FINDING OF NO SIGNIFICANT IMPACT

OPERATION SKYWATCH
USBP TUCSON SECTOR, ARIZONA

PURPOSE AND OBJECTIVE: The purpose of the proposed action is to assist in identifying and providing humanitarian assistance to undocumented aliens (UDAs) and illegal drug traffickers who may be at risk of dying due to overexposure along the U.S./Mexico border within the U.S. Border Patrol (USBP), Tucson Sectors' Areas of Operations (AO). Because of extremely hot weather during the summer in the Tucson Sector many undocumented Immigrants traversing the remote desert and mountain areas are subject to extreme physical stress and probable death with out assistance.

PROPOSED ACTION: The proposed action temporarily assignment of two additional fixed-wing aircraft, three helicopters, three pilots, three aircraft mechanics and other support personnel as needed in the Tucson Sector for a period of up to 123 days, beginning on 1 June 2001 and terminating on September 28th. The aircraft will be staged primarily at the Tucson International Airport, with other sites being utilized depending on changing operational needs. In addition aircraft from the adjacent Yuma Sector will perform surveillance overflights of the western desert of the Tucson Sector.

The aircraft will typically fly at an altitude of between 500 to 1000 feet above ground level (AGL). The flights will operate 24 hours per day and seven days per week. If UDAs who are in dire straits are located, ground patrol and/or helicopter units would perform the actual rescue efforts.

ALTERNATIVES: Alternatives addressed in the EA include no action and the proposed action described above. Another alternative evaluated was the use of the fixed wing aircraft for reconnaissance and helicopter rescue missions only (i.e., no ground patrol rescues). The no action alternative would not enhance the USBP ability to provide assistance to UDA's who have succumbed to the sever desert climate and would thus, indirectly place more migrants and/or USBP agents at risk. Of the alternatives considered, the proposed action would be the most efficient and effective to ensuring the USBP agents' and migrants' health and safety.

A Programmatic Environmental Impact Statement (PEIS) was prepared in 1994 for the Immigration and Naturalization Service (INS) and JTF-6 to address similar missions along the southwestern border of the U.S. The EA for the proposed action is tiered from that PEIS in accordance with the President's Council on Environmental Quality's Regulations for Implementing the National Environmental Policy Act of 1969.

ENVIRONMENTAL CONSEQUENCES: No significant adverse affects to the natural or human environment are expected upon implementation of the proposed action. In addition, no adverse effects to cultural resources are expected. Rescue efforts may affect Federally protected threatened or endangered species or habitats depending upon the time, duration, and location of the rescue mission. These potential effects are currently being coordinated through the U.S. Fish and Wildlife Service through the emergency consultation process, as specified by the Endangered Species Act.

Based upon the results of the EA and the environmental design measures to be incorporated as part of the proposed action, it has been concluded that the proposed action will not have a significant adverse effect on the environment. Anyone having comments regarding this action should contact Mr. Kevin Feeney, INS Headquarters, Facilities and Engineering Division, at (202) 353-9412. Or write to Mr. Feeney at INS, Facilities and Engineering Division, 425 I Street Northwest, Room 2060 Washington, D.C. 20536

Richard J. Diefenbeck
Director, Office of Administration
Headquarters Facilities and Engineering Division

Date June 1, 2001

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

FOR OPERATION SKYWATCH II

USBP TUCSON SECTOR, ARIZONA

May 2001

Lead Agency: U.S. Immigration and Naturalization Service
Facilities and Engineering Division
Washington, D.C.

Responsible Official: Mr. Kevin Feeney
INS Headquarters
Facilities and Engineering Division
425 I Street, Northwest, Room 2060
Washington, D.C. 20536

ABSTRACT

PROPOSED ACTION:	The proposed action would include the temporary assignment of three helicopters and two fixed-wing aircraft, three pilots, three aircraft mechanics and other support personnel as needed to the Tucson Sector for a period of about 123 days, beginning on 1 June 2001. The aircraft will be staged at one primary established airport site (Tucson International Airport), but staging sites can and will vary depending on changing operational needs. The proposed action also includes support form the Tucson Sector on an as-needed basis.
PURPOSE AND NEED FOR THE PROPOSED ACTION:	The primary purpose of the proposed action is to assist in identifying and rescuing undocumented aliens (UDAs) and illegal drug traffickers who may be at risk of dying due to overexposure along the U.S./Mexico border within the U.S. Border Patrol (USBP) Tucson Sector's Area of Operations (AO). A secondary purpose of the operation is to reduce illegal immigration and drug trafficking along the border by increasing the USBP's ability to detect, deter and apprehend illegal entrants before they endanger themselves.
ALTERNATIVES TO THE PROPOSED ACTION:	Alternatives addressed in the SEA include no action and the proposed action described above. Another alternative evaluated was the use of the fixed wing aircraft for reconnaissance and helicopter rescue missions only (i.e., no ground patrol rescues). The no action alternative would not enhance the USBP mission to detect and deter the UDAs from entering the U.S. and would thus, indirectly place more migrants and/or USBP agents at risk. Of the alternatives considered, the proposed action would be the most cost-efficient and strategically effective approach to ensuring the USBP agents' and migrants' health and safety.
ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION:	No significant adverse affects to the natural or human environment are expected upon implementation of the proposed action. In addition, no adverse effects to cultural resources are expected. Rescue efforts may affect Federally protected threatened or endangered species or habitats depending upon the time, duration, and location of the rescue mission.
CONCLUSIONS:	Based upon the results of the SEA and the environmental design measures to be incorporated as part of the proposed action, it has been concluded that the proposed action will not have a significant adverse effect on the environment.

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1.0 INTRODUCTION

This Supplemental Environmental Assessment (SEA) addresses the potential effects, beneficial and adverse, of the Immigration and Naturalization Service (INS) and U.S. Border Patrol (USBP) Operation Skywatch. Operation Skywatch is a temporary expanded air operations designed to reduce the number of fatalities of undocumented aliens (UDA) and enhance the continuing support to border enforcement activities within the USBP Tucson Sector. The USBP Yuma Sector would support Operation Skywatch within the Tucson Sector's Area of Operations (AO).

1.1 Background

1.1.1 INS Organization

The INS has the responsibility to regulate and control immigration into the United States. In 1924, the U.S. Congress created the USBP to be the law enforcement arm of the INS. The USBP's primary function is to detect and deter the unlawful entry of aliens and smuggling along the nation's land borders and between the ports-of-entry (POE). With the increase in illegal drug trafficking, the USBP also has become the leader for drug interdiction between land and POEs. Since 1980, an average of 150,000 immigrants have been naturalized every year. At the same time, however, illegal aliens have become a significant issue. INS apprehension rates are currently averaging more than 1.5 million illegal aliens throughout the country. The INS estimates that there are currently three to six million illegal aliens in the United States. Other studies have indicated higher numbers, closer to 10 million.

1.1.2 Tucson Sector

The mission of the USBP Tucson Sector is to protect the U.S.-Mexico boundary in Arizona through the detection and prevention of smuggling and illegal entry of aliens into the United States. The Tucson Sector encompasses all or parts of Cochise, Pima, Pinal, Maricopa, Yavapai, Navajo, Apache, Gila, Graham, Greenlee, Coconino, and Santa Cruz counties (Figure 1). The Tucson Sector is responsible for approximately 280 miles of the U.S.-Mexico border, most of which are remote and rugged lands, particularly along the Naco-Douglas corridor.

The Tucson Sector uses a variety of methods to detect and deter undocumented aliens (UDAs) and illegal drug traffickers. Deterrence is accomplished through the actual presence

