

STRATEGIES TO PROTECT ARIZONA'S \$9 BILLION MILITARY ECONOMY



FIGURE 1: F-16S ON A TRAINING MISSION. PHOTO COURTESY OF LUKE AIR FORCE BASE

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WESTERN MARICOPA COUNTY MILITARY LAND USE NEXUS

Public lands in western Maricopa County are a critical link between Luke Air Force Base (AFB) and other military installations, including the Goldwater Range. This report analyzes the nexus between public lands and Arizona's \$9 billion military economy.

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STRATEGIES TO PROTECT ARIZONA'S \$9 BILLION MILITARY ECONOMY

WESTERN MARICOPA COUNTY MILITARY LAND USE NEXUS



FIGURE 2: PUBLIC LANDS IN WESTERN MARICOPA COUNTY SERVE MANY PURPOSES, INCLUDING THE PROTECTION OF ARIZONA'S \$9 BILLION MILITARY ECONOMY. PHOTO COURTESY OF IAN DOWDY

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INTRODUCTION

In May 2005, Arizona breathed a huge sigh of relief when the final decision was announced by the Base Realignment and Closure Commission (BRAC), largely sparing the State's military installations. Arizona's economy took a hit just ten years earlier in the first BRAC process with the closure of Williams Field in Mesa. This decision was considered to be a major victory after initial reports indicated that Luke Air Force Base (Luke AFB), a major economic engine located in Glendale, part of the Phoenix Metro Region, might be on the short list for significant reductions or closure. In the years leading up to the 2005 BRAC process, the State of Arizona instituted a number of significant legislative programs to protect installations like Luke AFB, Davis Monthan AFB, and the Marine Corps Air Station Yuma from encroachment by urban growth, an important factor in determining base closure and realignment. Among these efforts, the Arizona State Legislature adopted new regulations for development within the operating area of a military installation and lands within high noise or accident potential zones, and created the Military Installation Fund which would help to fund land acquisitions or other projects that could serve to protect military facilities from encroachment by the development of incompatible uses.¹ To further enhance public support for military installations, Arizona municipalities, businesses, and residents joined the Luke Forward campaign to raise awareness of encroachment issues and develop a network of advocates who could respond to potential threats to the viability of the base.

In a recent study by the Morrison Institute for Public Policy titled "Watering the Sun Corridor," growth is projected to continue to an expected 7.8 million people in 2030, up 82% from the current 4.9 million that live in the Tucson, Phoenix, and Prescott regions today⁴.

It was no surprise to long-term residents of the West Valley when the broader community came together to protect Luke AFB from possible closure. Both Luke AFB and the Goldwater Range have long been fixtures in western Maricopa County. The biannual "Luke Days" open house and air show had long been the highlight event for many residents of the Phoenix region. While homeowners near the installation had grown used to the sound of jet fighters as they flew overhead, changes in perception from the community came as new residents, who were less familiar with the facility, moved into the area and began to complain about noise, prompting Luke AFB to escalate their existing public relations effort.² Efforts to protect the facilities paid off, not only producing new development regulations but also by providing additional guidance to direct incompatible development away from noise corridors and accident potential zones. These measures both ensured the viability of the military facilities and ensured that new residents received fair notice of military activities, allowing them to choose to buy the property with the understanding that noise or nuisance may occur. Additional measures recommended by the 2005 Goldwater Range Joint Land Use Study were adopted by some communities, further strengthening the protections from encroachment and incompatible uses around military installations.³

Future growth will continue to present challenges. In a recent study by the Morrison Institute for Public Policy titled "Watering the Sun Corridor," growth is projected to continue to an expected 7.8 million people in 2030, up 82% from the current 4.9 million that live in the Tucson, Phoenix, and Prescott regions today⁴. This increase, although down significantly from projections only five years ago, still demonstrates the popularity of Arizona for future residents—translating into increased urban growth and the fast pace of development that put military installations at risk ten years ago.

¹ "Arizona's Military Base Preservation": Arizona State Senate Issue Brief: October 2, 2012.

² "U.S. Air Force Fact Sheet; Flight Operations and Noise Question and Answer:" www.luke.af.mil

³ "Arizona Military Regional Compatibility Project; Part Two: Gila Bend Air Force Auxiliary Field/Barry M. Goldwater Range Joint Land Use Study;" Arizona Department of Commerce: February 2005.

⁴ "Watering the Sun Corridor", Morrison Institute for Public Policy, 2011.

