

## **Rationale and Justification for Conservation Measures**

### **Rio Grande Valley Sector**

Requested by: U.S. Customs and Border Protection

Requested on: February 25, 2011

Purpose: To provide justification for conservation measures included in the 2008 Environmental Stewardship Plan, Biological Resources Report issued for Tactical Infrastructure Construction and Maintenance and in support of amending the Interagency Agreement between the Department of the Interior and Customs and Border Protection to address impacts of waived border infrastructure. This justification would also provide background information in the event of a GAO inquiry or future oversight inquiries by Congress.

Prepared by: Corpus Christi Ecological Services Field Office

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Adopted by: U.S. Customs and Border Protection

Adopted on: March XX, 2011

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## **A. Background**

On February 24 and 25, 2011, U.S. Customs and Border Protection (CBP), DOI and Fish and Wildlife Service met to discuss amendment of the Interagency Agreement and to agree upon mitigation measures to be included in the amendment. After discussion, it was apparent that the report provided by CBP summarized the footprint of the project but did not include any assessment of other related impacts of the infrastructure, principally fragmentation of wildlife habitat. In addition, there were concerns by FWS about the calculation of the footprint of the project that needed review. It was agreed that FWS would provide a rationale for the mitigation acreage required to offset project impacts. It should be noted that the measures to be reviewed had previously been included in the Biological Resource Plan (BRP) (Appendix E of their Environmental Stewardship Plan for Construction and Maintenance of Tactical Infrastructure in Rio Grande Valley Sector, Texas, issued in July 2008 (CBP 2008). These measures were concerned primarily with mitigation of border infrastructure through land acquisition by a third party and a determination of the amount of land needed to offset impacts. CBP indicated the materials and description of species needs within the BRP were not sufficient rationale to support allocation of funds for mitigation beyond that identified in their report. FWS had understood that agreement on conservation measures had been reached in April of 2010.

In order to reconcile this issue and finalize the acreage required for mitigation, FWS agreed to provide a rationale for the mitigation ratios and the total acres required to offset impacts of waived border infrastructure in the Rio Grande Valley Sector.

When used in the context of endangered species, “conservation measures” represent actions pledged in the project description that the action agency or the applicant will implement to further the recovery of the species under review.

We have summarized in each section below our rationale for impacts and mitigation requirements.

## **B. Loss and disturbance to shrubland/woodland habitat**

Tamaulipan brushland is a unique ecosystem, found only in South Texas and northeastern Mexico. Characteristic vegetation of Tamaulipan brushland is dense and thorny. It is estimated approximately 95 percent has been cleared for agriculture, urban development, road developments and expansions, and recreation (USFWS 1990, Jahrsdoerfer and Leslie 1988). Tewes and Everett (1986) found less than 1% of South Texas supported the extremely dense thornscrub used by ocelots. The thickets do not have to be continuous, but may be interspersed with cleared areas (Tewes and Schmidly 1987). Ocelots also use riparian forests and savannahs for movements (Navarro Lopez 1985, USFWS 2010)

Jackson et al (2005) suggested that the ocelot in Texas prefers closed canopy over other land cover types, but that areas used by this species tend to consist of more patches with greater edge. Ocelots use narrow strips of habitat for travel movements (Caso 1994, Ludlow and Sunquist 1987, USFWS 2010a). Due to the lack of shrubland and woodland, the Service has consistently recommended that loss of shrubland/woodland areas be mitigated at a ratio of 3:1 for direct loss of habitat and that the land be conserved in perpetuity. For many years there have been similar recommendations for direct loss of habitat depending on particular project circumstances (USFWS 1993, USFWS 2003, BPUB 2004, USFWS 2010b, c and d, USIBWC 2010,), but since 2008-2009, the population of ocelots in the United States has dropped from an estimated 120 individuals to less than 50 individuals. Therefore, the Corpus Christi Ecological Services Field Office continues to recommend this mitigation ratio in conjunction with other conservation measures listed below to provide habitat that will aid in the recovery of the species.

