SECTION 5

Cumulative Impacts

5. CUMULATIVE IMPACTS

CEQ defines cumulative impacts as the "impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (Federal, state, and local) or individuals. Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

This cumulative impacts analysis summarizes expected environmental effects from the combined impacts of past, current, and reasonably foreseeable future projects. The geographic scope of the analysis varies by resource area. For example, the geographic scope of cumulative impacts on resources such as noise, visual resources, soils, and vegetation is very narrow and focused on the location of the resource. The geographic scope of air quality, wildlife and sensitive species, and socioeconomics is much broader and considers more county- or regionwide activities. Projects that were considered for this analysis were identified by reviewing USBP documents, news releases, and published media reports; and through consultation with planning and engineering departments of local governments, and state and Federal agencies. Projects that do not occur in close proximity (i.e., within several miles) to the proposed tactical infrastructure would not contribute to a cumulative impact and are generally not evaluated further.

Cumulative Fencing, Southern Border. There are currently 62 miles of landing mat fence at various locations along the U.S./Mexico international border (CRS 2006); 14 miles of single, double, and triple fence in San Diego, California; 70 miles of new pedestrian fence approved and currently under construction at various locations along the U.S./Mexico international border; and fences at POE facilities throughout the southern border. In addition, 225 miles of fence are proposed (including the 70 miles proposed in the USBP Rio Grande Valley Sector). Proposed new fence sections are being studied for Texas, New Mexico, Arizona, and California.

Past Actions. Past actions are those that have occurred prior to the development of this EIS. Past actions have shaped the current environmental conditions; therefore, the impacts of these past actions are generally included in the affected environment described in **Section 3**. For example, most of the proposed tactical infrastructure would follow the IBWC levee ROW or existing USBP patrol roads in the southernmost portions of Starr, Hidalgo, and Cameron counties in Texas. Consequently, some of the proposed sections would be on private lands and cross multiple land use types, including rural, urban, suburban,

and agriculture that have undergone changes as the result of commercial and residential development. These past actions are now part of the existing environment. Some recent past actions of note are as follows:

- USBP Operation Rio Grande. This operation was recently implemented on the border to reduce illegal immigration and drug trafficking along the Rio Grande corridor of the USBP McAllen Sector (renamed the Rio Grande Valley Sector), which includes USBP Rio Grande City, McAllen, Mercedes, Harlingen, Brownsville, and Port Isabel stations. USBP Operation Rio Grande included installation of lighting (permanent and portable), road improvement, fencing (5.4 miles of chain-link fencing near POEs in parts of Brownsville and Port Isabel stations), boat ramps, and maintenance mowing (DHS 2004).

- Private Residential Developments. For the past several years the Rio Grande Valley has experienced high demand for single-family homes. One example of these planned communities near the U.S./Mexico international border and the Rio Grande is Sharyland Plantation, a 6,000-acre master-planned multi-use community started in 1998 in Mission, Texas, near Fence Section O-5. A former citrus plantation, Sharyland Plantation is currently a residential, industrial, and commercial development of more than 1,400 newly constructed homes in 19 neighborhoods ranging from $160,000 to more than a $1 million (Sharyland 2007). South of Sharyland Plantation is the community of Granjeno.

Present Actions. Present actions include current or funded construction projects, USBP or other agency operations in close proximity to the proposed tactical infrastructure, and current resource management programs and land use activities within the affected areas. The following ongoing actions considered in the cumulative impacts analysis:

- Anzalduas POE. The Anzalduas POE is currently under construction in the Granjeno/Mission area. This POE is adjacent to a NWR parcel west of Granjeno and would become an extension of Stuart Road, which intersects farm to market (FM) 494. When completed, Anzalduas POE would contain elevated north- and southbound lanes. This bridge would provide access across two levees and a floodway just below Anzalduas Dam and Anzalduas County Park. The proposed fence Section O-5 would intersect this new roadway by crossing underneath the new Anzalduas POE bridge.

- University of Texas at Brownsville and Texas Southmost College Bond Program Projects. In November 2004, the City of Brownsville approved a $68 million bond package that would provide facilities necessary for growing enrollment. The bond is providing the financial resources to build seven projects.

- Texas Department of Transportation. TDOT has several ongoing road improvement projects scheduled for Cameron, Hidalgo, and Starr counties. However, the area of impacts would likely be minor, as the majority of the construction would be within existing ROWs. Projects include the widening of SR. 83 in Mercedes to a six-lane expressway with a median concrete barrier, and construction of bridges over the floodway and Mercedes Main Canal. The SR 83 Weslaco Project consists of reconstructing the expressway to six lanes from FM 1423 to FM 1015 and the construction of new overpasses.
- Road Construction San Benito. Construction for North Sam Houston Boulevard (FM 345) would expand and overlay the road, at a cost of $7.7 million. Completion is expected in 2009.

