



RANGE COMPATIBLE USE ZONE STUDY

MARINE CORPS BASE CAMP PENDLETON



JUNE 2007

MCB Camp Pendleton

Marine Corps Base Camp Pendleton (MCBCP) is a unique and irreplaceable resource for military training activities. Located in southern California about midway between Los Angeles and San Diego, MCBCP encompasses more than 125,000 acres and 17 miles of coastline. Its coastal terrain, extensive range and maneuver areas, and restricted airspace support the full spectrum of Marine Corps ground, amphibious, and aviation training activities.

What is the RCUZ Program?

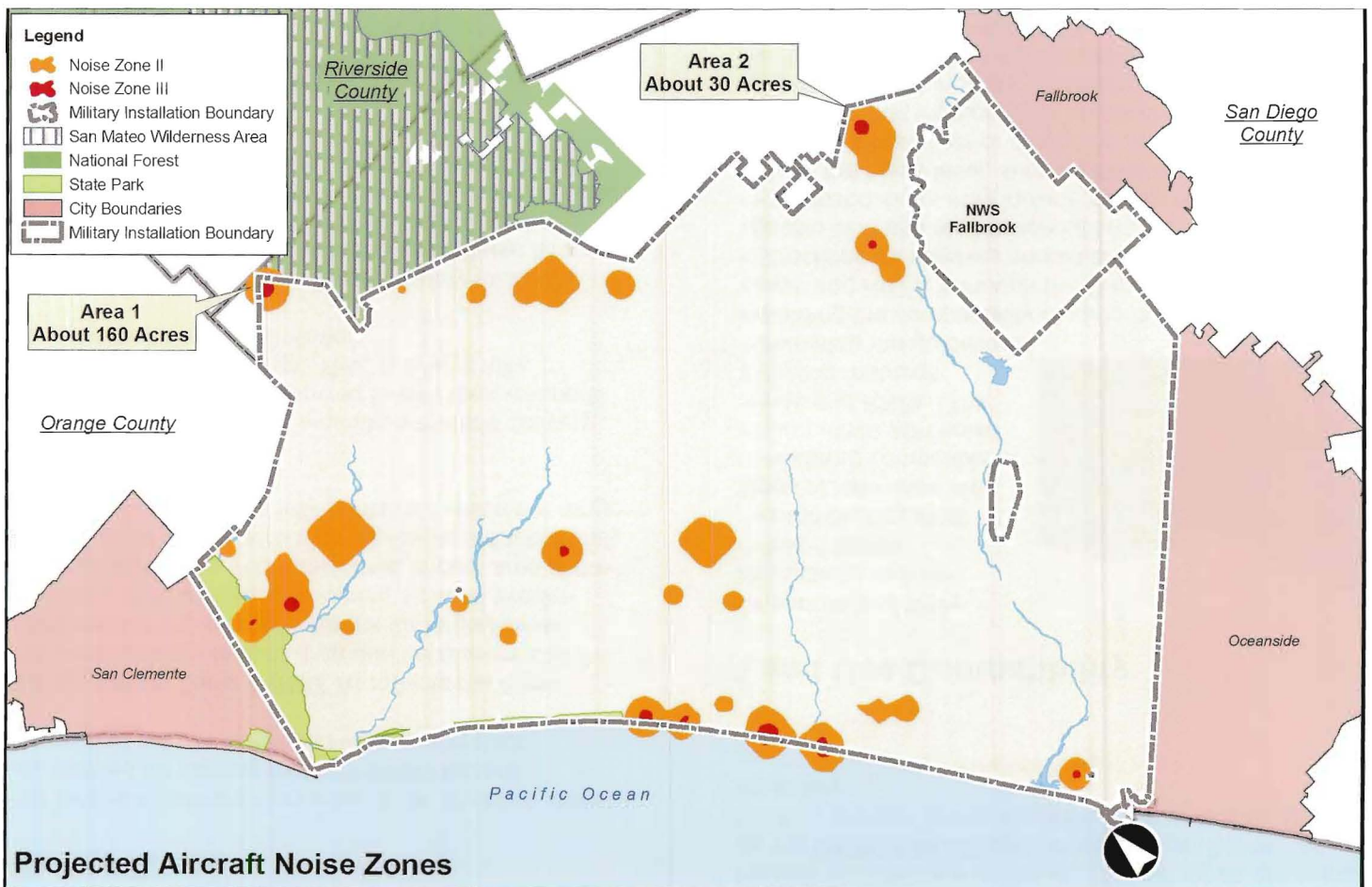
The Marine Corps initiated the Range Compatible Use Zone (RCUZ) program to help protect the public's health, safety, and welfare by minimizing both local community and on-base exposure to noise and potential safety hazards resulting from military training activities, while protecting the operational capacity of the range training complex. The RCUZ program seeks to achieve compatibility between military training range installations and neighboring communities by working in partnership with local governments. It seeks to achieve, to the extent practical, compatible development of lands adjacent to the MCBCP range complex by providing compatible land use recommendations to local communities for their consideration in local planning.