#### **Summary of Impact Assessment:**

**Compensate for any shrubland or woodland removal or disturbance due to the footprint of the project by acquiring like land in the ratio of 3:1; for every 1 acre removed or disturbed, 3 acres would be acquired (CBP 2008). Approximately, 98.2 acres lost or disturbed X 3 = 294.6 acres would be acquired. This conservation measure cannot be finalized for Hidalgo and Cameron County fence segments until construction is nearer completion.**

### **C. Loss and disturbance to riparian habitat.**

The ocelot is reported to occur along watercourses, and will readily enter the water (Goodwyn 1970 as cited by USFWS 1990), but it is unclear if this proximity to water is a habitat requisite or simply an indication of where dense cover is most likely to occur. Ocelots also use corridors, such as rivers, wetlands, shorelines, and natural drainages to travel between optimal habitat areas (Connolly 2009). Typical compensation for loss or disturbance of riparian and wetland areas ranges from 1:1 to 3:1 or greater depending on circumstances and can be confirmed from a variety of Environmental Impact Assessments where the U. S. Army Corps of Engineers required mitigation. For riparian, drainage and wetland areas impacted by the Rio Grande Valley Sector border infrastructure construction and maintenance needs to be evaluated according to the type of area impacted, importance of the area to endangered cat recovery, and the preconstruction condition of the area. Removing vegetation and grading during construction could temporarily increase siltation in the river and wetlands and therefore have short-term minor adverse impacts on water quality of water sources for ocelots and jaguarundi. Riparian habitat is important for ocelots. Water is significantly limiting in drought prone south Texas and consequently all riparian habitats should be mitigated

at a 2:1 ratio unless there is a restoration plan or restoration component. Recently, consultations were completed for a project and a riparian corridor was to be restored at 1:1 ratio. However, the habitat was also to undergo debris removal, invasive species control, and re-vegetation with native vegetation, and that a corridor of connectivity to other habitat would be maintained during restoration efforts (USFWS, 2008; USFWS 2010b and d).

**Summary of Impact Assessment:**

**Compensate for any riparian removal or disturbance due to the footprint of the project by acquiring like land in the ratio of 2:1 (for every 1 acre removed or disturbed, 2 acres would be acquired). Approximately, 4.6 acres lost or disturbed X 2 = 9.8 acres would be acquired. This conservation measure cannot be finalized for Hidalgo and Cameron County fence segments until construction is nearer completion.**

## **D. Loss and disturbance of grassland habitat**

A recent study validated biological observation and knowledge of available travel corridors for ocelots, and indicated that ocelots use grasslands much more than had previously been expected from the older scientific literature (Connolly, 2009). Grasslands are frequently used by ocelots to move among brush habitats particularly by dispersing young males (USFWS unpublished data, Laguna Atascosa) and ocelots use grassy areas for hunting and denning (Laack 1991). Due to the fact that grasslands will readily reestablish themselves if there is sufficient water and native seed source, a ratio to 1:1 for compensation for grassland impacts is usually recommended (USFWS 2010d).

**Summary of Impact Assessment:**

**Compensate for any grassland removal or disturbance due to the footprint of the project by acquiring like land in the ratio of 1:1; for every 1 acre removed or disturbed, 1 acre would be acquired (CBP 2008). Approximately, 163.5 acres lost or disturbed X 1 = 163.58 acres would be acquired. This conservation measure cannot be finalized for Hidalgo and Cameron County fence segments until construction is nearer completion. This acreage is being required to offset temporal loss of re-vegetation efforts in areas that could be re-vegetated, as well as, permanent loss of grasslands on levees and other project areas.**

