Section 4.0
ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

This section of the SEA addresses potential impacts to the affected environment within the project corridor for all three alternatives outlined in Section 2 of this document: the No Action Alternative, the Preferred Alternative, and the Full Build Out Alternative. An impact (consequence or effect) is defined as a modification to the human or natural environment that would result from the implementation of an action. The impacts can be either beneficial or adverse, and can be either directly related to the action or indirectly caused by the action. The effects can be temporary (short-term), long lasting (long-term) or permanent. For purposes of this SEA, temporary effects are defined as those that would last for the duration of the construction period. Long-term impacts are defined as those that would last five or more years upon completion of construction.

Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. The significance of the impacts presented in this SEA is based upon existing regulatory standards, scientific and environmental knowledge and/or best professional opinions. The significance of the impacts on each resource will be described as either significant, moderate, minor (minimal), insignificant or no impact. Significant impacts are those effects that would result in substantial changes to the environment (as defined by 40 CFR 1500-1508) and should receive the greatest attention in the decision-making process. The following discussions describe and, where possible, quantify the potential effects of each viable alternative on the resources within or near the project corridor.

While the Naco and Douglas Stations' AOs is 57 miles, the alternatives only entail activities across 49 miles of the project corridor due to avoidance of the Coronado National Memorial and Coronado National Forest. The USBP acknowledges the fact that all lands contained between fences and roadways, including illuminated areas, would eventually be disturbed either directly (i.e., removal as habitat) or indirectly (i.e., impacts associated with USBP operations). Table 4-1 provides a summary of the alternatives and the area that would be impacted as a result of incorporating the proposed infrastructure components.

Table 4-1. Approximate Impacts from Infrastructure Component Systems to the Natural Environment for Each Alternative

Infrastructure Components	Calculated Area (Approximate)	Acres Impacted
No Action Alternative		
Primary Fence Projects Primary fence (pedestrian and vehicle)	2 feet by 13 miles (10 feet added for maintenance roads)	21
Roadway Projects All-weather road upgrade and construction from original 8 foot wide road (25 miles in Douglas and 4 miles in Naco, including drainage structures)	20-24 feet by 29 miles	99
Lighting Projects Permanent lights installation Portable lighting units	25 ft^2 every 225 feet by 16.5 miles Plus 25 ft^2 by 73 units	0.05
No Action Alternative Impact Total		**120**
Preferred Alternative		
60-foot secondary fence areas along the U.S.-Mexico border (inclusive of roads, drainages structures, fences and lighting)	60 feet by 11 miles	80
270-foot secondary fence areas along the U.S.-Mexico border inclusive of roads, drainages structures, fences and lighting) and all-weather maintenance road north of proposed secondary fence 270-foot secondary fence areas	300 feet by 7 miles	255
Areas with primary fencing (pedestrian and vehicle barriers) and all-weather surface upgrades to existing roads widened from original width to 38 feet (28 feet for the surface and an additional 10 feet for slope and grade)	40 feet by 28 miles (10 feet added for maintenance roads)	191
Areas with all-weather surface upgrades to existing roads	28 feet by 3 miles	16
Preferred Alternative Impact Total		**542**
Full Build Out Alternative		
60-foot secondary fence areas along the U.S.-Mexico Border (inclusive of roads, drainages structures, fences and lighting)	60 feet by 11 miles	16
270-foot secondary fence areas along the U.S.-Mexico border inclusive of roads, drainages structures, fences and lighting)	300 feet by 46.8 miles	1,543
All-weather maintenance road north of proposed 270-foot secondary fence area	30 feet by 46.8 miles	171
Full Build Out Alternative Impact Total		**1,730**

All data compiled from approximate totals provided in Section 2.0. Calculations based on actual impact alignments derived from GAP data and aerial photography

Impacts vary depending on the alignments of infrastructure components and the presence of disturbed areas. Table 4-2 provides a summary of the total area directly impacted by each alternative and the amount of land that is currently disturbed.

Table 4-2. Acres of Impacts to Disturbed and Undisturbed Areas

INFRASTRUCTURE DESCRIPTION	AREA IMPACTED (Acres)
No Action	
Undisturbed	24
Disturbed Areas	96
No Action Impacts	**120**
Preferred Alternative	
Undisturbed	402
Disturbed Areas	140
Preferred Alternative Impacts	**542**
Full Build Out Alternative	
Undisturbed	1,486
Disturbed Areas	244
Full Build Out Alternative Impacts	**1,730**

4.1 LAND USE

4.1.1 No Action Alternative

Implementation of the No Action Alternative would affect 120 acres of the current land uses within the project corridor. However, as indicated in Table 4-2, 96 acres have been previously disturbed and most of this land is currently used for border enforcement. Past and ongoing projects identified in the Corridor EA include road improvement, fence construction, and the light installation. All of these projects are proposed to be installed within the 60-foot Roosevelt Easement or within extant road Right of Ways (ROW). Land uses within the remaining undisturbed area will not be significantly impacted by the No Action Alternative because the majority of the undisturbed areas exist within or near urban areas and current land uses are consistent with installation of roads, fences, and lights.

4.1.2 Preferred Alternative

Upon completion of the project under the Preferred Alternative, approximately 542 acres within the project corridor would be permanently changed from its current land use of rangeland, open space, and growth area to a restricted access area for border

enforcement. According to Table 4-2 a total of 402 acres of undisturbed land would experience land use changes. However, since the majority of the land is currently utilized as rangeland and/or designated as the Roosevelt Easement that is primarily used by the USBP for enforcement operations, the impact to land use would be minor. Additionally, direct recreational land use impacts would be limited to approximately 13 acres of the San Pedro Riparian NCA. It should be noted, however, that the majority of this area is currently used by USBP while conducting their enforcement activities so the proposed change to land use is only a minor impacts. Furthermore, land use changes would provide additional protection of areas to the north.

Approximately 4.3 acres of land east of the Naco POE is designated by the Town of Naco as recreational open space, and another 2.9 acres west of the Naco POE are designated as rural growth areas. In the City of Douglas, 8.7 acres are designated as urban growth area. However, all of these areas exist entirely within the 60-foot Roosevelt Easement and are under Federal jurisdiction. Given this, these municipal land use designations are erroneous since construction is already restricted and utilized for enforcement operations. Therefore, in these areas, land use impacts would be similar to those underlined in the No Action Alternative and would therefore not be significant.

Construction of infrastructure components would also provide substantial indirect beneficial impacts to areas north of the project corridor. In much of the remote areas of the project region, residential and commercial properties, as well as livestock grazing activities have been subject to disruptive IA-linked activities, such as fence cutting, water supply damage, and theft (INS 2002d). Implementation of an enforcement control system such as this would enhance USBP response time, which would deter illegal crossings. Ultimately, disruptive activities such as these would substantially decrease.

4.1.3 Full Build Out Alternative

The Full Build Out Alternative would result in the conversion of the entire area (1,730 acres) into a restricted access area for border control. Secondary fencing would restrict access to approximately 98 acres (inclusive of the 1,730 acres) of allotted grazing land leased by BLM to two private ranches causing an impact. Although not significant to the available recreational area in the region and within Cochise County, this alternative

would result in direct impacts and conversion of approximately 64 acres (0.11%) of the more than 58,000 acres that make up the San Pedro Riparian NCA. Conversion of these areas to restricted areas would result in direct impacts that would reduce public access of recreational land in the project region. Similar to the Preferred Alternative, land use impacts would not be significant in urbanized areas under the Full Build Out Alternative. Even though land use of 1730 acres would be changed, installation and improvements of these infrastructure components would be conducive of the current uses. Furthermore improvements would enhance the ability to protect rangeland north of the project corridor.

Construction of infrastructure components would also provide substantial indirect beneficial impacts to areas north of the project corridor. In much of the remote areas of the project corridor, residential and commercial properties, as well as livestock grazing activities have been subject to disruptive IA linked activities, such as fence cutting, water supply damage, and theft (INS 2002d). Implementation of a completely enforceable system would provide the best available defense against these activities.

4.2 AESTHETIC AND VISUAL RESOURCES

4.2.1 No Action Alternative

Completion of the No Action Alternative would result in approximately 11 miles of additional illumination impacts that could be visible across the night skies. Yet, illuminated areas would remain in and near the more urban areas, thus avoiding direct impacts to recreational or conservation areas that occur in rural areas within the project corridor. No impacts would occur within the San Pedro Riparian NCA since construction activities would not occur near this area. Other visual and aesthetic impacts would result from construction of 17-foot high fences. These fences would break up the visual appeal of the landscape surrounding the U.S.-Mexico border; however this is not a significant impact since fencing under this alternative has and would continue to be located near urban areas.

On the other hand, the continued influx (and possible increase) of IA and smuggler traffic through the natural landscapes within the project corridor would continue to degrade the aesthetic values due to the creation of footpaths, illegal roads, wildfires, and litter.

Furthermore, impacts to aesthetics related to trash cleanup incurred by land managers such as those estimated by the USFS (1.0 to 1.3 million pounds in FY 2002) in the Coronado National Forest would continue.

4.2.2 Preferred Alternative

Illumination impacts would be limited to 18 miles in the project corridor. However, any adverse impacts would be reduced to a less than significant level as a result of effective shielding, adjusting lighting to appropriate angles and restricting illumination to the border area only. Furthermore, permanent lighting would not occur in recreational or conservation areas (i.e., San Pedro Riparian NCA).

Road improvements would occur along the existing road through the San Pedro Riparian NCA including through the San Pedro River. Therefore minor increased temporary visual impacts during the construction period would result. Upon completion of road upgrades visual resources would return to pre-existing conditions. Furthermore, there would be no new construction of roadways; the existing road that travels through the San Pedro NCA would be upgraded and effective low water crossings would be installed in the river. Construction of vehicle barriers would result in only minor increased visual impacts since these structures are transparent and low in profile. The Class II VRM designation in which the project corridor crosses in the NCA indicates that activities may be seen, but should not attract attention to the casual observer. Therefore, the aesthetic values of recreational or conservation areas would remain within the BLM's Class II management objective and any impacts by this alternative would be minor.

Beneficial indirect impacts, due to the reduction of IA traffic and it's concomitant adverse effects, would occur to the aesthetic value of the project corridor and the surrounding region. The implementation of this alternative would also result in long-term beneficial impacts by limiting and possibly eliminating IA activities in protected areas to the north of the project corridor. Human induced fire, excessive amounts of litter, and illegal roads would be decreased, thus improving the scenic qualities of areas north of the project corridor. The amount of trash disposal required by land managers, such as the USFS, would be reduced thereby freeing up available budget and manpower for enhancement rather than cleanup.

4.2.3 Full Build Out Alternative

Direct impacts created by this alternative would be similar in type to that of the Preferred Alternative; however, the magnitude would greatly increase. The Full Build Out Alternative would create direct adverse impacts to the aesthetic and visual resources within the project corridor, especially within the San Pedro Riparian NCA. Proposed fences, lighting, and roadways along 49 miles of the project corridor would be visible across the immediate area at all hours. The fences would only be visible in the immediate area unless the observer is located at much higher elevations (e.g., Huachuca Mountains, Montezuma Pass). Otherwise, the undulating terrain and desert vegetation would impede sight of the infrastructure. Conversely, permanent lighting would degrade the tranquil, dark skies for which southeastern Arizona is so well known. Therefore measures would be required in order to reduce impacts to a less than significant level. Proper illumination shielding would minimize light trespass outside the corridor to a minimum. Beneficial impacts would also inherently mitigate impacts as well. The amount of trash cleanup would be lessened as well. Incorporation of this alternative would require close coordination with BLM since it would significantly conflict with the current VRM Class II designation for the riparian areas of the San Pedro River.

4.3 TRANSPORTATION

4.3.1 No Action Alternative

Implementation of the No Action Alternative would have only minor impacts to the area's transportation system. As discussed in Section 3.3, the only primary transportation routes intersect the project corridor at the Naco and Douglas POEs. These routes are currently controlled by manned inspection stations. Indirect impacts would result in continued increases in illegal vehicles. Furthermore, once the primary fence is breached there would be no obstacle or barrier (e.g., a secondary fence) to hinder the illegal entrants' northward movement and use of major transportation routes. Thus, this alternative would ultimately require increases in USBP manpower to man and maintain current or additional checkpoints.

