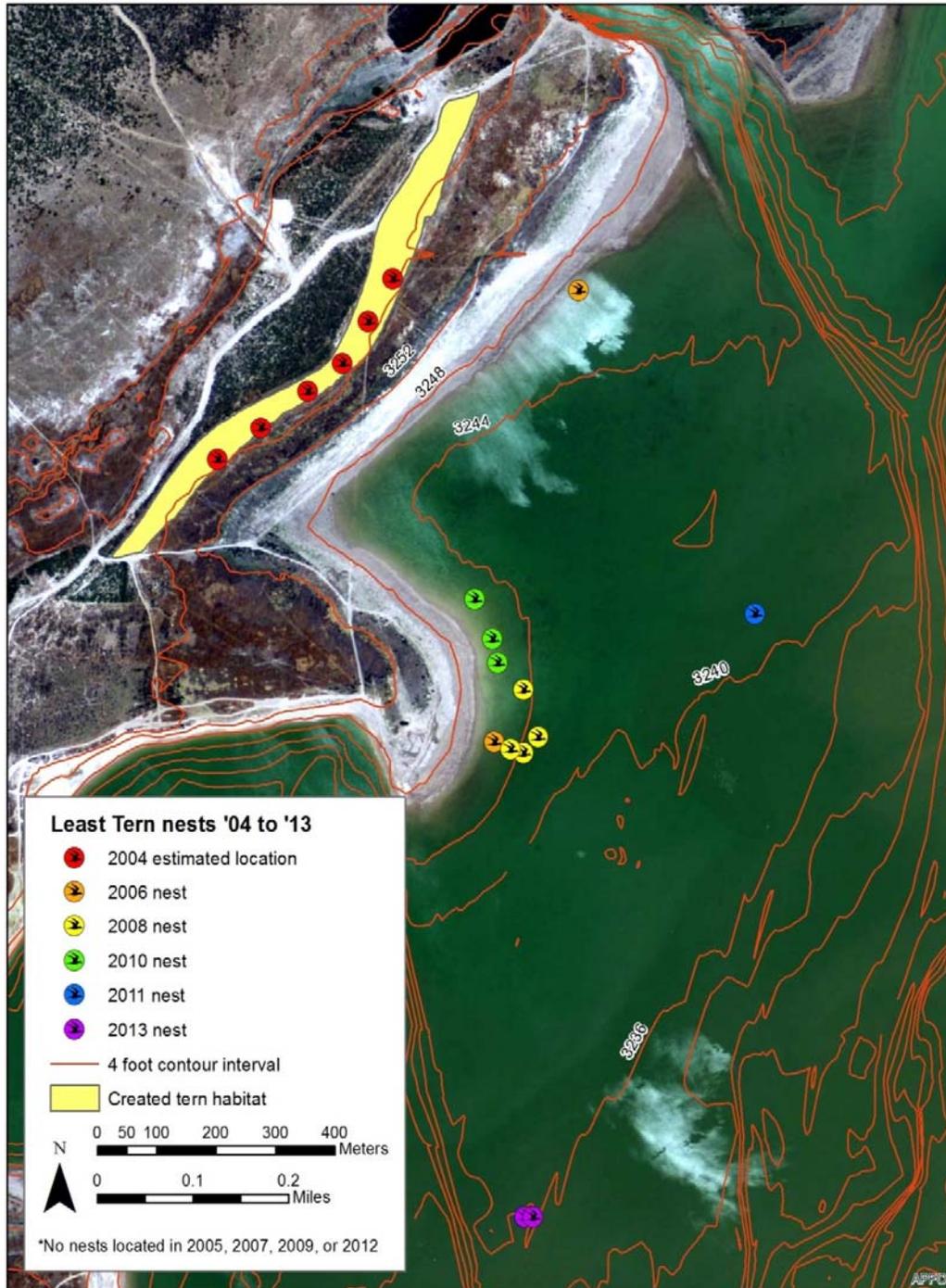


Figure 2. Least Tern nest sites (2004 to 2013) and reservoir elevation contours.

To the best of our knowledge there was no incidental take of tern nests during the summer of 2013. A complete 2013 report was completed in February 2014. Contact Reclamation’s Albuquerque Area Office for a copy of the 2014 tern monitoring report, or visit the following website for reports from 2008 or earlier: <http://www.usbr.gov/uc/albuq/library/eaba/saltcedar/saltcedar.html>

Indicator 7- Carlsbad Project Water Supply Status Criteria: One of the purposes of the EIS is to conserve Carlsbad Project water supply. Operation of Sumner for the benefit of the shiner could result in reductions to the available Carlsbad Project water supply, potentially impacting the CID. Water acquisition options have been developed to acquire additional water to compensate for net depletions to Carlsbad Project supply.

Trigger: The trigger is activated annually to evaluate whether a shortage or surplus is occurring with respect to the Carlsbad Project water supply. However, informal periodic discussions with CID should occur during the year to monitor the status of irrigation water supply and use.

Actions taken in CY2012 and CY2013:

Reservoir content levels at end of CY2011:

- Santa Rosa 10,136 af
- Sumner 5,382 af
- Brantley 11,076 af
- Avalon 2,275 af

Reservoir content levels at end of CY2012:

- Santa Rosa 4,691 af
- Sumner 9,157 af
- Brantley 4,773 af
- Avalon 2,494 af

Reservoir content levels at end of CY2013:

- Santa Rosa 98,617 af
- Sumner 37,218 af
- Brantley 31,911 af
- Avalon 2,300 af

Supplemental water management tools generic order of use:

1. Bypass (when available up to depletion volume of water leases plus credit water)
2. Vaughan (until exhausted and meets flow requirement)
3. Vaughan with FCP (until either is exhausted)
4. FCP (if pipeline is exhausted before FCP)/ pipeline with Forbearance (if FCP exhausted before Vaughan)

Year*	Bypass	Forbearance	Fallowing	Fish Conservation Pool	CID Exchange	Lynch	Vaughan	Total
2006	2,264	0	6,230	1,000		895		10,389
2007	4,584	0	3,476	1,000		895		9,955
2008	6,823	0		1,000		895	330	9,048
2009	6,109	0		1,000		895	1,693	9,697

