

Chapter 2. Alternatives, Including the Proposed Action

2.1 Introduction

This chapter describes the two alternatives analyzed in this EA. Alternative A is the no action alternative. Alternative B is the proposed action. Following the alternative descriptions section, the decision making process for advancing or eliminating alternatives is described.

2.2 Description of the Alternatives

2.2.1 Alternative A: No Action

Under this alternative the proposed action would not be constructed and no other measures, except routine operations and maintenance (O & M), would be taken to prevent erosion at the project area. Other ongoing O & M activities in the area generally consist of mowing the vegetation along the bankline slopes of the canals and levee, and maintaining the condition of the access roads.

2.2.2 Alternative B: Proposed Action

Reclamation proposes to reconstruct the east river bank and realign the existing river channel at the project area. The proposed project design involves splitting the existing river flow into a main channel and a network of secondary channels and installing a series of bendway weirs and other river bank stabilization treatments as shown in Figure 2. The benefit of using bendway weirs is that they provide additional bank stability and reliability during high flows, which would protect the east river bank against erosion. Another benefit of bendway weirs is that, once installed, they should require only minimal maintenance. Installation of rootwad revetments, debris piles, and deformable banklines would be used in combination with the bendway weirs to increase the complexity of the river bank and provide low-velocity zones with structure and cover near the river bank, thereby benefiting aquatic life in the project area. Bar and floodplain surfaces would be designed to improve connectivity with the river and allow for natural recruitment of cottonwood and willow species. Additionally, the infrequently inundated terrace surfaces between the levee and the Rio Grande would be recontoured and planted with native vegetation. A Rio Grande silvery minnow habitat feature would be constructed in the project area to benefit this native aquatic species. The total area of disturbance would be approximately 40.2 acres. Construction would take approximately 6 to 8 months to complete.

Construction access to the project area from the west side would be via the north side levee along the Arroyo Venada, located immediately north of the project area (see Figure 1). Construction access from the east side would be via the east levee access point on the southeast corner of the Highway 550 bridge located approximately 1.0 mile northeast of the project area (see Figure 1). Staging areas would be located within the project area (e.g., island location) and at the northeast access location adjacent to the Highway 550 bridge, if necessary. Some limited clearing of vegetation may be needed at construction access locations but is not anticipated. If needed, these areas would be reclaimed and rehabilitated to pre-project conditions as necessary.