***Reasonably Foreseeable Future Actions*.** Reasonably foreseeable future actions consist of activities that have been proposed or approved and can be evaluated with respect to their effects. The following are reasonably foreseeable future actions that are related to securing the U.S./Mexico international border:

- SBI*net*. This is a comprehensive program focused on transforming border control through technology and infrastructure. The goal of the program is to field the most effective proven technology, infrastructure, staffing, and response platforms, and integrate them into a single comprehensive border security suite for DHS. Potential future SBI*net* projects include deployment of multiple technologies, command and control equipment, pedestrian fence, vehicle barriers, and any required road or components such as lighting and all-weather access roads (Boeing 2007).
- Temporary or Permanent Lighting. USBP frequently uses temporary (portable) or permanent lighting in conjunction with fences and patrol roads in urban areas near POEs. Lighting acts as a deterrent to cross-border violators and as an aid to USBP agents. Lighting locations are determined by USBP based on projected operational needs of the specific area. While specific future operational requirements are not currently known and are not reasonably certain to occur, areas that might be suitable for lighting can be identified for the purposes of the cumulative effects analysis. Approximately 450 lights could be required at fence Section O-1 adjacent to the Roma POE, Section O-2 adjacent to the Rio Grande City POE, Section O-3 adjacent to the Los Ebanos Ferry POE, Section O-6 adjacent to the Hidalgo POE, Sections O-9 and O-10 adjacent to the Progreso POE, Section O-10 adjacent to the Pharr POE, Sections O-13 and O-14 adjacent to the Los Indios Bridge POE, Section O-19 adjacent to the Brownsville/Matamoros POE, Section O-19 adjacent to the Gateway POE, and Sections O-20 and O-21 adjacent to the Veterans POE. Standard design for temporary or permanent lights is further discussed in **Appendix E**.

Table 5.0-1 presents the reasonably foreseeable future actions by proposed section of tactical infrastructure.

Cumulative Analysis by Resource Area. This section presents the resource-specific impacts related to the past, present, and reasonably foreseeable actions discussed above. Only those actions that are additive to the potential impacts associated with the Proposed Action are considered. **Table 5.0-2** presents the cumulative impacts by resource area that might occur from implementation of the Proposed Action when combined with other past, present, and future activities that are discussed in more detail below.

5.1 AIR QUALITY

Minor, short-term, adverse cumulative impacts on air quality are expected from the construction of proposed tactical infrastructure in combination with other reasonably foreseeable future actions. As discussed in **Section 4.2.2**, emissions from construction, maintenance, and operational activities would not contribute to or affect local or regional attainment status with the NAAQS, and be below thresholds established by the USEPA for CAA cumulative impact analysis. Construction equipment would temporarily increase fugitive dust and operation emissions from combustion fuel sources. Since there would be no substantive change in USBP operations, emissions from vehicles would remain constant and there would be no cumulative impact on air quality.

5.2 NOISE

Minor cumulative impacts on ambient noise are expected from the additive impacts of construction, maintenance, and operation of tactical infrastructure and anticipated residential and commercial development activities and infrastructure improvement projects that routinely occur throughout the project area. Noise intensity and duration from construction, maintenance, and operation of tactical infrastructure would be similar to construction activities from residential or commercial development, or road construction and maintenance. Because noise attenuates over distance, a gradual decrease in noise levels occurs the further a receptor is away from the source of noise. Construction, maintenance, and operation of tactical infrastructure would be distant from other substantial noise-generating activities except in suburban and urban areas. Increased noise from construction of tactical infrastructure could combine with existing noise sources or other construction activities to produce a temporary cumulative impact on sensitive noise receptors. Construction noise would not be louder, but might be heard over a greater distance or over a longer time period.