2010	3,923	1,449		1,000		895	580	7,847
2011	2,370	2,500	4,220	1,000	2,500	895	1,568	15,053
2012	7,040	2,500	3,428	1,000	1,800	458	1,579	17,805
2013	4,435	2,500	2,959	1,000		0	1,576	12,470
Sum	37,548	8,949	20,313	8,000	4,300	5,828	7,326	92,264

*Year is Nov-Oct

Indicator 8- Aquifer Storage and Base Inflows from the Roswell Basin

Criteria: Surface and ground water resources are interconnected. An increase in ground water supplies in the Roswell and Artesia basins is expected to eventually result in an increase in surface water supplies. Thus, improving groundwater conditions can indirectly benefit the Carlsbad Project, CID and the shiner. In addition, ground water resources can be lost to evapotranspiration as aquifer levels rise. The USGS maintains four monitoring wells in the Roswell and Artesia basins that provide regular data of groundwater depths. NMOSE and NMISC collect and review data on aquifer storage and base inflows.

Trigger: Aquifer storage and base inflows from the Roswell Basin are used as an indicator and do not contain a trigger.

Actions taken in CY2012: The USGS periodically measures the depth to water in a series of wells in the Roswell Basin. Some of the wells are in Chaves County, and others are located in Eddy County. Within Chaves County, two wells had been measured by the USGS until October 2011. Depth to water measurements in these two wells suggests a decrease in aquifer storage for the artesian aquifer and a decrease in storage for the shallow aquifer in the Roswell Basin. The two wells are close together in a location approximately equidistant between Roswell and Dexter.

The first of these wells is designated USGS 331524104245101 and is completed at a depth of 231 feet below ground surface (bgs) in alluvial, bolson, and other surface deposits (see Figure 3). Based on nine measurements in 2011(partial year), the average depth to water was 109.12 feet bgs. In 2010 the average of eleven measurements was 108.37 feet bgs. A continuous downward trend from previous years can be seen in Figure 3. The last measurement recorded by the USGS for the well was on October 4, 2011.

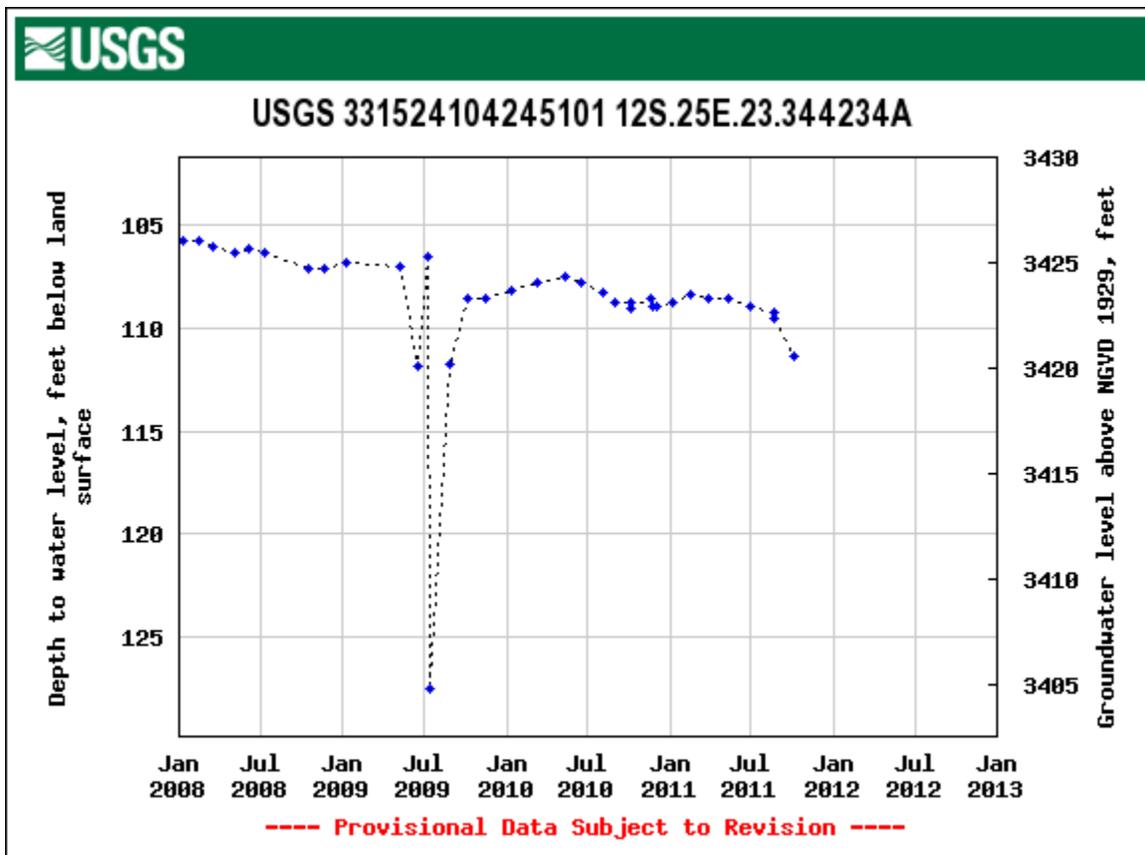


Figure 3. Depth to water for USGS shallow well 331525104245101 located in Chaves County, New Mexico.

The second Chaves County well, designated USGS 331525104245201, is 930 feet deep and is completed in the confined aquifer within the San Andres Limestone (see figure 4). The 2011 Report listed the average depth to water as 97.86 feet bgs. The depth to water was based on ten measurements (partial year ending 10/4/11). Using Pecos Valley Artesian Conservancy District (PVACD) data for the entire year, the average depth to water was 89.84 feet bgs. The average depth to water for 2012 was 88.99 feet bgs and for 2013 the average depth to water was 86.4 feet bgs. The last measurement recorded by the USGS for the well was on October 4, 2011. Figure 4b is a plot of the well data extended using data from PVACD.