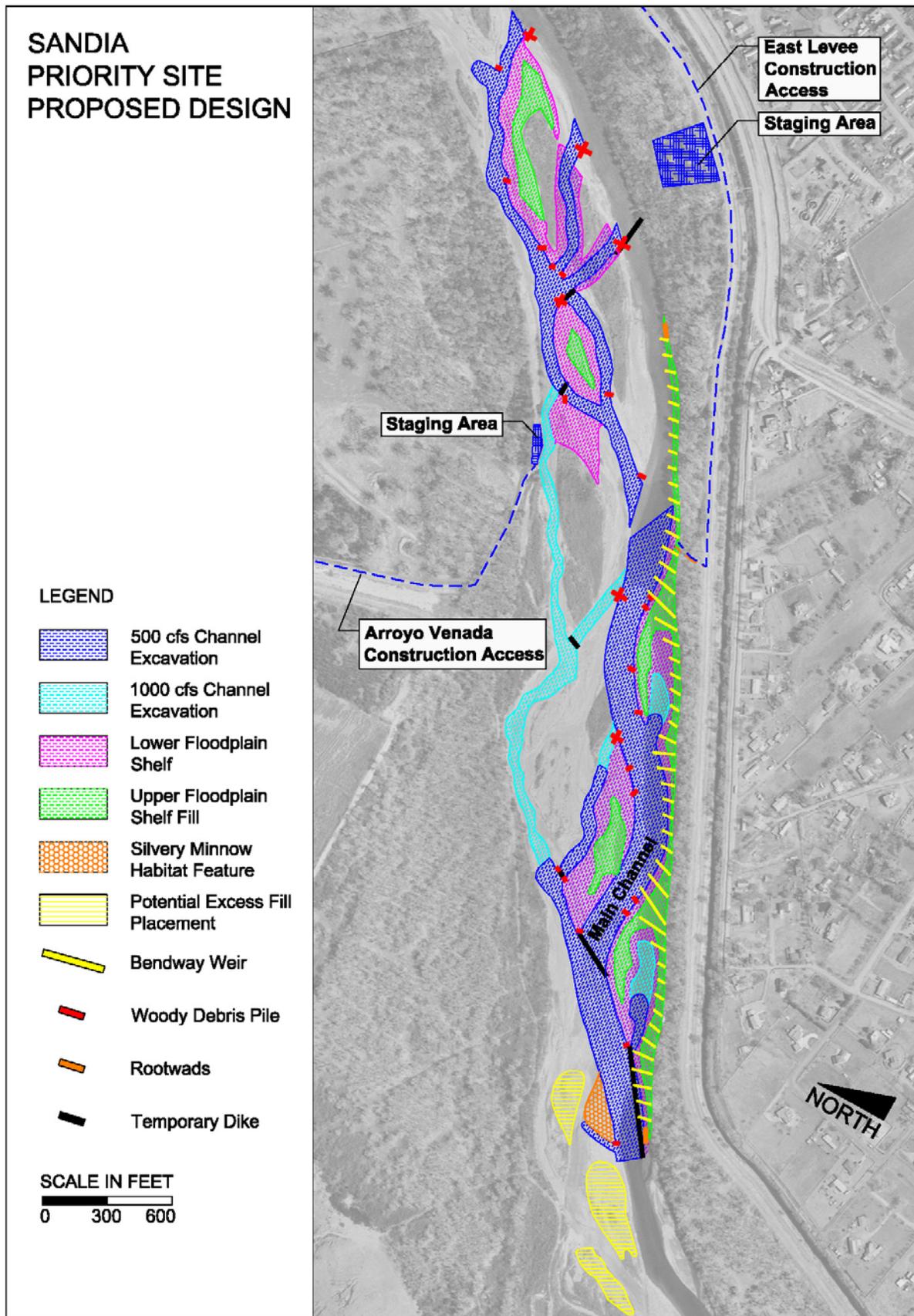


Figure 2. Aerial view of the project area showing proposed design features.

To reduce invasion of undesirable plants and enhance wildlife habitat, all disturbed areas would be planted and seeded with native vegetation. A minimum of 37 poles of Rio Grande cottonwood (*Populus deltoids* var. *wislizenii*) and 47 poles of Goodding's willow (*Salix gooddingii*) would be planted, along with 2,939 coyote willow (*Salix exigua*) poles. In addition, 223 false indigo (*Amorpha fruticosa*), 296 false willow (*Baccharis salicina*), and 339 New Mexico olive (*Forestiera pubescens*) containerized plants would be planted. All Rio Grande cottonwood and Goodding's willow pole plantings would be temporarily surrounded with a 4-foot-tall and 4-foot-diameter wire cage to prevent beaver damage. In addition, all containerized plantings would include a watering tube made of plastic pipe to facilitate deep watering of these plants.

All disturbed areas would be seeded with a native grass and wildflower seed mix. Planting and seeding would occur during appropriate seasons for plant germination and survival, as determined by Reclamation biologists in cooperation with the Pueblo of Sandia. Existing cottonwood trees, alive or standing dead, would be protected during construction. All existing non-native specimens would be removed from the project area as part of construction. Final numbers and species of plants and long-term monitoring of planted and seeded areas would be determined in cooperation with the Pueblo of Sandia. Table 1 presents the estimated construction quantities for the proposed action.

Table 1. Estimated construction quantities for the project area.

DESCRIPTION	UNIT	QUANTITY
Clear and grub	Acre	40 – 46
Excavation and embankment	Cubic yard	80,000 – 120,000
Riprap	Cubic yard	2,500 – 2,600
Mid-channel bar woody debris pile	Each	6
Side bar woody debris pile	Each	21
Rootwads	Each	20 – 30
Broadcast seeding	Pounds	80 – 90
Cellulose fiber mulch	Pounds	12,000 – 13,000
Tackifier A (or tackifier B instead)	Pounds	240 – 250
Tackifier B (or tackifier A instead)	Pounds	920 – 930
Rio Grande cottonwood (<i>Populus deltoides</i> var. <i>wislizenii</i>) pole	Each	35 – 40
Goodding's willow (<i>Salix gooddingii</i>) pole	Each	45 – 50
Coyote willow (<i>Salix exigua</i>) pole	Each	2,900 – 3,000
False indigo (<i>Amorpha fruticosa</i>) 1 gallon	Each	200 – 250
False willow (<i>Baccharis salicina</i>) 1 gallon	Each	250 – 300
New Mexico olive (<i>Forestiera pubescens</i>) 1 gallon	Each	300 – 350

2.3 Alternatives Considered but Eliminated from Further Study

A number of alternatives for protecting riverside facilities at the project area were considered to meet the purpose and need of the project (BIO-WEST 2005). During the alternative selection process, five substantially different alternatives were evaluated by Reclamation staff, though some of these alternatives had two or more options that are simply expanded versions of the original alternative. It was determined that all of these alternatives were feasible based on construction techniques only.

