Pecos River Riparian Monitoring Program

Bureau of Land Management
Roswell Field Office

Data Report 2008

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Table of Contents

Introduction..................................................................................................................................... 1
Methods........................................................................................................................................... 1
Results and Discussion ................................................................................................................... 5
Appendix A
Appendix B
Appendix C

List of Tables

Table 1. Monitoring plots visited in 2008, organized by allotment number................................. 2

List of Figures

Figure 1. Allotments in the Roswell Pecos River Riparian Monitoring Program ......................... 3
Figure 2. Monitoring-plot transect layout......................................................................................4

Cover photo: Allotment 5024 monitoring plot 1-2 looking downstream.
Introduction

The Roswell Field Office of the Bureau of Land Management (BLM) initiated a riparian vegetation monitoring program in 1999\textsuperscript{2} for its grazing allotments within the floodplain corridor of the Pecos River in southeast New Mexico. The intent of this program is to detect long-term trends in riparian plant communities in relation to grazing management practices and vegetation manipulation projects. In addition, the monitoring program is intended to help managers and ranchers effectively implement adaptive management techniques in response to trends indicated by the monitoring data. Beginning in 1999 and continuing through 2000, Natural Heritage New Mexico (NHNM) established a set of 47 high-resolution monitoring plots and reconnaissance surveys to collect the necessary baseline data for the 15 BLM allotments that are directly adjacent to the river. In July of 2008 21 of these plots were revisited and measured to provide data for assessing the impact of recent salt cedar removal treatments. This report provides the sampling methods and data collection locations which accompany the 2008 dataset.

Methods

Twenty-one monitoring plots were revisited in 2008, 15 of which were high-resolution monitoring plots with a pair of vegetation transects, and six of which were less intensive reconnaissance surveys to assess general condition (Table 1). A total of six allotments were visited in 2008, although not all monitoring plots within those six allotments were revisited. The distribution of all allotments sampled in 1999-2000 is shown in Figure 1. In 2008 allotments 4050, 4056, 5007, 5020, 5023, and 5024 were revisited.

In 1999 and 2000 at each monitoring site, two 30-meter-long transects were established parallel to the river, but separated from one another by at least ten meters. Where possible, transects were established parallel to one another to account for variation across the width of the floodplain. No measurements were taken for the first 10 meters on the outermost sides of the transects. Distances between the transects were measured using a one-quarter-millimeter accuracy with a Global Positioning System (GPS) receiver. The data were entered into a database and analyzed using SPSS software.

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\textsuperscript{1} Final report submitted in fulfillment of Bureau of Land Management Agreement GDA 070010-03.
\textsuperscript{2} Milford, E., E. Muldavin, S. Wood, and A. Kennedy. 2001. Pecos River monitoring program Bureau of Land Management, Roswell Field Office. Natural Heritage New Mexico, Biology Department, University of New Mexico, Albuquerque, NM; NHNM Publication No. 01-GTR-206. 118 p.
Table 1. Monitoring plots visited in 2008, organized by allotment number. Site-Plot = monitoring site and plot number; NHNM PlotID = plot identification number in NHNM plot database; Quadrat side = Right- or Left-hand side from 0 rebar looking at transect end/general compass direction.

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<td>Right/W</td>
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<td>3-1</td>
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<td>1999</td>
<td>Right/W</td>
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</tbody>
</table>

* Visited as reconnaissance survey only, due to missing rebar and lack of time for resetting.

stand, but where stands were too narrow, transects were placed end to end with at least two meters between them. The start and end points of each transect were monumented with rebar with a white PVC pipe placed over the rebar to make them more visible (see Appendix A for updated directions to the monitoring plots and Appendix B for exact coordinates of transect end points). Each rebar was tagged with metal tags indicating the site number, transect, and transect position. Each rebar was located with a GPS to within five-meter accuracy.

