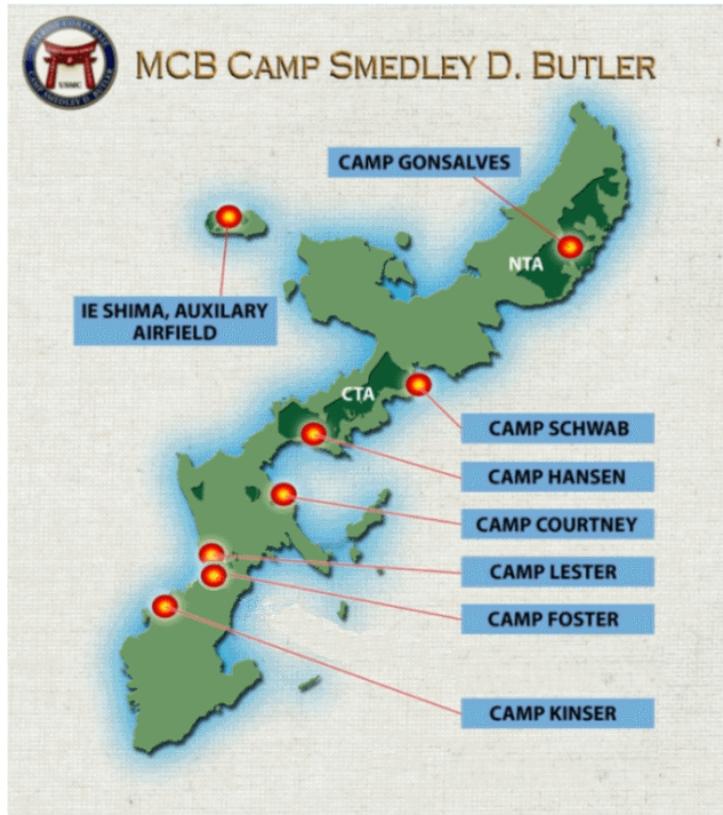




## 2014 SECRETARY OF DEFENSE ENVIRONMENTAL AWARD NATURAL RESOURCES CONSERVATION – TEAM MARINE CORPS BASE CAMP SMEDLEY D. BUTLER

### INTRODUCTION

Marine Corps Base Camp Smedley D. Butler (MCB Butler) is located on the island of Okinawa, Japan. Our installations and training areas are dispersed throughout Okinawa, creating a unique



The various Marine Corps camps are dispersed widely throughout Okinawa.

program is constantly focused on supporting military readiness while balancing environmental sustainability.

### BACKGROUND/ POSITION DESCRIPTIONS

Because of MCB Butler's broad military mission, the Natural Resources Management Program focuses on conservation, protection and preservation through the implementation of several major components and guidance documents: Integrated Natural Resources and Cultural Resources Management Plan, Installation Pest Management Plan, the Japan Environmental Governing Standards (JEGS) and various Marine Corps, Marine Corps Installation Pacific (MCIPAC) and MCB Butler orders.

Mr. Mitsugu Sugiyama, a natural resources specialist at MCB Butler since 1999, oversees the natural resources and the pesticide programs. As the natural resources program manager, Mr.

natural resources management challenge. Supporting over 32,000 active duty military and civilians, MCB Butler is the base support and provides training areas for III Marine Expeditionary Force (III MEF). III MEF is a Marine-Air-Ground Task Force that is rapidly-deployable to conduct operations across the spectrum from humanitarian assistance to amphibious assault and high intensity combat. MCB Butler provides unique training opportunities in various environmental habitats: from the last Jungle Warfare Training Center (JWTC) within the DoD, to the only US controlled live fire ranges in Japan. Encompassing more than 45,000 acres, MCB Butler contains hundreds of archeological sites and provides habitat to more than 3,000 species of flora and fauna, of which approximately 260 are rare, threatened or endangered.