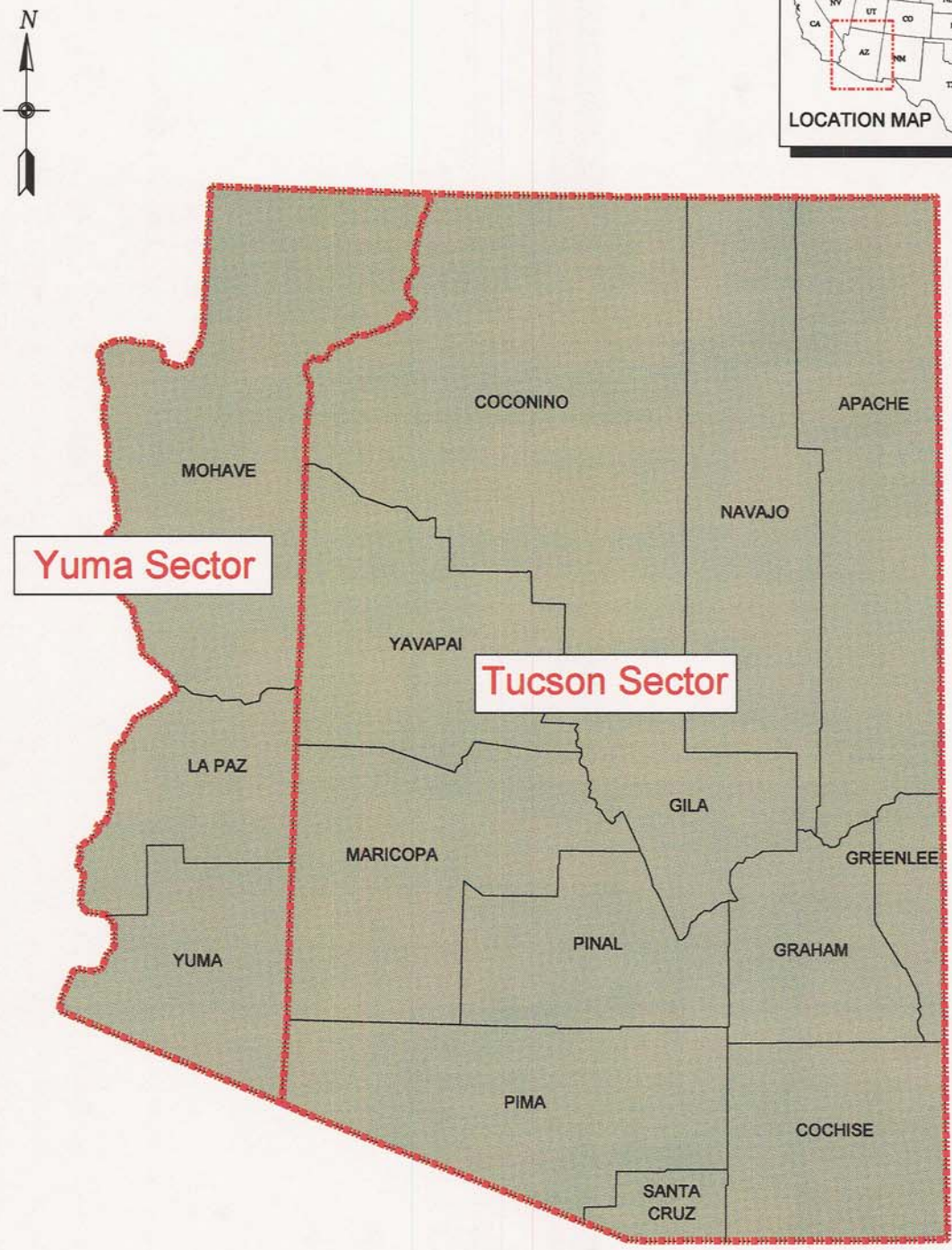

Figure 1: Yuma and Tucson Sectors

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Date:	June 2001

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(24 hours per day, seven days per week) of the USBP agents on the border, fences and other physical barriers (natural and man-made), lighting, and the knowledge that the illegal entrants will be detected and apprehended. Detection of the UDAs and illegal traffickers is accomplished through a variety of low technology and high-technology resources. These include observing physical signs of illegal entry (vehicle tracks and footprints, clothes, etc.), visual observation of the illegal entries from the ground or from aerial reconnaissance, information provided by private landowners or the general public, ground sensors, and remote video surveillance systems.

Currently, the aircraft equipment available for the proposed action is 10 aircraft comprised of eight helicopters, (7) OH-6, and (1) UH-1H, and two fixed wing airplane (1-Cessna 182 and 1-Piper Cub), which can provide assistance to any USBP station within the sector. The air operations center for the proposed action will be located at the Tucson International Airport. There are currently no established flight patrol routes within the Tucson Sector; however, when emergency assistance is requested, USBP helicopters will operate throughout the Tucson Sector's AO.

The Tucson Sector is currently employing a border enforcement program, called Operation Safeguard, in an effort to gain, maintain, and extend control of the Arizona border, as directed by the President's National Drug Control Strategy. Operation Safeguard is a complex and diverse program that uses increased surveillance, remote sensing methods and technologies, search and rescue missions, personnel deployment, and other related tasks to detect and deter UDAs and illegal drug traffickers from entering the U.S.

1.1.3 Yuma Sector

The Yuma Sector encompasses all or portions of Yuma, La Paz and Mojave counties in Arizona; Riverside, San Bernardino, Imperial counties in California; and Lincoln, Nye and White Pine Counties in Nevada. The Yuma Sector Headquarters is located in the southwest corner of Arizona and has responsibility for 118 miles of International Border. The sector area consists of 76,000 square miles, falling under the responsibility of three stations located at Yuma and Wellton, Arizona, and Blythe, California.

As with the Tucson Sector, the Yuma Sector has a variety of methods to detect and deter UDAs and illegal drug traffickers. Several measures have to be employed by the USBP in order to observe illegal activity or signs of illegal activity including low-level flights. Currently

the Yuma Sector maintains five OH-6 helicopters and two fixed winged airplanes, which can provide assistance to any station within the sector. The air operations center is located at the Yuma Airport. The Yuma Sector conducts a daily patrol route along the U.S.-Mexico border, which has been reviewed in accordance with the National Environmental Policy Act (NEPA) and Section 7 of the Endangered Species Act (ESA). The Yuma Sector will provide operational assistance on an as needed basis under Operation Skywatch within the western desert area of the Tucson Sector.

1.1.4 Regulatory Authority

The primary sources of authority granted to officers and agents of the INS are the Immigration and Nationality Act (INA), found in Title 8 of the United States Code (8 U.S.C.), and other statutes relating to the immigration and naturalization of aliens. The secondary sources of authority are administrative regulations implementing those statutes, primarily those found in Title 8 of the Code of Federal Regulations (8 C.F.R. Section 287), judicial decisions, and administrative decisions of the Board of Immigration Appeals.

Subject to constitutional limitations, INS officers and agents may exercise the authority granted to them in the Immigration and Nationality Act. The statutory provisions related to enforcement authority are found in Sections 287(a), 287(b), 287(c), and 287(e) [8 U.S.C. § 1357(a,b,c,e)]; Section 235(a) (8 U.S.C. § 1225); Sections 274(b) and 274(c) [8 U.S.C. § 1324(b,c)]; Section 274A (8 U.S.C. § 1324a); and Section 274C(8 U.S.C. § 1324c) of the INA. Other statutory sources of authority are Title 18 of the United States Code (18 U.S.C.), which has several provisions that specifically relate to enforcement of the immigration and nationality laws; Title 19 [19 U.S.C. 1401 § (i)], relating to Customs cross-designation of INS officers and agents; and Title 21(21 U.S.C. § 878), relating to Drug Enforcement Agency cross-designation of INS officers and agents.

1.2 Purpose and Need

The U.S. experiences a substantial influx of illegal immigrants and drugs each year. These illegal activities cost the American citizens billions of dollars annually due directly to criminal activities, as well as the cost of apprehension, detention and incarceration of criminals; and, indirectly in loss of property, illegal participation in government programs and increased insurance costs. INS has estimated that there were approximately five million illegal aliens residing in the U.S. in October 1996, and their numbers increased at an average rate of about 275,000 per year between October 1992 and October 1996 (GAO 1997).

As the number of UDAs increases, so does the number and frequency of UDA deaths, primarily due to heat exhaustion and overexposure. Between January and August 2000, the USBP rescued about 850 UDAs in Tucson Sector. Many of these migrants were found suffering from dehydration, hunger, and heat stroke. Some had been injured on their journey, or assaulted and left for dead by bandits, while others had been abandoned by smugglers when they were unable to keep up with the rest of the group. Over the past three years 110 deaths have occurred in the Tucson Sector while attempting to illegally enter the United States (i.e., 11 in FY98, 29 in FY99, and 70 in 2000). So far this year, the Tucson Sector has reported 30 deaths and the Yuma Sector has reported 18 deaths. The Yuma Sector, located immediately to the west of the Tucson Sector, also reported a doubling in the number of deaths from FY 99. The majority of these deaths are directly related to migrant smugglers leading groups of UDAs through remote and treacherous desert terrain. The migrants are thus exposed to extremely harsh climatic conditions and are not prepared to survive in these situations.

With the hottest temperatures registered between June and September, the number of UDA fatalities is anticipated to rise. The purpose of Operation Skywatch is to prevent deaths and reduce injuries in hazardous geographic locations in support of the USBP within the Tucson Sector's AO.

1.3 Proposed Action

Operation Skywatch is scheduled to commence on 1 June 2001 and continue for approximately 123 days (i.e., on or about 28 September 2001). The USBP Tucson Sector proposes to maintain and operate two additional fixed winged single engine aircraft and three helicopters, reassigned on a temporary basis from other USBP sectors, for aerial reconnaissance missions along the Douglas/Naco Corridor and the West Desert Corridor, Arizona (Figure 2). The aircraft support personnel for the proposed action would include three mechanics and three pilots.

The additional helicopters that would be used are (1) MD600 from the McAllen Sector, (1) OH6 and (1) UH-1 from the El Paso Fight Operations, Texas. These aircraft would be primarily staged at the Tucson International Airport. However, secondary staging sites can and would be established at other airports (e.g., Sierra Vista) depending on changing operational needs. The Yuma Sector will also assist in the Tucson Sector's search and rescue mission by providing two fixed winged aircraft on an as-needed basis. During the