To measure vegetation, a cloth meter-tape was stretched from the zero-end rebar to the 30-meter end and tied off tautly as close to the ground surface as possible. Beginning at the zero end, one-meter square PVC quadrat frames were positioned along the line at three-meter intervals (Figure 2). Quadrats occurred on either the right or left side of the line from the zero end depending on the plot; which side the quadrats occurred on is indicated in Table 1. There were ten quadrats per line for a total of 20 per monitoring site.
Figure 1. Allotments in the Roswell Pecos River Riparian Monitoring Program (left frame), and relevant USGS 7.5-minute quadrangles (right frame). Allotments 4050, 4056, 5007, 5020, 5023, and 5024 were visited in 2008.
Rebar end posts with PVC pipe covers

1-m quadrats at every 3 meter along tape

Transect is 30m long

Figure 2. Monitoring-plot transect layout.

In each quadrat, canopy cover of all species was evaluated to the nearest percent. For trees and shrubs, the number of stems were counted in each quadrat. In each quadrat the number of stems were counted, using standard size classes for all woody species except Emory’s falsewillow (*Baccharis emoryi*) and southern jimmieweed (*Isocoma pluriflora*).

Litter, rock, gravel, cryptogamic crust, and bare soil cover percentages were measured using the line-point intercept method. This method involves dropping a pin flag perpendicular to the ground at 30 cm intervals along the line and evaluating whether the end of the pin struck bare ground, litter, or live basal area of a grass or forb. The first point is randomly established somewhere in the 0 to 30 cm interval then 50 points are taken down the line. This was repeated twice on each line, for a total of 100 points per line and 200 per plot.

Photo points were established at both ends of the line looking at the transect giving four shots per monitoring plot. Photos were taken with a digital camera and are provided on the compact disk included with this report.

Data collected in the reconnaissance surveys was limited to a species list of common species in representative stands of vegetation, an evaluation of abundance of the dominant species, vegetation type identification and description, landscape features, plot conditions, GPS locations, and documentary photographs.

Vouchers of plant species were taken as necessary and have been archived at the herbarium of the University of New Mexico Museum of Southwest Biology. Special attention was paid during the surveys to locate populations of the puzzle sunflower, *Helianthus paradoxus*, but none were found. A comprehensive species list for the project is given in Appendix C.
The vegetation data was entered into NHNM’s Microsoft Access® ecology database. Over the past decade this database has been developed and populated with over 10,000 plot records from around the state and the Southwest. Accordingly, there is a set of data entry protocols that have been implemented that ensure data quality which includes independently proofreading the data for accuracy. Included on the compact disk with this report are a set of Excel files containing the 2008 data exported from the ecology database, photo point files, and this report.

Results and Discussion

The data collected in 2008 from 21 transects among allotments 4050, 4056, 5007, 5020, 5023, and 5024 is provided as a series of spreadsheet and document files provided on a separate compact disk as follows:

2. MS Excel file: CalculatedGroundCoverPercents2008.xls. Contains summarized percent ground cover values per plot created from the raw point-intercept data.
7. MS Excel file: SummaryPlotFloristicData2008.xls. Contains the complete floristic data for all plots. Cover values contained in this file were created by averaging quad-level data for the monitoring plots, and were estimated directly in the field for the reconnaissance plots.
8. Transect Photographs in jpg format. Each labeled with PlotID to match NHNM PlotID used in the various datasets and provided in the report. There may be more than one photo per PlotID which is followed by a brief description of photo location. More information on each photo, including location, azimuth, photographer and a short description are provided in the data file PhotoLogData2008.xls in the data folder.

Although data analysis is beyond the scope of this report, we feel it is important to report that there was one new noxious weed species of note observed on the transects in 2008. Ravenna grass (Saccharum ravennae) was added as a Class A species to the New Mexico Noxious Weed List in April of 2009. It was observed in 2008 in allotments 5020 and 5024 on the following six plots: 5020 1-1 (99RM006); 5024 1-1 (99RM011); 5024 1-2 (99RM012); 5024 2-1 (99RM013); 5024 2-2 (99RM014); and 5024 3-1 (99RM010).
Appendix A: Updated 2008 Plot Directions.