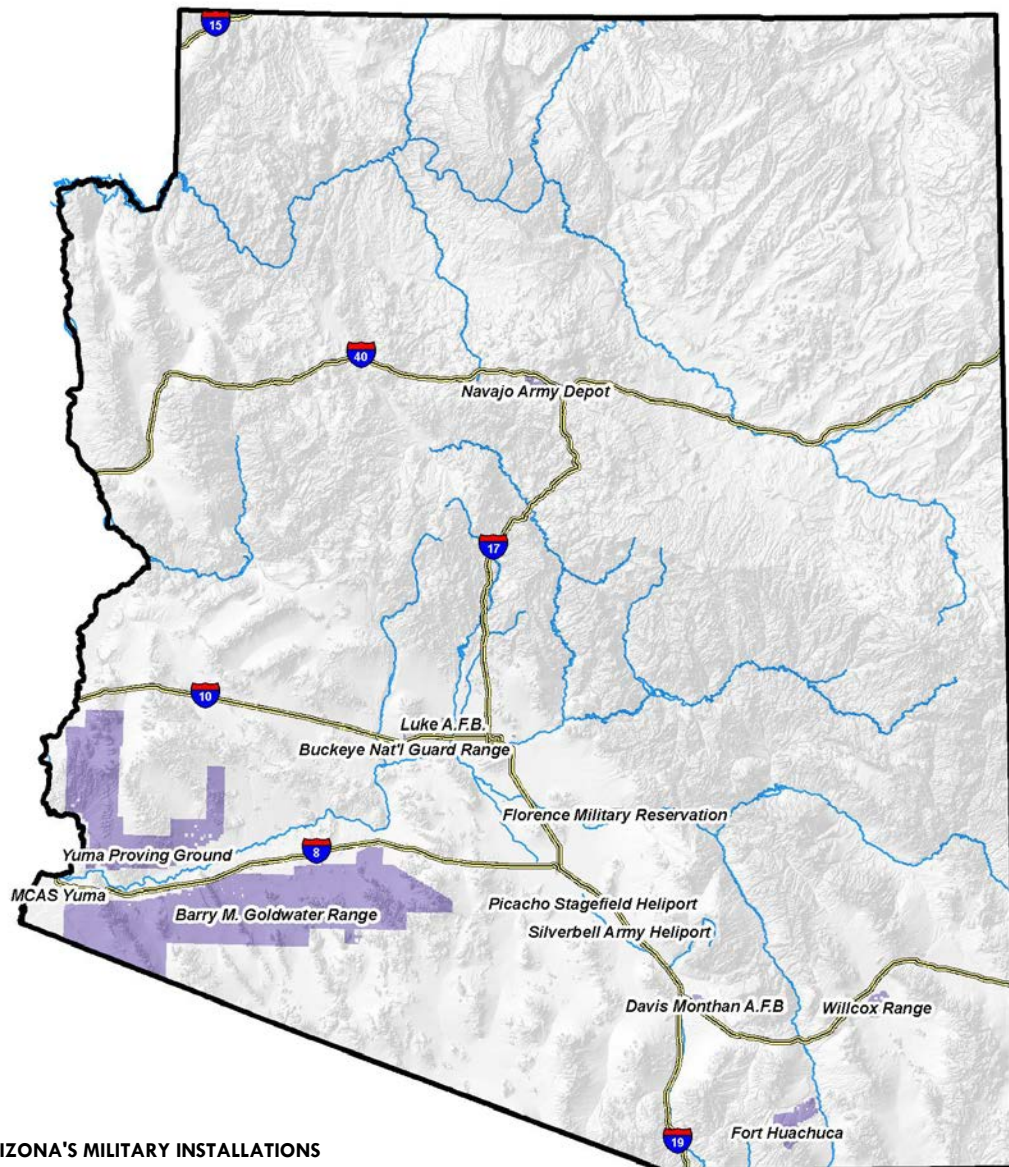


FIGURE 3: ARIZONA'S MILITARY INSTALLATIONS

Luke AFB and other facilities are positioned to weather the development storm thanks in part, to the acquisitions of the Military Installation Fund and the protections provided by statutes toward restricting incompatible uses near these bases. Should the BRAC process of 2005 occur today, most experts believe that suburban military facilities would again emerge unscathed. Unfortunately, however, the next process will likely focus less on urban encroachment and more on “mission encroachment,” which is a very different issue with diverse solutions—one from which Arizona’s facilities may be less able to defend. “Mission encroachment” is a term that refers to impacts that cause a lessened ability of installations to carry forward their operations and access training ranges because of increased restrictions and obstructions by outside forces. Camp Pendleton is a classic example of a facility whose mission has been impacted by a number of outside forces including “urban growth, competing land use, airspace restrictions, airborne noise, endangered species, cultural resources, wetlands, and air quality.”⁵

This report discusses two major factors that contribute to mission encroachment for Luke AFB and the Goldwater Range (BMGR): development encroachment within essential Military Training Routes (MTRs) and the possible challenges created by restricted wildlife connectivity that could result in the scenario where BMGR becomes a “refuge of last resort” for threatened and endangered species.

⁵ “Encroachment Impacts on Training and Readiness at Marine Corps Base Camp Pendleton,” SRS Technologies: March 2003.

Readiness and Environmental Protection Initiative (REPI)

The Readiness and Environmental Protection Initiative (REPI) supports cost-sharing partnerships authorized by Congress (10 U.S.C. § 2684a) between the military services, private conservation groups, and state and local governments to protect military test and training capabilities and conserve land. These win-win partnerships acquire easements or other interests in land from willing sellers to preserve compatible land uses and sustain wildlife habitat near installations and ranges where the military operates, tests, and trains.^a According to the REPI 2013 Annual Report to Congress, funds from this program exceeded \$215 million in fiscal year 2012 which when combined with partner and service funding totaled over \$784 million for land acquisition. To date, the program has protected over 264,000 acres of primarily private land holdings to prevent or reduce mission impacts to facilities.^b Arizona facilities could benefit from the use of REPI funds to secure private lands in areas at risk for encroachment or other lands important for the military mission.

REPI Program Benefit	Explanation
Preserving Live-Fire and Maneuver Training	The vast majority of projects protects existing live-fire or maneuver training and testing to provide flexibility for future missions. Protecting areas off-installation that are important for training (such as land underneath military airspace, training routes, or "away spaces") requires a greater amount of cooperation with outside partners, sometimes on a regional scale.
Reducing Workarounds and Lost Training Days	REPI projects help reduce the number of workarounds necessary to continue testing or training. Workarounds modify or segment standard ways to test and train in order to fulfill testing and training requirements, but are not as realistic or complete as the original approach. For example, protecting compatible land uses through REPI may allow an installation to increase the number of training days during the year.
Reducing Electromagnetic Spectrum Interference	Increased electronic complexity of the testing and training environment makes protecting against electromagnetic interference and preserving clear frequency spectrum increasingly important. Electromagnetic interference can emanate from areas with significant residential development and, conversely, military equipment can interfere with household electronics.
Mitigating Noise Conflicts	One of the most common issues across the services is preserving the ability to conduct testing or training activities that generate noise. This issue is the direct result of the proximity of civilian populations to installations, ranges, and operating areas. REPI buffers can protect against development and decrease the number of conflicts between communities and loud noise events like live-fire training and weapons testing, noted above, or helicopter training and other aviation.
Preserving Night Operations Capabilities	The U.S. military enjoys an advantage in conflict because of superior technology and capability with night vision devices. Although units continue to include training in higher-light conditions to maintain realism in some situations, dark-sky conditions are essential for effective testing and training. REPI projects can help preserve open spaces and prevent incompatible development that would increase nighttime lighting and decrease the realism of testing and training with night vision devices.
Providing for Mission Growth and Multi-Service Missions	Increasing flexibility to use more of the space already under military control for future or expanded missions—including joint and multi-service missions—helps to satisfy new and future operational demands. ^c

^a <http://www.repi.mil/About/Index.html>

^b "REPI 2013; 7th Annual Report to Congress;" Department of Defense: March, 2013.