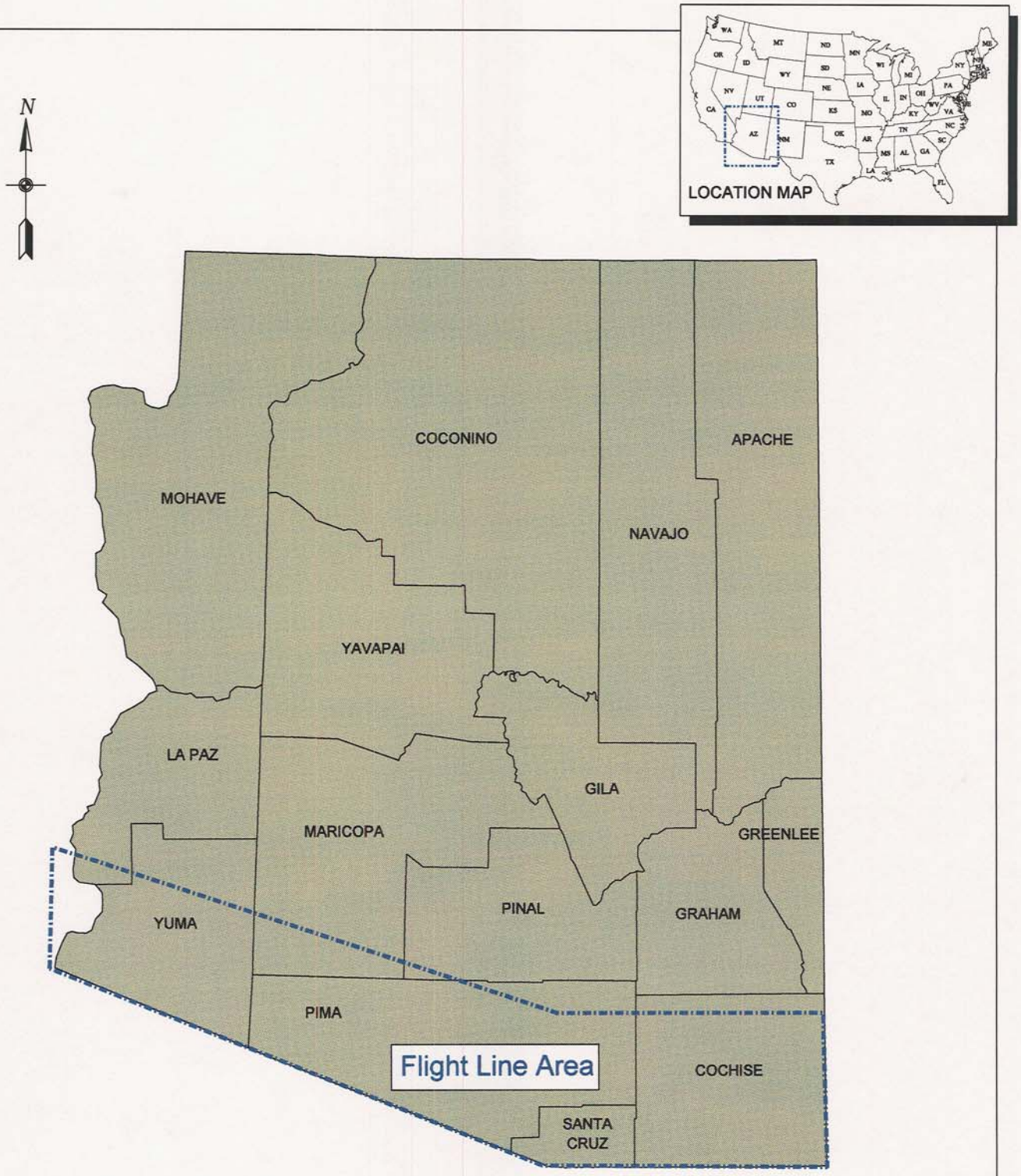

Figure 2: Flight line area

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Date:	June 2001

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operations all aircraft provided by the Yuma Sector would remain under the operational control of the Yuma Sector and based out of Yuma.

The aircraft would typically fly at an altitude of 500 feet above ground level (AGL) or higher. Typical reconnaissance missions will be flown at 2,000 to 4,000 feet but pilots may drop down to 500 feet AGL to accurately evaluate UDA conditions to determine if rescue operations are necessary. Shifts for the aircraft crew (pilots, mechanics, and other support personnel, as needed) would initially be 4:00AM to 12:00PM and 11:00AM to 7:00PM to provide approximately four (4) aircraft aloft at any time (from Douglas/Naco to Ajo). However, since the aircraft would not be equipped with searchlights and are not capable of hovering, they would fly along the border corridor during daylight hours only. Most of the aerial reconnaissance efforts would be conducted over the counties of Pima, Santa Cruz, and Cochise.

Once the aircraft pilots identify UDAs, information regarding their locations and apparent conditions would be transmitted to USBP ground patrol units. If a fatality appears to be imminent without immediate rescue efforts, helicopter search and rescue units may be called in. Similarly, if the UDAs are spotted in locations that are too remote or rugged for ground vehicles, helicopters may be used to rescue the UDAs.

2.0 ALTERNATIVES

This section of the SEA describes the alternatives considered during the preparation of the document. Three alternatives were considered: (1) No Action, (2) Fixed Wing Aircraft Reconnaissance with Helicopter and Ground Patrol Rescues—the preferred alternative; and (3) Fixed Wing Aircraft Reconnaissance with Helicopter Rescues Only. Two additional alternatives were considered but were eliminated from further evaluation. Each of these is discussed in the following paragraphs.

2.1 Alternative 1. No Action Alternative

The No Action Alternative would force the USBP to rely on their current resources to detect and provide humanitarian assistance to UDAs at a time when illegal immigration and temperatures are increasing. This alternative could result in a continued increase in deaths and increase the risks to USBP agents' health and safety while trying to rescue the UDAs in rugged terrain. This alternative would also result in additional ground disturbance from off-road vehicles during rescue operations. Ultimately, the USBP has determined that this alternative would unduly risk the lives of UDAs and USBP agents.

2.2 Alternative 2. Fixed Wing Aircraft Reconnaissance and Helicopter and Ground Patrol Rescues (Preferred Alternative)

This alternative will temporarily detail five additional USBP aircraft (two fixed wing and three helicopters), three pilots, and three aircraft mechanics from other USBP sectors to the Tucson Sector for a period of approximately 123 days. The proposed action also includes using the aircraft operated and maintained by the Yuma Sector to assist in reconnaissance of the western portion of the Tucson Sector.

The flight operations would be conducted along the southern Arizona border from Ajo eastward to the state boundary at altitudes of 500 feet AGL or higher. The pilots' mission will be to detect UDAs who appear to be at risk and to notify ground/helicopter patrols of their locations and the apparent conditions. These units will then initiate the appropriate emergency response action. Flight operations along the border would typically be flown during daylight hours only so that the pilots can make visual observations and assessments. The aircraft would be operated from established airports that are equipped with proper fuel and hazardous materials (e.g., cleaning solvents, petroleum, oils and lubricants) storage and

handling facilities. Pilots, mechanics, and other support personnel as assigned would be lodged in local hotels.

This alternative provides the most effective and efficient method for locating and providing humanitarian assistance to UDAs. Fixed wing aircraft can cover more territory at a faster rate than ground patrols and provide longer flight hours that helicopters due to increased fuel efficiency. Rescue operations using a combination of fixed wing aircraft and ground patrols and helicopters provide the fastest and safest method to assist UDA in distress and reduce the operational risks to USBP agents.

2.3 Alternative 3. Fixed Wing Aircraft Reconnaissance and Helicopter Rescues Only

This alternative would implement the temporary expansion of the fixed wing aircraft reconnaissance mission, but would provide for helicopter rescues only. This alternative would avoid some potential ground disturbances due to off-road maneuvers that may be required for ground patrol rescues. However, helicopter support is often not required. This alternative would dedicate helicopters to only emergency response reducing the overall effectiveness of the Sector flight surveillance operations.

2.4 Alternatives Considered but Eliminated From Further Evaluation

Several other alternatives and combinations thereof were considered during the preparation of this SEA. However, these were not carried forward for detailed analyses because they were not as effective, were more environmental damaging, and/or posed a greater health risk to UDAs and/or USBP personnel. Deploying additional USBP agents on the ground was considered but eliminated due to the urgency of the situation and the time required to hire/train the number of agents that would be needed to adequately patrol the area. The addition of these agents would also necessitate the procurement of other support resources including administration facilities, vehicles, and support personnel, and there would still be areas along the border that the agents could not effectively patrol due to natural barriers.

Implementation of Operation Skywatch with ground patrol rescue efforts was also considered but was not carried forward because of the increased risk to the safety and health of the USBP officers and UDAs. Some areas are geographically inaccessible by off road vehicles and attempting a rescue in these areas increases the probability of a fatality. The number of

vehicles that would be necessary to devote to search and rescue missions also would reduce normal patrol activities.

3.0 ENVIRONMENTAL BASELINE CONDITIONS

3.1 Climate

The climate in southern Arizona is quite varied due to differences in elevation and proximity to physical features such as mountains. Two distinct climatic zones, the Mexican Highland Zone and the Sonoran Desert Zone differentiate the Tucson Sector. The Mexican Highland Zone in Santa Cruz, Cochise, and eastern Pima counties is at a higher elevation than the Sonoran Desert Zone. Annual temperature variations in the area range from 111°F to -1°F. Relative humidity ranges from 50 percent in the mornings to 33 percent in the afternoons.

The Sonoran Desert Zone in western Pima, Maricopa, and Pinal counties has a desert climate. Annual precipitation in the area ranges from less than three inches at lower elevations to 12 inches at upper elevations. Almost 50 percent of the normal yearly precipitation occurs from mid-July to mid-September as a result of moisture-laden air currents moving into Arizona from the Gulf of California. Temperatures in the summer months range from 71° to 108°F with a maximum of 124°F having been reported. Due to the proximity of the Gulf of California, relative humidity ranges from 53 percent in the mornings to 23 percent in the afternoons, which can significantly increase the heat index. Prevailing winds are from the north and are highest (10 mph) in July.

3.2 Physiography

Southern Arizona lies within the Basin and Range Physiographic Province and is characterized by intensely deformed and intruded strata within numerous fault blocks. This province has roughly parallel but discontinuous mountain ranges that, in Arizona, tend to be linear and oriented generally northwest to southeast. Broad alluvial valleys separate these block-faulted mountain ranges. The Basin and Range Province in the study area can be subdivided into two physiographic sub-provinces: the Mexican Highlands and the Sonoran Desert (Hayes 1969).