Table 5.0-1. Reasonably Foreseeable Future Actions by Proposed Tactical Infrastructure Sections for the USBP Rio Grande Valley Sector

Proposed Tactical Infrastructure Section Number	Border Patrol Station	Description of Future Action
O-3	McAllen	Plans are likely to be developed sometime in 2008 for a new POE facility. This plan is only for the POE facility itself. There are no plans to construct a bridge. The plan involves keeping the ferry operational.
O-4	McAllen	Proposed levee upgrades. According to a recently released document from IBWC, the design phase of this project is scheduled through February 2008. Construction is scheduled from March 2008 through September 2009. Work would be completed by Hidalgo County Drainage District No. 1.
O-5	McAllen	Proposed levee upgrades. Preliminary plans indicate the IBWC would rehabilitate the south floodway levee from the Anzalduas Dam area to the Hidalgo area. Construction is projected to occur from March 2008 through September 2009. Work would be completed by Hidalgo County Drainage District No. 1.
O-6	McAllen	(1) According to the Chairman of the Hidalgo County Water District No. 3, there are plans to build a reservoir just northeast of the McAllen Pump on land currently owned by the district. The plans are to integrate the reservoir into the upgraded levee in this area. Exact timeframes for this project are unknown. (2) IBWC, in conjunction with the City of Hidalgo, is planning on relocating the current levee southward toward the river in the area just east of the Hidalgo POE. These plans have recently become available and indicate the rerouting of the levee from an area near or under the Hidalgo POE Bridge to a point near the Old Hidalgo Pumphouse. The length of this relocation project is approximately 0.65 miles. (3) Additional levee rehabilitation. Construction for Phase 1 of the levee rehabilitation is anticipated to begin in April 2008 from the Common Levee (south floodway levee) to the Hidalgo POE. Construction for Phase 2 is anticipated to commence during December 2008. Phase 2 begins at the Hidalgo POE and runs downriver for approximately 1.5 miles along the levee to the 2nd street canal. Construction for the levee in the Hidalgo area would be performed by IBWC.

Proposed Tactical Infrastructure Section Number	Border Patrol Station	Description of Future Action
O-8	Weslaco	The Donna POE facility would be located south of FM 493. Construction is to start early November 2008.
O-14	Harlingen	A 40-acre parcel is proposed by TDOT for construction of a state-of-the-art Department of Public Safety inspection station for commercial truck traffic.
O-15	Harlingen	In La Paloma near FM 732 TDOT would begin construction within the next few years of the expansion of U.S. 281 from La Paloma to Brownsville. The highway would be expanded to a four-lane highway to accommodate international commercial truck traffic. Dates of construction are not known.
O-16	Harlingen	Construction of a residential subdivision is proposed adjacent to the proposed project corridor in El Ranchito, Texas. Dates of construction are unknown at this time.
O-17	Brownsville	(1) The Brownsville/Matamoros railroad bridge (Union Pacific) is being relocated just west of River Bend Resort within the next 2 years. (2) ANCLA Design and Construction is considering subdividing land and developing a new neighborhood in the project area. (3) Expansion of U.S. 281 to four lanes. Stakes in the field indicate an expansion of the hardtop of about 21-30 feet. (4) USBP is proposing to improve the Russell/Barreda Canal, frequently used by smugglers and aliens to hide. USBP proposes to have it buried (install a pipe underground rather than open canal).
O-18	Brownsville	(1) Expansion of U.S. 281 from Pharr, Texas, to FM 3248 Alton Gloor. This would be a five-lane highway. (2) New proposed commercial POE Bridge at Flor De Mayo and IBWC levee. (3) USFWS and the City of Brownsville are proposing and planning a Nature Trail Park in this area.
O-19	Brownsville	(1) A residential subdivision is currently under construction adjacent to the levee/proposed fence area. (2) Brownsville waterfront redevelopment project near Hope Park, on private property. No additional information about this proposal is available at this time.

Proposed Tactical Infrastructure Section Number	Border Patrol Station	Description of Future Action
O-21	Fort Brown	(1) Proposed East Loop, Phase II Project, would begin at U.S. 77/83 and end at FM 1419. The project is a part of the Trans Texas Corridor I-69 that would link the Rio Grande Valley to Denison, Texas. It is slated for construction in 2010 and is being funded by the City of Brownsville and the TDOT. The levee would be redirected and would be placed further south of its current location. The existing levee would become a four-lane highway which would be used to redirect commercial traffic around Brownsville. The City of Brownsville is in the process of finalizing negotiations to purchase land from private landowners in the area. The city has already acquired a majority of the land with the exception of four land parcels. (2) The Mayor of Brownsville and the Brownsville Public Utility Board (PUB) are proposing the construction of a weir and reservoir approximately 6 miles downriver of the Gateway International Bridge. The weir proposal would impound a water reservoir approximately 42 river-miles long, extending from river mile 48 to river mile 90. The reservoir would be within the existing riverbanks and inside the levees that parallel the banks of the river. The USACE has prepared an EA, concluding that the proposal would have no significant impact on the quality of the human environment. The project would impact approximately 65 acres of jurisdictional riverine habitat and wetlands on the U.S. side of the Rio Grande, and 65 acres on the Mexico side of the Rio Grande. The proponent proposes to mitigate this loss through the creation or enhancement of 130 acres of wetlands downstream of the project area. The proponent also proposes to mitigate any impacts by purchasing and protecting a 280 acre tract of land that would form a corridor between the Laguna Atascosa NWR and the Boca Chica NWR that would allow wildlife to travel between the two refuges (BPPUB 2004).