4.3.2 Preferred Alternative

Since there are only two legal access points across the project corridor and they are located at controlled POEs, no adverse impacts associated with traffic congestion or alteration would be anticipated upon completion of this alternative. Traffic congestion on

U.S. Hwy 80 between the City of Douglas and the Towns of Naco and Bisbee would result in only minor increases during the period of construction to accommodate transportation of fill materials to construction sites.

Existing USBP roads and a limited amount of access roads would be used to the maximum extent practicable during construction activities to reduce or eliminate potential effects to public transportation routes. The magnitude of the indirect beneficial impacts would be decreased since this alternative would not be fully effective in deterring illegal IA foot traffic.

4.3.3 Full Build Out Alternative

Impacts associated with this alternative are similar in nature to the Preferred Alternative. Minor and temporary traffic congestion impacts on U.S. Hwy 80 between the City of Douglas and the Towns of Naco and Bisbee associated with transportation of fill material would result during the period of construction. However, the duration of these impacts would exist for a longer period than the Preferred Alternative since this alternative would take longer to complete. Indirect impacts would likely be beneficial to the region's transportation system by reducing or eliminating illegal vehicles using public roads and highways during their attempts to escape. No rail or air service would be affected by this alternative. Once infrastructure is complete, USBP vehicles would be primarily contained within the enforcement corridor, except during shift change, emergencies, or other administrative duties.

4.4 GEOLOGY, SOILS, AND PRIME FARMLAND

4.4.1 No Action Alternative

Implementation of the No Action Alternative would limit direct disturbances of soils to 120 acres. Since soils identified in Table 4-3 are all common to the area, impacts would be minor. Furthermore, most of these soils (96 acres) have been previously disturbed and construction activities would occur along existing alignments, only 24 acres of undisturbed soils. However, since a smaller amount of new construction and road improvements would occur, extant erosion problems would continue. This is especially true in the Naco Station AO, where only a limited amount of all-weather road surfaces would be constructed. USBP agents would continue to use the roads in their existing

degraded conditions and only minimal drainage improvements would be implemented to control erosion. Soils found within the project corridor have a high silt content and pose slight to medium erosion hazards, depending on the slope and construction methods. Implementation of the No Action Alternative would likely result in moderate indirect negative effects (although not substantially greater than existing conditions), as the current roads become even more degraded and IA/smuggler operatives gain knowledge that apprehension is affected by these poor road conditions. Furthermore, the illegal entrants would continue to create new footpaths and vehicle routes.

4.4.2 Preferred Alternative

All construction under this alternative would occur within the 300-foot project survey corridor and in close proximity to the border where soils have largely been disturbed by previous urban development, ranching, off-road enthusiasts, illegal foot and vehicle traffic, or prior USBP activities. Implementation of the Preferred Alternative would require direct disturbance of approximately 402 acres of previously undisturbed soils. The soils impacted in the project corridor would be within the Libby-Gulch Complex, Eloma-Caralampi-White House Complex, Blakeney-Luckyhills Complex, Sutherland-Mule Complex, Guest-Riveroad Association, and Tenneco Fine Sandy Loam (Table 4-3).

These soils account for 60% of the soils found within this corridor and have a relatively high sand and silt content which present erosion hazards of slight to medium depending on the slope. Therefore, construction design and activities on areas with high slopes must consider the potential for increased erosion. A Stormwater Pollution Prevention Plan (SWPPP) would be required for the entire project corridor prior to any of the construction activities proposed under this alternative. Best Management Practices (BMPs) identified in the SWPPP would be implemented to reduce erosion and sedimentation processes and protect disturbed soils from erosion. Therefore, since the disturbed soils are common to southern Arizona and a SWPP would be implemented prior to construction, impacts from soil disturbance under the Preferred Alternative would not be significant.

Table 4-3. Summary of Direct Impacts to Soils

Soil	Action Alternatives		
	No Action	Preferred	Full Build Out
Altar-Mallet Complex	0.02	0.4	2.7
Blakeney-Luckyhills Complex	16.7	56.1	202.3
Brookline-Fluvaqents-Riverwash Complex	0.02	2.6	2.4
Brunkcow-Chiricauhua-Andrada Complex	10	12.3	74.1
Courtland-Diaspar	0.36	9.6	55.8
Courtland-Sasabe-Diaspar Complex	0.02	5.6	2.8
Eloma Sandy Loam	2.5	3.2	18.5
Eloma-Caralampi-White House Complex	4.3	84.2	191.6
Gardencan-Lanque Complex		16.5	96.2
Guest-Riveroad Association	20.3	33.2	174.8
Kahn Complex	15	20.2	20.6
Libby-Gulch Complex	12.7	95.5	195.9
Luckyhills Complex-Mcneal Complex	14.8	3.6	17.8
Mabray-Chiricahua Rock Outcrop	2.7	15.2	79.9
Mabray-Rock Outcrop Complex	4.6	20	55.8
Nolam-Libby_Buntline Complex		19.5	150.4
Pits-Dump Complex		0	6
Riveroad and Ubik Soils	8.3	24.5	114.9
Riverwash-Bodecker Complex	0.4	0.5	4.9
Sasabe Complex		4	21.4
Sutherland-Mule Complex	7	46.1	135
Tenneco Fine Sandy Loam		38.1	59.4
Ubik Complex	0.05	1.5	8.5
White House Complex	0.3	30	38.4
TOTAL	**120 acres**	**542 acres**	**1730 acres**

Approximately 5 acres of prime farmland (Tenneco and Ubik) would be directly impacted by the implementation of this alternative. However, because these areas are not irrigated or currently used for agricultural production, impacts would not be significant since these areas would only be considered prime farmland if properly irrigated.

4.4.3 Full Build Out Alternative

Implementation of the Full Build Out Alternative would require approximately 1,730 acres of soils disturbance (Table 4-3). Soils within the Blakeney-Luckyhills Complex, Libby-Gulch Complex, Eloma-Caralampi-White House Complex, Guest-Riveroad Association,

and Nolam-Libby-Buntline Complex are the most impacted and account for approximately 60% of the potential soil impacts in the entire project corridor.

All of these soils have relatively high sand and silt content, which present erosion hazards of slight to medium depending on the slope. Of the 1,730 acres directly impacted, approximately 244 total acres have been previously disturbed. Therefore, approximately 1,486 acres of soils in a natural state would require disturbance under the Full Build Out Alternative. However, similar to the Preferred Alternative, these soils types are relatively common in A2 and a SWPPP would be implemented prior to construction reducing impacts from the Full Build Out Alternative to a less-than significant level.

Approximately 13 acres of potential prime farmland would be directly impacted (see Figure 3-4). However, these soils are considered prime farmland only if properly irrigated therefore impacts would not be significant. Furthermore, they are generally located within washes that are either not suitable for agriculture due to rugged topography and flash floods or within the San Pedro Riparian NCA where they are preserved for habitat conservation. None of these soils are currently in agricultural crop production within the project corridor.

4.5 VEGETATION

4.5.1 No Action Alternative

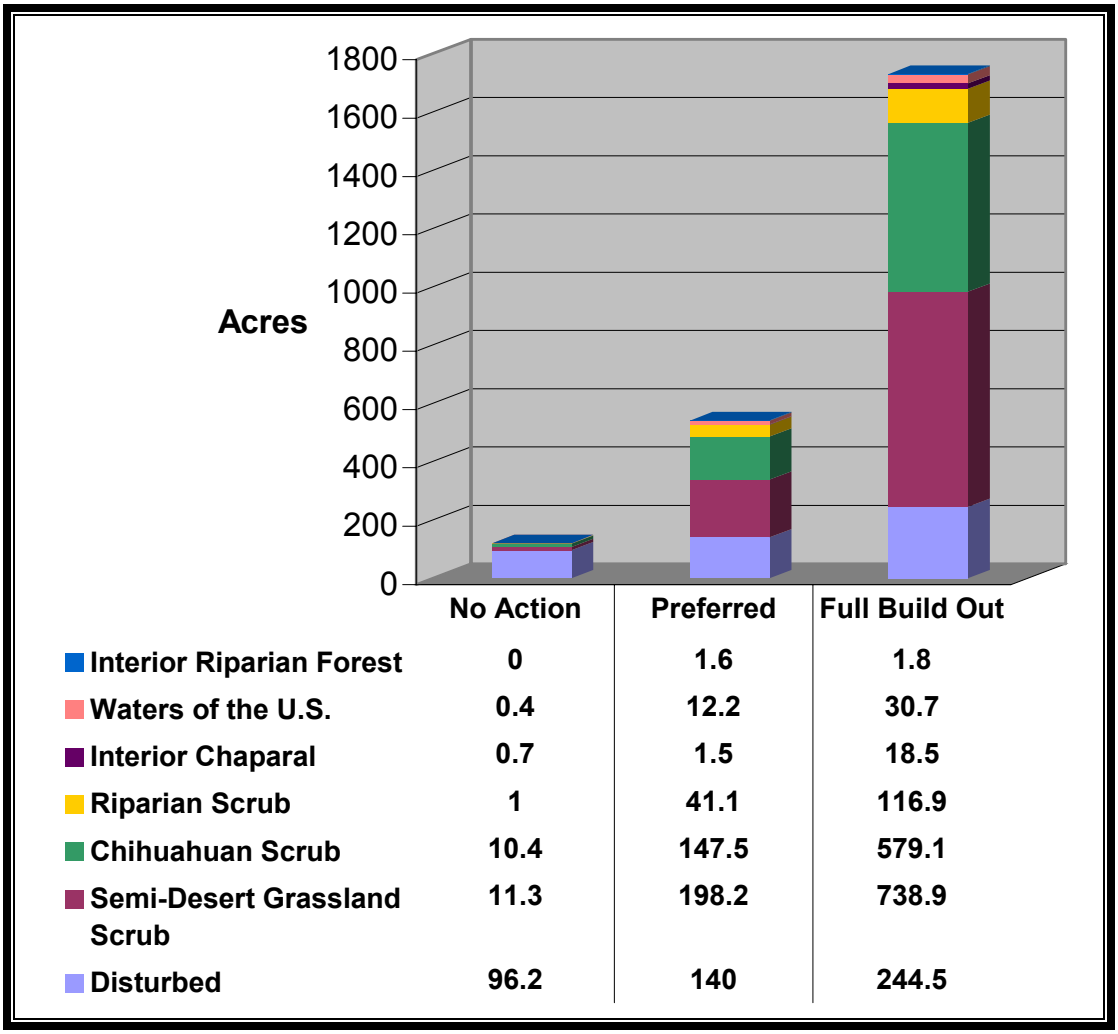
The majority of the remaining infrastructure projects comprising the No Action Alternative would occur mostly within previously disturbed areas; thus, no significant direct impacts (i.e., 24 acres) to relatively common vegetation types within the construction corridor would occur. As documented in Section 1.2, plant communities within the project corridor would indirectly experience continued degradation by illegal foot traffic, increased erosion, and dust from USBP and other vehicle traffic (INS 2002a). Therefore, by increasing the control along the U.S.-Mexico border and limiting illegal foot traffic north of the project corridor, indirect beneficial impacts would occur. Illumination could affect photosynthesis but shields would be placed on lights to limit the illumination footprint, reducing the impact to a less than significant level.

4.5.2 Preferred Alternative

By implementing this alternative, a total of 402 acres of undisturbed vegetation would be permanently altered. Table 4-4 shows that the greatest effects would occur to the semi-desert grassland scrub community and the Chihuahuan scrub vegetation community. Both of these are relatively common Arizona plant communities and therefore this represents a less-than-significant impact. The project will also impact 1.6 acres of interior riparian forest, which consists primarily of mature cottonwoods and willows and is limited to the stream banks of the San Pedro River and 41.1 acres of riparian scrub. Although these habitats are not common in southern Arizona, the implementation of this alternative will protect hundreds of acres of interior riparian forest and riparian scrub upstream of the impact zone. This will occur by protecting these upstream habitats from drive-throughs and traffic by IAs which have the effect of disturbing and removing vegetation through brush clearing, burning, trampling, and disturbing germination. Therefore, this alternative actually has a beneficial impact to these riparian plant communities. Minor indirect impacts to vegetation would occur to the area between the upgraded or improved roads and the proposed primary fence or vehicle barrier from illegal traffic and consequent enforcement actions. However, most of these areas are classified as relatively common semi-desert grassland scrub communities.