## E. Impacts due to construction noise

Noise can cause stress in animals and the autonomic responses to noise are varied. Geist (1979 as cited by Larkin 1996) believed that there was an energetic cost to animals being disturbed by noise. Others have used heart rate as physiological index of energy expenditure, monitored with telemetry, in wild animals exposed to noise. While others have used heart rate changes to indicate alarm or excitement of animals exposed to noise (Larkin 1996). For the proposed project the most severe noise likely to be encountered by the cats is that from construction equipment, vehicles, gates, and human activity. The noises vary according to the direction they are measured from. (Larkin 1996). Responses of wildlife to noise have included a range of responses from no reaction, to elevated alertness, disruption of feeding, and flight (Larkin 1996). There are no known studies that specifically address the effects of noise on ocelot or jaguarundi, in fact, information about the effect of noise on species of felines is generally lacking. It is reasonable to assume that the cats could display the range of responses to noise: they could have no reaction, become alert, and stop feeding, or display a fight or flight response.

Noise created during construction will have the potential to affect ocelot and jaguarundi individuals within the action area. Most project-related noise (with the exception of pile driving) is expected to attenuate to ambient noise levels of 55 to 80 dBA within 300 feet. Pile driving or similar actions will attenuate to ambient noise levels of 55 to 80 dBA within 1,800 feet. The impacts of noise will include subtle, localized impacts from the overall elevation of ambient noise levels during construction to elevated noise levels during construction could result in reduced communication ranges, interference with predator/prey detection, or habitat avoidance in the action area. More intense impacts could include behavioral change, disorientation, or hearing loss. Predictors of wildlife response to noise include the noise type (continuous or intermittent), prior experience with noise, proximity to the noise source, stage in the breeding cycle, activity, and age. Due to the nature of the noises anticipated by the proposed project, the effects of noise should be ongoing after construction as maintenance throughout the fence segments and flood wall will be occurring (CBP 2008).

Corpus Christi Ecological Services Field Office has recommended that various radii, 300-foot, 800-foot to 1800-foot be used to establish "noise zones" around the project area and that the area within the zone including the project area be compensated for at a 0.025:1 ratio (USFWS 2010c, d and e).

### **Summary of Impact Assessment:**

**Compensate for any noise disturbance due to the construction of the project by acquiring like land in the ratio of 0.025:1 for either 300-foot buffers or 1800-foot buffers around project footprint, depending on type of noise anticipated (CBP 2008). Approximately 118.9 acres would be acquired for fence segment O-4 through O-21.**

## **F. Impacts due to temporary construction lighting**

Ocelots are primarily nocturnal, while jaguarundi are primarily diurnal with some nocturnal activity recorded. The use of lights for nighttime construction and security will have the potential to adversely affect migration, dispersal, and foraging activities of individual ocelots and, to a lesser extent, jaguarundi within a particular action area (Beier 2006). Corpus Christi Ecological Services Field Office has recommended that impacts due to temporary construction and security lighting be avoided if at all possible, but if needed, that impacts be compensated at a 0.25:1 ratio for the lighted area, usually 150-foot zone around the construction area which was adopted as a conservation measure in CBP's BRP (CBP 2008).

### **Summary of Impact Assessment:**

**Compensate for any light disturbance due to the construction of the project by acquiring like land in the ratio of 0.25:1 for 150-foot buffers around project footprint (CBP 2008). Approximately 159 acres would be acquired for fence segment O-4 through O-21.**

## **G. 1700-Acre offset for Hidalgo County footprint and loss of connectivity and fragmentation of habitat**

Habitat fragmentation is a major cause of reduced biodiversity and population size (Noss et al 2001). Habitat fragmentation is the separation of preferred habitats of a species resulting in division of the wildlife population itself. Separation can occur through geological processes or, as is the case here, human activity. The result of fragmentation is the conversion of a contiguous habitat into various smaller sections of disjointed habitat patches. Fragmentation alters breeding, feeding, and sheltering habitats so as to make them less viable, and in some, cases unsuitable.