^c <http://www.repi.mil/Projects/Benefits.html>



FIGURE 4: WITH THE COMING OF THE F-35 TO LUKE AFB, IT IS INCREASINGLY IMPORTANT TO ENSURE MILITARY OPERATIONS CAN OCCUR WITH LIMITED IMPAIRMENT. PHOTO COURTESY OF LUKE AFB.

Arizona Military Operations: A \$9 Billion Industry

In 2008, The Maguire Company, in collaboration with ESI Corporation, updated their 2002 study entitled, “Economic Impact of Arizona’s Principal Military Operations.” The report identifies the military industry as “One of the largest and frequently overlooked industries in Arizona...” The study was commissioned by the State of Arizona and concludes: although Arizona was largely unaffected by the Base Realignment and Closing Commission (BRAC), future BRAC activities could threaten one or more military facilities in Arizona. Additionally, “federal actions may result in the reduction or closing of military facilities within Arizona, local action and activities also endanger the future of some military operations.”⁶ Military facilities in this state that were once remote are now near cities, recreation areas, and in the path of future development.

Arizona has been the most aggressive state in the union in terms of codifying protections for military facilities—but it still may not be enough. The report goes on to illustrate conflicts due to land uses both adjacent to the military facility and impacts “miles away from an airport, such as development immediately under low-level flight path impacting the military’s ability to train pilots.” In order to avoid conflicts, thoughtful development in proximity to bases and training facilities is an important, ongoing consideration. The report states, “Designations of open land near airports enhance safety in case an emergency landing is necessary.”⁶

The conclusion of the Maguire Company report states the military “provides substantial, stable employment, draws on the same private, non-governmental vendors and suppliers as many private commercial enterprises in the state, and serves as an important building block in the State’s overall economy.” It also laments that historically, the \$9 billion dollars in economic impact of the military’s operations in Arizona are significant and have been overlooked and that state and local government shouldn’t neglect the significance of these operations to local and statewide economies.⁶

⁶ “Economic Impacts of Arizona’s Principal Military Operations”, Maguire Company and ESI Corporation: 2008 Arizona Department of Commerce

According to the Western Regional Partnership's study on Airspace Sustainability, "Airspace is a finite resource and competition for its use is increasing."⁷ Western Regional Partnership is preparing a report summarizing state actions that have served to balance land use issues and military needs in local and state government which is due out in late 2013. Arizona leads the nation and should continue to set the example for how a state can come together to protect this valuable segment of the economy.

Recommendation 1: Continue looking for opportunities near military installations and in areas within low level MTRs to leverage the REPI program to create suitable conservation easements on private land.

Recommendation 2: Explore opportunities to conserve federal and state land near military installations and within MTRs which would protect the viability of the installations and prevent unnecessary mission encroachment conflicts.

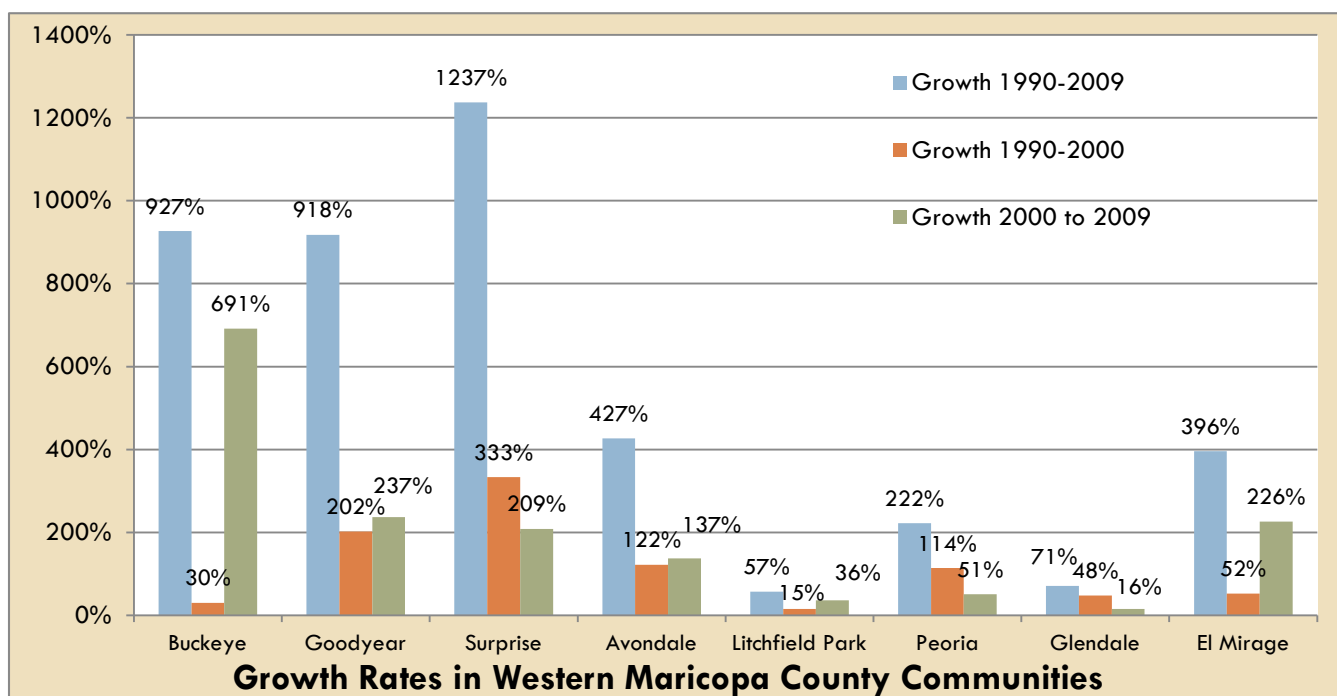


FIGURE 5: WITH THE RAPID PACE OF GROWTH IN WESTERN MARICOPA COUNTY, INCREASED CARE SHOULD BE TAKEN TO PROTECT MILITARY FACILITIES FROM MISSION ENCROACHMENT. (U.S. CENSUS BUREAU)

WESTERN MARICOPA COUNTY AND MILITARY FLIGHT TRAINING

The Land Use/Air Space Nexus

There has been much published about encroachment to Luke AFB itself, but less has been discussed on the threats to Military Training Routes (MTRs) between the base and the Goldwater Range. The close proximity between these two facilities means less fuel consumption and quicker access to training—both are important features that make these facilities attractive for military training, allowing for less stress on equipment, faster missions, and decreased operating costs. This factor may also be the key feature for the survival of future BRAC evaluations as their comparably economical relationship sets them apart from other similar military training venues. The connection between these installations is unique in the United States for preserving both low level and high level training routes for F-16s and the future F-35s.

