CHAPTER 2. EXISTING CONDITIONS IN THE MA

2.1 Hydrology

The MA is located in the eastern Colorado Plateau semidesert province. The La Plata River originates in the La Plata Mountains about 25 miles northwest of Durango, Colorado, and generally flows southward to its confluence with the San Juan River near Farmington, New Mexico. Average precipitation for the MA is about 10-12 inches a year. The hydrologic characteristics of the La Plata River have a major influence on the presence of riparian plant communities along the river corridor. Because of the river, the floor of the valley bottomland has a moist environment capable of supporting riparian plant communities, whereas the adjacent tablelands, in the absence of irrigation water, can support only semiarid plant communities. River flows and, currently, irrigation return flows recharge the alluvial water table and seasonally inundate the floodplain, creating sediment deposits that provide nursery habitat for the recruitment of riparian plants.

Flow in the La Plata River is characteristic of many western rivers that have watersheds containing both semiarid plains and high mountain headwaters. The average hydrograph typically crests during springtime melting of the mountain area snowpack. For over 100 years, irrigation diversions have influenced the hydrograph by lowering the peak of high flows and reducing the river flows throughout the irrigation season in some reaches but enhancing flows in other reaches due to irrigation return flows. Because of the highly variable and inconstant nature of the La Plata River, using average streamflow data from the USGS gauges at Hesperus and the CO-NM state line is misleading. Flows in some years are extremely low, and in others extremely high, or are flashy in the rainy seasons with very high but brief flows which will not show up on the averaged or even daily hydrograph.

Streamflow is typically very low from mid-summer until the end of the irrigation season. Rainfall-induced floods that originate as overland runoff in the watershed's lowlands may occur from July through October. These flood events have high peak-discharge flows but are short-lived, with the entire flood event lasting less than one or two days, or just a few hours. Late-summer floods typically have higher instantaneous peak flows than do spring snowmelt floods. High flow conditions on the La Plata River produce large suspended sediment loads and turbid water.

Within the MA, the La Plata River has perennial flow in some very limited segments above its confluence with Long Hollow primarily due to groundwater return flows from irrigated lands located east of the La Plata River. Summer flows within the MA are very low and may disappear, particularly in dry years, in sections of the La Plata River between Cherry Creek and Long Hollow. The river below Long Hollow is typically perennial due to the presence of irrigation return flows in Long Hollow.

River flow and irrigation return flow are indicators of depth-to-groundwater in the La Plata River valley's alluvial bottom land. Increased returns of surface and groundwater to the La Plata River are indications of a higher groundwater level under the irrigated lands. The shallow water table

within the river's zone-of-influence provides a source of moisture for water-loving (phreatophytic) species associated with riparian plant communities. The zone-of-influence is defined as that area within the river valley that is influenced by the river's hydrology; both surface water and ground water. The zone-of-influence can support riparian plant communities that are dependent on the hydrology and geomorphic processes of the river.

As described below, the La Plata River valley has four distinct alluvial surfaces that were formed by the geomorphic processes of the river. These surfaces have differing capabilities for supporting riparian vegetation because of varying flood frequencies and the depth to the underlying water table.