A meeting was held with Reclamation staff to help facilitate selection of the proposed action. Each staff member provided input related to his or her field of expertise. Construction costs, riparian-wetlands creation, southwestern willow flycatcher habitat value, Rio Grand silvery minnow habitat value, reliability and future maintenance needs, lands interest, cultural resources, and NEPA/404 permitting were discussed as some of the criteria for evaluating each of these alternatives. Table 2 provides some of the comparative information Reclamation used to help select a proposed action at the Sandia Priority Site.

None of the alternatives was excluded or changed based on cultural resources. Each of the alternatives had varying requirements of environmental compliance and potential future maintenance needs. Alternative 1.1 was eliminated because of its lack of benefits to threatened or endangered species habitat and because it was not likely to be approved by permitting agencies as proposed. The large-scale realignment alternatives (i.e., Alternatives 5.1 and 5.2) were also eliminated because they had unreasonable construction costs. Alternatives 2.1, 2.2, 3.1, and 3.2 were eliminated because of their lack of benefits gained as compared with their respective construction costs (e.g., >\$2,500,000). Alternative 4.1 was eliminated because of its lack of benefits and poor design life reliability (e.g., 10 to 15 years).

Alternatives 4.2, 4.3, 4.4, and 4.5 were advanced for further study and decision-making purposes within Reclamation. When comparing these alternatives in terms of total costs per acre of riparian-wetland created, the approximate results are as follows: Alternative 4.2 = \$156,906/acre, Alternative 4.3 = \$126,946/acre, Alternative 4.4 = \$90,752/acre, and Alternative 4.5 = \$84,847/acre. Alternatives 4.2 and 4.3 were eliminated because of their lack of benefits to threatened or endangered species compared with their costs (e.g., costs versus benefits). Although Alternatives 4.4 and 4.5 have similar costs on a per-acre basis, Alternative 4.5 does provide more channel capacity, and therefore more design life reliability, than the other alternatives advanced for further study. Alternative 4.5 also has the least cost on a per-acre basis and the greatest amount of wetland habitat created than other alternatives advanced for further study.

Based on the considerations presented in this section, the preferred alternative was identified as the Extended Variable Length Bendway Weirs with Habitat Creation alternative (Alternative 4.5). Under this alternative the existing riverine habitat is expected to improve and benefit listed species, and Reclamation would not need to acquire any adjacent land. In terms of the permitting process, the preferred alternative was considered one of the simplest alternatives for NEPA/ESA compliance and 404 permitting. Because this alternative did not disturb existing habitat for endangered species, environmental compliance would be easier and allow for timely

Table 2. Summary of alternatives considered and evaluated by Reclamation.

ALTERNATIVES CONSIDERED	CON- STRUCTION COSTS	RIPARIAN- WETLANDS CREATED (ACRES)	SOUTH- WESTERN WILLOW FLYCATCHER HABITAT VALUE (H, M, L) ^a	RIO GRANDE SILVERY MINNOW HABITAT VALUE (H, M, L)	DESIGN LIFE/ RELIABILITY (YEARS/CUBIC FEET PER SECOND)
1.1 Riprap Armoring	\$795,168	4.26	L	L	< 10 years / 5,000 cfs
2.1 Channel Realignment	\$2,439,030	12.56	L/M	L/M	> 20 years / 5,000 cfs
2.2 Channel Realignment	\$2,502,330	13.08	L/M	M/H	> 20 years / 5,000 cfs
3.1 Channel Realignment with Deformable Banks	\$2,754,030	12.56	M	L/M	> 20 years / 5,000 cfs
3.2 Channel Realignment with Deformable Banks	\$2,794,260	13.08	M	H	> 20 years / 5,000 cfs
4.1 Uniform Length Straight Bendway Weirs	\$179,720	1.91	L/M	M/H	10-15 years / 5,000 cfs
4.2 Variable Length Bendway Weirs	\$1,018,320	6.49	L/M	H	> 20 years / 5,000 cfs
4.3 Uniform Length Meandering Bendway Weirs	\$930,520	7.33	M	H	> 20 years / 5,000 cfs
4.4 Variable Length Meandering Bendway Weirs with Habitat Creation	\$979,215	10.79	H	H	> 20 years / 5,000 cfs
4.5 Extended Variable Length Meandering Bendway Weirs with Habitat Creation	\$1,371,120	16.16	H	H	> 20 years / 5,000 cfs
5.1 Bendway Weirs with Channel Widen/Realign	\$3,615,925	34.84	H	H	> 20 years / 5,000 cfs
5.2 Bendway Weirs with Channel Widen/Realign	\$3,615,925	34.84	H	H	> 20 years / 5,000 cfs