Confined aquifer water level measurements often show a dramatic response to irrigation pumping; consequently, yearly averages may not be a reliable indicator of aquifer storage. The measurements made during the non-irrigation season when water levels are the highest may be the most illustrative of aquifer conditions, as there is very little pumping occurring at that time. The general trend is for slightly decreasing recovery of water levels during the winter months: 28.24 feet bgs for winter 10/11, 30.94 feet bgs for winter 11/12 and 35.16 feet bgs for winter 12/13.



USGS 331525104245201 12S.25E.23.344412 ORCHARD P

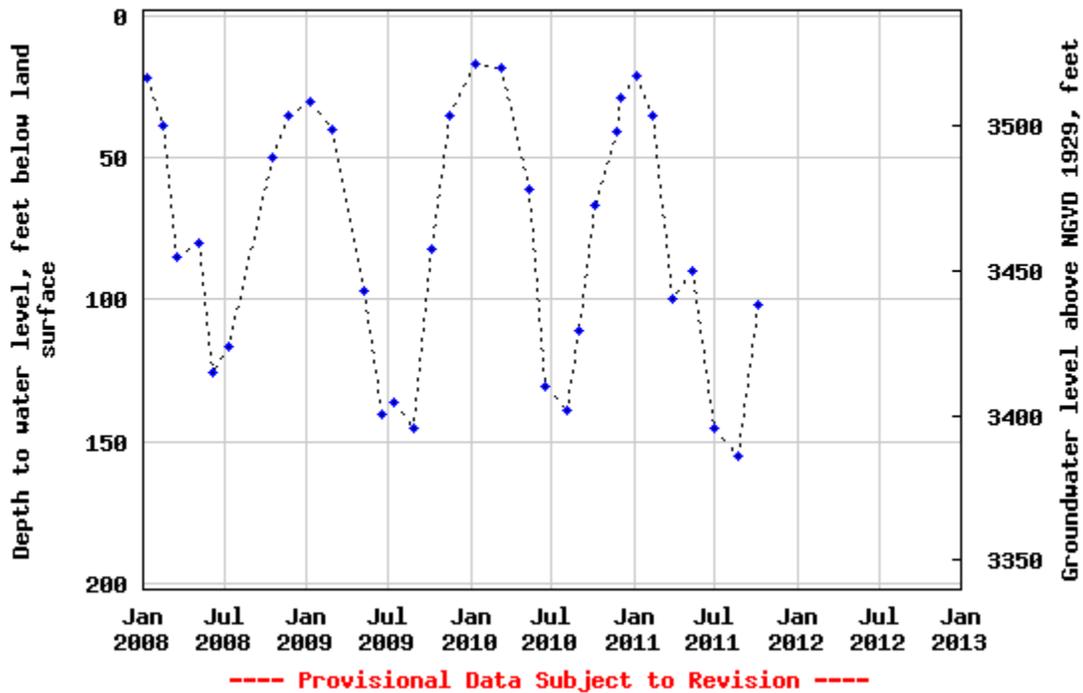


Figure 4. Depth to water for USGS Artesian well 331525104245201 located in Chaves County, New Mexico.

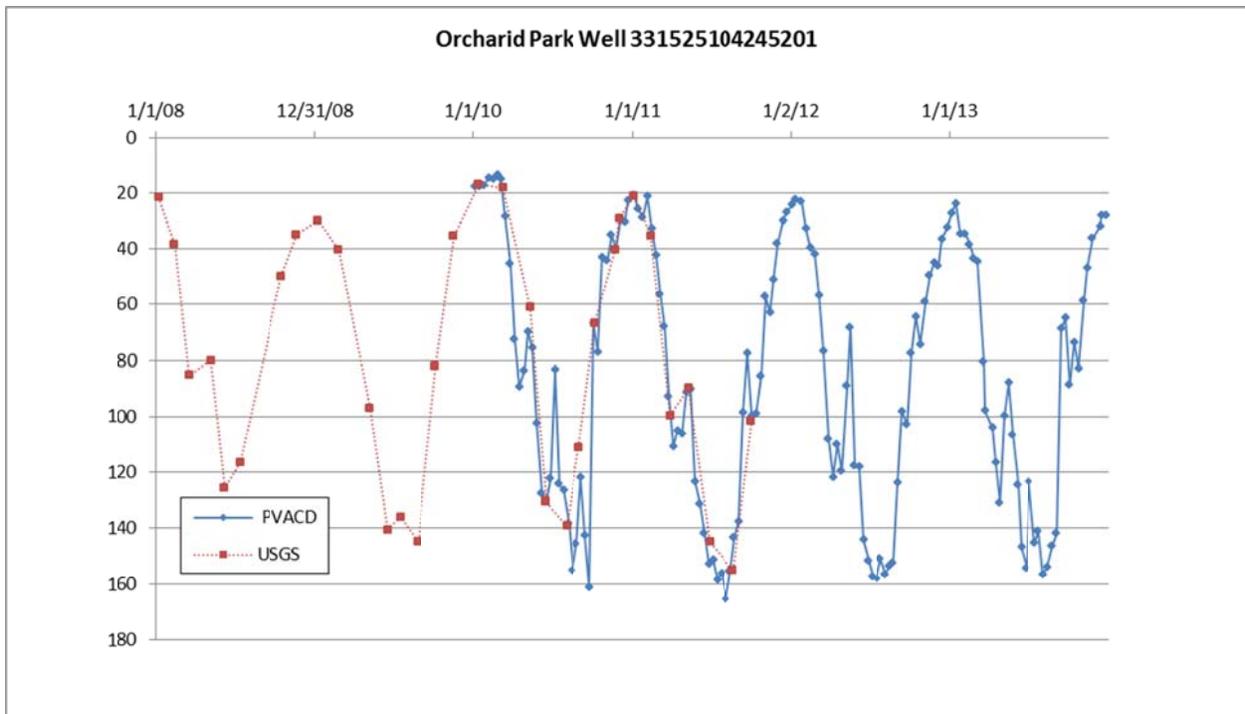


Figure 4b. Depth to water using USGS and PVACD data for USGS Artesian well 331525104245201 located in Chaves County, New Mexico.