2.2 Soils/Geomorphology

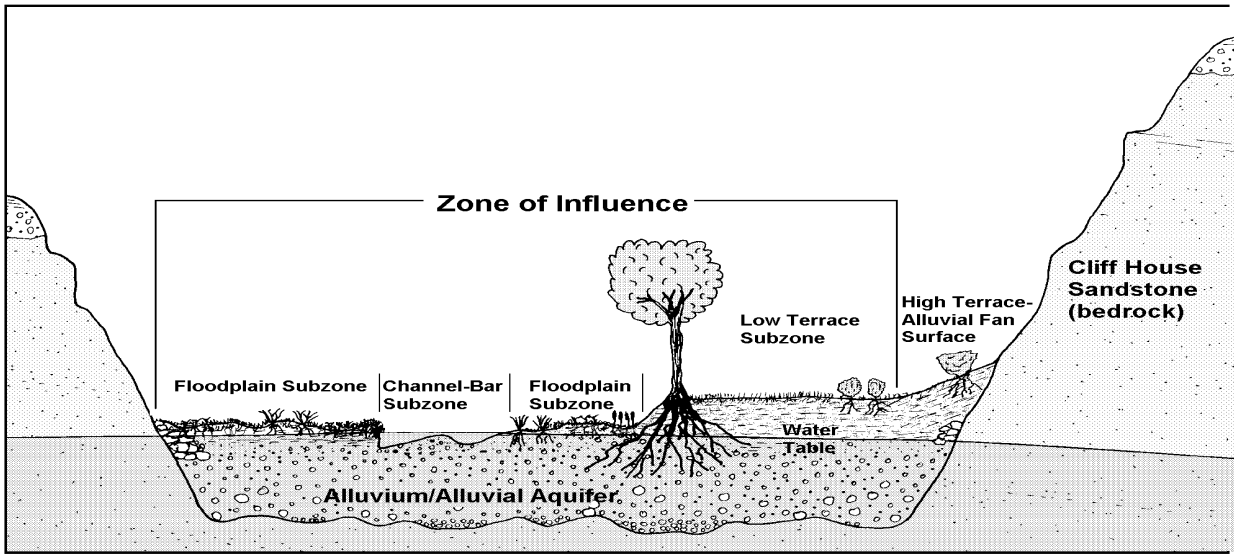
The La Plata River valley floor in the MA ranges from approximately 500 to 1,000 feet in width. The river channel averages about 30 feet in width, but varies dramatically in character from a meandering, single-thread channel to a wide, braided channel. Between the valley walls, the valley floor consists of several relatively flat surfaces underlain by alluvial sedimentary units that have been deposited by the river and its tributaries. These sedimentary deposits and their associated fluvial geomorphic surfaces provide the physical substrate for the presence of riparian plant communities of the valley floor.

Within the MA, four alluvial surfaces are present: 1) the channel-bar subzone, 2) the floodplain subzone, 3) the low terrace subzone, and 4) the high terrace-alluvial fan surface (Figure 5). Only the first three of these are within the river's zone-of-influence. The area of most active fluvial processes is the channel-bar subzone. This area incorporates the river channel and includes recently deposited sediment on either one or both riverbanks. The soils are typically poorly developed pebbly sands and contain little organic matter. This area is subject to seasonal flooding and is prone to rapid erosion, especially along unvegetated portions of riverbanks that lack stabilizing rootmasses. The floodplain subzone is located about 2-feet above the channel-bar subzone. This is a predominantly depositional environment, with clays, silts, and sands deposited from suspension during flooding. Soils are finer grained than on the channel-bar surface, but still may be quite pebbly in places. This area is subject to frequent flooding during certain times of the year (an example is the monsoon season) and is also prone to rapid erosion, particularly if vegetation has been removed. Most of the existing riparian vegetation within the MA is found on the channel bar and floodplain subzones.

Located 3- to 6-feet above floodplain level is the low terrace surface. This fluvial surface was the floodplain prior to turn-of-the century channel incision that created the current floodplain. Much of this surface is composed of loamy soils. In certain locations, the low terrace surface supports mature cottonwood and box elder stands that were established when this was the active floodplain. The tap roots of these mature stands are connected to the underlying water table, but the understories are usually composed of upland species due to the lack of near-surface groundwater. The high terrace-alluvial fan surface is situated more than 6-feet above the floodplain level. It is relatively unaffected by the present-day river process and hydrology. Riparian areas found on the high terrace are associated with tributary drainages and seeps that

collect irrigation return flows from adjacent tablelands.

Figure 5. Cross-section of the La Plata River Valley.



2.3 Riparian Plant Communities

Based on the 2001 inventory studies completed by Frontier, a total of approximately 234 acres of wetland/riparian habitat occurs within the ranch parcels (Table 2), with nearly all of this acreage occurring within the river's zone-of-influence. These 234 riparian acres will be the base to mitigate for the loss of 134 acres of wetland/riparian habitat within Ridges Basin and along Basin Creek in excess of the 1.5: 1 ratio committed to in the FSEIS and the ROD.

Four broad types of wetland/riparian habitats were identified: a) riverine, along with three palustrine types: b) riparian forest/scrub-shrub, c) riparian meadow, and d) emergent wetlands. Nearly all of the wetland/riparian habitats occur within the river's zone-of-influence. Emergent wetlands comprise a very small amount of habitat acreage and are found only in Tract II (North) and Tract III of the Huntington Ranch (Table 2). These emergent wetlands are dominated by bulrush, cattail, and sedges and are generally found in areas that are perennially wet, such as old meander scars that collect irrigation return flows or seeps along the valley wall on the high terrace.