The Mexican Highland subprovince includes Cochise County, Santa Cruz County, and the eastern part of Pima County. Mountain ranges make up nearly half of the area (Hayes 1969) and may rise to more than 9,000 feet. The Sonoran Desert subprovince includes Maricopa County and the western portions of Pima and Pinal counties. In contrast to those of the

Mexican Highlands, the mountain ranges in this subprovince are lower and narrower, and cover less than a fourth of the area (Hayes 1969).

A number of landforms are present throughout the Arizona border region. These physiographic features include relatively large-scale features such as mountains, basins, and volcanic cinder cones and flows, and relatively small-scale features such as sand dunes, alluvial fans, pediments, and playas. Landforms present in the study area are features typically associated with desert regions. Much of the shaping of the present southern Arizona landscape occurred during the Quaternary (i.e., the last two million years) (Cooley 1967).

3.3 Land Use

The land use in the area includes agriculture, rangeland, urban, forest, recreation/special use, and water. The major federal agencies controlling large land areas are the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM). The major state agencies controlling large areas of land are the Departments of Land and State Parks and the Arizona Game and Fish department. Native American nations also own significant areas of land. Private and corporate land ownership, a small percentage of the total land area, contains the urban areas and intensive specialized agriculture land, along with large areas of range. The "other" land ownership category includes land controlled by other federal agencies, such as, the National Park Service, Department of Defense, and USFWS, along with county and municipal lands.

3.4 Air Quality

The U.S. Environmental Protection Agency (USEPA) defines ambient air quality in 40 CFR 50 as "that portion of the atmosphere, external to buildings, to which the general public has access". In 40 CFR 50, USEPA has designated "criteria air pollutants" in which ambient air quality standards have been established. Ambient air quality standards are intended to protect public health and welfare and are classified as either "primary" or "secondary" standards. Primary standards define levels of air quality necessary to protect the public health. National secondary ambient air quality standards define levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Primary and secondary standards have been established for carbon monoxide, lead, ozone, nitrogen dioxide, particulate matter (total and inhalable fractions) and sulfur dioxide. Areas that do not meet these standards are called non-attainment areas; areas that meet both

primary and secondary standards are known as attainment areas. The state of Arizona has adopted the National Ambient Air Quality Standards (NAAQS) as the state's air quality standards. These standards are presented in Table 3-1.

The majority of the Arizona segment of the U.S.- Mexico border area is sparsely settled desert or semi-desert. However, this segment contains two large areas of urbanization, the Phoenix and Tucson metropolitan areas. Several "sister cities" are also located along the U.S.-Mexico border. There are a number of air quality problems related to the rural, urban, and industrial areas within this study area. Man-made sources of air contaminants affect the air quality of the study area. These sources include: industrial emissions, mobile (vehicular) emissions, area emissions (e.g., emissions from numerous residences and small commercial establishments in an urban setting), dust resulting from wind erosion of agriculturally disturbed lands, smoke from forestry burns, and pollutants transported into the study area on winds blowing from major urban/industrial areas outside the study area. One of the largest sources of air pollution in Arizona is the controlled burning of forest land.

Airborne particulates are a special problem in the border area. Construction activity and windblown dust from disturbed desert are significant sources of fugitive dust. In agricultural areas, farming activity is an additional source of fugitive dust. Many residences in the Mexican border area burn non-traditional fuels such as wood scraps, cardboard, and tires to provide warmth in the winter. The resulting particulate loading can also adversely affect air quality in the Arizona border counties.

In addition to airborne particulates, high concentrations of sulfur dioxide in the study area are of concern. Sulfur dioxide is the primary contributor to acid deposition, which causes acidification of lakes and streams and can damage trees, crops, historic buildings, and statues. In addition, sulfur dioxide compounds in the air contribute to visibility impairment and may affect breathing and aggravate existing respiratory and cardiovascular disease (USEPA 2000). Ambient sulfur dioxide in the study area results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills, and from nonferrous smelters.

TABLE 3-1
National Ambient Air Quality Standards

POLLUTANT	STANDARD VALUE	STANDARD TYPE
Carbon Monoxide (CO)		
8-hour average	9ppm (10mg/m^3)**	Primary
1-hour average	35ppm (40mg/m^3)**	Primary
Nitrogen Dioxide (NO_2)		
Annual arithmetic mean	0.053ppm (100µ/m^3)**	Primary and Secondary
Ozone (O_3)		
1-hour average*	0.12ppm (235µg/m^3)**	Primary and Secondary
8-hour average*	0.08ppm (157µg/m^3)**	Primary and Secondary
Lead (Pb)		
Quarterly average	1.5µg/m^3	Primary and Secondary
Particulate<10 micrometers (PM-10)		
Annual arithmetic mean	50µg/m^3	Primary and Secondary
24-hour average	150µg/m^3	Primary and Secondary
Particulate<2.5 micrometers (PM-2.5)		
Annual arithmetic mean	15µg/m^3	Primary and Secondary
24-hour Average	65µg/m^3	Primary and Secondary
Sulfur Dioxide (SO_2)		
Annual arithmetic mean	0.03ppm (80µg/m^3)**	Primary
24-hour average	0.14ppm (365µg/m^3)**	Primary
3-hour average	0.50ppm (1300µg/m^3)**	Secondary

Source: U.S. Environmental Protection Agency (USEPA) 1999.

Legend: ppm = parts per million
mg/m^3 = milligrams per cubic meter
µg/m^3 = micrograms per cubic meter

*The ozone 1-hour standard applies only to areas that were designated non-attainment when the ozone 8-hour standard was adopted in July 1997.

**Parenthetical value is an approximate equivalent concentration.

3.5 Noise

Noise is one of the major concerns associated with aerial reconnaissance operations. USBP noise-generating activities include low-level helicopter patrols, fixed-wing aircraft reconnaissance missions, and ground vehicular patrols. Helicopter patrols are flown in accordance with Federal Aviation Administration regulations and typically maintain an elevation of 500 feet AGL. However, lower flights and even landings can occur in the event of apprehensions and/or rescues. Helicopter patrols are seldom flown on specific routes or at regular times. Therefore, noise is generally infrequent in any single location. The aerial reconnaissance missions flown by fixed-wing aircraft are typically conducted at altitudes greater than 500 feet AGL. Again, no routine or specific routes are currently flown and thus infrequent noise is generated at sporadic locations. Vehicular patrols include the daily patrol operations and maintenance of a cleared tracking zone using tire drags.

The three common classifications of noise are: (1) general audible noise that is heard by humans; (2) special noise, such as sonic booms and artillery blasts that can have a sound pressure of shock component; and (3) noise-induced vibration also typically caused by sonic booms and artillery blasts involving noise levels that can cause physical movement (i.e., vibration) and even possible damage to natural and man-made structures such as buildings and cultural resource structures. Most noise sources will fall within the audible noise classification because of the rural nature of the majority of the study area.

Audible noise typically is measured in A-weighted sound pressure levels expressed in decibels (dBA). The A-scale de-emphasizes the low and high frequency portions of the sound spectrum and provides a good approximation of the response of the average human ear. On the A-scale, zero dBA represents the average least perceptible sound (gentle breathing) and 140 dBA represents the intensity at which the eardrum may rupture (jet engine at open throttle) (National Research Council 1977).

Since the proposed activities are not capable of attaining the speed of sound and thus are incapable of causing special noises, all noise levels discussed herein will be measured on the A-scale (dBA). Normal rural noise levels in the study area would range from a low of 35 decibels (dBA) over the majority of the corridor to a high of less than 60 dBA near any rural community. Noise levels would increase in proximity to Tucson and other urban communities (i.e., Douglas, Sierra Vista, and Nogales) due to vehicular traffic, commercial airlines, and

major construction activities. Noise levels in these areas could range as high as 90 dBA for short periods of time during daylight hours (Wyle Research Corporation 1992).

3.6 Surface Water

Surface water in southern Arizona is considered to be within the Lower Colorado Hydrologic Region. The state of Arizona has implemented a watershed management approach for its water resources. The major surface water basins in the study area delineated by the Arizona Department of Environmental Quality (ADEQ) are as follows: the Colorado/Lower Gila, the Santa Cruz/Rio Magdalena/Rio Sonoita, the San Pedro/Wilcox Playa/ Rio Yaqui, and the San Carlos/Safford/Duncan basins (ADEQ, Source Water Assessment, 1992). The Wilcox Playa Basin is a topographically closed basin that drains toward the interior. During seasonal flooding, shallow lakes appear that when dry become vast salt playas. The Gila River, San Pedro River, and Santa Cruz River basins ultimately drain into the Southern Colorado River Basin. The Rios de Mexico Basin, consisting of the Yaqui River and the Sonoran Drainage, drain south into Mexico. The Central Arizona Project (CAP) canal diverts waters from the Colorado River for agricultural use in Tucson and on farms in the Avra Valley, Pima County (USDOI 1977; Anderson and White 1986; ADEQ 1992; Eden and Wallace 1992). Many of the named drainage systems in the study area are intermittent streams and are often dry. The Colorado River and groundwater supply most of the potable water to the study area.