Within Eddy County, two wells had been measured by the USGS until late 2011. The two wells are close together in a location south of Artesia. The first of these wells is designated USGS 324620104255101 and is completed at a depth of 246 feet bgs in alluvial, bolson, and other surface deposits (see figure 5). Based on seven measurements in 2011 (partial year), the average depth to water was 137.33 feet bgs which was 3 feet below the 2010 average of 134.64 feet bgs. Water levels in this well vary with season most likely due to irrigation pumping; in 2011 the peak and minimum water levels were lower than that of 2010, indicating that 2011 was drier than 2010 overall. Since 2008, this well has seen a downward trend in its water levels. The last measurement recorded by the USGS for the well was on October 3, 2011.

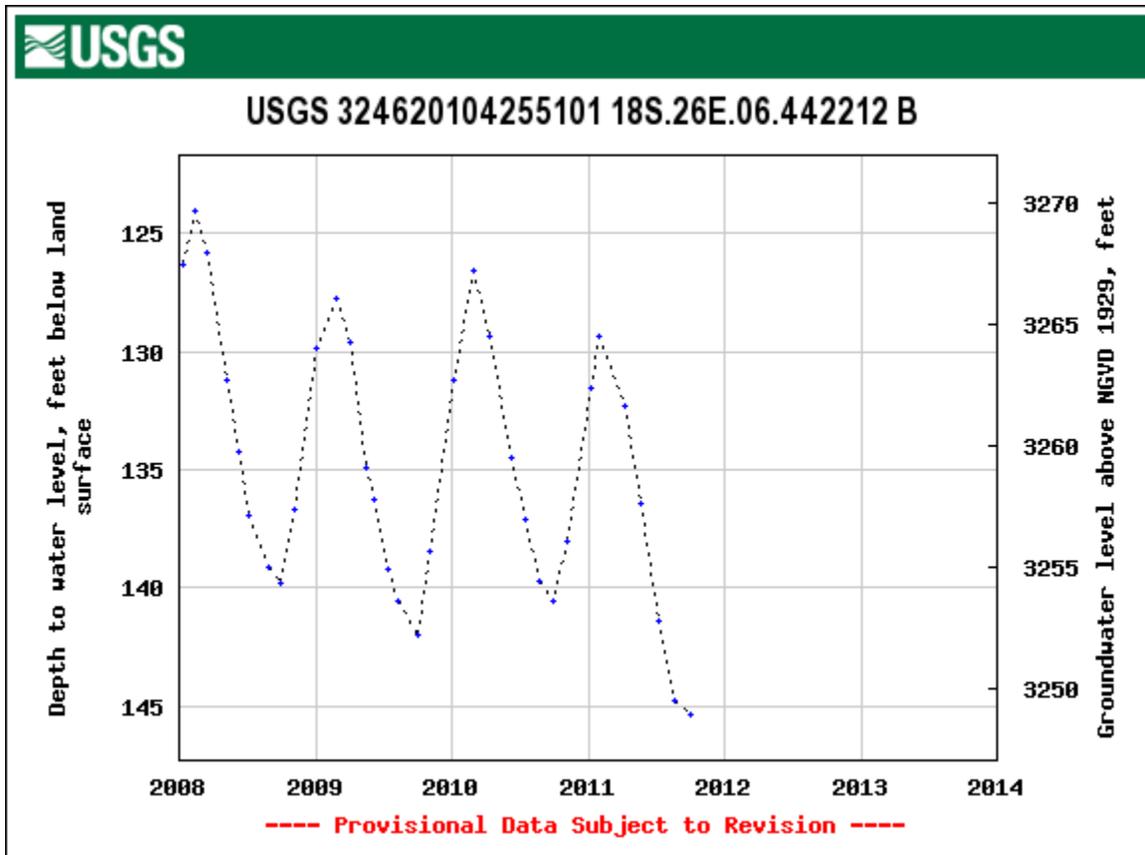


Figure 5. Depth to water for USGS shallow well 324620104255101 located in Eddy County, New Mexico.

The second Eddy County well, designated USGS 324620104255001, is 1,008 feet deep and is completed in the confined aquifer within the San Andres Limestone (see Figure 6). The 2011 Report listed the average depth to water as 124.26 feet bgs. The depth to water was based on seven measurements (partial year ending 8/23/11). Using PVACD data for the entire year, the average depth to water was 137.35 feet bgs. The average depth to water for 2012 was 147.53 feet bgs and for 2013 the average depth to water was 152.24 feet bgs. The last measurement recorded by the USGS for the well was on August 23, 2011. Figure 6b is a plot of the well data extended using data from PVACD.

Confined aquifer water level measurements often show a dramatic response to irrigation pumping; consequently, yearly averages may not be a reliable indicator of aquifer storage. The general trend is for decreasing recovery of water levels during the winter months: 96.25 feet bgs for winter 10/11, 113.34 feet bgs for winter 11/12 and 120.02 feet bgs for winter 12/13.



