

US Bases in Australia:

the social and environmental risks

**Friends of the
Earth Australia**



**Independent and
Peaceful Australia
Network**

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1.0 Introduction

1.1 About Friends of the Earth

We are the world's largest grassroots environmental network, uniting 76 national member groups and some 5,000 local activist groups on every continent. With over 2 million members and supporters around the world, we campaign on today's most urgent environmental and social issues. We challenge the current model of economic and corporate globalization, and promote solutions that will help to create environmentally sustainable and socially just societies.

Friends of the Earth (FoE) is a federation of autonomous local groups who are working towards an environmentally sustainable and socially equitable future. Our vision is of a world where everyone's needs are met in a way which safeguards the future of the environment. We campaign for a world where environmental protection, social justice and economic welfare for all people, go hand in hand. Through our

local, national and international networks, we work with the community to communicate, raise awareness, put forward alternatives and take action.

any kind of military activities in the Great Barrier Reef Marine Park and other environmentally sensitive areas should be disallowed; it is not compatible with sustainability, social justice or environmental protection

The alternative we seek to implement is a sustainable society. This involves a reliance on the use of renewable resources which are equitably distributed. It involves the recognition that there is an inextricable link between people and the environment. FoE recognises that organised resistance and action are necessary catalysts for environmental, economic and social change. Such action is essential if we are to achieve a sustainable society based on the equitable distribution of resources and power and recognition of the rights of all people.

FoE sees that pursuing environmental protection is inseparable from broader social justice concerns, and as a result uses an environmental justice perspective in its campaigning. FoE Australia supports indigenous sovereignty and works at both the local level with specific indigenous communities as well as participating in debates and campaigns at the national level. FoE Australia works through our local groups in partnership with indigenous communities including campaigning with the Yorta Yorta people to achieve joint management of the Barmah Millewa forests in Victoria. FoE Australia acts as the secretariat for the Alliance Against Uranium, a forum for indigenous and non-indigenous communities to work together on issues relating to all aspects of the nuclear fuel cycle.

FoE believes in working for a sustainable and empowering future. To this end, many FoE groups are working now to create the type of world we want: one that will be based on healthy communities and healthy ecosystems.

We believe that militarism is not in Australia's national interest, and that military exercises and increasing US military presence in Australia contributes to regional insecurity and threatens our Asian neighbours. We also believe that any kind of military activities in the Great Barrier Reef Marine Park and other environmentally sensitive areas should be disallowed; it is not compatible with sustainability, social justice or environmental protection.

Friends of the Earth believe that social, economic and environmental justice – not militarism - is fundamental to peace. FoE is a founding member of the Independent and Peaceful Australia Network.

2.0 Australian locations used by the US military

Left: Shoalwater Bay Training Area



In 2011 Australian Defence minister Stephen Smith and US Secretary of State Hillary Clinton announced an increase of US forces on Australian soil with the build-up of the Stirling Naval Base in Perth and the stationing of 2500 US troops on permanent rotation in Darwin. Smith denied these would be “bases” as such. The Pentagon report from the Center for Strategic and International Studies says, “the next phase of enhanced access arrangements with Australia” will include the stationing of a nuclear powered aircraft carrier in Perth, infrastructure development on RAAF bases to accommodate US bombers, drone deployment

from the NT and the stationing of US marines on Australian soil. In November 2012 the AUSMIN meeting of the US and Australian ministers announced the beginning of “joint facilities”, or bases, on Australian soil. In 2013 it was announced that the number of US troops stationed in Darwin would now double.

Australia has been hosting US military interests for decades at Pine Gap, which in 2012 expanded its surveillance and satellite communications capacity by the installation of a new radar dome. Pine Gap was strategic in the deployment of bombing missions in the Iraq and Afghanistan wars. Pine Gap is a US base and Australian politicians must request access to it. A new communications base was built in 2008 for US purposes at Geraldton in northern WA and another is mooted for development, North West Cape, also in WA. This recently proposed base is expected to be used for tracking and destroying enemy satellites. All three of these existing bases make Australia a strategic military target.