The ADEQ recognizes the geologic and hydrologic diversity of the state by delineating major river basins and reservoirs/lakes as classified segments. The ADEQ is responsible for adopting or removing the "designated uses" of each classified segment by formal ruling. Surface standards are designed to keep water free from pollutants in amounts or combinations that form bottom deposits, inhibit aquatic growth and recreational use, cause objectionable odor or taste of drinking water, cause off-flavor in aquatic organisms or waterfowl, promote excessive algae growth, violate aquifer water quality standards, change the color of the surface water, or are toxic to humans, plants, animals or other organisms.

Surface waters are also protected from oil, grease, and other pollutants that float as debris, foam, or scum; or that cause a film or iridescent appearance on the surface of the water; or that cause a deposit on a shoreline, bank, or aquatic vegetation. Designated uses of surface water include: full body contact, partial body contact, domestic water source, fish consumption, aquatic and wildlife (cold water fishery), aquatic and wildlife (warm water

fishery), aquatic and wildlife (ephemeral), aquatic and wildlife (effluent dependent water), agricultural irrigation, and agricultural livestock watering.

Water quality assessments for the study area indicate that the major causes of surface water (stream/riverine) non-attainment include heavy metals, ammonia, low dissolved oxygen, turbidity, total dissolved solids, and fecal coliform bacteria. The potential sources contributing to non-attainment of assigned uses in streams and rivers include the following: mining operations, municipal point sources including wastewater effluent, agriculture irrigation and recirculation, range management, and non-point sources.

3.7 Biological Resources

3.7.1 Biotic Provinces

There are two biotic provinces within southern Arizona: (1) the Chihuahuan province which runs west from the New Mexico-Arizona state line through a large portion of Cochise County, Santa Cruz County, and parts of Pima County and (2) the Sonoran province which includes the northwestern part of Santa Cruz County and Pima, Pinal, Maricopa, Yuma, and La Paz counties (Dice 1943).

The Chihuahuan biotic province covers the grassy high plains and mountains of southeastern Arizona and consists of plant and wildlife species adapted to semiarid conditions. The Sonoran biotic province covers the desert region of south-central and southwestern Arizona and is characterized by extensive plains from which isolated small mountains and buttes rise abruptly. Common vegetation includes creosote bush, lechuguilla, brittlebush, giant cactus, and palo verde.

3.7.2 Vegetation Communities

The rich flora communities (3,666 species of native and naturalized plants) of Arizona can be defined on the basis of the interaction of geology, soils, climate, animals, and man. These vegetation areas set the stage for a wide array of land uses that varies from intensive cropland agriculture to extensive ranching and urban development. Four major vegetation communities occur along the southern Arizona border (i.e., Forest, Woodland, Grassland, and Desert Scrubland) and are discussed in the following paragraphs as taken from Brown (1982) and Brown and Lowe (1983).

3.7.2.1 Chihuahuan Biotic Province

The Chihuahuan biotic province consists of species mainly adapted to semiarid conditions, and generally includes the areas of grassy high plains and the mountains of southeastern Arizona. Four major vegetation community types exist within the Chihuahuan Biotic province, as described in the following paragraphs.

Forest

The forest community of this province consists of the Petran Subalpine Conifer Forest and the Petran Montane Conifer Forest. The Petran Subalpine Conifer Forest is a boreal forest found only in Cochise County in the Chiricahua Mountains at elevations above 2,450 feet. It consists of Engelmann spruce/alpine fir series and bristlecone pine/limber pine series. The Petran Montane Conifer Forest is a cold-temperate forest and occurs in Cochise County in the Chiricahua Mountains between 2,300 and 3,000 feet in elevation. The major tree series are Douglas fir/white fir series, Pine series, and Gambel oak series.

Woodland

The only woodland vegetation in the study area is the Madrean Evergreen Woodland. It is a warm-temperate woodland found throughout the mountains of Cochise and eastern Pima counties starting at an elevation of 1,200 feet. This community is found in Pima County, which includes dominant tree species such as alligatorbark juniper, one-seed juniper, Mexican pinyon, Chihuahua pine, Arizona pine, Arizona white oak, Mexican blue oak, and Chihuahua oak.

Grassland

The Semidesert Grassland is found in the valley areas of Cochise and eastern Pima counties. This vegetation is dominated by grama grass, tobosa grass, curleymesquite grass, sacaton, and scrub-shrubs such as mesquite, one-seed juniper, littleleaf sumac, false mesquite and desert hackberry.

Desert Scrubland

Desert scrubland comprises the vast majority of the habitat within the study area. Desert scrubland is subdivided into Chihuahuan Desert Scrub and Sonoran Desert Scrub. Chihuahuan Desert Scrub is found only in Cochise and eastern Pima counties. Creosote bush is the dominant vegetation, but some cacti, squawbush, Ocotillo, yucca, and honey mesquite may also be found. The Sonoran Desert Scrub in the study area is further

subdivided into the Lower Colorado River Valley (LCRV) and Arizona Upland (AU) Subdivisions. The LRCV subdivision is the driest of the Sonoran Desert Scrub covering most of the study area in Pima County. The dominant vegetation series within the LCRV is the creosote bush-white bursage. The AU subdivision is primarily located in Pima County and is dominated by the palo verde-cacti-mixed scrub vegetation.

3.7.2.2 Sonoran Biotic Province

The Sonoran biotic province is the dominant vegetative community within the western half of the Arizona border region. The vegetative communities commonly found in this province consist of creosote bush, lechuguilla, brittlebush, giant cactus, and palo verde. The Sonoran biotic province is also comprised of four major community types.

Forest

The Petran Subalpine Conifer Forest and the Petran Montane Conifer Forest are both found within this province of the study area. The Petran Subalpine Conifer Forest consists of Engelmann spruce/alpine fir series and bristlecone pine/limber pine series. The Petran Montane Conifer Forest is a cold-temperate forest and occurs in Santa Cruz County in the Huachuca and Santa Rita Mountains between 2,300 and 3,000 feet in elevation. The major tree series are Douglas fir/white fir series, Pine series, and Gambel oak series.

Woodland

The only woodland vegetation found within this province in the study area is the Madrean Evergreen Woodland. It is a warm-temperate woodland found throughout the mountains of Santa Cruz, starting at an elevation of 1,200 feet, consisting of dominant tree species of Encinal oak and Mexican oak/pine. This vegetative community is found in Santa Cruz and Pima counties.

Grassland

The grassland community is comprised of the Semidesert and the Plains and Great Basin Grasslands. The Plains and Great Basin Grassland is located in eastern Santa Cruz County and is dominated by cold-temperate grasses and functions as a transition zone between the woodland and the desert scrub vegetation. The dominant grasses include: grama, buffalo-grass, wheatgrass, mixed bunchgrass, ricegrass, and sacaton. The Semidesert Grassland is found in the valley areas of Santa Cruz County. This community is dominated by species such as, grama grass, tobosa grass, curleymesquite grass, sacaton, and scrub-shrubs such as mesquite, one-seed juniper, and littleleaf sumac.

Desert Scrubland

Desert scrubland is subdivided into Chihuahuan Desert Scrub and Sonoran Desert Scrub. The Sonoran Desert Scrub in the study area is divided into the Lower Colorado River Valley (LCRV) and Arizona Upland (AU) Subdivisions. The Lower Colorado River Valley subdivision is the driest of the Sonoran Desert Scrub covering most of the study area in Pima County. The dominant vegetation series within the LCRV is the creosote bush-white bursage. The AU subdivision is primarily located in Pima County and is dominated by the palo verde-cacti-mixed scrub vegetation (Brown 1982; Brown and Lowe 1983).

3.7.3 Wildlife Communities

Arizona contains an enormous diversity of environments for wildlife (751 vertebrate species) ranging from hot, dry deserts at low elevations through rich upland deserts, grasslands, and woodlands at mid-elevations to cold, moist montane/alpine habitats. The distribution of these environments is controlled generally by climatic conditions as well as locally, by topographic factors. Physiographic features such as scarps, plateaus, plains, mountains, and drainage systems along with soil types and pedogenic and biotic elements influence wildlife distribution (Hendricks 1985).

3.7.3.1 Terrestrial Communities

The native faunal components of southeastern Arizona include 370 species of birds. The study area is dominated by sparrows and towhees (35 species); wood warblers (32 species); swans, geese, and ducks (31 species); tyrant flycatchers (30 species); and sandpipers and phalaropes (26 species). The majority of these bird species occur in spring and fall when neotropical migrants (e.g., flycatchers and warblers) pass through on their way to summer breeding or wintering grounds and in the winter when summer resident birds (i.e., robins, kinglets, and sparrows) from the north arrive to spend the winter. The majority of the 109 mammalian species found in the study area are bats and rodents (i.e., mice and rats, squirrels) with rodents (e.g., pocket mice and kangaroo rats) being the most commonly encountered mammals. Of the 23 amphibian species that inhabit southeastern Arizona, spadefoot toads and true toads are dominant and the most widespread. A total of 72 species of reptiles can be found in the area with the iguanid lizards and colubrid snakes being the most prevalent along with whiptails (Lowe 1964; Hoffmeister 1986; Lane 1988; USDOI 1989; USCOE 1990; Davis and Russell 1991; Lowe and Holm 1992).

3.7.3.2 Aquatic Communities

Distribution patterns of freshwater fish in Arizona are controlled by climatic and geological factors. Forty-seven fish species can be found in the major river basins and springs in the study area. The San Pedro River system supports 19 fish species; the Santa Cruz River system, 12 species; the Rio Yaqui Basin, 11 species; Monkey Spring, 10 species; Sycamore Bear Canyon, four species; and Quitobaquito Spring, two species. The lower Gila River system contains 11 fish species of which only the Desert pupfish is a native species (Minckley 1973; Rinne and Minckley 1991; Robbins et al. 1991).