⁷ "Western Regional Partnership Airspace Sustainability Overview," Western Regional Partnership: February 2013

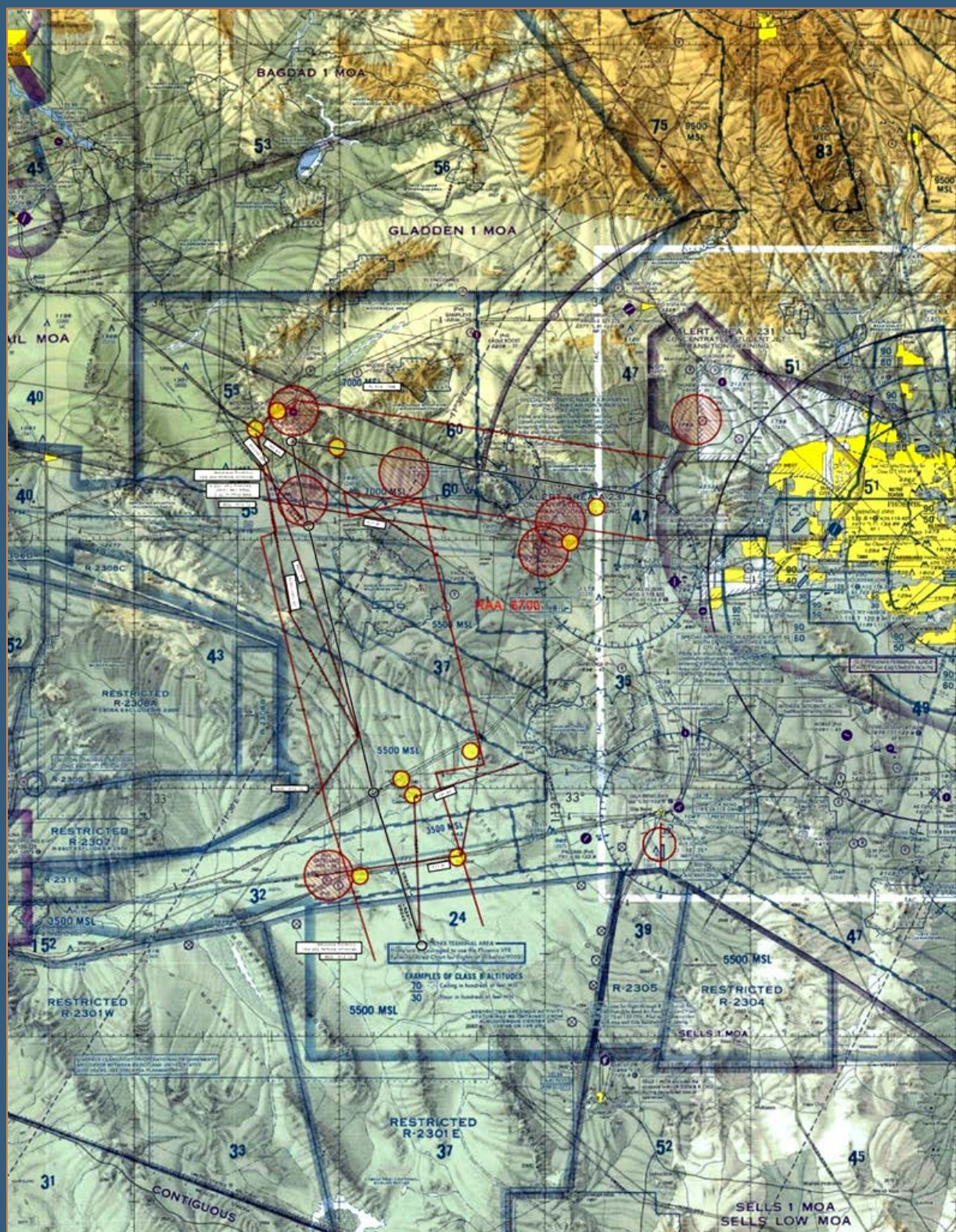


FIGURE 6: This image shows known conflicts that pilots must avoid within MTRs while traversing between Luke AFB and the Goldwater Range. Though pilots refer to them affectionately as “measles,” these conflicts can deter from the training operation and contribute to mission encroachment. Yellow areas represent cities and communities and other avoidance areas such as locations where noise complaints have been registered. Red circles show airports and airfields which require avoidance. As is evident on the map, lands under federal designations provide the highest level of compatibility with overflight operations. Image courtesy of Luke AFB.

In the recent past, many believed that there was little nexus between what happened on the ground and what occurs overhead within the MTRs connecting installations. However, through interviews with key personnel at Luke Air Force Base, there is a growing issue that threatens unfettered use of MTRs and flight safety for low altitude training missions. Significant pockets of incompatible uses have resulted in increased citizen complaints or areas of concern located on the ground and within training routes. Although they may represent a small threat individually, the increase of these pockets over time has diminished the training capacity in key MTRs. These areas, located along training routes between Luke AFB and Goldwater Range in western Maricopa County, require military pilots to avoid these locations to avoid complaints. These avoidance issues have reduced the functionality of flight training areas and have increased the need to navigate around problem areas, detracting from essential combat training.