USGS 324620104255001 18S.26E.06.442221 A

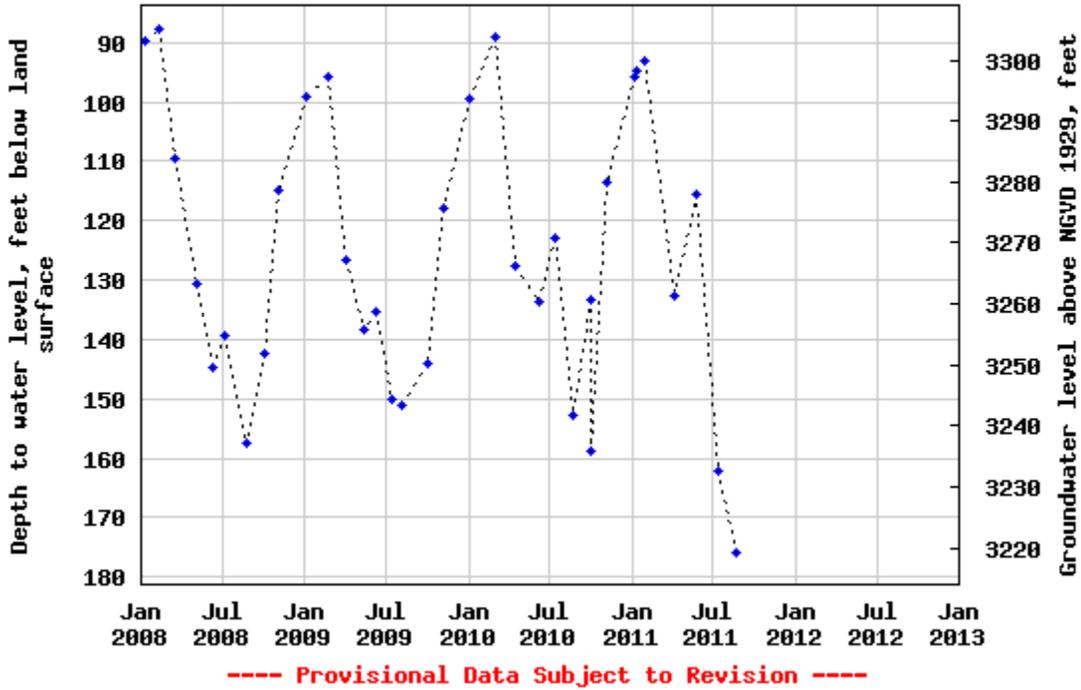


Figure 6. Depth to water for USGS Artesian well 324620104255001 located in Eddy County, New Mexico.

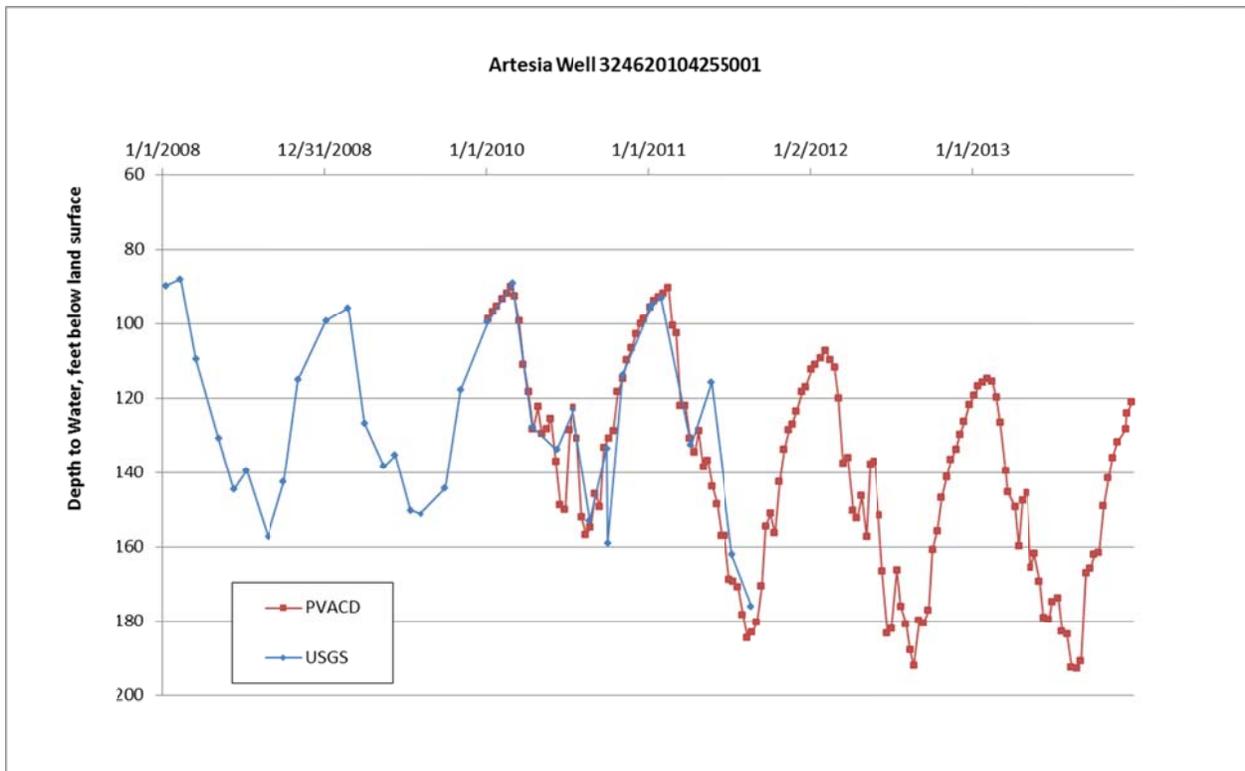


Figure 6b. Depth to water using USGS and PVACD data for USGS Artesian well 324620104255001 located in Eddy County, New Mexico.

Because this water level data set is very small, these measurements may not be representative of aquifer storage conditions throughout the entire basin. There may be areas of the basin in which water levels are rising in response to conservation programs, increased recharge, or other factors and areas where water levels are falling due to proximity to pumping.

The PVACD monitors water levels three times per month in ten wells in the Roswell Basin. The ten well average depth to water has been increasing for the period 2010 to 2013.