3.7.4 Threatened or Endangered Species

The Endangered Species Act (ESA) [16 U.S.C. 1531 et. seq] of 1973 as amended was enacted to provide a program for the preservation of endangered and threatened species and to provide protection for the ecosystems upon which these species depend for their survival. All Federal agencies are required to implement protection programs for designated species and to use their authorities to further the purposes of the act. Responsibility for the identification of a threatened or endangered species and any potential recovery plan lies with the Secretary of the Interior and the Secretary of Commerce.

Table 3-2 presents the species included on the Federal list of threatened or endangered species that are known or presumed to occur in the southeastern Arizona border counties. As can be seen from this table, there are nine plants, nine birds, eight fishes, six mammals, two reptiles, two amphibians, and one invertebrate. Most of these also occur along river drainages or canyons within the various mountain ranges. Some such as masked bobwhite and northern aplomado falcon, however, do use the desert grasslands and scrub habitats found at lower elevations along the border.

TABLE 3-2
Federally Listed, Proposed, and Candidate Species Potentially Occurring within Cochise, Pima, Santa Cruz, and Yuma Counties, Arizona and Imperial County, California

Common/Scientific Name	Status	Date Listed	Counties	USBP Stations	Habitat
PLANTS					
Acuna cactus *Echinomastus erectocentrus acunensis*	C	7/1/75	Pima,	SON, NGL, TUS CAG, AJO	Well drained knolls and gravel ridges in Sonoran desertscrub
Canelo Hills ladies' tresses *Spiranthes delitescens*	E	1/6/97	Cochise, Santa Cruz	WCX, DGL, NCO SON, NGL, TUS	Finely grained, highly organic, saturated soils of cienegas
Cochise pincushion cactus *Coryphantha robbinsorum*	T	1/9/86	Cochise	WCX, DGL, NCO	Semidesert grassland with small shrubs, agave, other cacti, and grama grass
Huachuca water umbel *Lilaeopsis schaffneriana* ssp. *recurva*	E	1/6/97	Cochise, Pima, Santa Cruz	WCX, DGL, NCO SON, NGL, TUS, CAG, AJO	Cienegas, perennial low gradient streams, wetlands
Kearney's blue star *Amsonia kearneyana*	E	1/19/89	Pima	SON, NGL, TUS, CAG, AJO	West-facing drainages in the Baboquivari Mountains
Lemmon fleabane *Erigeron lemmonii*	C	7/1/75	Cochise	WCX, DGL, NCO	Crevices, ledges, and boulders in canyon bottoms in pine-oak woodlands
Nichol's turk's head cactus *Echinocactus horizonthalonius* var. *nicholii*	E	10/26/97	Pima,	SON, NGL, TUS, CAG, AJO	Sonoran desertscrub on limestone slopes in desert hills
Peirson's milk-vetch *Astragalus magdalenae var. peirsonii*	T	10/6/98	Imperial	YUM	Well developed desert dunes
Pima pineapple cactus *Coryphantha scheeri robustispina*	E	4/20/92	Pima, Santa Cruz	SON, NGL, TUS, CAG, AJO	Sonoran desertscrub or semi-desert grassland communities

Source: USFWS 2000a. Last Updated November 14, 2000.

Legend:
E – Endangered
T – Threatened
C – Candidate
PT – Proposed Threatened

WCX – Willcox Station
DGL – Douglas Station
NCO – Naco Station
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TABLE 3-2 Continued.

BIRDS					
Bald Eagle *Haliaeetus leucocephalus*	T	1/12/95	Cochise, Pima, Santa Cruz, Yuma,	WCX, DGL, NCO, SON, NGL, TUS, CAG, AJO, WEL, BLY, YUM	Large trees or cliffs near water with abundant prey
Brown pelican *Pelecanus occidentalis*	E	10/13/70	Yuma	WEL, BLY, YUM	Feed in shallow estuarine waters; nest on small coastal islands
Cactus ferruginous pygmy-owl *Glaucidium brasilianum cactorum*	E	3/10/97	Cochise, Pima, Santa Cruz, Yuma	WCX, DGL, NCO, SON, NGL, TUS, CAG, AJO, WEL, BLY, YUM	Mature cottonwood/willow, mesquite bosques, and Sonoran Desertscrub
Masked bobwhite *Colinus virginianus ridgewayi*	E	3/11/67	Pima	SON, NGL, TUS, CAG, AJO	Desert grasslands with diversity of dense native grasses, forbs and brush
Mexican spotted owl *Strix occidentalis lucida*	T	3/15/93	Cochise, Pima, Santa Cruz	WCX, DGL, NCO, SON, NGL, TUS, CAG, AJO	Nests in canyons and dense forests with multi-layered foliage structure
Mountain plover *Charadrius montanus*	PT	2/16/99	Cochise, Pima, Yuma	WCX, DGL, NCO SON, NGL, TUS, CAG, AJO, WEL, BLY, YUM	Open arid plains, short-grass prairies, and scattered cactus
Northern aplomado falcon *Falco femoralis septentrionalis*	E	1/25/86	Cochise, Santa Cruz	WCX, DGL, NCO, SON, NGL, TUS	Grassland and Savannah
Southwestern willow flycatcher *Empidonax traillii extimus*	E	2/27/95	Cochise, Pima, Yuma	WCX, DGL, NCO, SON, NGL, TUS, CAG, AJO, WEL, BLY, YUM	Cottonwood/willow and tamarisk vegetation communities along rivers and streams
Whooping crane *Grus americana*	E	3/11/67	Cochise	WCX, DGL, NCO	Marshes, prairies, natural lakes
Yuma clapper rail *Rallus longirostris yumanensis*	E	3/11/67	Yuma, Imperial	CAG, AJO, WEL, BLY, YUM	Cattail and bulrush marshes along the Colorado River, Gila River, and Salton Sea

Source: USFWS 2000a. Last Updated November 14, 2000.

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TABLE 3-2 Continued.

AMPHIBIANS					
Chiricahua leopard frog *Rana chiricahuensis*	PT	6/14/00	Cochise, Pima, Santa Cruz	WXC, DGL, NCO SON, NGL, TUS, CAG, AJO	Streams, rivers, backwaters, ponds, and stock tanks
Sonora tiger salamander *Ambystoma tigrinum stebbinsi*	E	1/6/97	Cochise, Santa Cruz	WCX, DGL, NCO SON, NGL, TUS	Stock tanks and impounded cienegas in San Rafael Valley, Huachuca Mountains
INVERTEBRATES					
Huachuca springsnail *Pyrgulopsis thompsoni*	C	1/6/89	Cochise, Santa Cruz	WCX, DGL, NCO SON, NGL, TUS	Aquatic areas, small springs with vegetation slow to moderate flow
MAMMALS					
Black-tailed prairie dog *Cynomys ludovicianus*	C	10/4/99	Cochise	WCX, DGL, NCO	Short-grass prairie habitats
Lesser long-nosed bat *Leptonycteris curasoae yerbabuenae*	E	9/30/88	Cochise, Pima, Santa Cruz,	WCX, DGL, NCO SON, NGL, TUS, CAG, AJO	Desert scrub habitat with agave and columnar cacti present as food plants
Mexican gray wolf *Canis lupus baileyi*	E	3/11/67	Cochise, Pima, Santa Cruz	WCX, DGL, NCO SON, NGL, TUS, CAG, AJO	Chaparral, woodland, and forested areas; may cross desert areas
Ocelot *Felis pardalis*	E	7/21/82	Cochise, Pima, Santa Cruz	WCX, DGL, NCO SON, NGL, TUS, CAG, AJO	Humid tropical and sub-tropical forests, savannahs, and semi-arid thornscrub
Peninsular bighorn sheep *Ovis canadensis cremnobates*	E	3/18/98	Imperial	YUM	Steep, open slopes, canyons, and washes in desert regions where land is rough, rocky, and sparsely vegetated
Sonoran pronghorn *Antilocapra americana sonoriensis*	E	3/11/67	Pima, Yuma,	SON, NGL, TUS, CAG, AJO, WEL, BLY, YUM	Broad, intermountain alluvial valleys with creosote-bursage/palo verde-mixed cacti

Source: USFWS 2000a. Last Updated November 14, 2000.

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TABLE 3-2 Continued.

REPTILES					
New Mexican ridge-nosed rattlesnake *Crotalus willardi obscurus*	T	4/4/78	Cochise	WCX, DGL, NCO	Presumably canyon bottoms in pine-oak and pin-fir communities
Sonoyta mud turtle *Kinosternon sonoriense longifemorale*	C	9/19/97	Pima	SON, NGL, TUS, CAG, AJO	Ponds and streams
Desert tortoise *Xerobates agassizii*	T	8/20/80	Imperial	YUM	Flats and bajadas with soils ranging from sand to sandy-gravel with scattered shrubs
FISHES					
Beautiful shiner *Cyprinella formosa*	T	8/31/84	Cochise	WCX, DGL, NCO	Small to medium sized streams and ponds with sand, gravel, and rock bottoms
Colorado squawfish *Ptychocheilus lucius*	E	3/11/67	Imperial	YUM	Large rivers with strong to moderate current, deep pools, eddies, riffles, swift runs and quiet backwaters
Desert pupfish *Cyprinodon macularius*	E	3/31/86	Pima, Santa Cruz, Imperial	SON, NGL, TUS, CAG, AJO, WEL, BLY, YUM	Shallow springs, small streams, and marshes; tolerates saline and warm water
Gila chub *Gila intermedia*	C	9/18/85	Cochise, Pima, Santa Cruz	WCX, DGL, NCO SON, NGL, TUS, CAG, AJO	Pools, springs, cienegas, and streams
Gila topminnow *Poeciliopsis occidentalis occidentalis*	E	3/11/67	Pima, Santa Cruz,	SON, NGL, TUS, CAG, AJO	Small streams, springs, and cienegas vegetated shallows
Loach minnow *Tiaroga cobitis*	T	10/28/86	Cochise, Pima	WCX, DGL, NCO SON, NGL, TUS, CAG, AJO	Cool to warmwater, low gradient streams and rivers in the Gila River basin

Source: USFWS 2000a. Last Updated November 14, 2000.