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Table 5.0-2. Summary of Potential Cumulative Effects

Resource	Past Actions	Current Background Activities	Alternative 2, Route B	Known Future Actions	Cumulative Effects
Air Quality	Attainment criteria for all criteria pollutants.	Emissions from vehicles and agricultural areas.	Fugitive dust and combustion emissions generation during construction.	Fugitive dust and increased equipment operation during construction.	Continued attainment.
Noise	None.	Current background noise from development.	Short-term noise from construction equipment and increased traffic.	Short-term noise from construction equipment and increased traffic.	Short-term adverse impacts from construction equipment and increased traffic.
Land Use	Agricultural lands impacted by development.	Development of open and agricultural lands.	USBP purchase of land or easements to construct tactical infrastructure. Natural areas developed for tactical infrastructure.	Residential and commercial development permanently alters natural areas and agricultural lands.	Moderate adverse impacts on recreational and agricultural lands.
Geology and Soils	Installation of pipelines and other features.	Installation of pipelines and other features.	Installation of fence posts and other structures.	Installation of pipelines, fencing, and other infrastructure.	Minor long-term impact from additional infrastructure.

Resource	Past Actions	Current Background Activities	Alternative 2, Route B	Known Future Actions	Cumulative Effects
Water Resources					
Hydrology and Groundwater	Degradation of aquifers to historical pollution.	Continued degradation of aquifers from pollution.	None.	Minor to moderate short- and long-term impacts.	Minor to moderate short- and long-term impacts.
Surface Waters and Waters of the United States	Point and nonpoint discharges including wastewater treatment effluent, agricultural runoff, and storm water have impacted water quality. Removal of wetland vegetation and fill of waters of the United States, including wetlands.	Point and nonpoint discharges including wastewater treatment effluent, agricultural runoff, and storm water have impacted water quality.	Construction erosion and sediment runoff, potential oil spills and leaks. Removal of wetland vegetation and fill of waters of the United States, including wetlands, and temporary degradation of water quality.	Construction erosion and sediment runoff, potential oil spills and leaks. Removal of wetland vegetation and fill of waters of the United States, including wetlands, and temporary degradation of water quality.	Moderate short- term impacts from construction activities, including removal of wetland vegetation and fill of waters of the United States, and temporary degradation of water quality. Minor long-term erosion impacts from infrastructure.
Floodplains	Permanently altered by development and safety features such as levees and dams.	None.	Adverse impacts in Sections O-1 through O-3. No other impacts.	None.	Adverse impacts in Sections O-1 through O-3. No other impacts.

Resource	Past Actions	Current Background Activities	Alternative 2, Route B	Known Future Actions	Cumulative Effects
Biological Resources					
Vegetation	Degraded historic habitat of sensitive and common wildlife species.	Continued urbanization results in loss of native species.	Minor to moderate loss of native species and habitat.	Minor to moderate loss of native species and habitat.	Moderate adverse impacts on native habitats and vegetation.
Wildlife and Aquatic Resources	Urbanization and loss of green corridors impacted habitat and food sources.	Minor to moderate loss of green corridor for wildlife.	Minor to moderate loss of green corridor and water access for wildlife.	Loss of green corridor for wildlife.	Moderate loss of green corridor and water access for wildlife.
Special Status Species	Degraded water quality and urbanization impacted sensitive species.	Urbanization and agricultural development degraded habitat for sensitive species.	Minor to moderate loss of green corridor and water access for wildlife.	Loss of habitat for sensitive species and water quality degradation.	Current and future activities would continue to delete green corridor and water access for wildlife.
Cultural Resources	Development and infrastructure improvements adversely affected cultural resources; some preservation such as Old Hidalgo Pump House and in Roma Historic District.	Development and infrastructure improvements to be adversely affected cultural resources; some preservation.	Moderate to major long-term adverse impacts on cultural resources.	Continued development and infrastructure improvements to adversely affect cultural resources; continued preservation efforts.	Moderate to major long-term adverse impacts on cultural resources.