RCUZ Elements

The major elements in the RCUZ program are **noise** and **safety**. Noise and safety zones were developed using data gathered from the review of current and planned ground, amphibious, and aviation training activities at MCBCP. Noise contours depicting the degree of noise exposure on-base and within some surrounding areas off-base were developed and became the basis of the noise zones. Safety zones were developed based on severity of safety concerns of training activity and accident potential. The RCUZ program provides guidelines, to be applied in concert with other land use programs, for land use based on the determination of noise and safety impacts.



Ground-to-ground live-fire operations support a broad spectrum of weapons including pistols, rifles, machine guns, mortars, antitank assault weapons, grenades, missiles, and artillery



Noise Zones

Under the RCUZ program, noise contours are provided as a planning tool for local planning agencies. Noise exposure contours were developed to quantify and depict the noise environment associated with aircraft, small arms, and large caliber weapons activities within the MCBCP Range Complex and associated airspace. The RCUZ study does not address noise related to activities at Marine Corps Air Station Camp Pendleton nor the aircraft flight tracks to and from the ranges; these noise sources are addressed in a separate AICUZ document.

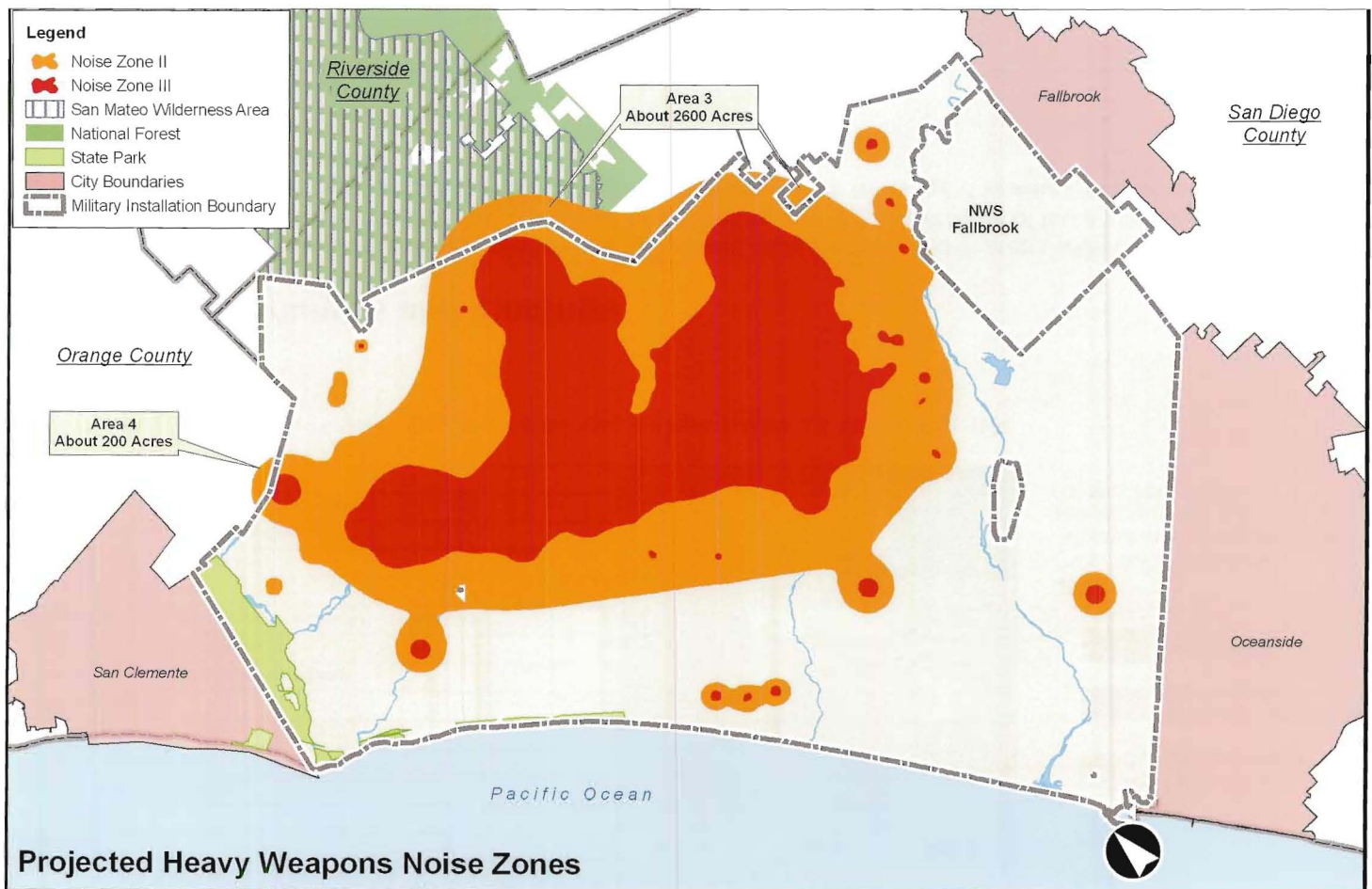
Noise exposure in California is measured using the Community Noise Equivalent Level (CNEL) and is represented as contours on RCUZ maps. CNEL contours represent the average exposure from the noise events that occur over a 24-hour period rather than the impact of a single event, but also assign a noise penalty for operations conducted in the early evening and at night because people are more sensitive to noise during these periods. Noise contours for the MCBCP RCUZ were generated using noise models that account for the nature of the noise source and the way the human ear hears noise together with data on the frequency and number of operations, the type of aircraft and flight characteristics, and the type of