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<th>Site-Plot, NHNM</th>
<th>Directions</th>
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</thead>
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<td></td>
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<td>1-1 00RM012</td>
<td></td>
<td>From US 285, approx. 7 mi N of US 70, turn E on CR 15 and go approx. 2.5 mi. Turn N on CR 26 (Cottonwood Rd). Continue for approx. 6.75 mi, then turn E on pipeline road towards Pecos R. Go approx. 3.2 mi to road heading S along Pecos. Head S for approx. 0.8 mi and walk E to plot.</td>
</tr>
<tr>
<td>2-1 00RM013</td>
<td></td>
<td>From US 285, approx. 7 mi N of US 70, turn E on CR 15 for approx. 2.5 mi. Then turn N on CR 26 (Cottonwood Rd.) for approx. 6.75 mi; turn E on pipeline road for approx. 2.8 mi. Turn N on road just E of gas pumping station. Continue for approx. 1.2 mi. Take road E towards Pecos R. for approx. 0.8 mi and walk E to plots.</td>
</tr>
<tr>
<td>2-2 00RM014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4056</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-1 99RM017</td>
<td></td>
<td>Take Old Clovis Hwy to crossing over railroad tracks, just S of underpass; cross railroad tracks and go 2.65 mi N on road just E of RR tracks. After 2.65 mi turn E, stay on road as it curves N 0.7 mi from jct, 0.5 mi after curve to N road will fork. Take right fork and follow 0.7 mi to pipeline road, then turn east onto pipeline road and follow out to river's edge.</td>
</tr>
<tr>
<td>2-2 99RM018</td>
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<td></td>
</tr>
<tr>
<td>5007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1 00RM015</td>
<td></td>
<td>From US 285 take US 70 E for approx. 14.5 mi; turn N on Aztec Rd (approx. 3.25 mi W of bridge over Pecos). At approx. 10 mi, road bends to E. After approx.1 mi take road N at fork; after 1 mi take NE road at fork, road will bend N again after approx. 1 mi. Road continues N for 4 mi. Take road E at fork down to river floodplain and park at oil pad. Walk W about 0.5 mi to plot on riverside terrace.</td>
</tr>
<tr>
<td>2-1 00RM017</td>
<td></td>
<td>From US 285 take US 70 E for approx. 14.5 mi; turn N on Aztec Rd (approx. 3.25 mi W of bridge over Pecos). At approx. 10 mi road bends to E. After approx.1 mi take road N at fork; after 1 mi take NE road at fork, road will bend N again after approx. 1 mi. Road continues N for 4 mi. Take road E at fork down to river floodplain and park at oil pad. Walk approximately 1 mi N to plot.</td>
</tr>
<tr>
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<td>1-1 99RM006</td>
<td></td>
<td>Take US 285 approx. 25.5 mi. N of US 70 jct, and turn E onto Cottonwood Rd (CR 26). CR 26 will go straight E for approximately 6.5 mi, then follow main road as it heads N for 0.6 mi, then E for 2 mi then SE for approx. 2.25 mi, and then due E again for 2.75 mi. When main road veers SE, take Roosevelt Rd, a smaller side road off to the NE, follow Roosevelt Rd as it heads due N 1.5 mi, then NE for 0.5 mi. At fork take road to the SE approx. 2 mi to the river's edge. Park and walk S approx. 200 m along riverbank to plot.</td>
</tr>
<tr>
<td>1-2 99RM007</td>
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<td></td>
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</tbody>
</table>
Allotment Number | Site-Plot, NHNM | Directions
--- | --- | ---
5020 - cont. |  | 
2-1 | 99RM008 | Take US 285 approx. 25.5 mi N of US 70 jct, and turn E onto Cottonwood Rd (CR 26). CR 26 will go straight E for approx. 6.5 mi, then follow main road as it heads N for 0.6 mi, then E for 2 mi then SE for approx. 2.25 mi, and then due E again for 2.75 mi. When main road veers SE, take Roosevelt Rd, a smaller side road, off to the NE, follow this road as it heads due N 1.5 mi, then NE for 0.5 mi. At fork take road to the SE approx. 1.75 mi towards the river; at second fork take road to SW approx. 0.75 mi to well pad. Park and walk E approx. 150 m to plot.