The Air Force on mission encroachment: “The results of encroachment can vary from seasonal to permanent operational constraints. They can include, for example, operational restrictions on airspace such as limiting flying hours and altering flight paths, restrictions in support functions such as limiting water consumption and discharge, training limitations due to lack of off-base compatible land use, or indirect mission encroachment from inadequate permit discharge limitations”⁸

The risk of a coming population boom within areas underneath MTRs has developed into a point of concern for Luke AFB officials.⁹ Increased growth is in direct correlation with increased mission encroachment, which in turn reduces capacity for training. If this trend continues unabated, it will diminish functional mission capacity to critical levels, narrowing the effective size of the training routes and causing additional diversions from training objectives. These conflicts, though initially limited in number, have multiplied in conjunction with population growth in western Maricopa County. Under a reasonable growth scenario, the continuation of the trend is inevitable requiring urgent action before significant MTR encroachment occurs that would decrease the value of the BMGR and Luke AFB for the military mission.

One example of the types of modifications that Luke AFB has had to make in response to mission encroachment includes changes to flight planning to reduce the risk of mid-air collisions due to the presence of large numbers of civilian aircraft to the north of the facility. “Flight safety must be our number one concern. We will continue to put safety first when planning our flight operations. As a matter of policy, Luke does not take off to the north with live munitions.”¹⁰ Encroachment is “death by a thousand cuts,” one military official stated, one small impact seems insignificant, but over a number of years their combined result can be severe.

Recommendation: A concerted effort should occur to maintain military MTRs with meaningful land management and the conservation of open space to ensure a sustainable future for Goldwater Range and Luke Air Force Base.

ENDANGERED AND THREATENED SPECIES AND LAND USE MANAGEMENT

Land management within military ranges and bases has evolved over the years. From revenue generating programs of the 70s and 80s that encouraged uses such as camping and grazing to the emergence of an ecosystem management philosophy in the 90s, military land managers have shown the ability to adapt and evolve. In 1994, the Department of Defense (DoD) published its “Ecosystem Management Policy Directive” that stated military installations will use ecosystem management to:

⁸ “2006 Air Force Environmental Program Strategic Plan”, Department of Defense: 2006

⁹ “Military Training Route (MTR) Activities,” Luke Air Force Base Fact Sheet: 1/19/2007.

¹⁰ “Flight Operations and Noise Question and Answer,” Luke Air Force Base: September 2009

- restore and maintain ecological associations that are of local and regional importance and compatible with existing geophysical components (e.g., soil, water);
- restore and maintain biological diversity;
- restore and maintain ecological processes, structures, and functions;
- adapt to changing conditions;
- manage for viable populations; and
- maintain ecologically appropriate perspectives of time (species nesting, mating and migration cycles) and space (how much room do they need to flourish in habitat).

In 1996, the DoD then developed policy guidance for enhancing and protecting Defense lands in a way that was intended to be easily integrated with their military mission. The dialogue focused on biodiversity and the conservation of natural landscapes that help maintain military readiness and provide a range of natural healthy conditions for conducting military operations. DoD also focused on expediting the compliance process to help avoid conflicts in the first place under the National Environmental Policy Act (NEPA) or the Endangered Species Act (ESA). Using this as a frame, the military petitioned for the ability to develop Integrated Natural Resources Management Plans (INRMP) in lieu of the more cumbersome Environmental Impact Statement process. Proactive conservation efforts have helped avoid critical habitat designations by showing that military conservation plans provided adequate protection for habitat while providing greater flexibility for training activities. DoD has concluded that this process engenders public support for the military mission and develops positive relationships with nearby communities. DoD also agrees that maintaining aesthetically pleasing surroundings and providing opportunities for outdoor recreation improves the quality of life for military personnel, their families, and the surrounding communities.¹¹

Nationally, the Defense Department manages around 25 million acres on more than 425 military installations. This land provides habitat for about 300 species listed as threatened or endangered.

"The department has been a good steward of the environment," Raymond DuBois, deputy undersecretary of defense for installations and environment said in a 2002 American Press Service article. Between 1991 and 2001, the DoD spent about \$48 billion on environmental programs. Each installation must have its own INRMP which looks at the ecosystem covered by the facility and takes under consideration the needs of any endangered or threatened species while balancing the needs of the military to provide realistic training. DuBois said that many scientists agree that the Integrated Natural Resources Management Plan is far better for species management than the Endangered Species Act.¹¹ In the case of Camp Pendleton, these environmentally-focused efforts almost certainly prevented the closure of the facility and a major loss to California's military economy.

Lessons Learned from Camp Pendleton

Camp Pendleton covers 195 square miles and contains three distinct climatic zones: coastal plain, coastal valley, and mountain. Located between the ever-expanding metro areas of San Diego and Los Angeles, the base remains 85 percent undeveloped, just the kind of pristine, high-value real estate speculators covet. The rugged terrain serves as both a buffer against rapid growth along California's coast and a magnet for wildlife. Eighteen threatened or endangered species reside on the base.

The latest update for Camp Pendleton's INRMP was published in 2012 and much to the DoD's credit, has been continually evaluated and updated since first inception based on evolving environmental conditions and training

¹¹ Jim Garamone, American Forces Press Service, May 14, 2002

needs. "We are restoring habitat so that we have sustainable or growing populations of threatened and endangered species," Major General Michael Lehnert says in a *Sierra Magazine* article in 2006, "We are also using the property for national defense purposes." He emphasizes, repeatedly, that if the Marines can't train, they'll leave Camp Pendleton, "and then environmentalists are going to be dealing with developers instead." Camp Pendleton has an annual natural-resource budget of \$35 million and an environmental staff of 84, charged with adhering to federal and state regulations. With Lehnert's support, the base also pursued studies and stewardship beyond what's required by law. "A country worth defending is a country worth preserving," he says while describing some of the base's erosion abatement, solar-powered water purification, and vernal-pool-restoration projects.¹²

For Camp Pendleton the ecological benefit of a successful special status species management program is apparent, even when it seems to increase cost and the complexity of base management. Sherri Sullivan, wildlife biologist at Camp Pendleton explains the benefit to the installation if a species recovers to a healthy population level: "If the species are delisted, we don't have to have the intense management, we have more freedom to conduct activities on that land space." The balance struck by Camp Pendleton and several endangered species may be imperfect, and most agree that in an ideal world, the best thing for most species would be to have more habitat in which to thrive. But according to biologist Will Miller of the U.S. Fish and Wildlife Service, without Camp Pendleton, there might not be some of these animals left to protect. "Probably the survival of the species has been greatly enhanced by Camp Pendleton," he says. Some feel the only thing standing between many of Camp Pendleton's endangered and threatened species and extinction may be the U.S. Marines.¹³