As mentioned previously, the USBP cannot control or monitor the south side of the primary fence. In fact, with enough time and the monetary incentives to enter the U.S., the IAs and smugglers would eventually breach the primary fence. The improved roads and ISIS components would facilitate detection and apprehension; but, without a secondary fence to impede their northward migration, the IAs and smugglers would have a temporal advantage over the USBP. Therefore, it is certain that some persons would be successful in their attempts to illegally enter the U.S. and illegal traffic would continue to create long-term direct impacts to vegetation from trampling, burning, and cutting. However, these impacts would be substantially reduced compared to existing conditions.

Table 4-4. Direct and Indirect Impacts by Vegetation Community



	No Action	Preferred	Full Build Out
Interior Riparian Forest	0	1.6	1.8
Waters of the U.S.	0.4	12.2	30.7
Interior Chaparal	0.7	1.5	18.5
Riparian Scrub	1	41.1	116.9
Chihuahuan Scrub	10.4	147.5	579.1
Semi-Desert Grassland Scrub	11.3	198.2	738.9
Disturbed	96.2	140	244.5

Conversely, vegetation communities on the western or eastern edges of the project corridor would potentially be indirectly impacted if the illegal traffickers shift their activities to areas without barriers. Quantification of those impacts is impossible because the routes, amount of traffic, and nature of these activities conducted by IAs and smugglers is solely based upon their discretion and is beyond the control of the USBP.

Short-term indirect effects to adjacent vegetation communities would occur during the construction of the infrastructure due to fugitive dust settling on leaves. The magnitude of this effect would depend upon several biotic and abiotic variables including the speed and type of construction vehicles, climatic conditions, success of wetting measures

during construction, and general health of the vegetation communities. However, upon completion, the USBP operations would be expected to generate less fugitive dust that would potentially settle on adjacent vegetative communities in the long-term since the roads would be surfaced and less traffic would be expected. Therefore this is a beneficial impact to vegetation communities.

Minimal or no illumination impacts are expected to vegetation communities outside the secondary fences and/or all-weather maintenance roadways since design measures would be implemented to ensure that illumination trespass is controlled. Furthermore, recent tests revealed that proper shielding techniques would significantly reduce illumination trespassing north of light poles. The recent test concluded that illumination measured in foot candles (FC) was 0.93fc at 90 feet from the U.S.-Mexico border which is comparable to street lighting, 0.02fc at 120 feet which is comparable to full moon light, and less than 0.01 at 145 feet.

4.5.3 Full Build Out Alternative

With the implementation of the Full Build Out Alternative, the 49-mile portion of the affected project corridor would be cleared of vegetation entirely, thus directly impacting vegetative communities in the project corridor. Of the 1,730 acres contained within the 300-foot corridor, about 1,486 acres are currently in biological production and thus would experience direct and permanent impacts. While impacts are expected to be similar in type as in the Preferred Alternative the magnitude of removing 1486 acres would undoubtedly be greater. However impacts are still expected to be below significant since the majority of vegetation types are common and abundant to the area. Through mitigation measures identified in Section 5, removal of approximately 1.8 acres of interior riparian forest would be reduced to a less than significant level. More importantly, hundreds of acres of interior or riparian habitat that exists upstream would benefit from reduction in the amount of trampling and habitat degradation that occurs, has occurred as a direct result of IA vehicular and foot traffic. The remaining 244 acres are currently classified as either disturbed or developed; therefore, no impacts would occur to vegetative communities within these areas. The semi-desert grassland-scrub community would be impacted the greatest while the interior riparian forest would be least affected. Based upon GAP data (National Biological Survey 1993), these losses

would represent less than one percent of the respective vegetation communities present within Cochise County (Table 4-4).

4.6 WILDLIFE

4.6.1 No Action Alternative

Under the No Action Alternative, about 24 acres of possible wildlife habitat (primarily Chihuahua and semi-desert grassland scrubs) would be impacted. Since, the majority of the land (96 acres) that would be impacted by the No Action Alternative, has been previously disturbed and the undisturbed habitat is comprised of relatively common plant communities that support relative common wildlife species, the impact will not be significant. Nevertheless, since absolute certainty of apprehension could not be conveyed due to the lack of infrastructure, illegal foot and vehicle traffic would continue (and possibly increase) to impact wildlife populations and habitat within the project corridor as well as surrounding areas.

4.6.2 Preferred Alternative

Implementation of the Preferred Alternative would result in the direct loss of 402 acres of undisturbed wildlife habitat within the project corridor. The remaining area (124 acres) is already disturbed or developed, and thus, is not suitable as wildlife habitat.

Much of the wildlife within the corridor would likely escape to adjacent lands. Mobile species would be able to escape to similar areas while slower species such as some reptiles, small mammals, and amphibians would likely be lost during construction activities. Animal density data calculated from worst case loss estimates provided in the SPEIS for JTF-6 Activities along the U.S.-Mexico Border (INS 2001a), suggests that 804 to 5,628 lizards, 20 to 361 birds, and 109 to 229 small mammals would be lost as a result of construction activities and habitat loss within the project corridor. Again, these are worst case estimates and assume that the entire project corridor would be completely altered and void of vegetation and wildlife upon completion of construction. Disturbed and developed areas are not included in these estimates. However, the majority of the habitats lost and all of the wildlife species that will be directly impacted by project construction are relatively common and are present in large numbers in southern

Arizona. Therefore the direct impacts to wildlife from the project construction is not significant.

There is also the possibility that the trans-boundary migration patterns of larger animals would be hindered or halted near the urban areas or anywhere that primary pedestrian fencing would be positioned. However, since vehicle barriers would be installed in lieu of primary fences where practicable (e.g. at stream and river crossings which are common migration corridors) to avoid hindrance to trans-boundary migration, the potential impacts would be reduced to less-than significant. Other environmental measures would also be implemented to minimize potential impacts, as discussed further in Section 5.4.

Wildlife deaths, particularly reptiles and amphibians, due to vehicle traffic may increase due to the faster speeds in which the USBP agents would be able to travel on the all-weather road. Wildlife populations within the project corridor would not be significantly impacted since common rodents and reptiles would be the most likely victims of road kill. In fact, the proposed project would provide a positive impact to wildlife habitat, as the adjacent plant communities would increase in quality due to reductions in fugitive dust as a result of the proposed road improvements. Furthermore, due to the USBP being able to better monitor the project corridor, a reduction in footpaths, vehicle trails, and wildfires created by IAs is expected, which would provide beneficial impacts to wildlife habitats.

Wildlife species that currently inhabit the surrounding area would be affected by the addition of lighting within the project corridor. Studies have been completed regarding wildlife and the effects of light on the circadian rhythms of wildlife species. Within several weeks under constant lighting, mammals and birds would quickly stabilize and reset their circadian rhythms back to their original schedules (Carpenter and Grossberg 1984). The long-term effect of an increased photoperiod on wildlife species, therefore, is expected to be not significant since illumination trespass into the surrounding habitat would not occur. The greatest impacts to wildlife from lighting would probably be to birds and insects that would be affected by the lights while migrating, causing them to alter their course or schedule. The tendency for nocturnal birds and other wildlife species (e.g., bats) to congregate around the lights to feed on insects attracted by the lights may also increase. This change in behavior may make these species more vulnerable to

predation or injury. The fence and lights would also provide perches for raptors, which would indirectly alter the biological demand on the region's prey base.

However, none of these impacts would be significant. Migrating birds are not likely to be affected by lights in and near urban areas (where the proposal lights will be placed) since these areas are already illuminated. Furthermore, most of the Neo Tropical migrant birds would utilize riparian corridors such as the San Pedro riparian area for migration. An increase in predation by from increased perches would not be significant, because most of the prey would be common rodents and reptiles. Instead, this would provide a beneficial impact to several raptor species that forage in the area. Insectivorus bats and birds preying on insects would also experience beneficial impacts from increasing foraging areas associated with lighting.

Indirect impacts to wildlife would occur as IAs and smugglers try to avoid areas with barriers or lights. These impacts, however, are not quantifiable because these activities are totally at the IA and smugglers' discretion.

4.6.3 Full Build Out Alternative

By implementing the Full Build Out Alternative, approximately 1,486 acres of undisturbed wildlife habitat would be permanently altered. The remaining areas within the project corridor are already disturbed, and thus, do not provide suitable habitat for wildlife species.

Again, mobile animals would be able to escape to areas of similar habitat; however, other slow or sedentary animals such as reptiles, amphibians, and small mammals would potentially be lost during construction. This displacement and/or reduction in the number of animals would impact animal communities on both sides of the border. Wildlife outside of the project corridor would experience temporary impacts due to dust, noise, and general construction activities during the construction of the enforcement systems. These effects are not considered significant since ambient noise and air quality levels would return to previous levels upon completion of the proposed project and construction activities would occur only during daylight hours.

The potential estimates of loss to wildlife, based upon wildlife densities and habitat loss within the project corridor would be 2,972 to 41,608 lizards, 1,872 to 2,080 birds, and 288 to 505 small mammals based on animal density data estimates (INS 2001a). These are worst-case estimates and assume that the entire project corridor would be completely void of wildlife post construction. However these wildlife species are common, widely distributed and have substantial available habitat. Therefore, this is not a significant impact. These estimates do not include those areas that are already disturbed, since such areas provide little, if any habitat for most wildlife species.

In addition to the potential for individual loss, the trans-boundary migration patterns of larger animals would be hindered or halted due to the secondary fences. A seamless array of lights and fences would serve as behavioral and physical barriers to numerous species that migrate north and south of the border. For example, Beier (1995) observed an individual cougar's first encounter with a well-lit sand factory. The cougar took two hours and four attempts to select a route around the facility. He consistently moved into the darkest horizon in order to cross (Beier 1995). Consequently, the potential for fragmentation of wildlife habitat is high under the Full Build Out Alternative. The following mitigation measures, will be implemented to reduce impacts to a less than significant level. They are as follows:

- Insure presence wildlife pathways
- Install small wildlife tunnels
- Restrict use of lighting
- Use vehicle barrier in lieu of pedestrian fence where possible
- Reduce footprint of roads in targeted areas

These measures are more fully described in Section 5.4.

Wildlife species that currently inhabit the surrounding area would be indirectly negatively affected by the addition of lighting within the project corridor. As noted, studies have been completed regarding wildlife and the effects of light on the circadian rhythms of wildlife species. Impacts to wildlife from lighting would be similar in type and magnitude (not significant) as in the Preferred Alternative. The long-term effect of an increased photoperiod on wildlife species is expected to be insignificant because of their ability to

acclimate. Furthermore, shields will be placed on the lights to reduce or eliminate light trespass outside of the project footprint.

Increased illegal foot traffic would occur in the areas east and west of the project corridor creating additional indirect negative effects to wildlife and their habitat. However, the extent of this possible increase in traffic is not quantifiable at this time because IA traffic patterns are beyond the control of the USBP.

4.7 AQUATIC COMMUNITIES

4.7.1 No Action Alternative

The No Action Alternative would temporarily impact aquatic communities in Whitewater Draw. Installation of low-water crossings is expected to permanently impact a total of approximately 0.35 acres. An additional 0.07 acres would experience temporary impacts due to construction activities. Current conditions would resume following the end of the construction period. These actions have been addressed in the Supplemental EA for Whitewater Draw, Douglas, Cochise County, Arizona (USACE 2001) and in an Individual Permit application under Section 404 of the CWA that has been submitted for the USACE, Los Angeles District. Indirect impacts would continue to occur in the San Pedro River basin and other riparian areas through the continued and possible increased degradation of aquatic habitat by IAs and smugglers and consequent USBP enforcement activities.

4.7.2 Preferred Alternative

Direct impacts would occur to approximately 0.5 acres of actual streambed within the San Pedro River where low-water crossings would be employed. This area would be altered from its natural state of gravel bed with riffles and pool complexes to concrete surfaces with associated riprap. The loss of 0.5 acres of streambed is not considered a significant impact because the steam is intermittent, is currently crossed by an unimproved road crossing and would merely be replaced by a concrete floor during flow periods.