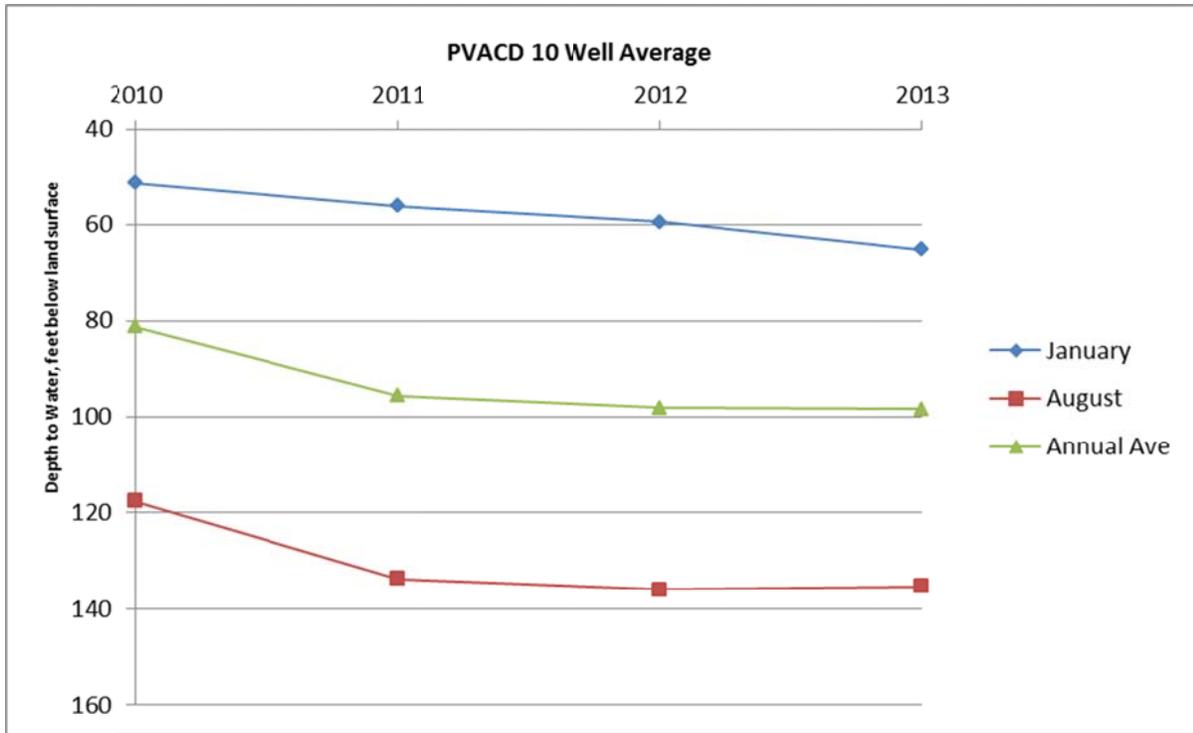


Figure 6c. Depth to Water 10 PCVAD Recorder Well Averages

Base Inflow

Beginning in 1985 and every year since then, the federal river master has determined and published base inflow for the Roswell Basin for the reach of the Pecos River between the Acme and Artesia stream gages. During calendar year 2012, the federal river master reported the base inflow was 12,900 af. This amount was less than that reported for calendar year 2011 when the base inflow was 13,100 af. The yearly base inflow has decreased from 39,300 af in 2005 to 12,900 in 2012. Between the years 1985 and 2012, the average base inflow was approximately 28,800 af.