Because of the various types of training and facilities that are supported by MCB Butler, the environmental



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Sugiyama coordinates with Camp and Station Environmental Coordinators and Range Control to ensure wildlife and its habitat are properly maintained within the training areas and the camp/station boundaries. As the pesticide program manager, Mr. Sugiyama collaborates with the Installation Pest Management Coordinator to ensure the proper procurement, storage and use of pesticides in accordance with the JEGS and applicable Marine Corps, MCIPAC and MCB Butler orders. Mr. Sugiyama is responsible for securing funding for conservation and protection of threatened and endangered species and control of invasive species, as well as reviewing installation construction and repair projects which have the potential to impact natural resources.

Dr. Takeharu Ikema has managed MCB Butler's soil erosion control program since 2008. Dr. Ikema's major responsibility is to solve soil erosion and landslide issues that occur throughout the training areas and within the camp/station boundaries. In order to solve the various soil erosion issues that occur through natural and man-made activities, Dr. Ikema conducts soil survey studies in order to determine the best available erosion control techniques. These techniques include slope stabilization, aerial hydro-seeding and erosion prevention. Dr. Ikema is also responsible for reviewing and analyzing construction and training projects that have the potential to impact the natural environment.

Mr. Sugiyama and Dr. Ikema maintain a positive collaborative relationship with both national and local Japanese government officials and frequently provide advice and assistance on host nation natural resource issues outside of the Installation. This collaborative partnership helps to improve relations between the U.S., Japan and Okinawa.

### SUMMARY OF ACCOMPLISHMENTS INVASIVE SPECIES MANAGEMENT- CANE TOAD

Invasive species control is a critical element of MCB Butler's Natural Resources Program as island ecosystems are particularly sensitive.

First identified in August 2011 on Camp Kinser, the cane toad (*Bufo marinus*) is one of the world's most notorious invasive species. Native to South America, Central American, and extreme southern United States (Texas), cane toads are most often intentionally introduced as a biological control agent for crop pests.

The cane toad is a prolific breeder with females laying single-clump spawns with upwards of tens of thousands of eggs. Its reproductive success is partially due to its indiscriminate feeding behavior: it has a diet of both dead and living matter, including: small terrestrial arthropods such as



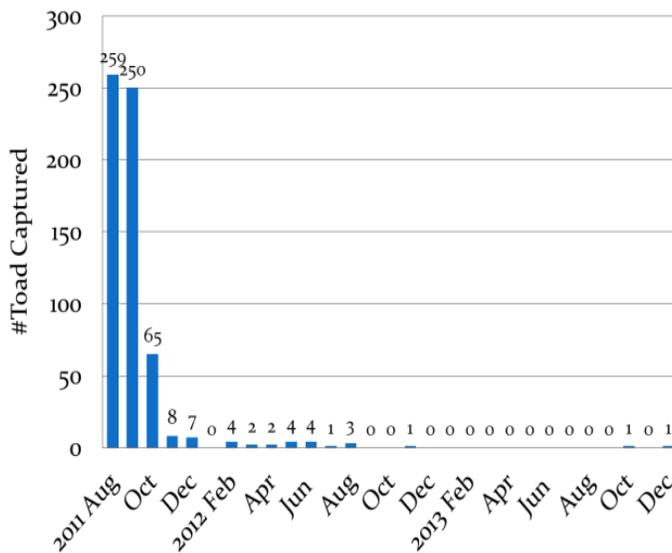
The cane toad (*Bufo marinus*) was first identified on Camp Kinser, Okinawa, in August 2011.



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spiders, centipedes, millipedes and ants; marine snails, other smaller toads and frogs, snakes, small mammals, small birds, plants, dog food and household refuse. The voracious appetite of the cane toad has the potential to decimate native species. The cane toad is also listed as an invasive species in the Japan Environmental Governing Standards.

Currently there are no management strategies that are specific to cane toads. As a result, Mr. Sugiyama has implemented a variety of actions to prevent the further spread of the invasive species. The formation of the Cane Toad Capture Team was pivotal to the initial detection, surveillance and capture efforts. Led by Mr. Sugiyama, the Cane Toad Capture Team consisted of in-house staff (biologists, archaeologists, soil scientists, chemists) and volunteer active duty Airmen and Marines.