Due to extreme habitat loss most of the Lower Rio Grande Valley consists of islands of suitable habitat with limited connectivity. Due to the small amount of habitat remaining it is critical that wildlife corridors connect remaining conservation lands. Such wildlife corridors are linear habitats, embedded in a dissimilar matrix of habitats that is proposed for conservation on the grounds that it will enhance or maintain the viability of specific wildlife populations in adjoining habitat blocks (Beier and Noss 1998). The original landscape in many areas, as in LRGV, was once a contiguous series of natural habitats. Today, corridors function to maintain or restore natural landscape connectivity. Increased connectivity along with increased effective habitat area, counteract habitat fragmentation (Noss 1987). Corridors facilitate gene flow and dispersal of individual animals. Life histories of wide-ranging animals suggest that maintenance or restoration of landscape connectivity is a good management strategy

(Noss 1987). Corridors alleviate threats from breeding depression, and a network of refuges connected by corridors may allow persistence of species that need more resources than are found in individual habitat patches.

Reduced patch size and habitat fragmentation can have subtle but significant impact on cat ecology. Some studies have indicated that the home range for males varies from 7,116 to 8,514 acres depending on habitat availability and type. For females, home range can vary from 5,201 to 7,301 acres (Dillon 2005). Increased fragmentation of habitat patches and the reduction of intact corridors causes cats to expend more energy finding available habitat and maintaining the necessary vigilance level required for less optimal habitat. In some cases may abandon habitat due to a lack of resources provided by the patch or higher predation risk (Brown 1999).

The LRGV NWR is a vital part of the wildlife corridor system in South Texas and in the project area. The FWS has been acquiring and enhancing native Tamaulipan brushland along the LRGV NWR for more than 20 years and to date has expended approximately \$75,000,000 to acquire and protect habitat for endangered species, other wildlife and public use. A principal purpose of the refuge was to promote conservation of endangered ocelots and jaguarundi, as well as, to promote other wildlife characteristic of Tamaulipan Brush.

Presently, two general types of brush habitats exist in LRGV, riparian and scrub forests, and upland thornscrub and thorn woodland. Riparian and scrub forests associated with the Rio Grande consist of several intergrading habitat types that produce taller vegetation than surrounding areas. This vegetation is important to wildlife as corridors throughout LRGV as are "resacas" which are former streambed meanders now subject to repeated drying and inundation and often forming a long quiet pond or oxbow (USFWS 1984 and Crosswhite 1980 as cited by Jahrsdorfer and Leslie 1988). Upland areas are dissected by "arroyos" or riparian strips of dense brush known as "ramaderos". Ramaderos provide important nesting and feeding habitat for various wildlife species as well as access routes to riparian brush along the Rio Grande (Collins 1984). Tamaulipan brushland provides important feeding, nesting and cover habitats for many species including the endangered ocelot and jaguarundi.

Much of the land purchased by the Service was actively cultivated. This is due to the fact that nearly all habitat in the region has been converted to other uses. To address this, the FWS has developed an extensive cooperative farming and revegetation program and is replanting between 750 and 1,000 acres (303.5 and 404.6 hectares) of farmland a year to native brush. Since 1993 over 8,000 acres (3,237.5 hectares) have been revegetated. The amount of needed revegetation remaining is substantial. In 2000, 30,000 acres (12,140.5 hectares) of land were in need of revegetation on LRGV NWR. Revegetation continues to be part of the active management plan for the Complex's units.

The resource protection and management strategy of the South Texas Refuges consists of five integrated approaches to address complex resource needs. They include: concentration of biotic community needs, maintenance of a wildlife habitat corridor, safeguarding of anchor units of large size, protection of strategically placed management units of smaller size, and the incorporation of about 20 habitat islands into the protection plan. The Refuge approach of protecting and connecting blocks of rare habitat is similar to approaches taken in many other parts of the country. As designed, these corridors can provide critical landscape connectivity, and are important aspects of ocelot conservation (Tewes et al. 1995, Tewes and Blanton 1998). Individual tracts of the LRGV NWR and Laguna Atascosa NWR serve as core habitat blocks and corridor links. Directly to the south are ecologically valuable areas such as the Laguna Madre of Tamaulipas, Mexico, and the Sierra Picachos (in Nuevo Leon, Mexico) that are receiving focused conservation attention from the Mexican Government and a number of interested Mexican and U.S. conservation organizations. The Service's Lower Rio Grande/Rio Bravo Binational Ecosystem Group has been working with Mexico to establish a wildlife corridor along the river within the project area and in Tamaulipas to connect these important ecologically valuable areas. To the north lie the Laguna Atascosa NWR and the great Texas ranch country with their huge blocks of intact ocelot, jaguarundi and other wildlife habitat,