Resource	Past Actions	Current Background Activities	Alternative 2, Route B	Known Future Actions	Cumulative Effects
Aesthetic and Visual Resources	Historical development of undeveloped lands.	Development of natural areas for community and industry infrastructure.	Constant static visual interruption at fixed points. Loss of recreational area.	Constant static visual interruption at fixed points.	Minor to moderate long-term impacts from permanent infrastructure.
Socioeconomic Resources, Environmental Justice, and Safety	Urban development throughout counties.	Strong local economy and high land values.	Minor to moderate short-term and long-term beneficial impacts on local construction.	Continued strong local economy, high land values, and expansion in counties.	Minor stimulation of local economies from construction activities. Minor adverse impact on environmental justice or protection of children or human health and safety.
Utilities and Infrastructure	Historical development and maintenance of utilities, infrastructure, and roadways in area.	Utilities, infrastructure, and roadways have been upgraded as necessary.	Minor to moderate short-term adverse impacts on local utilities, infrastructure, and roadways during construction.	Continued development and maintenance of utilities, infrastructure, and roadways in area.	None.
Hazardous Materials and Wastes	Use of hazardous substances in vehicles. Possible illegal dumping.	Use of hazardous substances in vehicles. Possible illegal dumping.	Minor use of hazardous materials during construction.	Minor use of hazardous materials during construction.	None.

5.3 LAND USE

Construction of tactical infrastructure would result in minor changes to land use. Recent activities that have most affected land use near the proposed tactical infrastructure are increased commercial and residential development of agricultural and open lands. Moderate cumulative impacts on land use are expected from the additive effects of the past, present, and reasonably foreseeable future actions, but changes in local land use would continue to be dominated by development. For example, the conversion of 508 acres to support tactical infrastructure is minimal when compared to multiple large developments such as Sharyland Plantation which converted 6,000 acres of agricultural land to residential and commercial use (Sharyland 2007). Recreational lands, residential areas, and agricultural lands would be displaced by the Proposed Action. Future development of residential areas would further alter the current land use.

5.4 GEOLOGY AND SOILS

Additive effects include minor changes in topography due to grading, contouring, and trenching; minor soil disturbance; a minor increase in erosion; and a loss of prime farmland. Construction of the tactical infrastructure would not be in close proximity to residential and commercial development and would not interact to cumulatively affect geological resources, including soils. However, each present or reasonably foreseeable future action identified has the potential for temporary erosion from construction activities.

5.5 WATER RESOURCES

Hydrology and Groundwater. Moderate impacts on hydrology and groundwater would occur from the construction of tactical infrastructure when combined with other past, present, and reasonably foreseeable future actions due to increased erosion and stream sedimentation.

Surface Water and Waters of the United States. Moderate impacts on surface water and waters of the United States could occur from increased erosion and stream sedimentation. Disturbance from construction and operation of the tactical infrastructure along with residential and commercial development have the potential for additional erosion and stream sedimentation and adverse cumulative effects. However, as discussed in **Section 4.6**, a Texas Construction General Permit would be obtained to include an SWPPP and sediment control and storm water BMPs to minimize potential impacts. Past actions, including historic and current fishing, vessel traffic, sewage, agricultural runoff, and industrial discharges have generally degraded the quality of water in the lower Rio Grande and have resulted in long-term direct moderate impacts on water quality. The Rio Grande is a CWA Section 303(d) impaired water.

Wetland losses in the United States have resulted from draining, dredging, filling, leveling, and flooding for urban, agricultural, and residential development. An

estimated 4.1 million acres of wetlands existed on the Texas coast in the mid-1950s. By the early 1990s, wetlands had decreased to less than 3.9 million acres including 3.3 million acres of freshwater wetlands and 567,000 acres of saltwater wetlands. About 1.7 million acres (52 percent) of the 3.3 million acres of freshwater wetlands were classified as farmed wetlands. The total net loss of wetlands for the region was approximately 210,600 acres, making the average annual net loss of wetlands about 5,700 acres. The greatest losses were of freshwater emergent and forested wetlands (USFWS 1997). Impacts on wetlands would be avoided to the maximum extent practicable. Approximately 8 acres of wetlands would be impacted by construction of the tactical infrastructure. USBP would obtain CWA Section 404 permits and mitigate the loss of wetlands. The cumulative impacts on wetlands would be long-term and adverse.