"We are restoring habitat so that we have sustainable or growing populations of threatened and endangered species," Major General Michael Lehnert says. "We are also using the property for national defense purposes." He emphasizes, repeatedly, that if the Marines can't train, they'll leave Camp Pendleton, "and then environmentalists are going to be dealing with developers instead." *-Major General Michael Lehnert*¹²

Camp Pendleton—the Cost of Success

Unfortunately, with the success that Camp Pendleton has enjoyed, increased rhetoric has emerged. In testimony before the U.S. House of Representatives Committee on Resources on May 6, 2003, Major General William Bowdon, Commanding General of Camp Pendleton said regulations protecting the tidewater goby fish and other endangered and threatened species have reduced the amount of beach available to the Marine Corps for training troops for amphibious assaults. Worse, if the Marines are forced by a pending lawsuit to add the California gnatcatcher and San Diego fairy shrimp to the protected list, over half the base—57 percent—will be hands-off to training and other readiness activities. However, in a memo responding to comments by both Debois and Bowdon, the National Wildlife Federation said "the ESA only limits large-unit amphibious landings on two to three miles of the 17-mile beach and only during the five-to-six month nesting seasons of the endangered Western snowy plover and California least tern." The actual action taken by Fish and Wildlife Service (FWS) advised that proposals to limit large sections of Camp Pendleton from training operations were rejected by the FWS. In its final rules, only 875 acres of Camp Pendleton were included in its final critical habitat designations. Camp Pendleton encompasses 125,118 acres, roughly 5,000 acres of which are leased for various non-military purposes, such as California's San Onofre State Park and agricultural operations. FWS's critical habitat designations have been

¹² Interview with Marilyn Snell, *Sierra Magazine* (Sierra Club): November/December 2006.

¹³ "The California Report," Valerie Hamilton: Jan 25, 2013

focused almost entirely on these non-training lands.¹⁴ Because of Camp Pendleton's consistent actions to manage habitat, additional protections on larger sections were avoided.

Somewhere between the rhetoric and the training is a very real need to balance environmental issues with training needs of America's armed forces. The lessons learned from Camp Pendleton are clear: manage the issue before it manages you. The military is built to adapt and overcome obstacles while fulfilling its objectives. Their success is a credit to a long history of achievement even in the face of continual encroachment on base facilities while managing threats to the accessibility of its test and training ranges. Arizona's military installations, especially the Goldwater Range should look proactively at preventing major restrictions imposed by the need to manage endangered or threatened species before they are faced with a scenario similar to that of Camp Pendleton.

Refuge of Last Resort

As in the case of Camp Pendleton, military installations in Arizona contain a number of threatened and endangered species, requiring each facility to balance the conservation of these plants and animals with the mission that they are tasked to perform. The degree of mission encroachment, however, varies based upon a number of factors, including how much of the facility is a home to these species and how much habitat is available in other locations. As of the October 2012 draft of the Goldwater Range INRMP, there are four known species of concern on the Goldwater Range, the crown jewel of Arizona's military economy. These animals include the Sonoran pronghorn antelope, Lesser long-nosed bat, Peirson's milkvetch and the Flat-tailed horned lizard. All but the horned lizard are currently listed as threatened or endangered and are protected under the Endangered Species Act (ESA). Of additional concern is the possible listing of the acuna cactus and designation of critical habitat for the species.¹⁵ Goldwater Range also contains a significant amount of habitat for the Sonoran desert tortoise which could be listed as a threatened or endangered species as early as 2014.

The Goldwater Range is home to four known species of concern, not including the Sonoran desert tortoise, which may become listed as early as 2014.

A military installation could become a "refuge of last resort" in the event that a protected species is left with no other viable or reasonable natural habitat except for areas within the military facility. Under these conditions, mission encroachment could become severe if the management activities to sustain the species hamper the operation of military training and defense-related tasks. Although facilities are generally accomplished at achieving a balance between ecological and mission-focused operations, the case of Camp Pendleton points to the possibility that restrictive ESA requirements to maintain special status species can cause significant costs and/or disruption to operations under certain conditions.

The most logical way to prevent a refuge of last resort condition is to ensure adequate wildlife connectivity between the military installation and other viable habitat areas that are inhabited by the species. In the case of the Goldwater Range, lands within the Sonoran Desert National Monument and within the Gila Bend Mountains north of Interstate 8 are similar to areas within the facility; providing a logical connection to prevent special status species from being isolated on installation property. In order for the Goldwater Range to be protected from mission encroachment, it is imperative that adequate wildlife migration corridors are permanently secured from development and environmental degradation—ensuring that wildlife can move between the Range and other habitat areas.

¹⁴ "National Wildlife Federation Factsheet: Conserving Imperiled Wildlife at Military Bases;" National Wildlife Federation. (<http://www.epw.senate.gov/108th/Anecdotes.doc>)

¹⁵ "Barry M. Goldwater Range INRMP;" U.S. Department of the Air Force, et.al: October 2012 Update.



FIGURE 7: THE SONORAN DESERT TORTOISE MAY BECOME LISTED AS A THREATENED OR ENDANGERED SPECIES AS EARLY AS 2014, REQUIRING ADDITIONAL EFFORTS BY LAND MANAGERS TO ENSURE ITS HABITAT IS CONSERVED. PHOTO COURTESY OF WWW.BRITANNICA.COM.

Recommendation: Ensure adequate wildlife connectivity to additional habitat outside of range land in order to prevent the Goldwater Range from becoming a refuge of last resort for threatened and endangered species. In many cases, lands under MTRs also serve as wildlife connectivity corridors—preserving them protects the military mission and provides important ecological benefits.