Approximately 95 percent of the vegetation in the LRGV has already been cleared or altered resulting in a heavily fragmented environment. The principal thrust of land acquisition and cat conservation in South Texas has focused on the purchase of conservation lands designed to increase the size of habitat patches and to connect them with each other. Beginning in the 1980s, the Fish and Wildlife Service, the State of Texas, private nonprofit organizations, and some private landowners have sought to acquire and restore habitat for these endangered cats and other wildlife. All of these acquisitions are important links in the effort to protect the tremendous biodiversity and related economics of the region. Placement of border infrastructure thus represents a reversal in the land conservation efforts by increasing fragmentation of habitats. These impacts were recognized early in the process of implementing border security measures. The approach was to offset impacts of required border infrastructure and compensate for those impacts by creating linkages, restoring habitat and establishing larger patches of habitat elsewhere.

The height of the primary pedestrian fence and flood wall clearly restrict the movements of the endangered cats and many other wildlife species. It is recognized that that cats could continue to travel through a vegetated corridor to the ends of the primary pedestrian fence and through wildlife openings in Section O-1 through O-3(yet to be constructed) and O-11 through O-21, for which wildlife opening have been installed. The extent to which the endangered cats will use the openings is unknown. Negotiating barriers created by border infrastructure will result in additional travel time for the cats, additional expenditures of energy and increase the risk of encountering humans or vehicular strikes. In some cases the infrastructure may prevent access to

essential habitat elements or reduce their availability significantly. The concrete wall completely precludes cats from visually assessing habitats that may be across the flood wall.

All ocelot and jaguarundi habitat between the fence and the Rio Grande could be indirectly, adversely affected by the presence of the primary pedestrian fence if it is not accessible for management purposes or if it is disconnected from other suitable habitats. Units of the LRGV NWR that will be located completely south of the fence include Los Ebanos in Section O-3 (will occur if O-1 to O-3 is built); Caballo Banco, Abrams West, Peñitas, La Pesquera, and Abrams in Section O-4; Gabrielson and Cottam in Section O-5; Pate Bend and Hidalgo Bend in Section O-6; Monterrey Banco in Section O-7; La Coma in Section O-8; Rosario Banco in O-10; Llano Grand Banco in Section O-11; Culebron Banco in Section O-13; Villitas Banco in Section O-11; Vaquerito Banco East in Section O-15; Las Palomas Banco in section O-14; Vaqueteria Banco in Section O-15; Ranchito in Section O-16; South Palo Banco, Phillips Banco, and Champion Bend in Section O-18; and Jeronimo Banco, Boscaje De La Palma, and Southmost Ranch in Section O-21. National Land Cover Data (NLCD) indicate that the land between the primary pedestrian fence and U.S./Mexico international border consists of 10,558 acres of planted/cultivated land; 1,706 acres of developed land; 4,880 acres of undeveloped land; and 6,700 acres of WMAs and NWRs. Therefore, potentially 11,580 acres of ocelot and jaguarundi habitat (undeveloped, WMA, and NWR lands) is indirectly impacted to some degree by the presence of the primary pedestrian fence (CBP 2008).

For species like the ocelot and jaguarundi that require large, unbroken blocks of habitat fragmentation of habitat into smaller pieces can result in making the habitat unsuitable for occupation. Fragmentation can also isolate cats from travel corridors and reduce dispersal for breeding. This in turn may result in adverse genetic affects. In situations with a small population, such as the ocelot and jaguarundi in South Texas, inbreeding can reduce fitness of individuals and loss of genetic variability can reduce the ability of an animal to adapt to a changing environment (Lande 1988).