Riparian forest/scrub-shrub is the most abundant habitat and is commonly found on both channel bar and floodplain terraces. In its native condition, it is dominated by cottonwood trees and willows with an herbaceous understory of riparian grasses. The functional condition of this habitat is dependent on the presence of a multilayered canopy with structural components in the tree, shrub and herbaceous stratum and the absence of non-native plants such as tamarisk and Russian olive. Riparian meadow occurs mostly on the floodplain terrace. In its native condition, riparian meadow is dominated by riparian grasses, sedges, rushes, and wildflowers. The

functional condition of this habitat is affected greatly by the removal of vegetation by livestock grazing, and the presence of non-native plants such as thistle, chicory, leafy spurge, cheatgrass and knapweed.

Table 2. Acreage of Habitats Delineated Within the Riparian and Upland Buffer Portion of the MA.

Habitat	Riparian Acres			
	Tract III	**Tract II (North)**	**Tract II (Main)**	**Totals:**
RFS-H-Type 1	0.9	0	2.7	3.6
RFS-M-Type 2	29.4	9.6	31.2	70.2
RFS-L-Type3	38	4.8	24.1	66.9
RM-H-Type 1	2.9	0	0	2.9
RM-M-Type 2	26.4	10	0.5	36.9
RM-L-Type 3	25	0.6	11.6	37.2
EW/M	0.1	0.4	0	0.5
RIVERINE	7.6	2.9	5.4	15.9
TOTALS:	**130.3**	**28.3**	**75.5**	**234.1**
Habitat	**Upland Buffer Acres**			
CO	2.2	0.6	0	2.8
DGS	253.2	68.2	202.6	524
GFU	11.5	5.1	0	16.6
IFPG	0	2	0	2
Oak Woodland	6.1	2.2	6.2	14.5
Pinyon-Juniper	207.3	43.5	85.9	336.7
RIR	0	0	0.8	0.8
SC	0	2.3	0.1	2.4
TOTALS:	**480.3**	**123.9**	**295.6**	**899.8**

RFS-H-Type 1 = High functioning riparian forest complex.
RFS-M-Type 2 = Mid-range functional riparian forest complex.
RFS-L-Type 3 = Low functional riparian forest complex.
RM-H-Type 1 = Riparian meadow in high functioning condition.
RM-M-Type 2 = Riparian meadow in mid-range functioning condition.
RM-L-Type 3 = Riparian meadow in low functioning condition.
EW/M = Emergent wetland/marsh habitat.
RIVERINE = Flowing river or canal.
CO = Cottonwood/Oak.
DGS = Desert Grassland/Sagebrush.
GFU = Grass/Forb Upland.
IFPG = Irrigated Farmlands, Pasture/Grazing.
Oak Woodland = Gamble's oak dominated deciduous woodland.
Pinyon-Juniper = Pinyon-juniper complex woodland.
RIR = Residential, Industrial and Roads.
SC = Sagebrush/Cottonwood.

The riparian forest/scrub-shrub and riparian meadow habitats were subclassified into Type 1 (RFS-H-1 and RM-H-1), Type 2 (RFS-M-2 and RM-M-2) or Type 3 (RFS-L-3 and RM-L-3) habitats, with Type 1 having the best habitat values. The subclassification is based on the presence/absence of undesirable weed species, vegetative cover, and habitat structure. Reference standards were developed separately for each of the habitat subclasses. A report describing the methodology and criteria that were used for developing the reference standards for the habitat subclasses is provided in Appendix A, Reference Standards. The purpose for developing the subclassification system was to create a pre-mitigation baseline of riparian habitat information for the MA. The subclassification system was useful for assessing potential mitigation measures in that it identifies several parameters that limit the functional conditions of these habitats (Table 2).

2.4 Upland Plant Communities

Approximately 900 acres of uplands were delineated within the river valley bottom of the MA (Table 2). In general, upland habitats occur on the low and high terrace surfaces. The presence of upland plant communities on the low terrace surface is evidence that the water table within the zone-of-influence has been diminished by streamflow diversions and further influenced by subsequent channel incision. Upland habitats found on the low terrace include: farmland/pasture; a grass/forb community dominated by wheat grass, cheat grass, and usually non-native forbs such as thistle and leafy spurge; and old cottonwood stands with sagebrush-dominated understories. Upland habitats typically found on the high terrace include: scrub oak; pinyon pine and juniper; a mixed scrub oak and conifer community; sagebrush/grassland complex and farmland/pasture.