CONCLUSION

Glide Path into Danger

While Arizona has proved to be up-to-the-task by establishing successful programs to combat urban encroachment on military installations and facilities, there is much to be done to ensure that important military operations are not compromised by mission encroachment. The continuation of the State's lucrative military industry rests upon the success of programs that proactively identify and resolve issues stemming from incompatibility of uses within and around the mission envelope. The reality of recent urban growth has heightened the awareness of the impacts of incompatible development, including those caused by housing, populous commercial centers, and vertical obstructions created by solar, wind, and other electrical generating facilities. Previous BRAC closures were based in large part upon urban encroachment on the boundaries of military installations. Future realignments may well be based in large part on the economic efficiency and operational effectiveness of Arizona's facilities. While encroachment issues have been effectively slowed by a poor real estate market, recent economic improvements will result in significant new threats to the military mission.

So far, Camp Pendleton has successfully navigated the balance between protecting important resources and preserving their military mission. Arizona must also exercise "out of the box" thinking to decrease the risk of significant operational obstructions that could be caused by threatened and endangered species protection, misplaced urban development, and potential changes in public perception of military facilities. By exercising creativity and leveraging the broader community, installations like Luke AFB and the Goldwater Range can be protected at little cost to the taxpayer while preserving Arizona's values and precious resources. Of high concern

is the protection of the irreplaceable military training routes (MTRs) and habitat connectivity that ensure the viability of the Goldwater Range (BMGR). Without these connections, the BMGR has a higher likelihood of suffering from mission encroachment in the form of environmental regulation and reduced mission efficiency and effectiveness.

Recommendation: Form a diverse task force that seeks to evaluate the impacts of Arizona's changing economic, social, and environmental landscape with the goal of providing clear direction toward limiting or eliminating encroachment into the military mission. Groups such as the Governor's Military Affairs Commission or the Arizona Base Commanders Summit could serve as positive venues for continued dialogue.



FIGURE 8: THIS IMAGE SHOWS THE SUCCESSFUL IMPACT OF ORDINANCE ON A TARGET WITHIN THE GOLDWATER RANGE. WITHOUT THIS FACILITY ARIZONA WOULD LOSE ITS APPEAL FOR MILITARY TRAINING. PHOTO COURTESY OF LUKE AFB.

Conserving Federal Land Protects the Military Mission

The longevity of Arizona's military installations relies on the successful protection and operational effectiveness of the Goldwater Range (BMGR) and their ability to get to the facility for training maneuvers. The connections between installations in the form of military training routes (MTRs) are the lifeline for Luke AFB and the BMGR for their sustained operation and success. Those who frequent lands within these corridors can often observe these activities as they occur—whether simply the flight of a jet overhead or the excitement of a flare release during dog-fighting maneuvers. MTRs in a free, unobstructed environment allow for the successful training of the next generation of military pilots. Unfortunately, development and other human interference can fragment these routes, restricting the free flow of military transit and the ability of installations to successfully perform their mission.

The protection of MTRs should be high on the priority list of Arizona's military community. Currently MTRs within Maricopa County are located above a variety of land uses and ownership. Generally, these routes are unobstructed and are located above open desert, farmland, or sparsely populated areas. It is important to remember that these lands are not under the control of the Department of Defense (DoD) which has limited authority over the ultimate land use and the degree of impact that future uses can have on the successful implementation of the MTRs purpose. It is imperative that proactive measures are taken to ensure they remain open and viable for the continuation of Arizona's military industry.

Land Use Under MTR Corridors in Maricopa County (Square Miles)				
	Total Area Under MTR Corridors	Protected Land*		
		Currently Protected	Additional Land Protected by Sonoran Desert Heritage (SDH) Proposal	Total Protected Land with SDH Approval
BLM	1,691.82	706.67	650.08	1,356.75
City or County Parks	0.86	0.86	-	0.86
Forest	537.15	536.89	-	536.89
Indian Reservation	98.62	98.61	-	98.61
Military	334.13	-	-	-
Other	18.34	4.53	-	4.53
Private	539.27	-	-	-
State Trust	341.27	-	-	-
Wildlife	5.72	5.72	-	5.72
Total	3,567.18	1,353.29	650.08	2,003.37

* Includes Wilderness, National Monument, Special Management, National Conservation, and Wildlife Management Areas.

As is evident in the chart above, the permanent conservation of federal lands through congressional action, similar to the [Sonoran Desert Heritage](#) (SDH) proposal, can provide needed protections that reduce or remove the likelihood of incompatible uses within MTRs and in areas around military installations. Additionally, conservation designations will retain the lands in permanent federal ownership, preventing disposal and resulting incompatible development. The SDH proposal, if passed by Congress, is an example of a low-cost measure that can prevent the encroachment of incompatible uses into these important corridors. The proposal will result in the permanent protection of 80% of Maricopa County BLM lands under MTRs—nearly doubling the amount that is protected today. As an added benefit, well balanced conservation programs like SDH also preserve necessary wildlife connectivity, which serves to reduce the scope and cost of threatened and endangered species management and decreases the likelihood that the Goldwater Range will become a refuge of last resort.

Conservation of federal lands is a rare win-win, allowing the protection of valuable ecological and cultural resources while preserving irreplaceable economic, social, and recreational values—all at little to no cost to the taxpayer. For the future of Arizona's \$9 billion military industry, actions must be taken now to prevent further mission encroachment on Luke AFB and the Goldwater Range. With care, the sound of an F-16, F-35, or some future generation of military jet will be heard by rugged adventurers five decades from now, but only if Arizona recognizes and responds to the threats of irresponsible development and habitat fragmentation before it is too late to act.

Conclusion 1: The designation of federal lands under MTRs such as the Sonoran Desert Heritage plan, can enhance the long-term viability of a military installation while protecting other important natural, ecological, social, and recreational values—effectively a low-cost conservation easement.

Conclusion 2: Conservation easements within private lands can prevent the development of incompatible uses and resulting mission encroachment.

Conclusion 3: Appropriate land trades as authorized by Proposition 119 between lands owned and managed by the Arizona State Land Department and lands under federal ownership within MTRs or in the vicinity of military installations can reduce the risks of mission encroachment.