Floodplains. Floodplain resources can be adversely impacted by development, increases in impervious areas, loss of vegetation, changes in hydrology, and soil compaction. Construction, maintenance, and operation of tactical infrastructure has the potential for negligible to minor impacts on floodplains from further loss of vegetation, soil compaction on access roads and patrol roads, and the placement of structures in the floodplains. Floodplains were previously impacted by the construction of the levee system which controls the flow of water over low lying areas. Sections O-1, O-2, and O-3 would further regulate water flow where no levee system exists. When added to other past, present, and reasonably foreseeable future actions, impacts from the new tactical infrastructure would be minor due to the relatively small impact within floodplains. As discussed in **Sections 1.5** and **4.6**, USBP would follow the FEMA process to flood proof the structures and minimize adverse impacts on floodplain resources.

5.6 VEGETATION

Moderate impacts on native species vegetation and habitat are expected from the additive effects of past, present and reasonably foreseeable future actions. Urbanization of the area has directly reduced habitat for sensitive flora species. Indirect impacts from urbanization include changes in floodways, water quality, and the introduction of nonnative species.

Development of land for urban use would continue at an unknown pace resulting in loss of farmland and of wildlife habitat. Construction of new POEs and other border facilities would contribute to this development issue. Conversion of native upland thornscrub to grazing land by using root-plowing and other methods would continue at an unknown pace. One such tract of land was observed. Purchase of land for management as wildlife habitat and for preservation would continue. Lands already purchased are undergoing restoration at various levels of success some of these are being affected by proposed fence construction. Water rights issues could become important and affect agricultural and urban acreages and planning efforts.

5.7 WILDLIFE AND AQUATIC RESOURCES

Minor to moderate impacts on wildlife and species are expected from the additive effects of the past, present, and reasonably foreseeable future actions. Urbanization of the area has effectively reduced green corridor and water access for wildlife. Cumulative impacts would mainly result from loss of habitat as described in **Section 5.7**, habitat disturbance and degradation, construction traffic, and permanent loss of green corridors. Displaced wildlife would move to adjacent habitat if sufficient habitat exists. Since the Rio Grande Valley has experienced substantial residential and commercial development, and such development is projected to continue, the amount of potentially suitable habit will continue to decrease, producing a long-term, minor to major adverse cumulative effect. Wildlife could also be adversely impacted by noise during construction, operational lighting, and loss of potential prey species. Species would also be impacted by equipment spills and leaks. The permanent lighting could have minor, adverse cumulative impacts on migration, dispersal, and foraging activities of nocturnal species.

5.8 SPECIAL STATUS SPECIES

As discussed in **Section 4.9**, USBP has begun Section 7 preconsultation coordination with the USFWS regarding potential impacts on listed species or designated critical habitat. Potential effects of fence construction, maintenance, and operation will be analyzed in both the Biological Assessment and Biological Opinion to accompany the Final EIS. Potential direct and indirect impacts on federally listed species are based on currently available data. Impacts are developed from a NEPA perspective and are independent of any impact determinations made for the Section 7 consultation process.

Special status species are commonly protected because their historic range and habitat has been reduced and will only support a small number of individuals. Construction, maintenance, and operation of tactical infrastructure, when combined with past, present, and future residential and commercial development has the potential to result in minor to major adverse cumulative impacts on these species. Potential threats to federally listed species within the proposed project corridor include trampling (for plants), habitat conversion, and noise.

Approximately 508 acres of vegetation would be cleared along the Alternative 2 corridor. Route A approaches known locations of individuals of Texas ayenia, Walker's manioc, and Zapata bladderpod. Implementation of Route A would have the potential for short-term major adverse impacts on these species due to trampling or mortality during fence construction. While Route B would cut across the lower portions of Los Velas and Los Velas West annexes of the LRGVNWR (Section O-2), it would entirely avoid the potentially more species-rich Arroyo Ramirez annex (Section O-1), the Culebron Banco annex (Section O-13), and the Tahuachal Banco annex (Section O-16). In addition, Route B borders instead of intersects the southern boundary of the Phillips Banco annex of the

LRGVNWR. Route B pulls the proposed fence alignment further away from several known locations of Zapata bladderpod and Walker's manioc. For this reason, Route B cumulative impacts on federally listed plants are anticipated to be short-term, moderate, and adverse.

The loss of approximately 125 acres of disturbed thornscrub shrubland and woodland habitat, predominantly honey mesquite and retama, and of approximately 50 acres of disturbed floodplain shrubland, woodland, and forest habitat, predominantly honey mesquite and sugarberry and to a lesser extent sabal palm, would represent a loss of approximately 150 acres of potential ocelot and jaguarundi habitat. The long-term, cumulative adverse impact from the loss of potential habitat for these species would be moderate to major.