The US has been holding military exercises with Australia for over 50 years. In recent years, Australia has been involved in US led military activity that has killed flora, fauna and humans, left oil fields burning, exposed civilians to toxic chemicals, left environments radioactive, and destroyed infrastructure vital to maintaining health and welfare of communities.

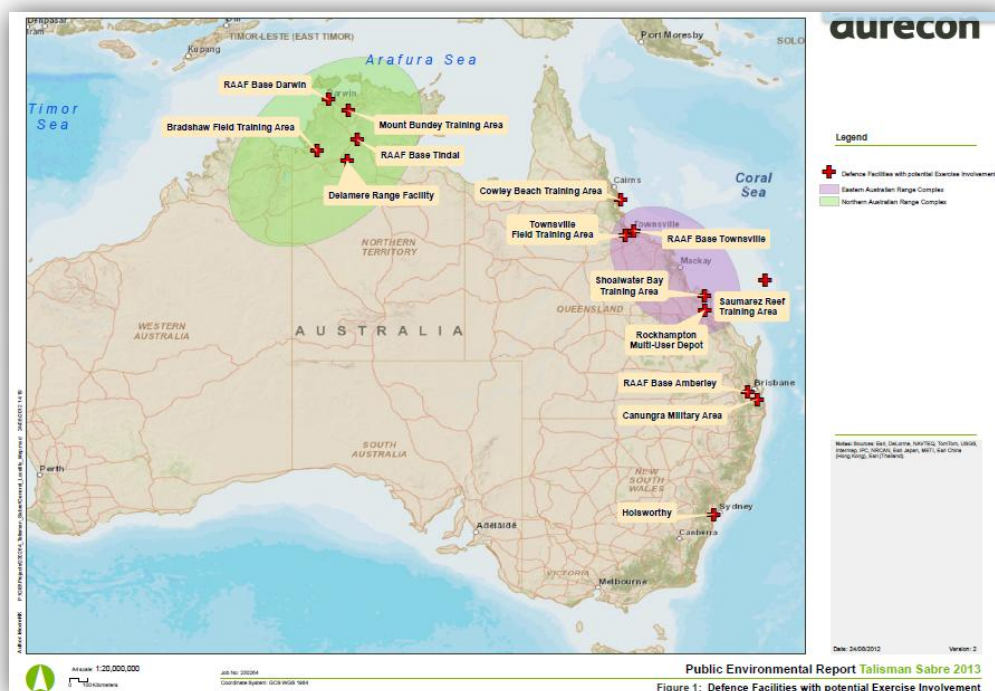
Talisman Saber is a US-led military exercise that takes place every second year: the largest joint and combined military exercises in which Australia engages and some of the world's largest military exercises. Around 30,000 Australian and American personnel are usually involved.

Talisman Saber 2013 is huge in scope, using military and civilian facilities in Queensland, Northern Territory, and New South Wales, including Shoalwater Bay, the Great Barrier Reef Marine Park, Saumarez Reef, the Coral, Arafura and Timor Seas, within the Australian Exclusive Economic Zone and international waters and at various support sites throughout Australia, including Brisbane, Darwin and Townsville. Shoalwater Bay is the centre of the on-the-ground manoeuvres.

Australian ports have been hosting US naval visits on a regular basis. It is widely acknowledged that the core of the US nuclear arsenal is at sea and probably visiting a port near you. It is also likely that that port is entirely unprepared for a nuclear incident and probably not testing for radiation leaks.

Political analyst Richard Tanter points to former Prime Ministers Malcolm Fraser and Paul Keating who have

questioned the inability of Australian governments to recognise the points at which Australia's national interests diverge from those of its major ally... Human interest and global responsibility need to be taken into account. And without the capacity to recognise and act in the national interest, a country with a parliamentary democracy operates under a severe democratic deficit. (2012).