Fragmentation and loss of connectivity, therefore; contribute to greater expenditures of energy by the cats to find ways around the obstacles, loss of available habitat due to patches becoming so isolated that a cat can not find them, reduced biodiversity of the patches for prey items, reduced dispersal, greater risk to predation, greater number of obstacles to avoid, reduced visibility, and in extreme cases genetic isolation (Lande 1988).

#### SUMMARY OF THE NEGOTIATIONS TO DETERMINE MITIGATION ACREAGE

Early in 2008, CBP asked FWS to assist with completing the Biological Assessment (BA) for the RGV Sector. (b) (6), (e2m consultant), (b) (6) (FWS) and (b) (6) (FWS) worked together on the BA to be submitted to CBP for acceptance and then forwarded to FWS. This BA would form the basis for the Biological Opinion that would

result as would normally be required in a formal section 7 consultation. (b) (7)(E), (b) (5)

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The amount was deemed by CBP to be extreme for the PF225 budget, at that time.

The significance of impacts of an approximately (b) (7)(E) concrete flood wall through a wildlife corridor was acknowledged and CBP and Hidalgo County were both concerned that the construction of the concrete flood wall would have significant adverse impacts to the cats, and a negative influence on the outcome of the Biological Opinion without appropriate measures to offset impacts being included in the proposed action. Recommendations to offset anticipated impacts were requested from FWS/DOI.

To address these concerns, a meeting at the McAllen Airport was held in late January 2008. Attendees included (b) (6) (DOI), (b) (6), (b) (7)(C) (OBP), (b) (6), (b) (7)(C) (LMI/CBP), (b) (6), (b) (7)(C) (OBP), (b) (6) (FWS-WO), (b) (6) (ARD- R2 ES-FWS), (b) (6) (FWS- Corpus Christi ES), (b) (6) (Lower Rio Grande Valley Refuge- FWS), (b) (6) and other members of Hidalgo County government, among others. Maps of the proposed fence and available habitat were provided and assessed. The ability of cats to travel to each habitat was approximated, the length of proposed fence segments was considered, and the available habitat on the north (non-river) side of the fence was assessed by members of meeting. From that meeting and some coordination afterwards, it was projected that 1,700 acres would be needed for direct loss of habitat from the footprint of the proposed wall, the affects of loss of connectivity. This amount was calculated based on an estimate of the habitat area needed to maintain a corridor after construction was completed and to offset impacts to the Refuge. This estimate was for the Hidalgo County flood control segments ((b) (7)(E)). Maps of land tracts were used to calculate several potential cat crossing areas from that would allow the cats to move from south to north and vice versa. Acreage from land tracts needed to connect habitat areas in the north and to the south, plus habitat areas the cats would have to travel to get to the potential crossing areas were calculated summed together. Most of the acreage was calculated using river tracts, but some northern tracts were included especially if that habitat was important in linking other available habitat to the tracts at the river. Again, estimates of the acreage, and actual acreage if known, were used to calculate what would be needed to provide a travel corridor from south of the flood wall to available habitat to the north. **Specific tracts of land were not identified to protect private land owners from misperceiving a government taking of property.** The 1,700

acre-figure also included the footprint of the flood wall as proposed, because of the direct loss of habitat due to the construction of the wall itself.

After this estimate was prepared it was presented by (b) (6) to (b) (6), (b) (7)(C) (February 11, 2008). The proposed conservation measure was discussed, to DOI's understanding, with (b) (6), (b) (7)(C) (CBP) and (b) (6), (b) (7)(C) (CBP). **It was agreed that the impacts from the foot print and loss of connectivity would be compensated with 1,700 acres for land acquisition and would not be further adjusted.** This amount of mitigation averaged over the 20 plus mile stretch of infrastructure at 83.78 acres of mitigation/mile.