Downstream temporary impacts associated with construction activities would include increased turbidity, erosion, and sedimentation within the river basin. These would be

reduced by implementation of BMPs continued in the project SWPPP. Long-term impacts consist of loss of aquatic habitat from culverts and low-water crossings, and possible increased stream velocity. Increased velocity would scour stream banks downstream, thus altering the existing habitat of native species as well as increasing turbidity. Thus, energy dissipaters and sediment basins would be incorporated into the project design to reduce velocity and sediment load and reduce this negative impact. All structures placed in aquatic habitat would be designed by professional engineers, to ensure that the natural flow of water is not impeded and impacts are minimized. All such designs would be submitted to the U.S. Section, International Boundary and Water Commission (IBWC), ADWR, BLM, as well as USFWS for review and approval. This activity would also require a permit from the USACE, Los Angeles District under Section 404 of the CWA. Mitigation measures associated with these impacts are discussed in Section 5.

Although the project corridor is generally within 60 feet of the border, the existing alignment of the road at the San Pedro River extends well outside of the 300-foot survey corridor used to analyze potential effects in this SEA. This alternative would make every feasible attempt to reduce impacts by remaining within existing roadway alignments and implementing appropriate BMPs. The specific BMPs are discussed in Section 5.1.

Indirect beneficial impacts associated with the implementation of this alternative would be the reduction or possible elimination of IAs and illegal smuggler traffic through existing aquatic communities in the San Pedro River. The extent of these impacts is not known due to the fact that travel patterns and routes chosen by illegal traffickers is solely at their discretion. However, in 2001 the daily average for IA crossings in the San Pedro Riparian NCA was 200 entries (INS 2002d).

4.7.3 Full Build Out Alternative

By implementing this alternative, similar impacts (approximately 3 acres) to aquatic communities would occur as in the Preferred Alternative. While the magnitude of these impacts would be greater compared to the Preferred and No Action Alternative, the impact would remain only minimal or moderate since the stream would not be significantly altered. Construction activities would be similar to that of the Preferred Alternative, but would include a secondary fence and road platform, thus requiring a

much larger footprint. All such designs would be submitted to the ADWR, BLM, as well as USFWS for review and approval. A Section 404 permit under the CWA would also be required. Mitigation measures that reduce the level of impacts are associated with these impacts are discussed in Section 5.

The Full Build Out Alternative would provide beneficial indirect impacts as well. With the implementation of culverts and low-water crossings, erosion and sedimentation resulting from the USBP and the public driving through the river basin would be reduced and possibly eliminated thereby reducing possible pollutants (e.g., oil, grease, gas) washed off vehicles during crossings. Furthermore, the lack of litter, debris, and human waste normally left behind by IAs would be decreased thus improving water quality, which in turn would have a beneficial effect on the aquatic community.

4.8 UNIQUE AND SENSITIVE AREAS

4.8.1 No Action Alternative

Implementation of this alternative would not directly affect any unique and sensitive areas within the project corridor. However, the continued and possible increases of IA traffic within these areas create moderate indirect and adverse impacts.

4.8.2 Preferred Alternative

Direct impacts to unique and sensitive areas (i.e. the San Pedro Riparian NCA) would occur under the Preferred Alternative within the San Pedro Riparian NCA. Approximately 4.2 acres would be permanently altered through the installation of the vehicle barriers, maintenance roads, low-water crossings, and all-weather road upgrades.

Since the existing road alignment in the San Pedro Riparian extends outside of the as it crosses the San Pedro River, indirect impacts would occur between the road and the border fence. The magnitude of these indirect impacts are not significant because they would be similar to or less than those currently incurred due to illegal traffic and continuous enforcement operations. Beneficial impacts would also occur, as a result of reducing fugitive dust and possible elimination of trails created by illegal foot and vehicle traffic.

4.8.3 Full Build Out Alternative

The Full Build Out Alternative requires that the project corridor traverse the San Pedro Riparian NCA. Approximately 64 acres of the San Pedro Riparian NCA, which represents approximately 0.11% of the approximately 58,000 acres in the San Pedro Riparian NCA in Cochise County, would be altered. Removal of 64 acres of unique and sensitive area would have a substantial adverse impact to the San Pedro NCA. However, this alternative would ability to eliminate IA traffic north of the project corridor, protecting hundreds of acres of the NCA from disturbance. Therefore this alternative would provide beneficial impacts to the San Pedro NCA.

Upon completion of construction activities, indirect impacts to the Coronado National Memorial and the Coronado National Forest would likely occur. The possibility of IAs and smugglers attempting to breach the U.S.-Mexico border west of the project corridor into these areas exists; however, the impacts associated with this possible shift are not quantifiable. The USBP has no control of activities south of the U.S. border and thus, cannot control these travel patterns.

The Full Build Out Alternative would indirectly benefit unique and sensitive areas by reducing or eliminating illegal traffic, brush clearing, trampling of sensitive resources, reducing the litter left behind, and fires caused by IAs. Vegetation and wildlife habitat north of the project corridor would improve, therefore, creating a more scenic and natural environment for public viewing.

4.9 PROTECTED SPECIES AND CRITICAL HABITAT

4.9.1 No Action Alternative

No protected species would be directly impacted, as no new infrastructure would be constructed in areas that support protected species or is designated critical habitat. However, the continued (and possible increased) use of the project corridor by IAs and illegal smugglers would have an adverse impact upon protected species north of the project corridor.

4.9.2 Preferred Alternative

Designated critical habitat for the Mexican spotted owl does occur within the project corridor, but not within any proposed construction area under this alternative; therefore, no direct impacts to Mexican spotted owls are expected with the implementation of this alternative.

A portion of the San Pedro River designated as spikedace and loach minnow critical habitat would be impacted. Proposed construction under this alternative would impact approximately 0.2 acres of critical habitat and would require mitigation or compensation measures directly coordinated with the USFWS and BLM. Erosion, increased turbidity, and sedimentation due to construction activities would temporarily affect water quality. All structures placed within critical habitat would be designed by professional engineers and approved by BLM and USFWS, under the Section 7 consultation process. This alternative would also provide indirect beneficial impacts by decreasing the amount of erosion and sedimentation. Other indirect impacts to critical habitat would likely occur from the withdrawal of water from the regional aquifer, which supplies the San Pedro River and may affect the spikedace and loach minnow. These impacts may significantly affect critical habitat if a significant deficit is experienced as a result of ground water withdrawal. Prior to implementation of actions within the San Pedro Watershed these effects would have to be addressed through the Section 7 consultation process. Conservation measures would be required to minimize impacts to, and incidental take of listed species, reducing impacts to these species and then habitat to a less than significant level.

There is a remote potential for project activities to affect a roaming jaguar. The report issued by JAGCT identified potential habitat for jaguars in their northernmost range. While the project corridor does exist within portions of the potential habitat that was identified, it must be noted that the identified habitat is highly variable. The JAGCT report noted in its recommendation that the potential habitat map depicts primarily land-cover requirements but little in the way of habitat needs and should be viewed with caution until more specific habitat-use data becomes available (Hatten 2002). While more data are becoming available about the jaguar in Arizona, it's northern most range information remains limited. However, due to the solitary and elusive nature that the jaguar exhibits to the human environment, and the fact that one individual has been seen in Arizona in

the past seven years, the project is not expected to have a significant effect on the jaguar.

4.9.3 Full Build Out Alternative

Since there is no designated critical habitat for the Mexican spotted owl within the proposed construction area under this alternative, no direct impacts are expected with the implementation of this Preferred Alternative.

Direct impacts to the critical habitat designated for the spikedace and loach minnow would be approximately 3 acres since the entire riverbed is designated critical habitat. The types of impacts are similar to that described in Section 4.7.2. Areas within critical habitat would be converted to concrete and associated rip-rap. Therefore, mitigation or compensation is required to reduce the level of impacts. These mitigation measures are similar to the Preferred Alternative and are more fully described in Section 5.5. Indirect impacts would occur from the water withdrawal from the regional aquifer. Similarly, Section 7 consultation with BLM and USFWS would be required to reduce impacts. Conservation measures would also be required to minimize impacts and incidental take of affected listed species.

Indirect beneficial impacts would occur as a result of reducing IA foot traffic since vehicle barriers, as proposed in the Preferred Alternative, do little to deter IA crossings on foot.

4.10 CULTURAL RESOURCES

4.10.1 No Action Alternative

Under the No Action Alternative, a total of three historic sites, four prehistoric sites and one site of unknown temporal and cultural affiliation would be affected by the proposed construction activities. Impacts to cultural resources under the No Action Alternative are summarized in Table 4-5. Of these, seven sites are considered eligible for listing on the NRHP. However, two sites (AZ FF:10:22 and AZ FF:11:82) have already undergone mitigation in coordination with the Arizona SHPO. Since these sites have already been mitigated, no additional consideration of those sites is anticipated. Five NRHP-eligible sites would be directly and adversely impacted from the implementation of the No Action Alternative and mitigation will be

Table 4-5. Summary of Direct Impacts to Cultural Resources

Site Number	Site Type	Status	No Action	Preferred	Full Build Out
AZ EE:12:38	Prehistoric Procurement; Historic Sites	Eligible – D		✓	✓
AZ EE:12:60	Prehistoric Mogollon Village	Eligible - D		✓	✓
AZ EE:12:61	Corral Complex	Eligible - A, C		✓	✓
AZ FF:9:10	Prehistoric Mogollon/Western Pueblo, possible Archaic Component	Eligible – D	✓	✓	✓
AZ FF:9:12	Historic Dump; Poss. Machine Gun place.	Not Eligible			✓
AZ FF:9:13	Historic Corral	Not Eligible		✓	✓
AZ FF:9:14	Historic Dump	Eligible – D	✓	✓	✓
AZ FF:9:21	Historic Homestead	Eligible – D			✓
AZ FF:9:22	Historic Homestead	Eligible – D		✓	✓
AZ FF:9:26	Unknown	Eligible - C, D	✓	✓	✓
AZ FF:9:88	Historic Dump, 1880s-1910s	Not Eligible			✓
AZ FF:10:20	Historic Homestead, Early 20th century	Not Eligible			✓
AZ FF:10:22	Prehistoric Early Formative	Eligible – D	✓*	✓*	✓
AZ FF:10:23	Historic Dump, 1940's – present	Not Eligible			✓
AZ FF:10:24	Historic Dump, 1930's – 1950's	Not Eligible			✓
AZ FF:10:25	Historic Dump, 1930's – 1950's	Not Eligible	✓	✓	✓
AZ FF:10:26	Historic Dump, 1900's – 1950's	Not Eligible			✓
AZ FF:10:27	Historic Dump, 1930's – 1950's	Not Eligible			✓
AZ FF:10:31	Prehistoric Procurement/Camp Archaic	Eligible – D	✓	✓	✓
AZ FF:10:54	Historic Campsite, 1892	Eligible – D	✓	✓	✓
AZ FF:10:56	Historic Structure, built ca. 1900-1910	Eligible– A, C			✓
AZ FF:11:81	Prehistoric Habitation site, Archaic	Eligible – D		✓	✓
AZ FF:11:82	Prehistoric Settlement, Formative	Eligible – D	✓*	✓*	✓
AZ FF:11:84	Historic Dipping Station, 1930's – 1940's	Eligible– A, C		✓	✓
AZ FF:11:85	Prehistoric Procurement, Archaic	Not Eligible		✓	✓
AZ FF:11:101	Prehistoric Scatter, Mogollon	Eligible – D			✓
AZ FF:11:105	U.S.-Mexico border	Eligible– A, C		✓	✓

*Site is within the Preferred Corridor but a portion has been previously mitigated
Source: Aztlan 2002

required to reduce impacts to a less than significant. Mitigation measures include the Section 106 review process prior to implementation.

Under the No Action Alternative, mitigation measures would involve data recovery and testing at eligible and potentially eligible sites. A potential exists for additional visual impacts to nearby historic districts and buildings resulting from proposed fence and stadium lighting construction. A viewshed analysis may be necessary in order to determine the extent of visual impacts on these historic structures and districts.

4.10.2 Preferred Alternative

There are 14 potentially eligible archaeological sites present within the project corridor affected by the Preferred Alternative. A summary of eligible and ineligible cultural resources sites present under the Preferred Alternative was provided previously in Table 4-5. Six of the sites are historic, six are prehistoric, one is a multi-component site (with historic and prehistoric components), and one is of unknown temporal and cultural affiliation. Two of the eligible sites (AZ FF:10:22 and AZ FF:11:82) have already undergone mitigation required for previous projects. Therefore, 12 NRHP-eligible sites would experience significant adverse impacts from the implementation of the Preferred Alternative. Mitigation measures similar to those in the No Action Alternative would be required.