Above: Map released by Aurecon (2012) showing Australian locations affected by Talisman Saber 2013 military exercises

2.1 Robertson Barracks and Shoal Bay, Darwin

On November 12, 2011 Australia and the US announced the permanent stationing of 2000 US marines at Robertson Barracks, at Palmerston, 20kms south of Darwin. It has a capacity to house 4500 troops.

The Robertson Barracks are adjacent to Shoal Bay, an important satellite interception station used by Australian and US military and part of the ECHELON surveillance system and part of the US X-key score program exposed by Edward Snowden and reported to be collecting millions of phone calls each month (NT News 2013).

Shoal Bay is an important bird habitat, identified by BirdLife International as an Important Bird Area with a coastal reserve between the Howard River and Gunn Point. Species include Magpie Goose, Brolgas and Rainbow Pitas. Threatened animals in the area include Northern Quoll, monitor lizards and turtles and many endemic flora species. It also has cultural significance to the Larrakia people.

In 2013 Minister for Defence, Stephen Smith announced an agreement to increase the number of US troops stationed at Robertson from 2014 to 1150, to “deepen... interoperability” of the Australian military with the US forces (Minister for Defence media release, 14 June 2013).

Australian Greens Senator Scott Ludlam asked, on the occasion of US President Barack Obama’s visit to Australia in November 2011:

The November 2011 announcement of the establishment of a US Marine base at Robertson Barracks has left many questions unanswered. Will the base host intelligence services, or is it strictly a training facility? Will military deployments be launched from there? What agreements have been made about its potential expansion? Will weapons and munitions be stored there, and will these include depleted uranium munitions and cluster weapons?

Former Australian Prime Minister Malcolm Fraser has called the decision to station US marines in Darwin is “mistaken” and sends the wrong message to our Asian neighbours and that it does in fact constitute a US base (Flitton 2012).

2.2 Shoalwater Bay Military Training Area

Shoalwater Bay Military Training Area (SWBTA) is located north of Yeppoon on the east coast of Queensland. It is adjacent to the Byfield National Park, the Great Barrier Reef Marine Park and RAMSAR listed Shoalwater and Corio Bay wetlands.

The military of other nations including the US, Singapore and Japan use the SWBTA. It includes over 300km of coastline, mangrove fish breeding habitats, wetlands, sea grass meadows and sub-tropical rainforest.

Over 100 species of note are listed in the military’s own Public Environment Reports. The military recognise this biological diversity.

Shoalwater Bay is the biggest and one of the most environmentally significant parts of the Great Barrier Reef Marine Park although not all of the training area is part of the national park. Shoalwater Bays protected situation and extensive mangrove ecosystem makes it an excellent fish refugia and breeding habitat. The seagrass meadows, on which dugongs totally depend, are also the breeding place for economically important species such as rock lobsters, blue swimmer crab and and



many species of prawns. Other endangered species such as the loggerhead turtle also visit Shoalwater Bay. The reef and other relatively undisturbed marine habitats are already under pressure from global warming and comprise a place of natural heritage that should be preserved at any cost. In November 2006 the British journal Science published a report on the state of the world's fisheries that indicates if we do not protect fish habitats and restrain fishing, fish stocks will collapse by 2048. This area of biological diversity is at risk by military uses.

The 1994 Commonwealth Commission of Inquiry into Shoalwater Bay featured the first in-depth research into the biological values of the area. Melzer, Barry and Kershaw (1993) carried out the first comprehensive floral survey of the training area and identified over 5000 plant species and Arthington (1993) conducted a survey of the freshwater communities of the SWBTA.

Melzer et al noted that the “distribution of flora in the SWBTA have only been partially explored and are not well understood” (p.10). There have been no subsequent floral surveys. Melzer et al note that, contrary to military claims that they have recovered the land from the damage of grazing, that “limited information exists as to the environmental condition of the training area prior to acquisition” (1993 p.104). Melzer et al cited the work of Stanton and Morgan (1977) who before them had noted that the area “had the potential to be a national park of international stature because of its size, scenic qualities and immense biological diversity” (Melzer et al 1994, p.113).