The Hidalgo County's own website reiterated this point subsequent to the meeting:

*"Nevertheless, on Feb. 8, 2008, Sec. Chertoff announced acceptance of the alternative compromise plan to fencing that he said meets the operational needs of the U.S. Border Patrol as well as the flood control needs of Hidalgo County. Financing was still an issue, though. On April 1, 2008, DHS issued two waivers to expedite security improvements along the southwest border. One waiver was specifically tactical for the levee-barrier project in Hidalgo County to strengthen flood protection systems. And even despite the waiver, which was necessary in order to comply with Congress' mandate and Hidalgo County's FEMA deadline, all players in the levee-barrier tactical reconstruction project pledged to be good stewards of the environment. Another EIS was not released; instead, DHS put together an environmental stewardship plan, encompassing public comments. DHS also offered, and environmental agencies accepted, a mitigation package in return for their cooperation" (<http://www.co.hidalgo.tx.us/index.aspx?nid=543>).*

As the waiver for Hidalgo County was prepared, this negotiated sum was also carried over from the draft BA into the CBP Biological Resource Plan (BRP) as conservation measure number 3. (b) (6) made significant changes to the draft BA as it was being converted to a BRP for the purposes of the waiver. For example, all reference to indirect impacts of the fence on habitat resulting from illegal traffic being shifted to previously unused areas was removed from the document without coordination with DOI/FWS. However, all conservation measures, including number 3, which addressed direct loss of habitat, disturbance to habitat, noise buffers, temporary light disturbance, and loss of connectivity were carried over into the BRP, indicating a commitment to implement the measures as part of the project. As such this mitigation was regarded by FWS as a conservation measure typically included in a BA. As was mentioned above this acreage figure was derived from an estimate of the amount of habitat that would be required to provide sufficient habitat for a wildlife corridor to allow the endangered cats to move from among existing conservation lands. Additionally, the 1700 acre figure for conservation measure number 3 was not questioned when originally mitigation tables were presented to CBP ((b) (6), (b) (7)(C)) at the RGV Sector mitigation meeting in late 2008, in fact there were no questions that required follow-up. During the submission of Project Description Worksheets in early 2009, Texas was not asked to change any parameters other than to adjust the final mitigation acreage based on the

final footprint calculation, As noted above, the Hidalgo County, 1700-acre land acquisition mitigation, was not to be further adjusted as it accounted for both footprint and loss of connectivity. (b) (6), (b) (7)(C) (CBP) emailed (b) (6) (FWS) on April 10, 2010 to confirm that all conservation measures in the BRP were accepted by CBP except for those conservation measures which would need to be adjusted based on the actual footprint of the project. This was understood to mean that CBP accepted Conservation Measure .This was the basis on which subsequent assessments of impact were based.

Additional impacts resulting from construction of the flood wall came from unanticipated events in the summer of 2010, when flooding of the Rio Grande occurred. This flooding was the result of tropical storms crossing into northern Mexico causing flooding in the Rio Grande. The result of these storms was an almost 120 day extended hydro-period. Water from the Rio Grande reached the flood wall in all sections. The floodwall blocked almost all egress for terrestrial wildlife species. Animals caught between the river and the flood wall that could not escape around the edges of the floodwalls likely perished. Routine inspections of tracts during the event found terrestrial species in trees, swimming and wading in rising water. The longevity of the event precluded the opportunity to search for dead or injured animals. Hundreds of shells of Texas Tortoise have since been found demonstrating high mortality for species which could not retreat from rising water levels. The Service fears any ocelots or jaguarundi that may have been caught in these areas when water began to rise may have been malnourished, injured, been forced to relocate to less optimal habitat or perished.