weapons used during training on the MCBCP ranges. The RCUZ program defines three noise compatibility zones that are used for land use planning to prevent conflicts with noise-sensitive land uses.

Noise Zone 1 is the lowest noise zone. This level of noise does not pose any hazard, but it may occasionally interfere with certain activities of some residents, particularly during periods of more intensive operations. Typically, only minor restrictions are associated with Noise Zone 1.

Noise Zone 2 represents the area where noise may at times interfere with speech, sleep, or the ability to hear television or radio shows. Certain commercial and industrial activities are compatible and some other activities may be compatible with the use of sound attenuation measures. Generally, residential development is not recommended within Noise Zone 2.

Noise Zone 3 is the zone of highest noise intensity. Land uses that include human occupied facilities or sustained periods of human activity are not recommended.



Safety Zones

For land use planning purposes, three areas of concern are defined for varying levels of safety hazard associated with air-to-ground weapons impact.

Range Safety Zone A (RSZ A) reflects the most dangerous safety hazard area and corresponds to the composite of the safety footprints for large caliber weapons used at the range during aviation live-fire training operations. This dedicated impact area is the only on-base area where high explosive ordnance may be delivered. RSZ A is fully contained within the range boundary.

RSZ B coincides with the aviation ordnance delivery line where aircrews are allowed to arm their weapons before firing on their target. RSZ B is also fully contained within the installation.

RSZ C defines a minimum level of safety hazard concern and corresponds with the special use airspace that is restricted for safety of flight. In the case of MCBCP, this is primarily the land areas under restricted airspace R-2503B. Some of this area is beyond the installation boundaries.

Surface Danger Zones

For ground-to-ground fired weapons, like artillery, firing fans are developed to depict locations on the ground where potential danger areas exist when live-fire

training activities are underway. These areas are noted on the MCBCP RCUZ as Surface Danger Zones. All Surface Danger Zones are entirely within the MCBCP boundary.

Land Use Compatibility

Department of Navy instructions include detailed tables recommending what types of land uses are considered compatible or incompatible with noise zones and RSZs. The following matrices summarize the guidelines regarding the compatibility of various land uses in noise zones and RSZs, although the Department of Navy instructions themselves should be referenced for specific land use recommendations. Some land use recommendations may include special measures to reduce the noise level, such as installing sound attenuation materials or designing and constructing a building so that interior noise levels are less than with normal design standards. Similarly, there are exceptions as to when a given land use is conditionally compatible within certain RSZs.



SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES								
Land Use	CNEL (decibels)	Noise Zone 1		Noise Zone 2		Noise Zone 3		
		< 55	55-64	65-69	70-74	75-79	80-84	85+
Residential		Compatible	Generally Compatible with Restrictions	Generally Incompatible with Exceptions	Generally Incompatible with Exceptions	Incompatible	Incompatible	Incompatible
Manufacturing		Compatible	Compatible	Compatible	Generally Compatible with Restrictions	Generally Incompatible with Exceptions	Incompatible	Incompatible
Manufacturing – professional scientific, etc.		Compatible	Compatible	Compatible	Compatible	Generally Incompatible with Exceptions	Incompatible	Incompatible
Transportation and utilities		Compatible	Compatible	Compatible	Compatible	Compatible	Generally Incompatible with Exceptions	Incompatible
Communication		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Trade – wholesale and building materials		Compatible	Compatible	Compatible	Compatible	Compatible	Generally Incompatible with Exceptions	Incompatible
Retail Trade		Compatible	Compatible	Compatible	Compatible	Compatible	Generally Incompatible with Exceptions	Incompatible
General Services		Compatible	Compatible	Compatible	Compatible	Compatible	Generally Incompatible with Exceptions	Incompatible
Cemeteries		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Warehousing and storage/repair services		Compatible	Compatible	Compatible	Compatible	Compatible	Generally Incompatible with Exceptions	Incompatible
Hospitals and other medical facilities		Compatible	Compatible	Compatible	Compatible	Compatible	Generally Incompatible with Exceptions	Incompatible
Nursing homes		Compatible	Compatible	Generally Incompatible with Exceptions	Generally Incompatible with Exceptions	Incompatible	Incompatible	Incompatible
Government services		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Education services		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
General cultural, entertainment, and recreation		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Nature exhibits		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Public assembly		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Outdoor music shells, amphitheaters		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Outdoor sports arenas, spectator sports		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Amusements		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Recreational activities (golf courses, riding stables, water recreation, etc.)		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
General agriculture and forestry		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Livestock farming and animal breeding		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Fishing, mining, and other resource production or extraction		Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible

Key:

- Compatible
- Generally Compatible with Restrictions
- Generally Incompatible with Exceptions
- Incompatible

Source: Adapted from OPNAVINST 11010.36B, Department of the Navy and Headquarters U.S. Marine Corps 2002

Note: This chart is for general information only, for specific land use compatibility guidelines, see OPNAVINST 11010.36B.

LAND USE COMPATIBILITY GUIDELINES IN RANGE SAFETY ZONES			
Land Use	RSZ A	RSZ B	RSZ C
Residential	Incompatible	Incompatible	Generally Compatible with Restrictions
Schools, libraries, churches	Incompatible	Incompatible	Generally Compatible with Restrictions
Hospitals, nursing homes	Incompatible	Incompatible	Generally Compatible with Restrictions
Auditoriums, concert halls	Incompatible	Incompatible	Generally Compatible with Restrictions
Office buildings	Incompatible	Incompatible	Generally Compatible with Restrictions
Commercial, retail, manufacturing, utilities	Incompatible	Incompatible	Generally Compatible with Restrictions
Playgrounds, neighborhood parks	Incompatible	Incompatible	Generally Compatible with Restrictions
Golf courses, riding stables, water recreation, cemeteries	Incompatible	Generally Compatible with Restrictions	Generally Compatible with Restrictions
Outdoor spectator sports	Incompatible	Incompatible	Generally Compatible with Restrictions
Industrial, warehouse, supplies	Incompatible	Incompatible	Compatible
Livestock, farming, animal breeding	Incompatible	Generally Compatible with Restrictions	Compatible
Agriculture (except livestock), mining, fishing	Incompatible	Generally Compatible with Restrictions	Compatible
Recreational wilderness areas	Incompatible	Generally Compatible with Restrictions	Compatible

Key:

-  Compatible
-  Generally Compatible with Restrictions
-  Generally Incompatible with Exceptions
-  Incompatible

Note:
This chart is for general information only, for specific land use compatibility guidelines, see OPNAVINST 3550.1.

Source: adapted from OPNAVINST 3550.1, Department of the Navy and Headquarters U.S. Marine Corps 1998

RCUZ Impact Analysis and Findings

The RCUZ impact analysis compared the existing and future land uses on base and in areas within the surrounding communities with the land use compatibility guidelines as defined by the RCUZ elements of the noise zones and safety zones. The following table summarizes the RCUZ findings for these zones with regard to areas with an existing or potential future land use concern.