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TABLE 3-2 Continued.

Razorback sucker *Xyrauchen texanus*	E	5/22/90	Yuma, Imperial	CAG, AJO, WEL, BLY, YUM	Rivers with strong, uniform currents over sandy bottoms
Sonora chub *Gila ditaenia*	T	4/30/86	Santa Cruz	SON, NGL, TUS	Large, deep, and permanent pools with bedrock-sand substrates
Spikedace *Meda fulgida*	T	7/1/86	Cochise, Pima	WCX, DGL, NCO SON, NGL, TUS, CAG, AJO	Cool to warmwater streams and rivers of moderate gradient in the Gila River basin
Yaqui catfish *Ictalurus pricei*	T	8/31/84	Cochise	WCX, DGL, NCO	Moderate to large streams with slow current over sand and rock bottoms
Yaqui chub *Gila purpurea*	E	8/31/84	Cochise	WCX, DGL, NCO	Deep pools of small streams, pools, or ponds near undercut banks
Yaqui topminnow *Poeciliopsis occidentalis sonoriensis*	E	3/11/67	Cochise	WCX, DGL, NCO	Vegetated springs, brooks, and margins of backwaters. Found generally in the shallows

Source: USFWS 2000a. Last Updated November 14, 2000.

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3.8 Cultural Resources

The archeology of southern Arizona is quite detailed, and relatively complex considering the various geographic and related cultural features. For purposes of clarity, the following text will present the broad overview of southern Arizona prehistory before outlining the various previous investigations that are important to the understanding of the study area. The cultural chronology of southern Arizona is composed of five periods, namely:

Paleo-Indian	10,000 to 7,500 B.C
Archaic	7,500 to 400 BC
Formative	AD 100 to 1450
Protohistoric	AD 1450 to 1539
Historic	AD 1539 to Present

These periods are commonly subdivided into smaller temporal phases based on particular characteristics of the artifact assemblages encountered in each of three archeological regions within southern Arizona. The prehistoric periods and corresponding phases are defined by the presence of particular diagnostic artifacts such as projectile points, certain types of pottery, and occasionally, particular site locations. For the Historic period, documentary information more often is used to distinguish certain phases; nevertheless, particular artifacts also can be used to recognize certain historic affiliations. Numerous sites have been recorded throughout the border region, many of which have subsequently been listed on the National Register of Historic Places (NRHP). Literally hundreds of other sites and structures in southeastern Arizona are considered potentially eligible for NRHP-listing.

3.9 Socioeconomics Conditions

3.9.1 Population

The population areas potentially affected by Operation Skywatch mission include the urban area of Tucson in Pima County and the smaller cities (i.e., Douglas, Sierra Vista, and Nogales) scattered throughout Cochise, Santa Cruz, and Pima counties. Much of the land area is owned by the federal government (e.g., Fort Huachuca, San Pedro National Wildlife Refuge, Coronado National Forest) and is therefore sparsely populated. According to the latest Census Bureau estimates, the 1997 population in the 3-county area was estimated to be 930,268 (Table 3-3) of which 74 percent is in Pima County. The 1997 population demonstrates an 18 percent increase over the 1990 population. Tucson, the largest city in the study area, had an estimated 1996 population of 449,002 (Table 3-4).

TABLE 3-3

Demographic Information for Counties (1997 Estimate) along the Arizona Land Border

				Race (Non-Hispanic)					
County	Population	Land Area (sq. miles)	Density (per sq. mile)	White	African-American	Native American	Asian	Other	Hispanic
Cochise	112,248	6,170	18	70,762	5,536	752	1,424	144	32,630
Santa Cruz	37,870	1,238	31	7,871	71	37	167	91	29,633
Pima	780,150	9,187	85	532,188	22,759	19,893	13,135	1,183	190,992
Totals	930,268	16,595		610,821	28,366	20,682	14,726	1,418	253,255

Legend: sq. = square
Source: U.S. Department of Commerce 1998

TABLE 3-4

Population of Cities and Towns for Counties (1990 and 1996 estimates) within the Region of Influence

County Population	City	1990 Population	1996
Cochise	Douglas	13,908	15,015
	Sierra Vista	32,983	37,434
Santa Cruz	Nogales	19,489	22,087
Pima	Tucson	411,480	449,002

Source: U.S. Department of Commerce 1991 and 1998

As can be seen from Table 3-3, the population density varied from 18 persons per square mile in Cochise County to 85 persons per square mile in Pima County. The racial mix of the area was mainly comprised of non-Hispanic whites (64 percent). The second largest racial group was Hispanics, which accounted for 29 percent of the population, and Native Americans represented two percent of the population.

3.9.2 Housing

The report, *The State of Housing in Arizona*, produced by the Arizona Housing commission in 2000 states that Arizona is currently going through housing crisis where housing prices are rising twice as fast as income statewide. This is of particular importance to low income and minority households.

For both minority and non-minority households, the incidence of housing problems increases dramatically as income levels decrease. Since the percent of minority households that is considered to be in the low income bracket far exceeds the proportionate number in the general population, minorities suffer disproportionately in terms of their basic need for adequate, affordable shelter. This is particularly alarming considering the growth rate of minority populations in Arizona (Arizona Housing Commission 2000).

The total number of housing units in the region of influence (ROI) in 1990 was 1,435,913. The largest amount of housing units is located in Pima County while the smallest is located is located in Santa Cruz County, Arizona. Santa Cruz County, Arizona also has the smallest percentage of vacant units, while Pima County, Arizona has the largest number of vacant housing units. The highest household growth is occurring in Santa Cruz County, Arizona, while the lowest is occurring in Cochise County, Arizona. The largest discrepancy between in median household income growth and house sales price growth occurs in Pima County, Arizona. House sales prices are growing faster than median household income in all of the counties within the ROI except for Santa Cruz County.

3.9.3 Employment

Total employment in the 3-county area was 1,392,970 as of 1996. The labor force in 1997 was 474,269 with 75 percent of the labor force being in Pima County. Unemployment averaged 15 percent in 1997 for these counties combined, but individually the rates varied from a low of 3.3 percent in Pima County to a high of 17 percent in Santa Cruz County (Table 3-5). This rate of unemployment was significantly higher than the 4.6 percent rate for the state.

TABLE 3-5

Employment and Unemployment Figures for Counties (1997 Annual Average) Along the Arizona Border

		Unemployment	
County	**Employment**	**Number**	**(%) Rate**
Cochise	36,003	3,259	6.27
Santa Cruz	11,445	2,951	17.28
Pima	345,522	11,791	3.30
Totals	392,970	18,001	

Source: Arizona Department of Economic Security, 1998

The economic structure varies from the diversified urban areas of Tucson to the rural areas of the other counties. Leading employment sectors include services, retail trade, and government.

3.9.4 Income

Income distribution is similar to the employment sectors of government, services, retail trade, and manufacturing. Per capita personal income averaged $16,494 in the border region. This is well below the state average of $21,335.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Climate

None of the alternatives would affect the climate. The climatic conditions of the Arizona border region, however, play an integral role in the purpose and need for Operation Skywatch. The upcoming summer months typically experience the highest temperatures and without commitment of additional resources and efforts, migrant deaths are highly likely to occur due to the climatic conditions.

4.2 Physiography

None of the alternatives would affect the physiography of the Arizona border region.

4.3 Land Use

4.3.1 No Action Alternative

Implementation of this alternative would have no affect on the regional land use. UDAs and drug traffickers would continue to trespass on private and public lands, forcing the USBP agents to attempt apprehensions and/or rescues, wherever possible. The overall use of the land would not be expected to change.

4.3.2 Preferred Alternative

No effects to overall land use would be expected as a result of the preferred alternative. Some minor, temporary disturbances would occur whenever rescue operations are employed. The 500-foot AGL floor would ensure that recreational opportunities on public lands are not significantly affected. These disturbances would be temporary and sporadic. Wilderness areas and National Parks/Monuments may have more stringent requirements for aviation and off road vehicle operations, which would be complied with to the maximum extent practicable.

4.3.3 Fixed Wing Reconnaissance with Helicopter Rescues Only

This alternative would have similar, but slightly higher, effects as the preferred alternative. With an increased number of helicopter rescues, there would be an increase in the probability

of disturbances to recreational activities. Still, these disturbances would be temporary, minor and sporadic.

4.4 Air Quality

4.4.1 No Action Alternative

The No Action alternative would require additional USBP agents and vehicles to patrol the area in search of UDAs and illegal drug traffickers. Fugitive dust emissions would be greater under this alternative, since the vast majority of the roads in the border region are dirt or gravel and the patrol traffic would necessarily increase. However, no violations to air quality standards would be expected.