Under the Preferred Alternative, mitigation measures would involve data recovery at eligible and sites and testing of potentially eligible sites to determine their eligibility and mitigation measures if needed. Under the Preferred Alternative, a total of nine historic sites and one prehistoric site would be avoided when compared to the Full Build Out Alternative. Only three of these sites avoided however, are considered eligible for listing in the NRHP. A potential exists for additional visual impacts to nearby historic districts and buildings resulting from proposed fence construction. Similarly a viewshed analysis will be necessary in order to determine the extent of visual impacts on these historic structures and districts.

4.10.3 Full Build Out Alternative

There are 17 potentially eligible archaeological sites that could be affected by the Full Build Out Alternative, including eight historic sites, seven prehistoric sites, one multi-component site (with historic and prehistoric components), and one site of unknown temporal and cultural affiliation. Of the 27 archaeological sites, 17 are eligible for listing on the NRHP. As mentioned previously, portions of two sites (AZ FF:10:22 and AZ FF:11:82) have undergone previous mitigation. Though portions of both sites have been mitigated, under the Full Build Out Alternative, additional undisturbed areas of these sites would be impacted. Thus, all 17 NRHP eligible sites would experience direct and adverse impacts from the implementation of the Full Build Out Alternative (Table 4-5).

Since avoidance would not be feasible within the Full Build Out Alternative, mitigation measures, as prescribed in Section 5.0, would be required and would primarily involve data recovery at eligible sites and testing at potentially eligible sites. In addition, potential visual impacts to nearby historic districts and buildings would result from fence and lighting construction. A viewshed analysis would be necessary in order to determine the extent of visual impacts on these historic structures and districts.

4.11 AIR QUALITY

4.11.1 No Action Alternative

Increased air emissions are primarily expected during road construction. Air emissions due to routine patrol activities are expected to remain the same or possibly increase due to the need for additional patrols. The Douglas Station would ultimately experience reduced fugitive dust emissions as a result of improved roadway conditions. The Naco Station's AO would continue to experience fugitive dust emissions similar to present levels as a result of substandard road conditions. These impacts are expected to remain at a less than significant level over the foreseeable future.

4.11.2 Preferred Alternative

Since Cochise County is classified as a nonattainment area for SO_2 and PM_{10}, emissions of those two pollutants were addressed as specified by the General Conformity Rule under the CAA. SO_2 emissions were calculated based on AP-42 Section 3.3 Table 3.3-1 (Providence Engineering 2002). However, the air quality impact and conformity analysis

was performed for the Full Build Out Alternative, which was considered worst case scenario. Discussion of this analysis is provided in the next section and the results are provided in Appendix D. Briefly, the analyses indicated that total emissions resulting from construction of the Full Build Out Alternative, which requires substantially more construction activities than the Preferred Alternative, is expected to be less than the *de minimus* thresholds. Thus, an air conformity analysis would not be required. The Preferred Alternative would result in far less emissions of both SO_2 and PM_{10}. While minor short-term impacts would result from the implementation of the Preferred Alternative, ambient conditions would be expected to return shortly after cessation of the construction activities. In fact, ambient air quality conditions would most likely improve since surfaced roads would reduce dust emissions made by USBP patrols and current dragging operations that are conducted on the existing roads.

Past projects have acquired fill material from a local source located approximately 5 miles north of the City of Douglas. It is likely that this same source would be utilized for fill material during the extent of this project as well. Based on the estimated fill requirements identified in Section 2.2.2.1, approximately 7,300 loads (17 CY trucks) could possibly be required. With an average 33 mile round trip from the local storage site to any site within the project corridor, it is estimated that trucks transporting fill material would log between 24,000 and 48,000 miles per year during the period of construction. Although these additional trips were not included in the air quality analyses, they would not result in emissions above *de minimus* thresholds since the majority of the transportation of materials would occur on improved roadways (U.S. Hwy 80) and then to access roads leading to the construction sites in both the Naco and Douglas Station AOs. Furthermore, construction emissions that were calculated in the air quality analysis could be quadrupled and not exceed *de minimus* thresholds. Therefore air quality impacts would remain at less than significant levels.

4.11.3 Full Build Out Alternative

As noted, an air quality and conformity analysis was performed on the construction activities proposed under the Full Build Out Alternative to determine the total air quality emissions of both SO_2 and PM_{10} due to the construction footprint (see Appendix D). Based on these analyses, total emissions resulting from proposed construction are

expected to be below the *de minimus* thresholds. Thus, an air conformity analysis would not be required.

SO_2 emissions were calculated based on AP-42 Section 3.3 Table 3.3-1 (Providence Engineering 2002). The AP-42 is a compilation of the recommended air pollutant emission factors for stationary point and area source emissions set by USEPA under the CAA. A summary of SO_2 emissions from construction activities is presented in Table 4-6.

Table 4-6. Summary of SO_2 Emissions from Construction Equipment

Construction Equipment	SO_2 Emissions (tons/year)
Light Truck	0.001
Bus	0.001
Dump Truck	0.050
Heavy Truck (Tractor Trailer)	Negligible
Water Truck	0.070
Bulldozers/Grades	0.450
Scrapers	0.001
Total Emissions	**0.570**

Source: Providence Engineering 2002

Particulate emissions from vehicle trips on unpaved roads were calculated using AP-42 Section 13.2.2 Equation (2). Particulate emissions from bulldozing and compacting were determined using AP-42 Sections 13.2.3 and 11.0. Particulate emissions from loading excavated material to trucks and truck dumping were determined using AP-42 Section 13.2.4 Equation (1). Particulate emissions from scraping operations were determined using AP-42 Section 13.2.3 where an empirical emission factor in pounds per vehicle mile traveled was given. A summary of PM_{10} emissions from construction activities is presented in Table 4-7.

Table 4-7. Summary of PM_{10} Emissions from Construction Activities

Construction Activity	PM_{10} Emissions (tons/year)
Vehicle Traffic on Unpaved Roads	13.560
Bulldozing and Compacting	2.110
Grading	0.240
Truck Loading and Dumping	0.040
Scrapers	0.620
Blasting	0.001
Total Emissions	**16.570**

Source: Providence Engineering 2002

Part of Cochise County is a moderate nonattainment area for PM_{10} and SO_2. Per 40 CFR 51.853(b)(1), the moderate nonattainment threshold value for General Conformity determinations is 100 tons per year for both PM_{10} and SO_2. The total emission rates as shown in Tables 4-6 and 4-7 are less than 100 tons per year for both SO_2 and PM_{10}; therefore, an air conformity analysis is not required. As a result, only short-term, minor impacts to air quality would be expected during construction.

Upon completion of the Full Build Out Alternative, USBP operations within the project corridor would produce only minimal impacts to the region's air quality. In fact, it would be expected to reduce current fugitive dust emissions since roads would be surfaced and dragging operations would only occur on designated drag roads rather than to existing roads.

The Full Build Out Alternative would require approximately twice the amount of fill material as the Preferred Alternative, and would require approximately 8 to 12 years to complete. Given this, it is estimated that trucks transporting fill material would log between 44,600 and 67,000 miles per year for the period of construction. Even at these levels of haul traffic, annual PM_{10} and SO_2 of the Full Build Out Alternative are expected to remain below the *de minimus* thresholds. Therefore air quality impacts would remain at less than significant levels.

4.12 WATER RESOURCES

4.12.1 No Action Alternative

Implementation of the No Action Alternative would have temporary impacts to water resources; however, indirect impacts to area streams' water quality and flood plain capacities would occur since erosion would likely increase. Over time, movement of large amounts of sediments during the traditional monsoon season would adversely alter the floodplain capacity. Additionally, increased erosion ultimately increases turbidity and lowers dissolved oxygen in downstream aquatic ecosystems.

Under the SSA Protection Program any Federal financially assisted project that has the potential to contaminate the designated SSA are subject to USEPA review. All alternatives discussed in this SEA would be entirely Federally funded, and therefore not subject to USEPA review under the SSA Protection Program.

It must be noted that under any of the alternatives presented in this SEA, roadway construction activity requires that workable soil moisture content be obtained in order to properly compact soils for roadbed construction. Additionally, in order to reduce air quality impacts, water must be used to suppress fugitive dust at the construction site and along construction corridor routes. Based on worst-case estimates provided by preliminary engineering designs and water usage from a previous roadway project, a mile of all-weather surface would require approximately 66,000 gallons of water for construction and dust suppression (Michael Baker 2003).

Water usage requirements for any of the alternatives analyzed in this SEA would result in impacts to the annual recharge of both the Upper San Pedro and Douglas basins. The Douglas basin is currently estimated to have 22,000,000 ac-ft of water in aquifer storage with a recharge deficit of 31,010 ac-ft/year. The Upper San Pedro basin currently contains an estimated 56,700,000 ac-ft of water in aquifer storage (EEC 2002). The deficit in the Upper San Pedro is estimated at 7,400 ac-ft/year (CEC 1999). Water required for construction in the Douglas and Naco Station AO would be withdrawn primarily from the Douglas and upper San Pedro basins, respectively.

Under the No Action Alternative, water requirements would result in approximately 1.9 million gallons of water (5.74 ac-ft) for construction activities. The period of construction

is expected to take 3 to 5 years to complete, which would equate to between 1.15 and 1.91 ac-ft/year required for construction activities. Approximately 0.79 ac-ft would be required for construction in the Naco AO and 4.95 ac-ft (1.0 to 1.65 ac-ft/year) would be required in the Douglas AO. The No Action Alternative would result in a minor impact, contributing a negligible increase to the yearly recharge deficit in both the Upper San Pedro and Douglas basins. In either case, these impacts would be considered less than significant since the withdrawal would be a one-time withdrawal and could be minimized by distributing the usage over the 3 to 5 year period of construction.

4.12.2 Preferred Alternative

Under implementation of the Preferred Alternative, water usage for construction and dust suppression would require approximately 3.3 million gallons (10 ac-ft) of water. Construction is expected to take 5 to 10 years to complete. Thus, it is estimated that approximately 5.3 ac-ft (0.5 to 1.0 ac-ft/year) would be required to be withdrawn from from the Upper San Pedro basin for construction activities and approximately 4.8 ac-ft (approximately 0.5 to 1.0 ac-ft/year) from the Douglas basin.

Based on the data provided in Section 3 moderate impacts would occur within either basin. Water required from public sources in the Douglas basin would increase the yearly deficit by 0.02% for the period of construction. Water requirements from sources in the Upper San Pedro basin would result in a 0.07% increase to the annual deficit. This reduction in available groundwater would not significant relative to the current total aquifer storage in either basin. Due to long-term deficits in the San Pedro Watershed any large increase to the long-term deficit would be considered significant. Therefore conservation measures would be identified and incorporated to mitigate the net loss.

The cone of depression located in the Fort Huachuca and Sierra Vista area has also been a site of successful conservation measures. Fort Huachuca is mandated to operate IAW the USAIC&FH Policy 19, Fort Huachuca Water Use Mitigation Policy (USAIC&FH), which mandates effective water use conservation measures. A recent example of the effectiveness of such measures involves the ground water resource issues with a recent USBP operations expansion project at Fort Huachuca. This project estimated the annual groundwater use of 6.1 ac-ft. However, the entire consumptive use was offset by the conservation measures at Fort Huachuca and the ROI. Similar

measures identified in Section 5 would minimize impacts of the Preferred Action to a less than significant level. In addition, consumable water required for construction purposes would be transported for sources outside of the San Pedro watershed to the maximum extent practicable.

The Preferred Alternative would result in minor temporary construction impacts, such as increased turbidity, and water consumption due to compaction and dust suppression activities. These impacts would be further minimized to the extent practicable with BMPs and an effective SWPPP, which would require control of sediment runoff (discussed in Section 5.1).