Since its initial discovery in August 2011, more than 600 cane toads have been captured on Camp Kinser. Only two cane toads were captured in 2013 as a result of the various monitoring efforts employed by Mr. Sugiyama.

Mr. Sugiyama employed a variety of environmental monitoring efforts which included surveying, identifying and monitoring ponds and ditches, which could be potential cane toad breeding sites. Dissections of female cane toads have yielded vital information regarding ovary development; key to monitoring breeding. No eggs, tadpoles or toadlets have been sighted which indicates that the capture of toads has been effective. The rapid response and implementation of weekly cane toad surveys, resulting in the capture of more than 600 cane toads as of 2013, aided in the successful suppression of the invasive species on Camp Kinser.

Mr. Sugiyama also implemented a successful Cane Toad Awareness Campaign, which further aided the successful suppression efforts through the development of community outreach and general awareness posters and publications. These flyers, posters, and public service announcements on local cable channels aided in the successful communication of the issue to the local community. Frequent, on-going meetings and collaboration with local stakeholders such as the Ministry of the Environment, Okinawa Prefectural Government, Urasoe City, University researchers and the Natural Resources Program Team have further increased the collaborative efforts between Okinawa and the U.S.



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### Cane Toad (*Bufo marinus*) is still on Kinser

Since August of 2011, when the first cane toad was found on Camp Kinser, a total of 605 toads have been captured on the Camp as of June 2012. Because only 2-4 toads were captured each month in the last few months, it is predicted that the majority of the cane toad population has been removed, but a small number of the toads are still left on the Camp. Because one female is capable to lay more than 10,000 eggs, a pair of the toads can easily reproduce the same or more number of offspring we have caught so far. We must get rid of all from the Camp before they breed.

**If you see or capture any cane toads, please contact  
Camp Environmental Office at 637-4405/1815!!!**



**Warning:** The cane toad releases a **toxin** from its glands behind the eyes as a defense mechanism. This white milky toxin can kill or harm animals (native predators, small animals including domestic cats and dogs). Humans can get skin and/or eye irritation from handling the toad. When capturing cane toads, latex gloves should be worn.

**Please do not transport any cane toads to other Camps or off-base  
for any reason!**

EMP 13.7.1 Jul. 2012

Community Awareness flyers, available in English and Japanese, were distributed to personnel and families on all Marine Corps Camps and facilities on Okinawa.

Continuously evolving environmental monitoring efforts are vital to ensuring the eradication of the cane toad at Camp Kinser. In 2013, The Ministry of the Environment and Mr. Sugiyama monitored for breeding at the two most probable breeding sites on Camp Kinser. During the four month surveillance period, two recording devices were installed in an effort to detect early breeding. No male courtship calls were detected during the monitoring period. Because no signs of breeding have been found and recently only small numbers of the toad have been captured, it appears that the toad population has been successfully suppressed on Camp Kinser.

The success of the cane toad eradication efforts has been the result of Mr. Sugiyama's (1) initial rapid response; (2) community outreach; (3) evolving monitoring and surveying methods.

### NATIVE SPECIES CONSERVATION- MONGOOSE TRAPPING

Natural resources on Okinawa have benefited immensely by Mr. Sugiyama's natural resources management. For example, the Jungle Warfare Training Center (JWTC) contains some of the most pristine habitats in Okinawa. Located in the northern part of Okinawa and covered mostly with subtropical rainforest, the JWTC is home to a variety of endemic and rare species; approximately twenty threatened/endangered and protected species, such as Okinawa Woodpecker (*Sapheopipo noguchii*), Okinawa Rail (*Gallirallus okinawae*), and Jamber Long-armed Beetle (*Cheirotonus jambar*).



Examples of protected species in Okinawa: Top Left: Okinawa Woodpecker (*Sapheopipo noguchii*); Top Right: Okinawa Rail (*Gallirallus okinawae*); Bottom Left: Jamber Long-armed Beetle (*Cheirotonus jambar*).