3-1 | 99RM009 | Take US 285 to One Horse Rd, take One Horse Rd NE to Cottonwood Rd, then Cottonwood Rd to NE to intersection with Roosevelt Rd. Go E on Roosevelt Rd 1.3 mi to three-way split. Take center road 0.8 mi to well pad. Park and walk approx. 0.2 mi to site.

5023 |  | 
OPP-1 | 00RM009 | From US 285, take One Horse Rd approx. 2.5 mi E, then NE approx. 8 mi. Take Adir Well Rd E approx. 2.7 mi, turn S at fork before the road descends to the floodplain (Adir Well Rd becomes pure sand in floodplain.). Go approx. 0.5 mi, then take E fork approx. 0.5 mi out to floodplain, then N approx. 0.1 mi to oil pad. Park and walk E to river’s edge.

OPP-2 | 00RM010 | From US 285, take One Horse Rd approx. 2.5 mi E, then NE approx. 8 mi. Take Adir Well Rd E approx. 2.7 mi, turn S at fork before the road descends to the floodplain (Adir Well Rd becomes pure sand in floodplain.). Go approx. 0.5 mi, then take E fork approx. 0.5 mi out to floodplain, then N approx. 0.1 mi to oil pad. Park and walk E to terrace just W of river’s edge.

OPP-3 | 00RM011 | From US 285, take One Horse Rd approx. 2.5 mi E, then NE approx. 8 mi. Take Adir Well Rd E approx. 2.7 mi, turn S at fork before the road descends to the floodplain (Adir Well Rd becomes pure sand in floodplain.). Go approx. 0.5 mi, then take E fork approx. 0.5 mi out to floodplain, then N approx. 0.1 mi to oil pad. Park and walk E to middle of old floodplain.

OPP-4 | 00RM027 | From US 285, take One Horse Rd approx. 2.5 mi E, then NE approx. 8 mi. Take Adir Well Rd E approx. 2.7 mi, turn S at fork before the road descends to the floodplain (Adir Well Rd becomes pure sand in floodplain.). Go approx. 0.5 mi, then take E fork approx. 0.5 mi out to floodplain, then N approx. 0.1 mi to oil pad. Park and walk E onto floodplain.

OPP-5 | 00RM028 | From US 285, take One Horse Rd approx. 2.5 mi E, then NE approx. 8 mi. Take Adir Well Rd E approx. 2.7 mi, turn S at fork before the road descends to the floodplain (Adir Well Rd becomes pure sand in floodplain.). Go approx. 0.5 mi, then take E fork approx. 0.5 mi out to floodplain, then N approx. 0.1 mi to oil pad. Park and walk E to edge of floodplain.
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<th>Allotment Number</th>
<th>Directions</th>
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From US 285 take US 70 E for approx. 14.5 mi; turn N on Aztec road (approx. 3.25 mi W of bridge over Pecos). Approx. 2 mi N is jct with oil pipeline road. Take pipeline road NE for approx. 2.25 mi to river's edge. Park and walk S along riverbank to plot.
Appendix B: Location of monitoring-plot transect-line endpoints and reconnaissance survey plots, grouped by allotment. Coordinates are in UTM (Universal Transverse Mercator) NAD-27, zone 13.

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### Appendix C: Plant species list for Pecos River Riparian Monitoring Program

Origin refers to native (N) or introduced (I) species. NHNM Acronym is the Natural Heritage New Mexico codes used in the associated database. NRCS Plants Symbol is the symbol used in the NRCS Plants Database.

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<tr>
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<td>Indian rushpea</td>
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<tr>
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<td>pale eveningprimrose</td>
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<td>golden crownbeard</td>
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<td>rough cocklebur</td>
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