Construction of low-water crossings would generally consist of concrete pads placed in the bottom of the drainages at road crossings. Temporary effects would include increased levels of sedimentation and turbidity. The streambed would be permanently impacted by concrete paving, although the flow of water would not be impaired or impeded since streams in the project corridor are mostly intermittent. Impacts associated with sedimentation and turbidity would only occur during periods of water flow. Construction of these crossings would be planned during the dry season and appropriate BMPs would be implemented during construction; therefore, only minimal erosion impacts would occur.

Impacts to approximately 19 acres of floodplain and watershed area could not be avoided, due to the need to construct an infrastructure system parallel to the border. However, the result of impacts would be either insignificant or beneficial to the floodplain conditions since low water crossings and improved roadways would reduce erosion. In addition, impacts to approximately 5 acres of potential wetlands and 12 acres of unvegetated Waters of the U.S. would be significant. Consultation would be completed with the USACE (Los Angeles District) to confirm potential impacts to jurisdictional wetlands or Waters of the U.S. caused by this alternative. In proposed construction that impacts jurisdictional wetlands and/or Waters of the U.S., would require that the proper permits (e.g., Section 404 permits) be obtained prior to construction in these areas and proper mitigation (if required) is conducted mitigation measures identified as required in applicable permit. Coordination would also be required with local municipalities to ensure that construction activities do not adversely impact the floodplain. No activities

would be initiated that may affect floodplains and wetlands without compliance to the extent practicable, of Executive Order (EO) 11988 on Floodplain Management and EO 11990 on Protection of Wetlands, respectively. The USBP would make every feasible attempt to minimize or reduce impacts to wetlands and floodplains. However, due to the general north/south orientation of these drainages and the need to place infrastructure parallel to the international border, impacts would be unavoidable.

Placement of primary and secondary fences is likely to create minor temporary impacts in the floodplain during construction. However, proven designs such as the bollard fence identified in Photograph 2-4 would be placed within floodplains and drainages. This type of fence design would allow for the free flow of water during local rainfall. All drainage structures would be designed by professional engineers, to ensure that the natural flow of water is not impeded and floodplain capacities are not decreased. All such designs would be submitted to the IBWC, ADWR, USACE, USEPA, and BLM (for the San Pedro River) for review and approval.

4.12.3 Full Build Out Alternative

Implementation of this alternative would result in temporary direct impacts to surface water drainages due to increased turbidity and sedimentation. The construction contractor or military unit would be required to strictly adhere to an effective SWPPP to reduce the magnitude of these potential effects.

Under the Full Build Out Alternative, impacts to the regional watershed would result from water usage totaling approximately 5.9 million gallons (18 ac-ft) for construction activities. However, a project of this magnitude would take 8 to 12 years to complete. Therefore, these estimates would be extended over time requiring between 1.5 and 2.3 ac-ft /year. Approximately 9.5 ac-ft (0.8 to 1.2 ac-ft/year) of water would be required from sources in the Douglas basin, increasing the yearly deficit by 0.06% throughout the period of construction. Water requirements from sources in the Upper San Pedro basin would total 8.2 ac-ft (0.7 to 1.0 ac-ft/year) and would result in a 0.1% increase to the annual deficit. While in most cases an increase in deficit of 0.1% would be considered minimal, because of the scarcity of available water in the region an increase in the annual deficit must be considered moderate. However, the withdrawals would be

distributed throughout the construction period and conservation measures would be incorporated to mitigate the net loss if required.

Approximately 50 acres of floodplain and watershed area and 8.3 acres of potential wetlands and approximately 28.8 acres of Waters of the U.S. would likely result in significant impacts under the Full Build Out Alternative. Similar consultation, permitting, and mitigation as discussed in the Preferred Alternative, would be required prior to initiation of construction in these areas to reduce the level of these impacts to a less than significant level.

4.13 SOCIOECONOMICS

USBP activities generally result in beneficial impacts to local, regional, and national economies. The diversity of projects performed by the USBP implies that socioeconomic impacts would vary considerably. Some projects have very small construction and operational impacts while others are more substantial (e.g., construction costs, operational impacts, and project magnitude). The actual construction impacts are usually localized due to the temporary nature of the construction activities and the fact that the predominance of labor for these projects in the past has been provided by the Arizona National Guard or Active/Reserve military units. Consequently, the purchase of construction materials and supplies (increase in local sales and income) is typically the primary, direct economic effect in the project vicinity.

Although construction impacts are temporary in nature, the beneficial effects associated with implementation of USBP projects are expected to continue for the economic life of the project. All actions provide socioeconomic benefits from increased detection, deterrence, and interdiction of illegal drug smuggling activities. Benefits include reduced enforcement costs, losses to personal properties, violent crimes, and entitlement programs. These actions can also have direct positive benefits from increased economic activity.

Effects to the aesthetics and/or quality of life would be incurred in certain regions that experience significant new construction actions or increases in patrolling activities. This would be of special concern in urban areas, as well as sensitive sites such as open

public lands. These effects can be either positive or negative, depending upon an individual's judgment.

4.13.1 No Action Alternative

Socioeconomics in the area would generally remain the same as they are now for the No Action Alternative. Limited control of the border and access along the border would impede USBP response, which, in turn, would not enhance the apprehension capabilities. The No Action Alternative would not likely be beneficial for the Naco area since a very small amount of road improvements would occur; while, it would be somewhat beneficial to the Douglas area because minimal road improvements would stimulate the economy to a small degree. Due to the limited interaction within the community impacts are expected to be less than significant.

4.13.2 Preferred Alternative

No significant effects, direct or indirect, would occur to population or employment, because of implementation of the Preferred Alternative. Under the Preferred Alternative, a total of approximately $36,447,520 would be spent during construction (INS 2002c). The exact amount of that total that would be spent in the local area is not known but can be assumed to be between 15% and 30%. These expenditures are subject to economic multiplier effects. The multiplier indicates the total impact of a project or action as estimated from direct expenditures. The economic multiplier for Cochise County, Arizona is 2.22 (U.S. Army 2002). Using this multiplier, the overall impact on local sales, income and employment can be estimated to be between $12,027,681 and $24,055,363. National Guard or Active/Reserve military units from JTF-6 personnel would perform most construction activities; therefore, the overall area population would not be significantly impacted. Minor increases in local population would occur during periods of construction over a 5- to 10-year period. No housing impacts are anticipated since these units would be housed at camps situated at defined bivouac sites. Approximately 202 acres of private land would be removed from the tax base of the area. This would result in a $20,314 to $50,784 loss in annual property tax income.

Since the existing roadway alignment is located adjacent to the border within the Town of Naco and the City of Douglas, construction efforts would be limited to the Roosevelt Easement through these areas. As a result, no residential or commercial structures

would be impacted. There would be no displacement of housing or any impact to neighborhood cohesion resulting from the implementation of this alternative. The socioeconomic community would actually benefit from effective enforcement operations across the Naco and Douglas Stations' AOs. Overall, implementation of this alternative would reduce adverse impacts that currently exist on local law enforcement and the emergency response community.

4.13.3 Full Build Out Alternative

No effects to population or employment would occur with the Full Build Out Alternative. If military personnel from the National Guard or Active/Reserve military units perform all of the construction activities as anticipated, the unemployment rate within the area is not likely to be affected. A minor increase in the overall area population would occur periodically as units come in for construction during the 8 to 12 year period. Housing impacts are not anticipated, as the units would stay in camps at established bivouac areas. Therefore, the overall area population would not be significantly impacted. Labor and most materials would be brought into the local area; however, some expenditures are expected to occur within the ROI. The Full Build Out Alternative would involve approximately $93,809,480 in construction costs (INS 2002c). Assuming that between 15 and 30% are spent locally and the economic multiplier effects, the overall impact on local sales, income and employment can be estimated to be between $30,957,128 and $61,914,256.

As a result, short-term increases in local revenues for commercial establishments, trade centers, and retail sales would result from the purchase of supplies (e.g., concrete, water, fuel, lumber, etc.) and equipment rental. Any potential impact from the implementation of this action alternative would ultimately be absorbed into the broader economy. A total of 518 acres of private land would be removed from the tax base of the area at the current property tax rate of 3.3521% (Cochise County 2002). This change in ownership would result in a $52,091 to $130,229 loss in annual property tax income. Within the communities of Naco and Douglas, construction efforts will be limited to the Roosevelt Easement (60 feet). As a result, no residential or commercial structures would be impacted from the implementation of this alternative. There would be no displacement of housing or any impact to neighborhood cohesion resulting from the implementation of this alternative.

The socioeconomic benefits from an effective enforcement corridor across the Naco and Douglas Stations' AOs would be decreased drug trafficking and smuggling. Overall, implementation of this alternative would reduce socioeconomic impacts and burdens that currently exist on the local law enforcement and emergency response communities.

4.14 E.O. 12898 AND 13045, ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

Executive Order 12898 of February 11, 1994, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" required each Federal agency to identify and address, as appropriate, disproportionate adverse effects of its proposed actions on minority populations and low-income communities. Executive Order 13045 requires each Federal Agency "to identify and assess environmental health risks and safety risks that may disproportionately affect children; and "ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." This Executive Order was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. As indicated earlier in Section 3.0 of this SEA, approximately 30 % of the population claims Hispanic origin. In the Town of Naco, it is 82 % and in the City of Douglas, approximately 86 % claim Hispanic origin. Cochise County has about 21% of its total population living at or below poverty levels. The 1997 PCPI was estimated to be about $17,000, which indicated a 28% increase since 1990. Some construction will take place close to residential areas. As a result, there is a potential for construction taking place near children in some areas.

Under both the Preferred Alternative and the Full Build Out Alternative, all construction would be limited to an area 60 feet north of the U.S.-Mexico border within populated areas and no greater than 300 feet in unpopulated areas. As a result, all work in the communities of Naco and Douglas would be within the Roosevelt Easement and there would be no direct impacts (i.e. relocation or displacement) to any residential or commercial structures. Minor impacts to neighborhoods close to the border from noise and dust during construction is anticipated. This has the potential to affect both low-income and minority populations as well as children. Environmental design measures to

mitigate impacts from noise and dust are given in Section 5.0 under the noise and air quality sections, respectively. Best management practices would be used at all construction sites to ensure the safety of the local population, particularly children, during construction. As a result, there would be no significant impacts to neighborhood cohesion or environmental justice resulting from this alternative. A minor visual impact to some neighborhoods within Naco and Douglas from the construction of a second fence is possible. Mitigation measures for potential visual impacts are given in Section 5.0.

Alternatively, implementation of either of the alternatives would enhance the probability of success for the USBP although the levels of enhanced success would vary between the alternatives. This increased success in controlling illegal drug activity and decreasing the flow of IAs through the project corridor would benefit all populations, regardless of age, income, nationality, or ethnicity. These benefits would be greater under the Full Build Out Alternative since this alternative would provide a much more effective enforcement corridor.

4.15 NOISE

The short-term effects associated with the DNL noise levels would be expected to be greater than 60dBA and would occur within the general area of construction activities. Because of the linear nature of the proposed projects, construction activities would be relocated as different components are completed. Therefore, peak DNL noise levels would not be located in a central area for an extended period.

Upon completion of the construction period long-term effects associated with the DNL noise levels in rural areas of the project corridor are likely to range from a low of 35 dBA over the majority of the corridor to a high of about 60 dBA. Near the Town of Naco and City of Douglas, DNL would peak at levels greater than 60 dBA resulting from the accumulation of associated noise levels such as development and other construction noises.

4.15.1 No Action Alternative

Implementation of the No Action alternative would result in only minor temporary impacts to noise levels due to construction. Heavy equipment such as graders, bulldozers, and dump trucks would cause temporary increases in noise levels. The magnitude of these effects would depend upon the time of year, climatic conditions, type and number of equipment, and terrain. Based on past similar activities, construction would occur only during daylight hours, thus reducing the DNLs and the chances of causing annoyances to sensitive receptors (e.g. schools, hospitals, churches, and residences) in the Town of Naco and the City of Douglas. There is one school and two churches in the Town of Naco, and 10 schools and 33 churches in the City of Douglas that could potentially be affected by this alternative depending on the proximity of construction activities.

4.15.2 Preferred Alternative

The Preferred Alternative would result in only temporary impacts to noise levels due to the operation of heavy equipment such as graders, bulldozers, and dump trucks. With the implementation of this alternative, a slight increase would occur in noise impacts to sensitive receptors compared to that of the No Action Alternative.