#### **Summary of Impact Assessment:**

**1,700 acres for land acquisition for the purposes of mitigating the flood wall construction was part of a negotiated agreement and was instituted in the BA and carried over to Biological Resource Plans as a conservation measure by Customs and Border Protection. This was done to offset impacts of the footprint of the flood wall and for loss of habitat connectivity. It was generated based on direct loss of habitat, fragmentation of habitat including fragmenting units of the Lower Rio Grande Valley National Wildlife Refuge, and impacts to wildlife movements (loss of connectivity and total loss of visibility). The assumption was that the ability of ocelots to move from habitat to habitat along flood wall segments was impeded and that this had adverse impacts on ocelots and jaguarundi. CBP agreed to provide funds to purchase 1,700 acres of habitat for conservation in perpetuity (CBP 2008). Tracts proposed for acquisition were reviewed by CBP and they did not support the acquisition of land tracts along the river due to concerns about possible impacts on their operations. It was agreed that the 1,700 acres could be added to other areas, approved by CBP, to help increase home range sizes and travel corridors available to the cats at locations north of the river. Other components of the flood wall, roads, access roads, staging areas, etc... would be offset by other conservation measures.**

## H. Loss of connectivity or Habitat Fragmentation for Cameron County Fence Segments

Please see section G above for a summary of the analysis used to calculate mitigation acreage requirements to compensate for loss of connectivity and habitat fragmentation. Corpus Christi Ecological Services Field Office now recommends for any project that results in increased fragmentation of habitat, habitat loss or adverse impacts on the ability of the cats to move among suitable habitat that the degree of impact be assessed based on the specific project plan. The project under consideration here is unique in terms of scope and impact. However previous evaluations lead the FWS to conclude that compensation in the range of 5.4 acres/mile of reduced connectivity to as much as 73 acres/mile or greater is appropriate. The amount is dependent on the degree of loss of connectivity, other mitigation measures and whether natural areas such as refuges where the government has made a significant investment in acquisition and management are impacted (USFWS 2010c). For this project much of the analysis was based on the collaborative exercise at the McAllen Airport in early 2008 that gave the initial figure of 83.78 acres/mile when an impermeable structure is constructed.

Stepping down from the 83.78 acres/mile, for example, 10.8 acres/ mile was used recently for compensation due to loss of connectivity for maintaining a narrow right-of-way (ROW) for a pipeline (USFWS 2009). The approach used here to calculate impacts to endangered cats is based on how many acres of actual habitat would be needed for a cat to find an alternate route around the infrastructure or object causing the reduction or loss of connectivity between habitats. Several examples of actual areas constricted by a reduction or loss of connectivity were used in the evaluation. We believe these ratios may vary depending on the location and type of infrastructure being evaluated and other factors unique to a particular project but that they are generally applicable for the larger question of determining the level of mitigation required to offset impacts of border infrastructure in general.

### **Summary of Impact Assessment:**

**As discussed above, CBP accepted the following conservation measures and included them in their BRP, to compensate for reduced connectivity from the construction of a pedestrian fence with *wildlife openings* at 21.6 acres/mile (essentially double the estimated mitigation for a narrow right-of way with no structures impeding but with vegetation removed), For lost connectivity due to placement of a “floating fence” the estimate was 43.2 acres/mile. The Service was told, at the planning stages that the floating fence could be moved during extreme conditions such as hurricanes and small**

mammals would have be able to navigate to available habitat on the other side of the floating fence. For infrastructure that abuts or severs conservation areas, including LRGV NWR tracts (CBP 2008), the ratio was increased to 73 acres/mile, as corridors in existing conservation areas were severed or connectivity was greatly reduced. Based on these rations we estimate that approximately 1,042 acres would be acquired for mitigation of fence segments O-11 through O-21.

**I. Other impacts to be discussed, assessed and finalized in later documentation (prior to 2011 appropriations for mitigation becoming available):**

The following activities or construction impacts were either not assessed or need additional consideration following completion of construction activities.

- Impacts due to installation of permanent lighting (The working group has not yet reached consensus)
- Impacts due to road access construction, and road use
- Impacts due to staging areas
- Impacts due to fires started due to construction activity
- Impacts due to infractions of best management practices according to severity and time to resolution of a particular infraction (Construction will need to be near completion in order to incorporate all BMP infractions)
- Temporal losses due to construction continuing over projected timeline
- Impacts due to construction and maintenance of fence segment O-1 to O-3, should construction planning begin.

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