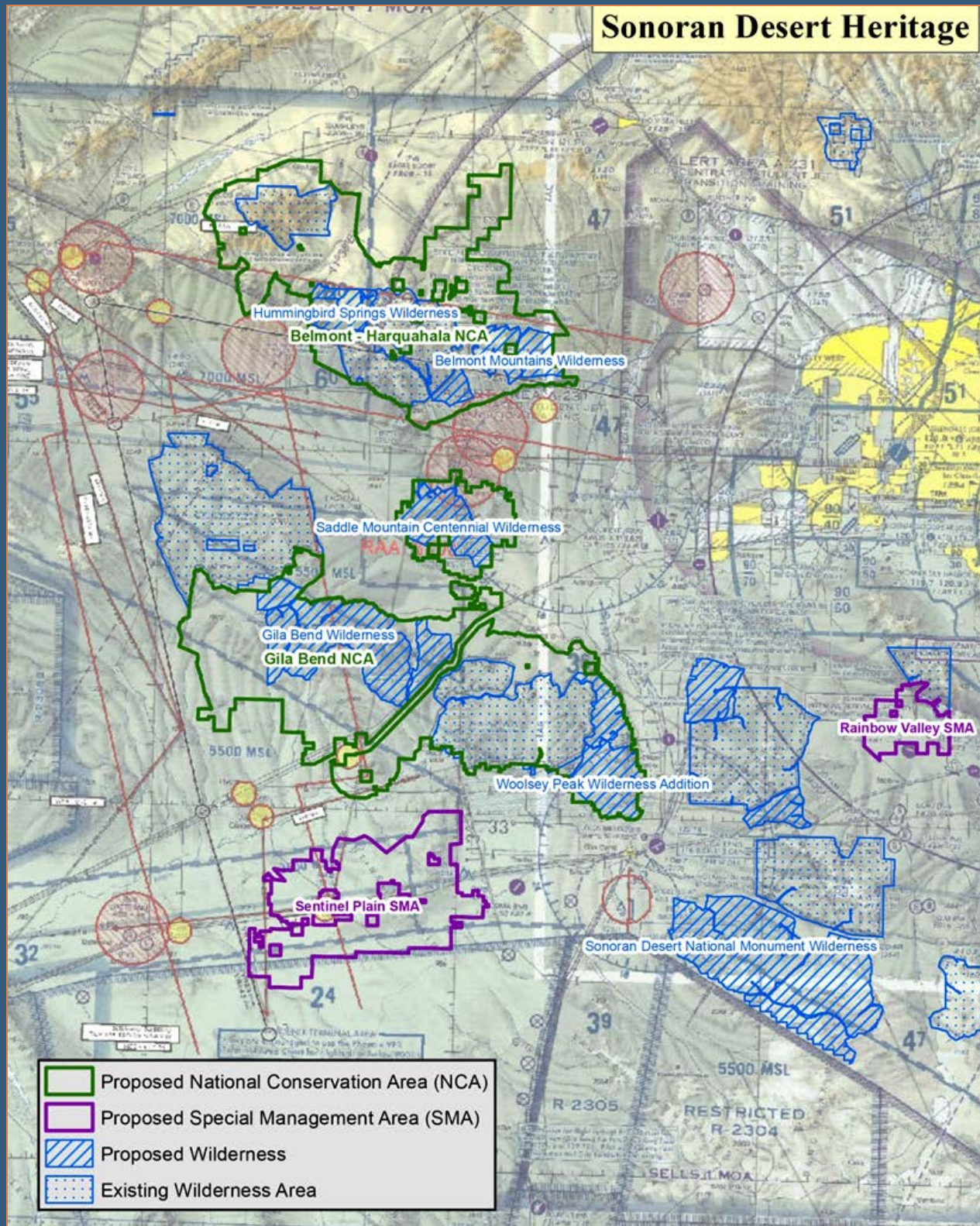


FIGURE 9: This exhibit shows the relationship between federal lands protected in the Sonoran Desert Heritage proposal and the MTRs that serve the Goldwater Range. If approved by Congress, SDH will ensure that 80% of federal BLM lands under MTRs in Maricopa County are permanently protected under a conservation designation like National Conservation Area, Special Management Area, and/or Wilderness Area.

THE SONORAN INSTITUTE:

The Sonoran Institute inspires and enables community decisions and public policies that respect the land and people of western North America. Facing rapid change, communities in the West value their natural and cultural resources, which support resilient environmental and economic systems.

Founded in 1990, the Sonoran Institute helps communities conserve and restore those resources and manage growth and change through collaboration, civil dialogue, sound information, practical solutions and big-picture thinking.

Our passion is to help shape the future of the West with:

- **Healthy landscapes** that support native plants and wildlife, diverse habitat, open spaces, clean energy and water, and fresh air.
- **Livable communities** where people embrace conservation to protect quality of life today and in the future.
- **Vibrant economies** that support prosperous communities, diverse opportunities for residents, productive working landscapes and stewardship of the natural world.

The Sonoran Institute is a nonprofit organization with offices in Tucson and Phoenix, Arizona; Bozeman, Montana; Glenwood Springs, Colorado; and Mexicali, Baja California, Mexico.



THE ARIZONA WILDERNESS COALITION:

The mission of the Arizona Wilderness Coalition (AWC) is to protect and restore wild lands and waters throughout Arizona. A key component of this mission is to advocate for responsible and sustainable policies toward economic success without compromising important ecological resources and opportunities for primitive and unconfined recreation. AWC also actively advocates for pragmatic new conservation measures including appropriate designations for wilderness, National Conservation Areas, and Wild & Scenic Rivers to ensure a sustainable future for coming generations of Arizonans. The Arizona Wilderness Act of 1984, Arizona Desert Wilderness Act of 1990, and the Fossil Creek Wild & Scenic River designation of 2009 are among the Arizona Wilderness Coalition's many achievements. To learn more, please visit www.azwild.org.



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RAINMAKER SOLUTIONS:

Rainmaker Solutions, LLC was founded in 2012 by Carolee Martin. With over 20 years of experience in Security operations, Armed Forces integration, Foreign Service, and Law Enforcement, Rainmaker Solutions specializes in government and corporate consulting and provides an innovative, holistic approach to operational security assessments. Having served as a senior advisor to the Department of Defense in support of the military operations, Carolee Martin has extensive, first-hand operational expertise and possesses a unique understanding of DoD - US Governmental agency relationships and the required points for interface. Rainmaker's task was to provide a comprehensive assessment of the dynamics of the current military and security requirements in specified regions of Arizona and to identify potential friction points with local communities as it relates to public policy and land programing initiatives.