^a H, M, L = High, Medium, Low.

completion of construction permits. The preferred alternative was affordable in terms of construction costs (e.g., <\$1,500,000) and would not require major maintenance needs for at least 20 years, as opposed to some of the other alternatives that could require maintenance work in as little as 10 years. In short, the preferred alternative provides a long-term fix for erosion problems at the project area and provides enhanced fish and wildlife habitats, while at the same time allowing the permitting and compliance process to be smoother and less time consuming.

2.4 Other Planned Projects in the Area

Another similar project is being investigated at this time by Reclamation for the Bernalillo Priority Site located 0.5 mile upstream of the project area. Reclamation has identified the split flow with bendway weirs method as the preferred action to address similar problems at that site through a decision-making process similar to the one described for the project area. Realignment

of the Rio Grande and reconstruction of the east stream bank would be very similar to the proposed action in this EA. The effects of such an activity would be expected to be very similar in nature to those described in Chapter 4 of this document. Reclamation is pursuing a separate NEPA process for the Bernalillo Priority Site because it is a smaller project and does not involve Native American Indian Trust lands.

Another project is being undertaken by the Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA) at the mouth of Arroyo Venada and involves construction of approximately 600 feet of earthen berm, 1 to 3 feet in height, as a water quality treatment pond near the river. A separate environmental permitting process for this project is being pursued by SSCAFCA.

2.5 Environmental Issues Addressed by the Proposed Action

The following issues correspond to those identified in Section 1.5. These issues are discussed in greater detail in Chapters 3 and 4 of this EA.

- No southwestern willow flycatchers were detected during surveys. Clearing and grubbing operations would occur in the winter months before nesting season begins. Monitoring protocols for wintering bald eagles, as described in Chapter 4, would be implemented during construction. Rio Grande silvery minnow may be found in the project area. However, the construction techniques used in the proposed action are designed to minimize contact with the Rio Grande silvery minnow and the potential for harm or harassment. There would be no destruction of or adverse modification to the Rio Grande silvery minnow's designated critical habitat. Reclamation would continue to coordinate with the Service on whether Rio Grande silvery minnow should be transported away from the project area.
- Any existing trees or shrubs removed at the beginning of construction would be replaced by a minimum of 37 poles of Rio Grande cottonwood and 47 poles of Goodding's willow, along with 2,939 coyote willow poles. In addition, 223 false indigo, 296 false willow, and 339 New Mexico olive containerized plants would be planted. These new trees and shrubs would be spaced irregularly throughout the project area in appropriate locations to improve their potential for survival and create a more natural condition. All pole plantings would be caged to prevent beaver damage. In addition, all containerized plantings would include a watering tube made of plastic pipe to facilitate deep watering of these plants. Final numbers of plants and species, as well as long-term monitoring of planted and seeded areas, would be determined in cooperation with the Pueblo of Sandia.
- Native grasses and wildflowers would be seeded in areas disturbed by construction to re-establish vegetation. Only the amount of the proposed staging and stockpiling areas needed would be used or disturbed. Upon completion of stabilization activities, all work areas would be cleaned up and all materials and equipment removed. The areas would be reseeded as discussed in Section 2.3. The re-establishment of vegetation would be monitored and irrigation water would be brought in by truck, if necessary, to ensure the successful establishment of planted and seeded areas. The introduction of State-listed noxious weeds would be avoided to the extent possible by using equipment that has been

thoroughly pressure washed prior to arrival at the project area. The reseeding activities would contribute to a more rapid establishment of native species, thus minimizing the opportunity for noxious weeds on disturbed ground. Long-term monitoring of planted and seeded areas would be determined in cooperation with the Pueblo of Sandia.