The condition of upland habitats has been degraded by the invasion and proliferation of undesirable plant species. In addition, overgrazing has diminished upland habitat vegetative structure and has created disturbances that further proliferate the invasion of undesirable weeds.

2.5 Factors Limiting Habitat Functions and Values

There are six main factors that are currently limiting riparian habitat functions within the MA. First, streamflow diversions, principally for irrigation uses affect the amount of surface water that historically was available to riparian plants growing in the river's zone-of-influence as evidenced by existing remnant communities. However, groundwater return flows resulting from irrigation provide a source of perennial flow under low flow conditions in limited areas within the MA.

Second, livestock grazing has reduced streambank vegetation, thereby causing accelerated rates of riverbank erosion and loss of riparian vegetation. The lack of riparian vegetation along the banks limits shading, increasing the evaporation from the ground surface which can limit the amount of moisture available for plants. In addition, grazing effects habitat structure and limits the amount of cover available for wildlife and creates a vector for the further introduction of weed species. The cattle prefer the grasses that occur in the MA over the weed species. In areas

where the grasses have been removed, weeds have taken over and been allowed to grow, producing seeds and spreading throughout the MA. The removal of livestock will eliminate the grazing effects that have impacted both bank stability and the functional condition of riparian plant communities.

Third, the invasion of undesirable, non-native weeds has greatly affected the functional condition of existing riparian habitats. In many areas, native plant communities have been either wholly or substantially replaced by undesirable plant assemblages, such as tamarisk and Russian olive. Riparian plant communities cannot be restored to their highest functional condition practicable unless a vegetation management plan is implemented to control the presence of undesirable plant species.

Fourth, certain river reaches that have been affected by vegetation removal are experiencing rapid bank erosion and the loss of riparian plant communities. Stabilization of these eroding riverbanks may be necessary in order to prevent further loss of riparian habitat acreage and to restore habitat functions. Natural recovery processes, after the removal of livestock, may suffice to stabilize these segments of river bank.

A fifth and major effect has been human modification of the river channel and floodplain within the MA. River straightening and the construction of flood control levees have severely impacted riparian areas along an approximately 0.5 mile reach of the river within the MA. Elimination of man-made modifications (channel straightening, berming and inappropriate bankline armoring) and river channel/floodplain restoration will be required in these areas in order to restore riparian plant communities and corresponding riparian functions.

Sixth, the poor conditions of upland habitats also limit the functional condition of the riparian habitats within the MA. A major problem is that noxious weeds in the uplands act as seed sources that facilitate spread into the neighboring riparian habitats. Also, over-grazed uplands provide poor transitional habitat to buffer riparian areas because they lack effective protective groundcover.

In combination, these six factors have affected the riparian habitats within the MA, but some of these effects can be corrected with proper mitigation measures, as described in Chapter 3, “Mitigation Plan”.

2.6 Riparian Comparative Functions and Values Assessment

Described below in Table 3 is a qualitative analysis of existing riparian habitat functions and values in the MA and a projection of enhanced habitat functions and values in the MA, which, once accomplished, will effectively off-set all functions and values to be lost at Ridges Basin. Reclamation agreed to mitigate the estimated 134 acres of wetland/riparian habitat lost at a 1.5:1 ratio requiring an approximate 200 acres of wetland or riparian functions and values to be replaced elsewhere. Also described are habitat functions and values assessed in Ridges Basin by an interdisciplinary and interagency team in 2000, during the preparation of the ALP Project

404(b)(1) Evaluation analysis under the Clean Water Act[2]. Both the Service and the EPA agreed that the La Plata River would be a suitable location for wetland mitigation because it had the greatest overall potential to achieve full mitigation success of all alternatives reviewed.

Because the MA is a significantly different ecosystem from that which would be impacted at Ridges Basin, the mitigation performed is considered out-of-kind. Therefore, Reclamation believes that acquiring, restoring, protecting and enhancing approximately 3.9 miles of the La Plata River corridor will more than off-set the qualitative loss of functions and values at Ridges Basin. Quantitatively, some enhanced functions and values on the La Plata River will not fully off-set all functions and values lost in Ridges Basin, while others will be overly compensated for. In other words, Reclamation proposes to protect and improve an existing, self sustaining riparian

Table 3. Functional Capability of Ridges Basin Wetland/Riparian Habitat and MA Riparian Area Before and After Mitigation.