SUMMARY OF RCUZ FINDINGS		
RCUZ Zone*	Definition	Findings
Noise Zone 3	Maximum noise impact – noise levels greater than 70 dB for blast noise and greater than 75 dB for aircraft and small arms noise	Noise Zone III contours do not extend beyond the base boundaries nor into cantonment or family housing areas on-base
Noise Zone 2	Noise levels between 62 and 70 decibels (dB) for blast (heavy weapons) noise and between 65 and 75 dB for aircraft and small arms noise	Projected military operations results in Noise Zone II contours that affect about 3,000 acres north of the MCBBCP boundary including: <ul style="list-style-type: none"> • areas within unincorporated San Diego County, including undeveloped federal land • areas within unincorporated Orange County, including portions of the Rancho Mission Viejo Company's Ranch Plan • proposed housing area identified in Planning Area 8 of the Ranch Plan Affects part of the Stuart Mesa Housing Area on MCBBCP
RSZ A	Air-to-ground maximum hazard area defined by the composite of all weapons safety footprints	Defines the dedicated impact area; fully contained within the Base boundary; no compatible land uses
RSZ B	Area of armed overflight – the aviation ordnance delivery line within the ordnance impact areas	Only participating aircraft allowed in this area; fully contained in the Base boundary; no underlying compatible land uses
RSZ C	Minimum level of safety hazard concern – aircraft maneuver area in restricted airspace	Affects some areas within Planning Area 8 of the Ranch Plan master planned community in Orange County and undeveloped federal and private land north of the base
Surface Danger Zone (SDZ)	Ground and airspace needed to safely contain projectiles, fragments, and debris from firing, launching, or detonating weapon systems	SDZ does not extend beyond the base boundaries nor into cantonment or family housing areas on-base
* Noise Zone I is not included because it is not confined and includes areas below the threshold of 62 dB for blast noise and below 65dB for aircraft and small arms noise		

Range Compatible Use Zone (RCUZ)

Marine Corps Base Camp Pendleton, CA

Legend

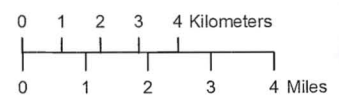
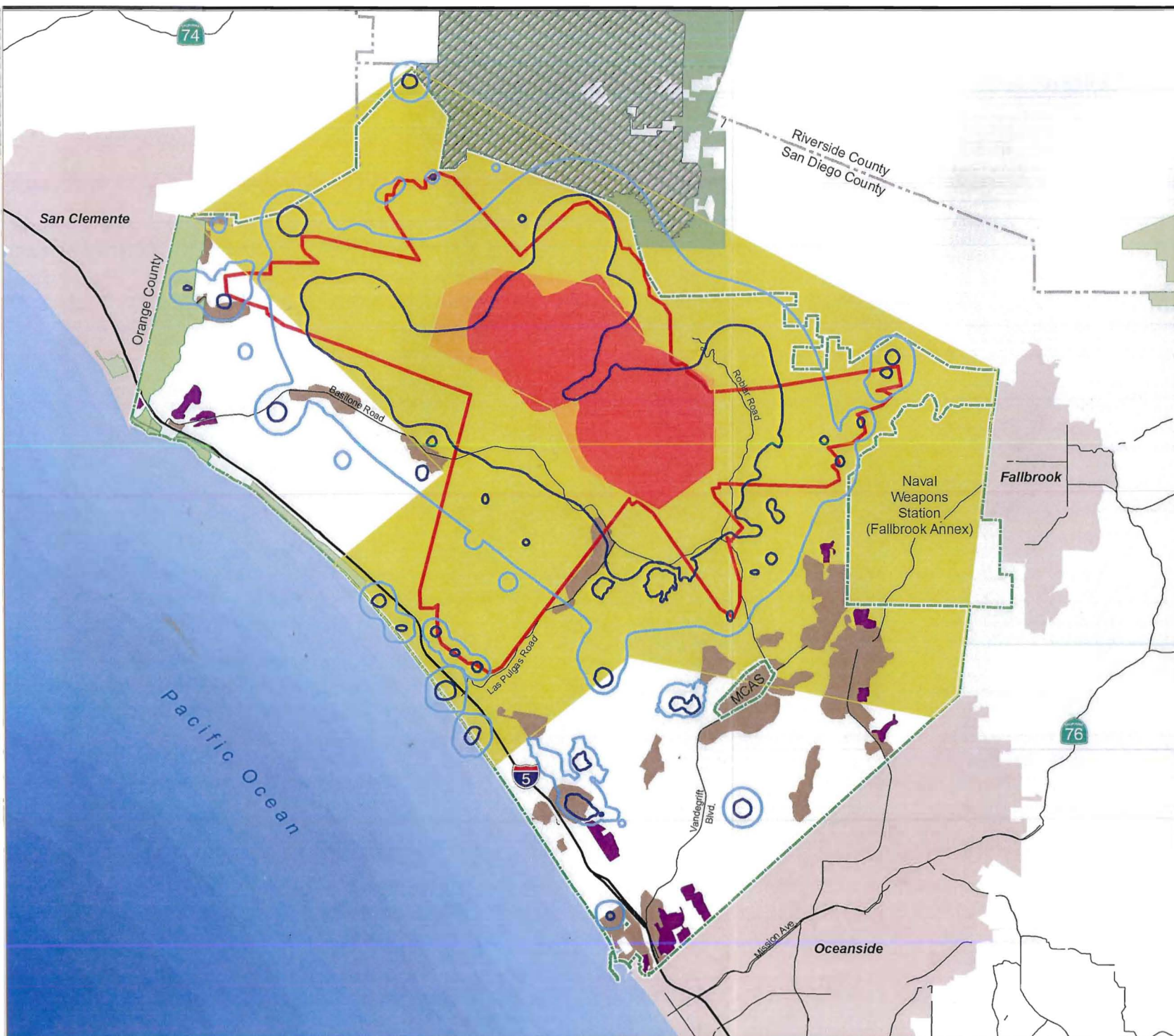
- County Boundary
- City Boundaries
- National Forest
- State Park
- San Mateo Wilderness Area
- On-Base Housing Areas
- Cantonment Area
- Military Installation Boundary
- Surface Danger Zones