Habitat loss of state-listed species in Sections O-1, O-2, O-8, and O-10 (i.e., Mexican treefrog, Mexican burrowing toad, Texas horned lizard, white-lipped lizard) would affect a small area and would be a minor, adverse cumulative effect on these species. BMPs to avoid and minimize impacts, such as pre-construction clearance surveys would to reduce potential adverse impacts.

Cumulative, adverse impacts on migratory birds could be substantial due to the potential timing of fence construction. Implementation of BMPs presented in **Section 4.9** could reduce their intensity. However, past loss of habitat combined with potential construction has the potential for long-term, major, adverse cumulative impacts.

5.9 CULTURAL RESOURCES

Moderate to major adverse, long-term impacts on cultural resources are expected from the additive effects of past, present, and reasonably foreseeable future actions. Past, current, and future commercial and residential development, improvements to infrastructure such as highway and irrigation projects, and the clearing of land for agriculture have caused significant impacts on cultural resources and can be expected to continue to do so. At the same time, some past and present efforts have resulted in the preservation of some historic properties such as the Old Hidalgo Pumphouse and some properties in the Roma Historic District. Similar preservation efforts can be expected to continue. Cumulative effects on historic properties are expected to be moderate to major, adverse, and long-term.

In compliance with Section 106 of the NHPA, cultural resource surveys are underway to identify and evaluate properties listed in or eligible for listing in the NRHP that may be affected by the proposed tactical infrastructure. Consultation with Native American tribes would ensure that properties of religious and cultural significance to the tribes are addressed. It is anticipated that additional properties to be determined as eligible for listing in the NRHP will be identified that would be affected. Known historic properties would also be affected.

Impacts on cultural resources (including resources potentially eligible for inclusion in the NRHP) would be avoided, minimized, or reduced through careful planning, siting, and design of the proposed tactical infrastructure and development of special measures. For example, by locating Section O-1 below the bluff, impacts on the Roma Historic District would be substantially reduced. In other cases, special designs could be developed to reduce effects on historic properties. The integrity of areas that may have significant archaeological resources and be potentially affected by the proposed infrastructure would be studied, such as Fort Ringgold, Fort Brown, and Roma Historic District. Additional archaeological resources are expected to be identified.

5.10 AESTHETICS AND VISUAL RESOURCES

Minor to moderate impacts on aesthetics and visual resources are expected from the additive effects of past, present, and reasonably foreseeable future actions. The presence of construction equipment would produce a short-term adverse impact on visual resources. Once installed, the tactical infrastructure would create a permanent and fixed visual interruption at fixed points. Adverse cumulative effects could include temporary construction impacts and the introduction of light poles and increased night illumination during construction. Other commercial and residential development would introduce night illumination into previously open or agricultural lands. Recreational activities such as star-gazing would be adversely affected by this cumulative impact in night illumination.

5.11 SOCIOECONOMIC RESOURCES, ENVIRONMENTAL JUSTICE, AND SAFETY

Short-term beneficial impacts on local and regional socioeconomic resources are expected from the additive effects of past, present, and reasonably foreseeable future actions. Economic benefits would be realized by construction companies; their employers and suppliers; and by Cameron, Hidalgo, and Starr counties through a minor increase in tax receipts for the purchase of goods and services. Construction of tactical infrastructure has the potential for minor beneficial effects from temporary increases in construction jobs and the purchase of goods and services in Cameron, Hidalgo, and Starr counties. Approximately 25,000 workers are employed in the construction industry in the three counties. An increase of 200 construction jobs would represent only about 1 percent of construction jobs, so the cumulative effect would be minimal. Since the construction jobs would be temporary, negligible cumulative effects on population growth, income, or other services would be expected.

The Rio Grande Valley has experienced growth including residential and commercial development. The conversion of 508 acres to support tactical infrastructure is a minimal cumulative impact compared to other development.

For example, a single development, Sharyland Plantation, converted 6,000 acres of agricultural land to residential and commercial development.

Some residents might be adversely impacted by the construction and Government purchase of their property. The potential exists that some residents might have been impacted by a previous USBP action to install lights or patrol roads under Operation Rio Grande. Although no residents have been identified as being impacted this way, this would be an adverse cumulative effect.

The cumulative impacts of USBP activities to reduce the flow of illegal drugs, terrorists, and terrorist weapons into the United States and the concomitant effects upon the Nation's health and economy, drug-related crimes, community cohesion, property values, and traditional family values would be long-term and beneficial, both nationally and locally. Residents of the border towns would benefit from increased security, a reduction in illegal drug-smuggling activities and the number of violent crimes, less damage to and loss of personal property, and less financial burden for entitlement programs. This would be accompanied by the concomitant benefits of reduced enforcement and insurance costs. There could be an adverse cumulative effect on agriculture and other employers of low-income workers if the labor pool of illegal aliens was substantially reduced. Operation and maintenance of the tactical infrastructure has little potential for cumulative impacts on socioeconomics.