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The Small Indian Mongoose (*Herpestes javanicus*), an invasive exotic animal, was first introduced to southern Okinawa in 1910 in an effort to control rats and poisonous snakes. Since then, the mongoose population has expanded its habitat to northern Okinawa Island, posing a significant threat to the existence of native animal species inhabiting the region. The existence of the mongoose has adverse impacts on the native animal species and will degrade the quality of the natural environment in the JWTC.

Through a collaborative partnership, Mr. Sugiyama has been working with the Okinawa Prefecture Government and the Japanese Ministry of the Environment to trap and remove mongoose in the JWTC in an effort to protect the endemic and rare species of Okinawa. The Mongoose Trapping project has resulted in the successful removal of 12 mongooses from the U.S. Marine Corps training area during the FY12-13.

### NATURAL RESOURCES CONSERVATION

Okinawa provides real world training environments that are critical to mission readiness. The natural jungle environment found in the JWTC provides dense tree canopy cover which conceals troop movement from air reconnaissance. The dense ground vegetation provides excellent cover for ground maneuvers. Many of the plant species in the JWTC are edible, which enables the Marines to survive off the land.



Erosion from agriculture, landslides and other sources can severely impact the sensitive marine ecosystems of Okinawa.

Okinawa's intense rainfall, steep slopes, and thin soils, pose a significant soil mitigation challenge. Numerous military training activities have the potential to reduce the natural vegetation and increase erosion: helicopter landing zones, which are bare of vegetation, have the potential to increase erosion; live-fire munitions damage the soil and vegetation upon impact; and heavily traveled trails for land navigation, have the potential to increase erosion.

### SOIL SURVEYS

Dr. Takeharu Ikema, MCB Butler's Soil Erosion Control Project Manager, has the responsibility of solving the various soil erosion and landslide issues that threaten to destroy the natural environment. Soil surveys are critical to maintaining the training areas on Okinawa, but also for understanding

subsurface conditions. Three major soil surveys were completed during FY12 and FY13: the Northern Training Area, Ie Shima Auxiliary Airfield and the Central Training Area. These

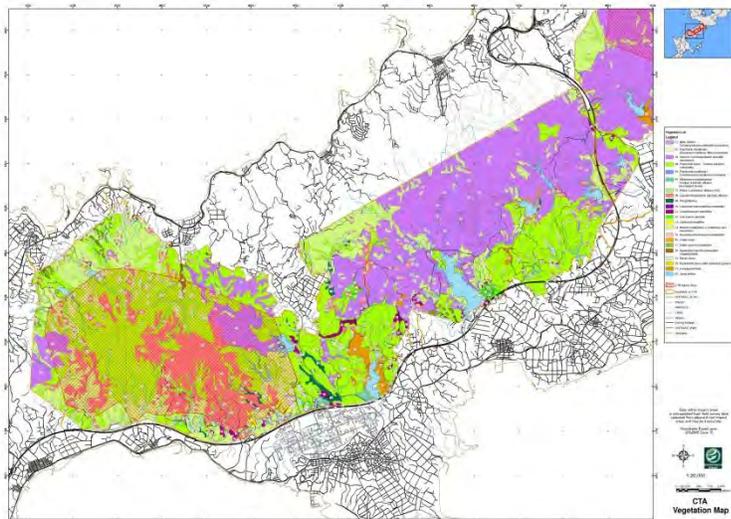
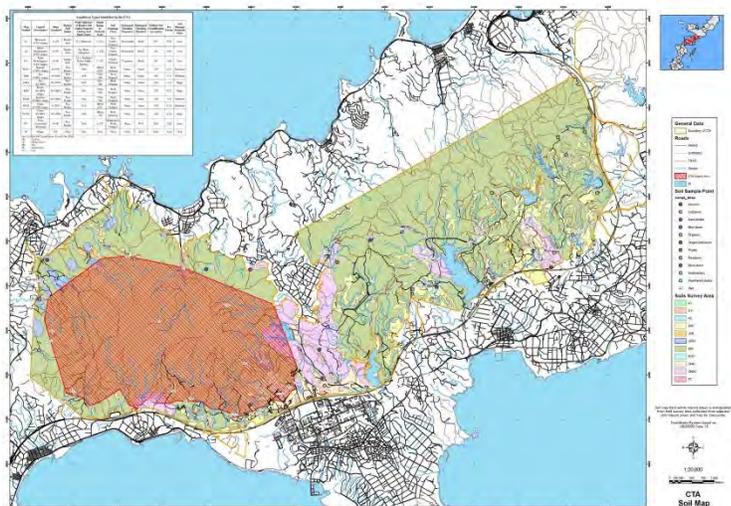