Major Category	Specific Wetland Function Category	Functional Capability		
		Ridges Basin (2000)	MA Before (2001)	MA After (2015)
Water Quality	(a.) Nutrient Removal/Retention	(a.) Low	(a.) Medium	(a.) High
	(b.) Pollutant Removal/Retention	(b.) Low	(b.) Medium	(b.) High
	(c.) Stream Bank Shading	(c.) Low	(c.) Low	(c.) High
Hydrology	(a.) Groundwater Recharge	(a.) Low	(a.) Medium	(a.) Medium
	(b.) Flow Enhancement*	(b.) Low	(b.) Low	(b.) Medium
	(c.) Flood Control	(c.) Low	(c.) Low	(c.) Medium
Landscape	Maintenance of Biocomplexity			
	(a.) Position within the Landscape	(a.) Medium	(a.) High	(a.) High
	(b.) Pattern	(b.) Medium	(b.) Medium	(b.) Medium
	(c.) Connectivity	(c.) Medium	(c.) Medium	(c.) High
	(d.) Distribution	(d.) Medium	(d.) Medium	(d.) High
	(e.) Permanence of Landscape Feature	(e.) High	(e.) Low	(e.) High
	(f.) Species Richness	(f.) Low	(f.) Medium	(f.) High
Recreation/ Aesthetics/ Heritage	(a.) Sport Hunting**	(a.) Low	(a.) Low	(a.) Medium
	(b.) Wildlife Observation	(b.) Medium	(b.) Low	(b.) High
	(c.) Education	(c.) Low	(c.) Low	(c.) High
	(d.) Public access to wetlands	(d.) High	(d.) Low	(d.) High

*No additional water will be added to the La Plata River system. Flow enhancement is expected as a result of reduction in evaporation rates within the MA from channel and vegetation management.

**In the 2000 FSEIS sport fishing was also considered but is excluded here as the La Plata

[2] A more thorough discussion of ALP Project related wetlands can be found in Volume 2, Attachment B to the ALP Project FSEIS.

River system in the MA does not provide a sport fishery resource.
ecosystem to off-set the loss of a largely artificially maintained (historically irrigated) wet meadow. The overall value of the mitigation effort is recognized by all agencies as being more beneficial than simply recreating an artificially supported wetland.

Since the assessment of habitat functions and values is based on best professional judgment, it was determined that a more accurate assessment could be made through a team decision process. An interdisciplinary assessment team was formed to develop, by consensus, the habitat functions and values displayed in Tables 3 and 4. As set forth in Table 3, functional categories of water quality, hydrology, landscape and recreation/ aesthetics/ heritage were assessed based on the current and projected ability of the La Plata River's riparian areas to perform those functions.

Water quality parameters were all assessed to become improved due largely to the increase in vegetative cover and the river restoration work to be preformed in the MA on the La Plata River below the confluence of Long Hollow. While groundwater recharge was not expected to improve significantly, flood control and flow will be improved upon completion of the restoration work. Flow enhancement is expected to come from deepening and narrowing the channel, removing heavy water use weed species, and encouraging stream shading native vegetation. These factors combined should result in less evaporation and transpiration in the MA. The various landscape criteria evaluated would also improve to some degree from the control of noxious weeds, removal of salt cedar and Russian olive and the reestablishment of native plant species, all of which would increase biocomplexity within the MA. The same habitat criteria identified in the 2000 FSEIS were used to assess landscape integrity functions. These were:

- Contiguity to nearby wetland areas
- Degree of wetland isolation
- Extent of existing disturbance
- Landform contrast
- Long-term stability
- Presence of open space or corridors
- Diversity of cover
- Species diversity
- Wildlife access to other wetlands

In addition, the commitment by Reclamation to protect the acquired properties throughout the life of the ALP Project, along with the removal of livestock grazing were also factors deemed significant in terms of both maintaining and enhancing the landscape properties evaluated. Since Reclamation has acquired approximately 6,000 acres to be managed for mitigation purposes, approximately 234 acres of riparian habitat will be enhanced by the additional upland buffer provided. Recreation/ aesthetics/ heritage criteria were evaluated as benefiting the most for the same reasons identified above, but also because the property would be opened to the public for multiple uses that were not available when the property was under private ownership. The only motorized vehicle access to be allowed into the MA will be that which is required to complete

the mitigation enhancement activities and for future operation and maintenance. Reclamation will promote public use activities compatible with maintaining the MA riparian functions and values.