As discussed in **Section 4.12**, some tactical infrastructure would be constructed on or adjacent to residential properties. Of the 21 fence sections, 11 are within census bureau tracts in which a portion of the tracts have a higher proportion of minority or low-income residents. Of the proposed 70 miles of tactical infrastructure, substantially less than half is within census bureau tracts that have a higher proportion of minority or low-income residents—therefore the overall impacts of the proposed tactical infrastructure would not fall disproportionately on minority or low-income populations. Of the 16 census tracts identified in **Table 3.12-11** that have a higher proportion of minority or low-income residents, 6 of the sections have populations near fence sections that might be adversely impacted by construction or operation of the tactical infrastructure. These are section O-4 (census tract 242.02); O-5 (census tract 213.01); O-13 (census tract 121); O-15 (census tract 125.05); O-19 (census tracts 128, 133.07 and 140.01); and O-21 (census tract 141). Temporary lights approved under Operation Rio Grande along the same alignment as Section O-5 (census tract 213.01) might be installed. New tactical infrastructure when combined with the temporary lights might be a long-term, adverse cumulative impact to this population.

5.12 UTILITIES AND INFRASTRUCTURE

Residential and commercial development in Cameron, Hidalgo, and Starr counties has increased demand for utilities such as drinking water, wastewater treatment, natural gas and electric power distribution, and transportation. The construction, maintenance, and operation of tactical infrastructure would have

minimal demand for utilities and infrastructure, combining to produce a minimal adverse cumulative impact. Minor impacts on roadways and traffic are expected from the additive effects of past, present, and reasonably foreseeable future actions.

5.13 HAZARDOUS MATERIALS AND WASTE

Construction, maintenance, and operation of tactical infrastructure would require minimal quantities of hazardous materials and generate small quantities of hazardous wastes. Therefore, minimal cumulative impacts on hazardous materials and wastes would occur.

5.14 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be reversed or recovered, even after an activity has ended and facilities have been decommissioned. A commitment of resources is related to use or destruction of nonrenewable resources, and effects that loss will have on future generations. For example, if prime farmland is developed there would be a permanent loss of agricultural productivity. Construction, maintenance, and operation of tactical infrastructure involves the irreversible and irretrievable commitment of material resources and energy, land and wetland resources, biological resources, and human resources. The impacts on these resources would be permanent.

Material Resources. Material resources irretrievably utilized for the Proposed Action include steel, concrete, and other building materials (for construction of fence). Such materials are not in short supply, would not limit other unrelated construction activities, and their irretrievable use would not be considered significant.

Energy Resources. Energy resources utilized for the Proposed Action would be irretrievably lost. These include petroleum-based products (e.g., gasoline and diesel) and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. During operations, gasoline and diesel would be used to maintain the tactical infrastructure including mowing. USBP operations would not change, and the amount of fuel used to operate government-owned vehicles might decrease slightly due to increased operational efficiencies. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

Biological Resources. The Proposed Action would result in the irretrievable loss of vegetation and wildlife habitat. In the long term, construction of the tactical infrastructure would result in the loss of 125 acres of potential wildlife habitat, force the relocation of wildlife, and require the removal of natural

vegetation. This result would be a permanent loss or conversion of decreasing open spaces. Approximately 7.5 acres of wetlands could be permanently impacted by the Proposed Action. However, it is possible to mitigate wetland loss by re-creation of other biologically significant wetlands elsewhere.

Human Resources. The use of human resources for construction is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities, and is considered beneficial.

5.15 RELATIONSHIP BETWEEN THE SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Short-term uses of the biophysical components of the human environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of the human environment include those impacts that occur over a period of more than 5 years, including permanent resource loss.

Activities that could result in short-term resource uses that compromise long-term productivity include filling of wetlands, construction of tactical infrastructure on prime farmlands, and development in floodplains. Adverse impacts include destruction of cultural resources, or loss of unique habitats for rare or sensitive species. In the context of Rio Grande Valley, long-term loss of unique habitats for rare or sensitive species would be a significant adverse impact. This could include the loss of threatened or endangered or other special status species of vegetation. Although no direct impacts on special status wildlife are expected, the short- and long-term loss of potential habitat for these species could result in long-term, moderately adverse impacts on ocelots and jaguarundi.

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