4.4.2 Preferred Alternative

Operation of reconnaissance and rescue aircraft, as well as the ground patrol vehicles, would create hydrocarbon emissions. Dispersal capabilities within the region would be expected to minimize any effects these emissions would cause. The emissions would also be expected to be below deminimus threshold levels; therefore an air quality conformity analysis is not required.

4.4.3 Fixed Wing Reconnaissance with Helicopter Rescues Only

Emissions generated upon implementation of this alternative would be similar to the preferred alternative. Hydrocarbon emissions may be slightly higher due to the increased use of helicopters, but it is anticipated that they would still be below de minimus levels and would not be expected threaten the attainment status of the border region.

4.5 Noise

4.5.1 No Action Alternative

The No Action alternative would not significantly affect the ambient noise levels. Some temporary and minor increases in noise levels would be generated by the increase in ground patrol traffic.

4.5.2 Preferred Alternative

Implementation of the preferred alternative would result in slight increases in noise levels due to fixed-wing aerial reconnaissance operations. Helicopter rescue missions would create higher noise levels, above 100 dBA, at the specific rescue locale, but these effects would be temporary, localized, and sporadic. The level of disturbance to humans and wildlife resources would depend upon the time, terrain, and distance to receptors. Attenuation of the sound pressures to less than 60 dBA would be anticipated at distances of 0.5 miles and less, depending upon the location of the rescue mission.

4.5.3 Fixed Wing Reconnaissance with Helicopter Rescues Only

Noise levels for this alternative would be similar, but more frequent, than the preferred alternative. Having rescue operations limited to only helicopters would result in additional hovering and landing maneuvers, thereby increasing the chance of disturbance to human and natural environment.

4.6 Water

4.6.1 No Action Alternative

No direct adverse effects to surface or ground water supplies or quality would be anticipated as a result of the No Action alternative. Indirect effects may occur from erosion and sedimentation caused by the increase patrol traffic. The magnitude of these effects are difficult, if not impossible, to determine and would be dependent upon several biotic and abiotic variables. Such variables would include number and speed of the patrol vehicles, condition of vegetation communities adjacent to roads and drainages, soil types along road beds, extant condition of road beds, and climatic conditions.

4.6.2 Preferred Alternative

The preferred alternative would not be expected to significantly affect the region's water supply or water quality. Aerial reconnaissance operations would reduce the need for ground patrols and thus could decrease erosion and sedimentation potentials. Petroleum, oils and lubricants and other hazardous materials used in the maintenance and operation of the aircraft would be stored at established facilities at the Tucson and Sierra Vista airports under strict compliance with appropriate regulations. No effects to surface or ground water supplies would be expected to occur as a result of the use and handling of these materials.

4.6.3 Fixed Wing Reconnaissance with Helicopter Rescues Only

The effects to water supplies and quality resulting from implementation of this alternative would be similar to that of the Preferred Alternative.

4.7 Biological Resources

4.7.1 No Action Alternative

Implementation of the No Action Alternative would not be expected to cause significant adverse effects to biological resources. This alternative would increase the need for off-road rescue attempts, thereby increasing the potential for effects to vegetation communities, with concomitant effects to wildlife populations. The magnitude of these effects would depend upon numerous variables including the number of off-road trips required in the same general area, the extant condition of the vegetation communities, climatic conditions, soil types, and topography.

4.7.2 Preferred Alternative

Aerial reconnaissance missions would not be expected to significantly affect wildlife populations due to the height of the flight routes and the temporary and sporadic nature of the reconnaissance missions. Higher altitudes over canyons and known bat roosts (e.g., Bluebird Mine, Copper Mine, State of Texas Mine, and Aqua Dulce Mountains) would reduce, or eliminate, the chances of disturbing falcon nest sites and endangered bats. Helicopter rescue missions may have an affect on protected species, depending upon the time and location of the operation. Therefore, INS will enter into emergency consultation with the USFWS in compliance with the Endangered Species Act (50 CFR § 402.05). Fixed-wing aircraft and helicopter pilots will notify the USFWS of any protected species that are observed during the reconnaissance and rescue missions.

4.7.3 Fixed Wing Reconnaissance with Helicopter Rescues Only

The effects to biological resources resulting from implementation of this alternative would be similar to the preferred alternative.

4.8 Cultural Resources

4.8.1 No Action Alternative

Since the No Action alternative would require that additional ground patrols be conducted, and in particular off-road rescue missions, the potential to adversely affect unknown, but potentially significant cultural resources would be increased. The magnitude of these effects, of course, would be dependent upon the number of off-road trips required, the location, and the number and type of vehicles used in the rescue mission.

4.8.2 Preferred Alternative

Implementation of Operation Skywatch would not affect cultural resources. Rescues using ground patrols, as discussed above, could potentially disturb significant, but yet unknown, sites. Helicopter rescue missions would also have the potential to disturb cultural resources sites, but the potential would be much less due to the amount of ground actually disturbed in comparison to off-road vehicle traffic.

4.8.3 Fixed Wing Reconnaissance with Helicopter Rescues Only

This alternative would have the least chance of disturbing cultural resources since it would significantly reduce ground disturbances by eliminating ground patrol rescues.

4.9 Socioeconomics

4.9.1 No Action Alternative

The No Action alternative may create additional job opportunities, but only if funds were available to employ a sufficient number of USBP agents and support staff that could patrol the same amount of area in a similar time frame as Operation Skywatch. Since this is a highly unlikely situation, especially given the extreme time limitations, no direct effects to socioeconomic resources, beneficial or adverse, would be expected to occur as a result of the No Action alternative.

4.9.2 Preferred Alternative

The preferred alternative would require at least three USBP pilots and three mechanics to live within the Tucson Sector for up to 123 days. This is a very negligible and temporary effect to the region's population. Likewise, some additional local expenditures will result upon

implementation of the preferred alternative, but the effects will be negligible given the temporary nature of the proposed action.

4.9.3 Fixed Wing Reconnaissance with Helicopter Rescues Only

Similar effects would occur upon implementation of this alternative as would be anticipated for the preferred alternative.

4.10 Environmental Justice and Protection of Children

This section of the SEA addresses the Proposed Action's potential to generate disproportionately high and adverse human or environmental effects on minority and low-income populations, as required under Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." The predominance of the population (about 64) claims to non-Hispanic whites. The average per capita income (PCPI) of the families within the counties along the border is below the state and national average for PCPI. However, no construction activities or other permanent actions are expected to be located near minority or low-income residential and commercial areas. No displacement of residential or commercial structures or areas is anticipated as a result of this project. The project would beneficially affect the entire ROI regardless of race and/or income level, by saving lives regardless of race, nationality or income. Therefore, this project would not result in any violations of the intent of Executive Order 12898.

Executive Order 13045, "Protection of Children from Environmental Health Risks" requires that Federal agencies evaluate the potential to generate disproportionately high environmental health and safety risks to children. The actions proposed in this SEA would not result in disproportionately high or adverse environmental health or safety impacts to children. To the contrary, the proposed actions would increase the safety of children who are illegally attempting to enter the United States through the harsh southern Arizona desert.

4.11 Cumulative Impacts

This section of the SEA addresses the potential cumulative impacts associated with the implementation of the alternatives outlined in Chapter 2.0 and other projects/programs that are planned for the region. The following paragraphs present a general discussion regarding cumulative effects that would be expected irrespective of the alternative selected.

The Council of Environmental Quality defines cumulative impacts as the incremental impact of multiple present and future actions with individually minor but collectively significant effects. Cumulative impact can be concisely defined as the total effect of multiple land uses and developments, including their interrelationships, on the environment.

Currently, there are several on-going projects along the U.S.-Mexico border within Arizona. On-going projects within the Naco-Douglas corridor include road improvement projects, installation of stadium and portable lights along the U.S.-Mexico border, and the installation of numerous RVS sites. These projects are primarily for the purpose of deterrence apprehension. If apprehension is not assured, deterrence will not be achieved. Thus, in the absence of such projects there is the likelihood of an increase in possible border crossings into the rugged terrain and possibly an increase in UDA deaths within the summer months.

Impacts due to off-road rescue attempts are unquantifiable because the number of rescues cannot be determined at this point. There would also be an increase in the noise levels because of the helicopter overflights. The noise impacts would be temporary and only for the duration of this project.

Resources, such as soil, water supplies, and air quality, would be impacted during and immediately after completion of Operation Skywatch II. These impacts would be temporary and none of these resources would be expected to incur significant cumulative impacts. None of the projects to date have indicated a potential excursion that could violate National air quality standards.

Indirect increases in traffic and/or vehicular speeds could occur as a result of apprehensions. The magnitude of these effects would depend upon current traffic conditions, proximity to population centers, and other available transportation corridors. However, based upon observations made after past road improvement projects, these effects, if any, are expected to be insignificant.

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6.0 LIST OF ACRONYMS/ABBREVIATIONS

ADEQ	Arizona Department of Environmental Quality
AO	Area of Operations
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
CWA	Clean Water Act
CO	Carbon monoxide
dBA	decibel
E.O.	Executive Order
ESA	Endangered Species Act
FY	Fiscal Year
INA	Immigration and Nationality Act
INS	Immigration and Naturalization Service
$\mu g/m^3$	Micrograms per cubic meter
mg/m^3	Milligrams per cubic meter
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NO_2	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
O_3	Ozone
PM_{10}	Particulate matter
Pb	Lead
POE	Port of Entry
ppm	Parts per million
SEA	Supplemental Environmental Assessment
$S0_2$	Sulfur dioxide
UDA	Undocumented Aliens
USBP	U.S. Border Patrol
USC	United States Code
USDOI	U.S. Department of the Interior
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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