Animals, particularly domesticated species, would be expected to quickly habituate to construction noise. Wildlife may be startled and flee the construction area; however, wildlife species, too, have demonstrated rapid habituation, even to loud and sudden noises, which cause panic responses. Bowles (1997) reported that habituation occurs with fewer than five exposures. Several other recent studies (Workman et al. 1992; Kraussman et al. 1993, 1998; Weisenberger et al. 1996) have indicated that wildlife habituate through repeated exposure without long-term discernible negative effects. Blasting activities, if required, would especially cause a startled response in wildlife. Because of the sporadic occurrences of these activities, their effects are not considered significant.

4.15.3 Full Build Out Alternative

The types and magnitude of effects caused by implementation of this alternative would be similar, but would either be of greater magnitude or over a longer period of time than those described for the Preferred Alternative, primarily due to the increase of construction activity.

Although blasting is not proposed, conditions are likely to occur where it may be required on a limited basis. If required, blasting would occur only in remote and rugged areas where sensitive receptors are not likely to be affected. No blasting would be conducted near urban areas. Blasting would typically generate peak noise levels ranging up to 140 dBA; however, mitigation measures would be employed, such as blasting blankets or soil overburden, to reduce blast noise and reduce impacts to a less than significant level.

Construction activity would temporarily increase noise levels within the immediate vicinity of the construction site. However, ambient noise levels would return upon completion of construction work with no long-term, significant adverse impacts.

4.16 SOLID AND HAZARDOUS WASTES

4.16.1 No Action Alternative

Because of the random nature of illegal dumping along the border areas, it is difficult to determine the location and quantity of hazardous waste that may be present within the project corridor. If hazardous materials or wastes are present, there would be a potential for exposure during construction activities. Construction personnel would be informed about the potential to encounter hazardous wastes that may be present on the site from dumping and the appropriate procedures to use if suspected hazardous contamination is encountered.

An accidental release or spill could occur as a result of fuels, oils, lubricants, and other hazardous or regulated materials brought on site for the proposed construction activities. A spill could result in potentially adverse impacts to on-site soils, and threaten the health of the local population, as well as wildlife and vegetation. However, the amounts of fuel and other lubricants and oils would be limited, and the equipment would be located on site to quickly contain any contamination. Additionally, a Spill Prevention, Control and Countermeasures Plan (SPCCP) would be in-place prior to construction, and all personnel briefed on the implementation and responsibilities of the plan. As a result, no impact is expected.

4.16.2 Preferred Alternative

Under the Preferred Alternative, impacts would be similar to those under the No Action Alternative. Since more construction activities would take place, there would be a greater potential for accidental spills and encountering unknown deposits of hazardous waste. As under the No Action Alternative, construction personnel would be informed about the potential for encountering hazardous wastes and the appropriate procedures to use if suspected hazardous contamination is encountered. Safety measures outlined under the No Action Alternative would be followed under the Preferred Alternative. Finally, as in the No Action Alternative, a SPCCP would be in place prior to construction to ensure that no impacts occur.

4.16.3 Full Build Out Alternative

Under the Full Build Out Alternative impacts would be similar to the Preferred Alternative. Therefore, similar safety measures would be implemented and a SPCCP would be in place prior to construction. No impacts are expected.

4.17 CUMULATIVE EFFECTS

This section of the SEA addresses the cumulative impacts associated with implementation of proposed USBP infrastructure, the No Action Alternative and other projects/programs that are planned for the region. A general discussion regarding cumulative effects that would be expected irrespective of the alternative selected is provided in the following paragraphs. The resources that would be impacted are addressed within each alternative discussion.

As discussed earlier, site densities for cultural resources are relatively high in the project corridor; consequently, there is a high potential to have significant cumulative impacts to these sensitive resources if proper mitigation measures are not provided. Implementation of either of the alternatives would be required to follow a similar strategy of mitigation for NRHP-eligible properties so that the actions would result in mitigated impacts to historic properties. Construction activities would be coordinated with the Arizona State Historic Preservation Office (SHPO) through the Section 106 review process, which has been initiated. USBP would be responsible for any mitigation

required for the initial construction of the project, as well as that required for associated maintenance activities.

Air quality would be temporarily impacted during and immediately after completion of major construction projects. This resource would be expected to incur only minor or possibly moderate cumulative impacts. The proposed construction would not cause a violation of air quality standards and, upon completion, fugitive dusts would be expected to be lower than ambient conditions due to all-weather surfaces.

Soils that are disturbed during construction activities would be vulnerable to erosion. However, an indirect beneficial impact of a majority of road construction projects would be to improve road surfaces thereby reducing soil erosion; thus, the cumulative effect to soils would be beneficial. Reduced erosion rates would reduce turbidity and enhance water quality within local streams and drainages.

Groundwater resources within the Upper San Pedro Basin have been the subject of controversy for some time. However, the one time water usage required by the Preferred Alternative would likely result in moderate adverse cumulative impacts. In fact, once construction is concluded, it is likely the USBP water demands could return to pre-project conditions. However, the possibility of current aquifer yields returning to present conditions would be highly dependant on the water usage requirements of other developments within the basin in the foreseeable future and the efficiency of water conservation programs. Furthermore, it must be noted that the present conditions do not reflect historical conditions of the riparian area. It has been suggested that recent declines in the Upper San Pedro basin are partially the result of changes in vegetation along the riparian corridors caused by the 1880 entrenchment. Historically, the riparian areas were once predominantly grassland. Woody vegetation was either not present at all or very sparse. Once woody vegetation became established along the river, it began to play a significant role in the available ground water conditions, due to a high evapotranspiration rate (estimates are approximately 30.7 ac-ft per day for the entire San Pedro riparian corridor).

Direct cumulative impacts on socioeconomics would be beneficial. The magnitude of these effects would depend upon the project costs and would be dependant on what is

actually spent in the local economy (i.e., local expenditures), as well as the economic multipliers in the region. Cumulative indirect effects to socioeconomic resources (e.g., daily purchase of fuel) would also be beneficial, yet insignificant.

The USBP and other entities are currently conducting projects in the region. Other previously addressed, proposed or ongoing projects in or outside of the vicinity of the project corridor are discussed below. A synopsis of each project may be viewed in Table 4-8.

Numerous, past border road construction projects near the project corridor have already been conducted. The Preferred Alternative and Full Build Out Alternative proposed in this SEA would incorporate the previous designs and work addressed in the Corridor EA, as well as infrastructure assessed under other similar NEPA documents to the maximum extent practicable. The proposed actions would, therefore, either enhance effectiveness or encompass previously addressed projects identified in this SEA. The USBP intends to employ similar projects such as those analyzed in this SEA across the remainder of the U.S.-Mexico border in the Tucson Sector. Many of these projects have yet to be identified and therefore, the cumulative impacts cannot be fully analyzed at this time. However, it should be assumed that the cumulative effects of projects in the reasonably foreseeable future would have similar impacts, as well as appropriate mitigation measures such as those analyzed in this SEA. Thus, future projects would likely add to the overall cumulative effect in the region.

An analysis of each component of the affected environment was completed from the existing EAs in order to identify which actions would have cumulative impacts because of the past and proposed operations. Additional information was considered, including real estate ownership, growth rates, and known future projects in the area. No long-term significant impacts have occurred based on analyses of these past project reports.

Table 4-8. Current and Future Projects

Arizona Department of Transportation Current and Future Projects		
Agency	**Project Name, Description, and Location, Status**	**Construction**
Arizona Department of Transportation (ADOT)	State Route 80 - Silver Creek to Bernardino, 3" Paving Overlay	2003
ADOT	State Route 80 - St. David to Clifford Wash, Extend cross drainage	2003
ADOT	State Route 82 - Cochise County Line to State Route 90, Paving Overlay	2003
ADOT	State Route 82 - Junction of State Route 90 to Junction of State Route 80, 2" Paving Overlay	2004
ADOT	State Route 82 - Fairbank Historic Townsite, Widen Turn Out and Pave Parking Lot	2003
ADOT	State Route 90 - Sierra Vista to San Pedro River, Paving and Safety Improvements	2003
ADOT	State Route 90 - San Pedro River to the Junction of State Route 80, Safety Improvements	2003
ADOT	State Route 92 - Carr Canyon Rd. - Hunter Canyon, Widen and Improve Roadway	2004
ADOT	U.S. 191 - Segment I: I-10 to Mile Post 91.6 (Bowie Spur), Construct Divided Highway	2004
ADOT	State Route 80 - Junction Double Adobe Rd. to Cochise Jr. College, Mill and replace pavement	2004
ADOT	I-10 - Pantano Railroad Underpass, Reconstruct Bridge	2003
ADOT	I-10 - Cienega Creek - Marsh Station, Design Traffic Intersection and New Bridges	2006
ADOT	B-10 - San Simon, 2" Paving Overlay	2005
ADOT	State Route 80 - Tombstone Courthouse State Park, Design park roads and Visitors Parking Area	2005
ADOT	State Route 80 - Benson South to the Clifford Wash, 3" Paving Overlay	2005
ADOT	State Route 90 - Kartchner Caverns State Park, Roadway Design	Undetermined
ADOT	I-10 - State Route 90 to the Ocotillo T.I., Construct Climbing Lane	2006
ADOT	I-10 - Fort Grant T.I, Reconstruct Traffic Intersection	2006
USFS, Coronado National Forest - Sierra Vista	Carr House Parking Lot and Restroom, Huachuca Mountain Range, Arizona. (1 to 2 acres impact).	No start date established
USFS, Coronado National Forest - Sierra Vista	Scotia Riparian Fence, 2-miles in length, Huachuca Mountain Range, Arizona. (2.42 acres impact).	Mid- November
USFS, Coronado National Forest - Sierra Vista	Perimeter Trail and Parking Lot (Impacts include 3 miles of trail (assuming 4-foot ROW then 1.5 acres) plus 1 acre for parking lot). (Total of 2.5 acres impact).	December 2003
NPS, Coronado National Memorial	Construction of approximately 1.5 miles of vehicle barrier from eastern boundary of the Coronado National Memorial. (1 mile by 11 feet or 1.36 acres).	October 27, 2003
AGFD	Construction of 2 new Wildlife Viewing Platforms at Whitewater Draw Wildlife Area, McNeal, Arizona. (< 0.5 acre).	In progress
DOD, Fort Huachuca	Construction and Operation of a DOD HUMINT Training Center. (10 acres impact).	Unavailable
DOD, Fort Huachuca	Construction and Maintenance of a Security Fence for Libby Army Airfield/Sierra Vista Municipal Airport. (25.7 acres of impact).	Unavailable
DOD, Fort Huachuca	Construction and Operation of an AAFES Shopette. (1.5 acres of impact)	Unavailable

Table 4-8. Current and Future Projects (Continued)

Current and Future Vicinity Projects		
Agency	**Project Name, Description, and Location, Status**	**Construction**
DOD, Fort Huachuca	Real Property Master Plan for EPG. (62 acres of impact).	Unavailable
DHS, USBP	Construction of new USBP station located about 2 miles west of Douglas (approximately 15 acres impact).	Completed
DHS, USBP	30 to 50 portable lights in a 10.5 mile corridor near the Naco POE (approximately 0.5 acres impact).	Completed
DHS, USBP	Improvements to 2 miles of Kings Ranch Road to provide north/south access from the new Douglas Station to the border (approximately 9 acres impact).	Completed
DHS, USBP	Improvements to 4 miles of border road and 9 miles of pedestrian fence west of Naco (approximately 10 acres impact).	In Progress
DHS, USBP	Installation of 9 RVS systems in USBP Naco and Douglas Stations' AO (approximately 0.4 acres impact).	In Progress
DHS, USBP	Wilcox Station	Completed
DHS, USBP, Ajo Station	10-acre development for family housing units (52) to house about 215 people (agents and family members). This will be a private development and USBP will lease the units from the developer. Currently in planning stage.	2004
DHS, U.S. Customs Service Lukeville, Arizona, POE	Customs Service family housing units (15) at the Lukeville POE. Currently in planning stage.	2004
DHS, USBP, Tucson Station	2-acre site (at Randall & Valencia in Tucson) for expansion of a maintenance facility in a vacant residential area. Currently in planning stage.	2004
DHS, USBP, Ajo Station	Lease a maintenance facility in Ajo and develop a 5-acre site near the station headquarters for parking and horse corrals. The project may involve modular buildings for office. Currently in planning stage.	2004

Source: ADOT 2002; NPS 2003; USFS 2003b, U.S. Army Garrison 2002a, U.S. Army Garrison 2002b, U.S. Army Garrison 2002c, U.S. Army Garrison 2003

Cumulative benefits have resulted from past USBP projects. The estimated area of infrastructure currently in place within both the Naco and Douglas Stations (previously identified in Section 1.1.2 and sections 1.1.3) such as currently patrolled roadways (approximately 165 miles), drag roads (approximately 46 miles) and fencing (7 miles) are estimated to total approximately 458 acres. This estimate is based primarily on operational impacts of all roads utilized for USBP operations. Road improvements and the installation of detection/deterrence systems have increased the USBP's apprehension and interdiction rates. The installation of drainage structures has probably improved downstream water quality, by alleviating erosion and consequent sedimentation. Projects implemented by other agencies in the region, which would also affect the natural and human environment, include road improvements by the ADOT and

various construction projects by the USDA Forest Service (USFS), the NPS, and Fort Huachuca. With the exception of the proposed widening project on State Route 92 (Carr Canyon Road) at Hunter Canyon located west of Naco, all other ADOT projects identified in Table 4-8 within the vicinity of the project corridor would occur along existing corridors and/or within previously disturbed sites. Land use would change along the ROW, and additional wildlife habitat would be lost. The magnitude of these effects would depend upon the length and width of the ROW at Carr Canyon Road and the extant conditions within and adjacent to the ROW. Projects proposed by other agencies such as the USFS and Department of Defense (DoD) are located significantly outside of the project corridor and while they may impact various sized areas or distances, their impacts would not affect those created by the USBP's projects. However, the cumulative effect would not increase to significant levels over the long-term. In addition, the other agencies are conducting NEPA analysis for their proposed projects.