RCUZ Safety Zones

- RSZ A - Composite Weapons Safety Footprints Area
- RSZ B - Area of Armed Overflight
- RSZ C - Minimum Restricted Airspace for Aircraft Manuvering

RCUZ Noise Zones

- Noise Zone 3
- Noise Zone 2



Recommendations

Marine Corps and community cooperative action is required to achieve the compatible land use goals of the RCUZ. The Marine Corps has commissioned a RCUZ Study and has taken actions to mitigate noise and accident potential. Local municipalities have the authority for enactment of land use controls in the areas surrounding MCBCP's training ranges and are urged to consider adoption of the RCUZ recommendations in comprehensive land use plans and land development controls. Additionally, fair disclosure in the sale, lease, and rental of property located in the area surrounding MCBCP would ensure that purchasers are fully aware of the noise and/or accident potential condition of any such property under consideration. It is envisioned that through wide public distribution of this document and a continuing dialogue between the Base Commander and local government officials, the MCBCP RCUZ can serve as a mutually beneficial program for both organizations. The Marine Corps believes that adoption of the following recommendations will strengthen existing Base and Community relationships, increase the health and safety of the public, and help protect the integrity of the Base's mission.

1. Continue the positive interaction and communication with local officials regarding MCBCP activities and overall land use planning.
2. Continue to maintain a proactive dialogue with community planning officials, citizen groups, and local officials to inform them of the nature of the military mission of MCBCP and any anticipated changes in the mission that may affect off-base areas.
3. Continue to maintain the noise complaint response program, including an investigation into the possible reasons for the noise complaint and appropriate follow-up with the person making the complaint so that citizens understand that MCBCP is concerned about avoiding noise/land use conflicts.
4. Monitor off-base development activities near MCBCP and, when developments are proposed, take actions to encourage that future residents and business owners who plan to live and work in the proposed developments are provided with disclosure notices informing them of the proximity of the development to Camp Pendleton and the types of training and associated noise that may occur.
5. Within MCBCP, coordinate on-base development plans within the RCUZ noise exposure zones, Range Safety Zones, and Surface Danger Zones to ensure land use compatibility considerations when practicable.
6. Continue positive relationships with the U.S. Forest Service in addressing land use compatibility issues in the Cleveland National Forest and San Mateo Wilderness Area.
7. Continue to pursue ongoing funding and seek partnerships under the Department of Defense land buffering authority to acquire or obtain conservation easements, and consider additional opportunities for encroachment partnering particularly in areas that may be affected by RSZ C or Noise Zone II.
8. Update the Range Operations Manual, as appropriate, to reflect the findings of this RCUZ document.
9. Pursue land acquisition to re-align the range perimeter boundary in the "key hole" area to the northwest of Naval Weapons Station Fallbrook to increase flexibility for firing operations from AFA 39.

Additional Information

For more information relating to details of the RCUZ study, please contact on of the following offices:

Community Plans and
Liaison Office
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Pendleton, CA 92055-5010
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