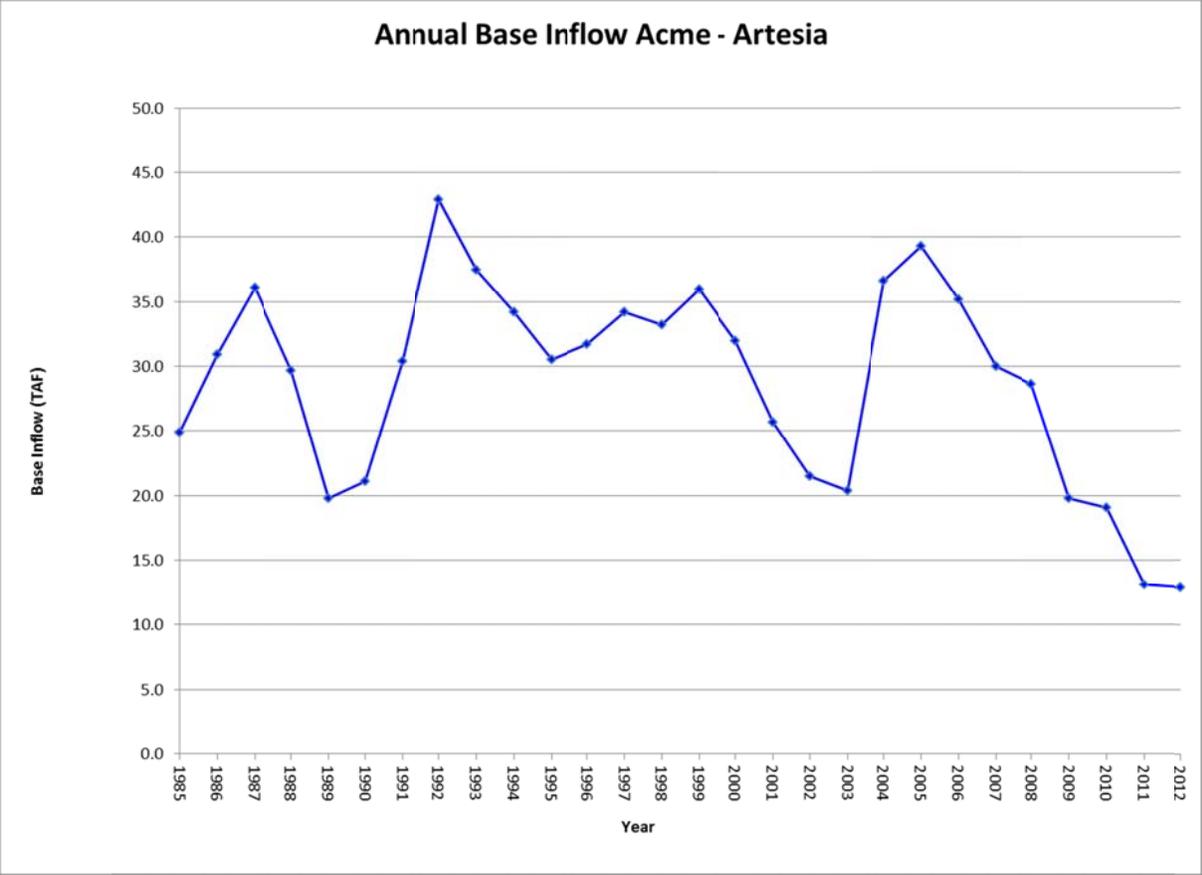


Figure 7. Annual Base Inflow Acme-Artesia

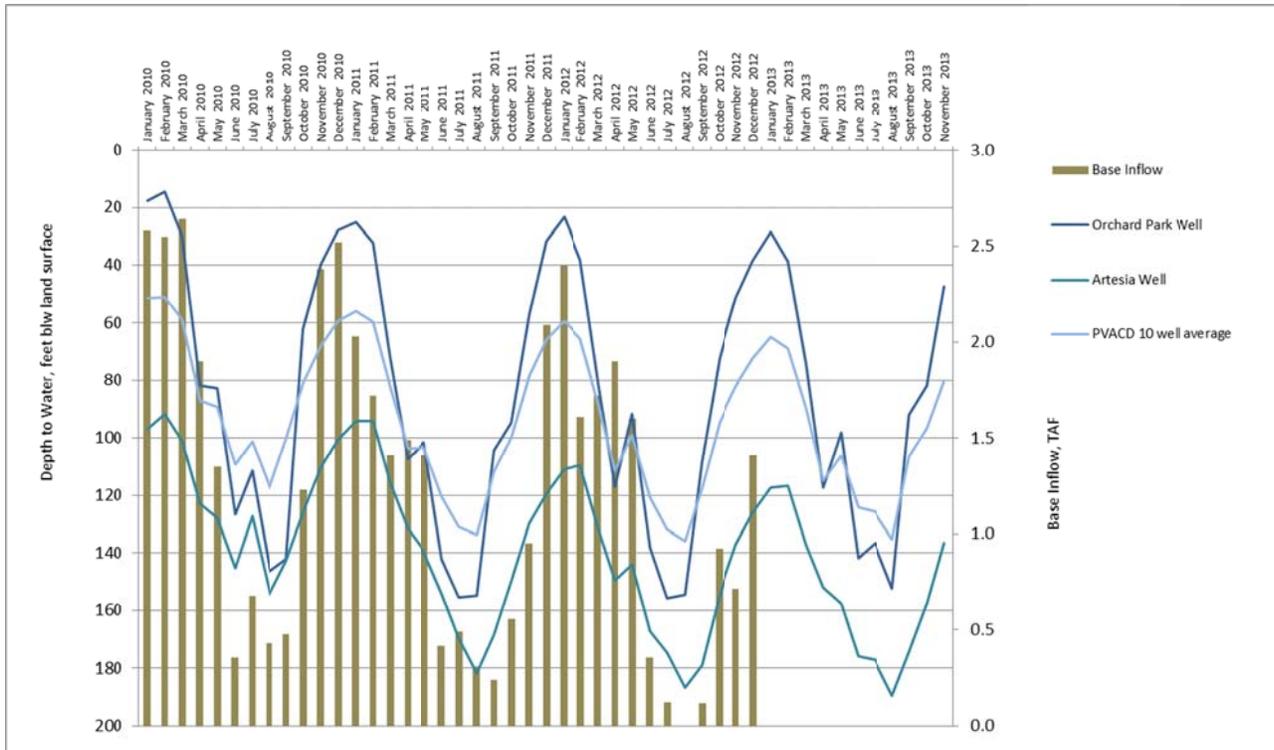


Figure 7b. Plot of monthly averages showing relationship between depth to water in PVACD wells and base inflow Acme – Artesia

The monthly average base flow for the period 2010-2012 has been decreasing. The base flow for July 2012, 0.1 taf, and August 2012, 0.0 taf, is below the average for the period 1950-2012, 1.3 taf, and 1.4 taf.