The USFS projects include the Carr House parking lot and restroom construction project in the Huachuca Mountain Range of Arizona in the Sierra Vista Ranger District (RD). Although no start date has been established, the estimated area of impact would be 1 to 2 acres. The Sierra Vista RD has other planned construction projects including the proposed 2-mile long Scotia riparian fence in the Huachuca Mountains. Construction is planned to begin in mid-November with project completion achieved in early 2004. A Sonoran Tiger Salamander Habitat Restoration project is also planned for the Sierra Vista RD. The total project impact would be less than 20 acres and the project is currently in the scoping stage with a project decision date of September 2004. The Perimeter Trail and Parking Lot project would result in 3 miles of new hiking trail being created on new ground as well as one acre of impact from parking lot construction. The project is currently in the scoping stage with a decision anticipated in December 2003 (USFS 2003b).

The National Park Services' proposed vehicle barrier in the Coronado National Memorial has been approved and a contractor has been selected. The proposed vehicle barrier is approximately 1.5 mile in length beginning at the eastern boundary of the Memorial, continuing along the border and crossing Montezuma Wash, and continuing to East Forest Lane then turning north for approximately 0.5 mile. The estimated construction date is October 27, 2003 with approximately 3 to 4 weeks for project completion.

The AGFD, Whitewater Draw Wildlife Management Area (WMA) has proposed to construct two wildlife viewing platforms at the WMA. Currently, one platform has been installed and the second one is under construction. Collectively, both platforms would impact less than a total of 0.5 acre. Estimated completion time for the second platform is mid-November.

The Department of Defense (DoD), Fort Huachuca has a number of proposed construction projects planned on the military base. Fort Huachuca proposes to expand its Human Resources Intelligence (HUMINT) Training Center at Fort Huachuca, Arizona by increasing the existing facility by 65,000 square feet. Another proposed project involves the construction and maintenance of a security fence for Libby Army Airfield/Sierra Vista Municipal Airport at Fort Huachuca. The DoD proposes to construct and operate an Army and Air Force Exchange Service (AAFES) Shopette, which would result in 1.5 acres of impacts for construction of the facility. The DoD also proposes the Real Property Master Plan for EPG at Fort Huachuca. The proposed action is the collocation of four EPG facilities and project site modification. The proposed project would impact up to 62 acres on the military base.

As stated in Section 2.0, the No Action Alternative includes infrastructure projects previously identified in the 2000 Corridor EA that have been addressed and completed, are awaiting construction or require separate NEPA analysis. Therefore, since all infrastructure identified in this alternative have the potential to exist should the Preferred Alternative or the Full Build Out Alternative be implemented, the cumulative effects of the No Action Alternative activities require analysis in this SEA. The total estimated cumulative impact for all current and proposed projects depicted in Table 4-8 is 160 acres. When combined with the impacts that currently exist as from past projects It is estimated that the cumulative impact from past and present and future projects in the ROI is estimated at 618 acres. The following sections provide a discussion of the culmination of impacts that would be associated with implementation of each of the alternatives analyzed in this SEA.

4.17.1 No Action Alternative

Direct impacts have resulted from past USBP activities and would occur as a result of the No Action Alternative. Briefly, these effects were calculated to have a total impact of approximately 120 acres. Therefore, the total cumulative impact across the ROI is approximately 738 acres over the long-term.

No threatened or endangered species or critical habitats have been affected. Air quality has been temporarily affected by past construction activities, but due to good dispersion factors in the region and the short duration of most construction activities, impacts have been minimal. The fact that no SO_2 or PM_{10} violations have occurred in over 12 years is further evidence these past activities have not caused excessive emissions. However, water resources would continue to experience impacts across the Douglas and Upper San Pedro basins, as recharge deficits are likely to continue. However since with increased knowledge of the area's watershed and increased conservation measures, the watershed may actually benefit from future projects through identification of even more efficient ways to conserve the existing groundwater supply. Therefore, water resources would likely experience less than significant cumulative impacts

Cultural resources sites within the proposed alignments of the infrastructure would not be avoided under either of the alternatives. Burial and buffer zones are measures that would be considered to reduce or eliminate potential effects to these resources. If these measures were deemed impractical, mitigation through data recovery would have to be performed. All mitigation measures would be coordinated through the Arizona SHPO, appropriate THPO, and land manager.

Long-term indirect cumulative effects to wildlife and their habitat have occurred and would continue to occur. However, these effects, both beneficial and adverse, are difficult, if not impossible, to quantify. Reductions in habitat have obviously created inter- and intra-species competition for available food and shelter and, eventually would result in slight reductions in some wildlife populations. However, wildlife populations effected are common and abundant both locally and regionally and no impacts to habitat for rare, threatened or endangered species have occurred.

Given the rural nature of the project corridor and the surrounding region, habitat that has been altered is considered a negligible loss. The existing and remaining installation of lights along the border have and would possibly produce some long-term cumulative effects, although the magnitude of these effects is not yet known. Some species such, as insectivorous bats, may benefit from the concentration of insects that would be attracted to the lights. However, circadian rhythms of other diurnal species, may be disturbed enough that breeding or feeding patterns are skewed, causing synergistic physiological changes. Increased USBP patrol activities would increase the potential for some wildlife specimens to be accidentally hit and killed. However, most of the wildlife species in the region are common and abundant, therefore, such losses would not be expected to result in significant impacts to the populations.

Past and ongoing USBP activities have and will result in positive cumulative benefits as well. The region has undergone numerous surveys regarding threatened or endangered species and cultural resources, thereby increasing the knowledge base of these resources and how the regional ecosystem interacts with USBP operations.

4.17.2 Preferred Alternative

Approximately 618 acres of land and habitat have and are proposed to be disturbed as a result of past and future projects within the ROI. Given the impacts across the region implementation of this alternative would increase the cumulative impact to approximately 860 acres. This estimate takes into account the 402 undisturbed acres identified under the Preferred Action.

Impacts on vegetation, protected species, and fish and wildlife due to lighting and fencing would be mitigated to avoid a significant impact under this alternative. While the magnitude of these effects depend upon the location, if left unmitigated, this action has the potential to cause long-term detrimental effects to many large migratory animal populations. Therefore, fragmentation and impacts to critical habitat would be minimized by incorporating mitigation measures such as effective wildlife corridors and/or use of vehicle barriers in lieu of pedestrian fences along targeted areas of the project corridor. Further discussion on these measures is provided in Section 5 of this document. Close coordination and approval from USFWS, BLM, AGFD, and other affected land managers would be required to develop an effective wildlife corridor system that addresses both

environmental and USBP operational concerns in order to ensure adverse effects would be avoided or substantially reduced to a level that is not significant.

These impacts would generally occur within the Roosevelt Easement along existing roadway alignments. Since one fence would act to the same degree as a physical and behavioral barrier to wildlife as two fences would, similar mitigation measures and coordination would still be required along the proposed enforcement corridor in the more rural areas.

Impacts to cultural resources sites within the proposed alignments of the infrastructure would be unavoidable. Mitigation through data recovery on those sites considered NRHP-eligible would have to be performed. All mitigation measures would be coordinated through the Arizona SHPO, appropriate THPO, and land manager.

Future cumulative impacts in the area would also occur across the entire Tucson Sector, if similar infrastructure components are implemented. However, quantifying this worst-case scenario is impossible since each individual USBP station has not yet identified its own enforcement needs while minimizing environmental impacts to the greatest extent practicable. However, upon fruition, the cumulative effects of the Preferred Alternative and the impacts across the remainder of the Tucson Sector would be the largest impacts to date resulting from land disturbance caused by USBP projects.

Identifying the most defensible and enforceable areas along the U.S.-Mexico border (i.e., preferred approach) would result in the most beneficial long-term impacts to the local environment north of the border. The majority of the southeastern portion of Arizona's natural and human environment would experience a significant reduction in the influx of IA and drug traffic activity. Additionally, sensitive habitat such as the San Pedro Riparian NCA, Coronado National Memorial, Coronado National Forest, Organ Pipe Cactus National Monument, and the San Raphael National Wildlife Refuge would benefit through reduction of wildfires, litter and damage to vegetation due to illegal foot and vehicle traffic. Furthermore, real property would be protected and the general aesthetic appearance of the desert southwest would be improved. The beneficial impacts associated with protection of habitat due to degradation from IA traffic; combined with effective mitigation measures associated with erosion control, wildlife corridors,

protection of endangered species, critical habitat, water resources and sensitive and unique habitat, the adverse impacts on the ROI would be reduced to a level that is less than significant.

4.17.3 Full Build Out Alternative

This alternative would result in a substantial increase (2,188 acres) in cumulative impacts to the area upon implementation. Again, this estimate combines the 618 acres identified earlier and the total undisturbed acreage (1,486 acres) identified in the Full Buildout Alternative. While the total cumulative impacts would result in minor impacts to the entire region, it would be beneficial relative to the vast area of wildlife habitat in the region that would be enhanced through protection. This area would be protected from further erosion and habitat degradation caused by illegal vehicles.

Impacts to cultural resources sites are unavoidable. Mitigation through data recovery on those NRHP-eligible sites would be performed. All mitigation measures would be coordinated through the Arizona SHPO, appropriate THPO, and land manager.

Direct cumulative adverse impacts would result in the reduction of biological production and would be the largest increase in impacts to date. This, too, does not include other similar infrastructure projects across the remainder of the entire Tucson Sector. While the USBP has developed an internal planning and reference document that identifies potential infrastructure systems, the individual stations have not yet identified the infrastructure that each station would require to control the border. The only assumption that can be made is that the remainder of the Tucson Sector would incorporate a similar highly defensible corridor where needed and that the stations would minimize impacts or avoid sensitive areas for the extent practicable.

By creating highly defensible and enforceable areas along the U.S.-Mexico Border, long-term beneficial impacts to the regional environment would be provided as well. The majority of the southeastern portion of Arizona's natural and human environment would experience a significant reduction in the influx of IA and drug traffic activity. Additionally, sensitive habitats such as the San Pedro Riparian NCA, Coronado National Memorial, and the San Raphael National Wildlife Refuge (Sonoita Station AO) would benefit through reduction of wildfires, litter and damage to vegetation due to illegal foot and

vehicle traffic. Furthermore, real property would be protected and the general aesthetic appearance of the desert southwest would be improved. Mitigation measures associated with erosion control, wildlife corridors, protection of endangered species, critical habitat, water resources, and sensitive and unique habitat would be implemented on a large scale in order to reduce direct adverse impacts to a less-than-significant level.

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