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training areas allow for numerous training activities: jungle warfare and jungle skill training, combat tracking, medical trauma and survival, evasion, resistance, and escape training, infantry maneuvers, helicopter exercises, and artillery drills; critical for mission readiness. These detailed soil surveys have produced vital information regarding the existing soil types and conditions through the identification of hydric soils for wetlands mapping, slope categories, and predominant vegetation.

### IMPLEMENTING 3D IMAGERY AND COMPUTER-BASED MODELS

Red soil erosion from construction sites, agricultural areas, landslides, roads, helicopter landing zones, live-fire training areas and other critically eroding lands continue to be one of Okinawa's most significant environmental issues.



Soil series (above) and predominant vegetation mapping, provide fundamental scientific information useful for land and natural habitat management. These specific maps are from the Marine Corps' Central Training Area.

Specifically in the JWTC, where the natural habitat is vital to training effectiveness, erosion control is critical. Under the guidance of Dr. Ikema, Marine Corps Base Camp S.D. Butler (MCB Butler) continues to be a leader in Okinawa for controlling soil erosion by using advanced three-dimensional (3D) imagery and computer-based erosion modeling to best determine soil erosion control methods. The compilation of vital landscape information, such as land-use, elevation and soil type, can be used to potential erosion models. The use of 3D imagery can then be applied to these erosion hotspots to design construction methods for soil erosion has significantly improved efficiency in manpower; reducing the time to analyze slopes from a few weeks to a few days.

### EROSION CONTROL

The waters around Okinawa sustain more than 340 coral species, three times more than the recorded species



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at the Great Barrier Reef. Dr. Ikema has gone above and beyond to preserve the natural environment through the implementation of innovative soil erosion control methods.

During FY12 and FY13, Dr. Ikema completed more than 20 erosion control projects. These erosion control projects varied in size and location throughout Okinawa and employed different erosion control techniques.

Aerial hydroseeding is a cost-effective and environmentally safe soil erosion control and slope stabilization method in marginally accessible or inaccessible areas. To re-vegetate eroded areas caused by field training and naturally occurring landslides, MCB Butler's aerial hydroseeding program prevents red soil runoff by allowing the rainwater to flow cleanly to the ocean.

As a direct result of our extensive erosion control program, US Marines can continue to use our dynamic training areas for live fire and jungle warfare training. An

alternative to hard-armor erosion control techniques, soil nailing and vegetation mats offer additional natural support to steep slopes. Slope stabilization projects effectively prevent soil runoff from reaching Okinawa's beautiful and sensitive coral reef ecosystems.



Aerial hydroseeding and Soil nailing projects effectively prevent red soil erosion from impacting Okinawa's coral reef ecosystem. Images here are from a soil erosion control project in the Central Training Area.

### CONCLUSIONS

MCB Butler provides unique training environments that are vital to mission readiness. Our Natural Resources Management Program team plays a pivotal role with balancing environmental protection and sustainability with mission requirements. Mr. Sugiyama has incorporated numerous management strategies to protect the sensitive island ecosystems from the threat of invasive species. The development of new invasive management techniques has allowed Mr. Sugiyama to effectively eradicate the cane toad from Camp Kinser. Dr. Ikema has employed cutting edge technology and cost-effective slope stabilization techniques, to reduce red soil erosion from negatively impacting Okinawa's delicate coral reef ecosystem and maintaining the vitality of the training areas in support of the Marine Corps training needs. Through community awareness and collaborative partnerships with prominent Japanese universities, local governments and U.S. agencies, MCB Butler's Natural Resources Management Program has been a cornerstone in improving relations between the people of Okinawa and the Marine Corps.