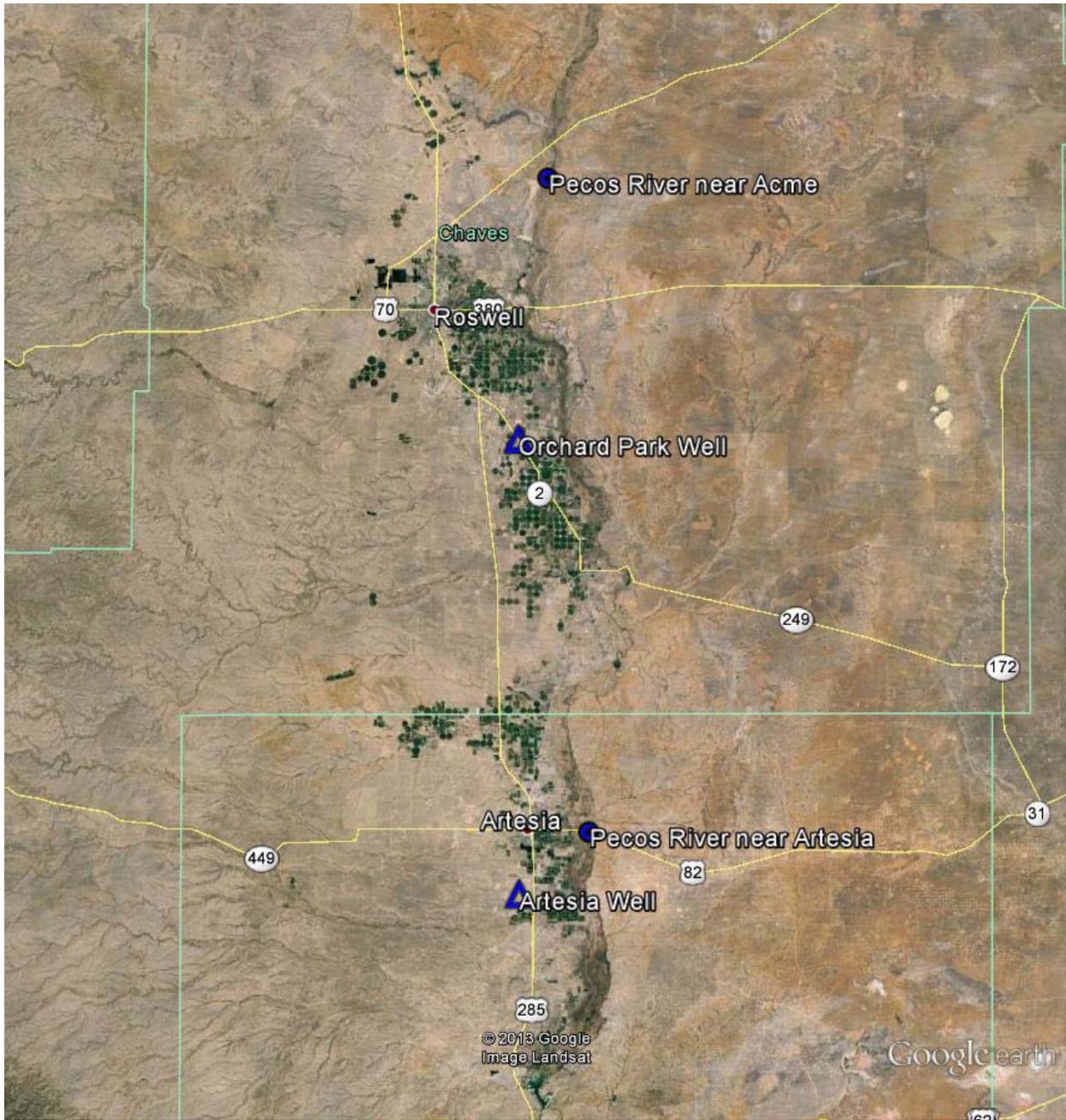


Figure 7c. Location of USGS Stream Gages and PVACD monitoring wells

Indicator 9 – Decreasing Flow Target at Taiban to Conserve Water Supplies Criteria:

Recognizing that keeping the river from intermittency throughout the year is higher priority and more beneficial to the endangered Shiner than always keeping Taiban gage at 35 cfs, Reclamation will drop flows in times of anticipated shortage and coordinate with the Service to conserve supplemental water supply.

Trigger: Consistently high flows at Acme (>10 cfs) gage while Taiban is at the target of 35cfs or lower. This usually occurs during weather events and commonly during non-irrigation months.

Monitoring: Reclamation funds USGS to operate and maintain the gages along the Pecos River. Inoperable gages are reported to the USGS and Reclamation initiates contracted monitoring as necessary to measure gage sites and report all findings immediately. Bureau of Reclamation Albuquerque Area Office Water Operations Group will initiate the need to begin this variance based on their evaluation of the current water situation.

Response: Reclamation will consult with the Service to determine the most prudent water management based on the well-being of the endangered species. If variance from the Taiban target of 35cfs is the most prudent action Reclamation will adjust its operations as such.

Actions taken in CY2012:

A total of 1,550 af was bypassed for ESA related purposes during the non-irrigation season, between January 1 and February 12, at an average rate of 18 cfs. During the irrigation season, which runs from March 1 through October 31, approximately 3,000 af was bypassed during the spring runoff, 1,000 af was released from the Fish Conservation Pool, 2,500 af from the FSID Forbearance Agreement Pool, and 1,800 af from the water exchanged with CID for ESA related purposes. During the non-irrigation season, between November 1 and December 31, 2,730 af of additional CID forborne water was bypassed for ESA related purposes. Additional water for ESA was acquired under a fallowing agreement with FSID and is discussed under the FSID operations section. The section on Reclamation's water offset program discusses the effects of these modified operations on the Carlsbad Project.

Actions taken in CY2013:

A total of 1,732 af was bypassed for ESA related purposes during the non-irrigation season, between January 1 and February 12, at an average rate of 18 cfs. During the irrigation season, which runs from March 1 through October 31, approximately 3,000 af was bypassed during the spring runoff, 1,000 af was released from the Fish Conservation Pool, 2,500 af from the FSID Forbearance Agreement Pool, and 1,000 af from the water exchanged with CID for ESA related purposes. During the non-irrigation season, between November 1 and December 31, 1,972 af of additional CID forborne water was bypassed for ESA related purposes. Additional water for ESA was acquired under a fallowing agreement with FSID and is discussed under the FSID operations section. The section on Reclamation's water offset program discusses the effects of these modified operations on the Carlsbad Project.

Discussion

Actions available to Reclamation include: 1) if bypass water is available, Reclamation will begin bypassing inflow to target 35 cfs at Taiban and/or keep the river continuous. 2) If bypass water is not available and the pipeline is operational and available for use, Reclamation will order the operation of the pipeline at a rate needed to keep the river continuous. 3) If bypass water is unavailable and the pipeline is unavailable or not enough, Reclamation will release Fish Conversation Pool or forbearance water at a rate needed to avoid intermittency. 4) Supplemental water pumpers (water leases) are used.

Recommendations:

Improve Communication/Coordination Improvements to communications between CID, FSID, and Reclamation should be incorporated into 2014 Carlsbad Project water operations. Irrigation districts should provide updates on the progress of repairs and maintenance on facilities critical to water delivery. Reclamation should actively prompt irrigation districts for timely updates or progress reports when maintenance is occurring on facilities that could become critical to Reclamation's operations to benefit the shiner. Specific recommendations include:

- 1 FSID should provide inform Reclamation as soon as possible when they plan to forbear their winter allotment and when the Wilson pump will be turned on.
- 2 CID should increase coordination of block releases with Reclamation to allow for discussion and potential changes to minimize disturbance of Tern nesting and reduce potential for river intermittency.
- 3 Reclamation should give both CID and FSID as much advance notice as possible when there is the potential for changes in water operations to benefit the shiner or Tern.
- 4 Reclamation should actively work towards the most efficient use of the supplemental water to the river and continue to seek new, stable sources of water.
- 5 Reclamation should continue to work with the US Army Corps of Engineers and NMISC to secure storage space and increased flexibility of water storage in Santa Rosa Reservoir.
- 6 Reclamation should work with the irrigation districts to inform their members about the ESA and how it effects then and how their operations are tied to meeting ESA requirements.

No new indicators for 2014 are suggested or indicated.