Table 4 depicts the assessment ranking of the functional capabilities in the riparian habitat for variables considered important for indigenous species comparing existing functional capabilities in the MA versus what Reclamation will eventually achieve through various enhancement strategies within the MA. The functional habitat categories evaluated were:

- Contiguity
- Vegetation Community Structure
- Vegetation Community Diversity
- Proximity to other Wetlands
- Land use management
- Wetland size and shape

These broad habitat categories were evaluated:

- Big game habitat
- Waterfowl habitat
- Shorebird habitat
- Amphibians/reptile habitat
- Aquatic habitat
- Neotropical bird habitat
- Small mammal habitat
- Threatened and endangered species and species of special concern habitat

The wildlife habitat value in the MA for big game, primarily deer and elk, was assessed to be improved through a variety of enhancement measures primarily associated with livestock removal, non-native vegetation removal/control and native plant augmentation. The acquisition of 6,000 acres of land to be managed primarily for wildlife purposes will enhance habitat for big game species by providing elk and deer winter and summer range, elk calving areas and improved forage within the MA. Though on a smaller scale, habitat for small mammals will also be enhanced by increasing vegetative cover and available forage and replacing non-native vegetation with more suitable native vegetative species.

Aquatic habitat analyzed in Table 4 will be enhanced to some degree, primarily as a result of stabilizing eroding riverbanks and river channel/floodplain restoration work. Vegetation improvements may also provide stream shading to aid in moderating water temperatures.

The enhanced benefits to threatened, endangered, and species of special concern, are tied to the protection and enhancement of native vegetation, in particular willow and cottonwood species. Adequate habitat provided by these plant communities is expected to benefit numerous species.

Other wildlife categories, such as waterfowl, shorebird, amphibian/reptile and neotropical migrant bird habitats, were assessed to improve to a more modest degree. The two functional categories that most consistently would benefit indigenous fauna are land use management and vegetation community structure. Planned enhancement of the MA is largely associated with these two categories.

Once Reclamation's mitigation plan in the MA is fully implemented, the riparian habitat functions and values in the MA would off-set all lost wetland/riparian functions and values associated with Ridges Basin and should be largely self-sustaining.

Table 4. Habitat Functional Capability Assessment.

Ridges Basin Reservoir Wetland/Riparian Habitat Functional Capability Assessment and MA Riparian Habitat Functional Capability Assessment Before and After Mitigation Enhancement Applied								
Functional Category	**Location**	**Year**	**Contiguity**	**Vegetation Community Structure**	**Vegetation Community Diversity**	**Proximity to other Wetlands**	**Land Use Management**	**Wetland Size and Shape**
Big Game Habitat	Ridges Basin	2000	Medium	Low	Low	Low	High	Low
	MA Before	2001	High	Medium	Medium	High	Low	Medium
	MA After	2015	High	High	High	High	High	Medium
Waterfowl Habitat	Ridges Basin	2000	Low	Low	Low	Low	N/A	Low
	MA Before	2001	Medium	Low	Medium	Medium	Low	Low
	MA After	2015	Medium	Medium	Medium	Medium	High	Medium
Shorebird Habitat	Ridges Basin	2000	Low	Low	Low	Low	N/A	Low
	MA Before	2001	Medium	Medium	Medium	Medium	Low	Medium
	MA After	2015	Medium	Medium	Medium	Medium	Medium	Medium
Amphibian/ Reptile Habitat	Ridges Basin	2000	Low	Low	Low	Low	Low	Low
	MA Before	2001	Medium	Low	Low	Medium	Low	Low
	MA After	2015	Medium	Medium	Medium	Medium	Medium	Medium
Aquatic Habitat	Ridges Basin	2000	Low	Low	Low	Low	Low	Low
	MA Before	2001	Medium	Low	Low	Medium	Low	Low
	MA After	2015	Medium	Medium	Medium	Medium	Medium	Medium
Neotropical Bird Habitat	Ridges Basin	2000	Medium	Medium	Medium	Medium	Medium	Medium
	MA Before	2001	Medium	Medium	Medium	High	Low	High
	MA After	2015	High	High	High	High	High	High
Small Mammal Habitat	Ridges Basin	2000	Low	Low	Low	Low	Low	Low
	MA Before	2001	High	Medium	Medium	Medium	Low	Medium
	MA After	2015	High	High	High	Medium	High	Medium
Threatened & Endangered Species & Species of Special Concern Habitat	Ridges Basin	2000	Low	Low	Low	Low	Low	Low
	MA Before	2001	Medium	Medium	Medium	Medium	Low	Medium
	MA After	2015	High	High	High	Medium	High	Medium