- Standard Best Management Practices (BMPs) would be used to manage water runoff during construction activities to prevent rainstorm runoff from causing an unnaturally high level of sediment loading in the river. The contractor would utilize straw bales and silt fences placed at strategic locations to manage water runoff in the construction areas.
- Dust generated by earth-moving equipment would be suppressed daily by watering disturbed areas.
- Because the project is located in the original meandering path of the Rio Grande and in the construction zone for the east levee and canal system, any cultural or archaeological artifacts that might have once existed in the project area have a very low probability of remaining.
- The project area is located on tribal lands within the Pueblo of Sandia. No additional ITAs were identified in the project area.
- The project would not have any effect on low-income or minority populations. The project is in compliance with Executive Order 12898.
- Effective revegetation and burying of much of the proposed bendway weirs would minimize effects to visual resources as a result of construction activities.

2.6 Environmental Commitments

- Clearing and grubbing activities would occur prior to the nesting season (approximately April 1 through September 1) for migrant birds, including the southwestern willow flycatcher.
- Should a bald eagle be observed within 0.25 mile upstream or downstream of the active project area in the morning before project construction activity starts or following breaks in project construction activity, the construction crew would be required to suspend all activity until the bird leaves of its own volition or the Reclamation biologist, in consultation with the Service, determines that the potential for harassment is minimal. However, if a bald eagle arrives during project construction activities or is observed beyond the specified distance, construction would not need to be interrupted. If bald eagles are found consistently in the immediate project area during the construction period, Reclamation would contact the Service to determine whether formal consultation under the ESA is necessary.
- Fish barriers (i.e., temporary earthen berms) would be installed to prevent Rio Grande silvery minnow from moving into the active construction area of the main river channel. Management of a refugial pool area within the construction zone that provides sufficient

depth and area for Rio Grande silvery minnow to avoid construction equipment and activities would be implemented during construction. Reclamation would coordinate site visits with the Service to evaluate the refugial pool management during construction activities and would continue to coordinate with the Service on whether Rio Grande silvery minnow should be transported away from the project area. Reclamation would coordinate with the Service to have biologist(s) on site to rescue fish stranded in off-channel and in-channel pools as a result of construction activities during removal of the temporary earthen berms.

- Any existing trees or shrubs removed at the beginning of construction would be replaced by a minimum of 37 poles of Rio Grande cottonwood and 47 poles of Goodding's willow, along with 2,939 coyote willow poles. In addition, 223 false indigo, 296 false willow, and 339 New Mexico olive containerized plants would be planted. These new trees and shrubs would be spaced irregularly throughout the project area in appropriate locations to improve their potential for survival and create a more natural condition. All pole plantings would be caged to prevent beaver damage. In addition, all containerized plantings would include a watering tube made of plastic pipe to facilitate deep watering of these plants. Final numbers and species of plants and long-term monitoring of planted areas would be determined in cooperation with the Pueblo of Sandia.
- Native grasses and wildflowers would be seeded in areas disturbed by construction to re-establish vegetation. Only the amount of the proposed staging and stockpiling areas needed would be used or disturbed. Upon completion of stabilization activities, all work areas would be cleaned up and all materials and equipment removed. The areas would be reseeded as discussed in Section 2.3. The re-establishment of vegetation would be monitored and irrigation water would be brought in by truck, if necessary, to ensure the successful establishment of seeded areas. Final numbers and species of plants, as well as long-term monitoring of seeded areas, would be determined in cooperation with the Pueblo of Sandia.
- To minimize the potential for the establishment of State-listed and other noxious weeds, an aggressive revegetation plan would be implemented. Reclamation would monitor the project area following construction (3 to 5 years) for noxious weeds and treat them as necessary.
- In addition to reseeding and planting, the introduction of noxious weed seeds would be minimized by requiring that all project equipment be pressure washed before arriving and leaving the project area.
- To minimize soil erosion and increased turbidity in the Rio Grande during rain storms, standard construction BMPs would be used to minimize runoff during construction.
- Fugitive dust would be suppressed by spreading water over disturbed areas where heavy equipment is working during dry conditions.
- Reclamation would follow CWA Sections 401, 402, and 404 Permit requirements.