The 1994 report concluded that the SWBTA was

- “a highly significant nature reference site” (p.107)
- “a wide range of habitats...has given rise to a very diverse flora” (p.112)

- “the conservation of such an intact mosaic of vegetation types over a large area is a significant and increasingly rare feature in Australia” (p.112)
- That the Shoalwater Bay training area had higher biodiversity than some World Heritage Areas in terms of the number and type of species (p.112)
- That such areas are “essential for the long term preservation of the regional diversity” (p.113)
- Unique in that it is the place where northern and southern species are found together, “the only key area in which the major features of Region 12 (South Eastern Qld) and Subregion 11d (coastal extensions of the brigalow belt) can be included...(and it) unique” (Stanton and Morgan 1977, in Melzer et al 1994 p.113)
- *“Its importance as a reference area will continue to increase over time with further coastal developments” (p. 114)*
- *“there remains considerable doubt as to the ability to rehabilitate the plant communities to a structure, composition and complexity resembling that which is currently present...(it is of) high conservation value” (p. 114)*
- *“Six vulnerable species, two rare species, two poorly known and one new species were identified during the current (1994) survey” (p.108)*
- *“63 species are at/near their northern limits of distribution in the SWBTA and a further 55 are*



63 species are at / near their northern limits of distribution in Shoalwater Bay and a further 55 are at /near their southern limits of ... This is an unusually high proportion of the total flora to be at individual species limits of distribution and is a reflection of the biogeographic significance of the Shoalwater Bay Training Area

at/near their southern limits of distribution in the SWBTA. This is an unusually high proportion of the total flora to be at individual species limits of distribution and is a reflection of the biogeographic significance of the SWBTA.” (p.108)

The vegetation communities 1994 Melzer report identified numerous vegetation communities. Of note are those that occur in the Dismal Sector where live firing and bombing occurs and both physical damage and contamination from UXOs may be occurring:

- *Dune systems* - foredune vegetation, spinifex grassland, casuarina woodland, low woodland and low heath, eucalyptus woodland (in which were found two new species during this survey), Melaleuca woodlands, notophyll vine forest with palms.

- *Wetlands systems* including – closed sedge scrubs (the dominant feature of the sector). This sedge community forms peat over many generations and is considered “unsurpassed elsewhere in Queensland, possibly Australia” (p.166).
- *Closed forest* that resembles rainforest is found along creek areas in the sector where the tallest species reach 12m. The eucalyptus woodland is the most at risk from fires caused by exercises. This area of biological diversity is at risk by military uses.



Arthington (1993) analysed the effect of military activities on the ecological values of freshwater ecosystems in the SWBTA. Some of the issues found included:

- Soil erosion and sand movement – by road works, vehicle movements and tank manoeuvres – could impact dune (perched) lakes by increasing turbidity, reducing light penetration and reducing algae growth which is a source of food to macrophytes. Arthington noted that in 1993 Trnski et al described some of the freshwater streams flowing into Waterpark Creek (water source for the city of Yeppoon) as “deeply stained” rather than the “white water” expected (Arthington 1993 p.300)
- Trnski (in Arthington 1993) “suggests that any threat to the water supply from the Manifold dunes to the south west or to water quality within this lake will threaten its fish community” (p.301)
- Because of the low nutrient levels of dune lakes, they can be easily impacted by human activities including “urination in or near the water, septic tank seepage, decay of fruit skins and other rubbish, use of soaps and detergents and any behaviour or process that adds nutrients to groundwater” (p302-303). Very low levels of nutrient increase will affect fish species
 - Arthington cites Townley and Fleming (1993) who notes that accidental spills of fuels, oils or other chemicals could affect water quality. The Public Environment Reports for military exercises note that the risk of such accidents as high
 - “The unusual mode of origin of perched dune lakes and their geomorphological features have been stressed in several environmental inquiries, including the 1975 Fraser Island Inquiry (Hicks and Hooney 1975), the Moreton Island Inquiries (Coaldrake 1976, QCC 1977) and the studies leading to the declaration of Coolooloa as a National Park. The great Sandy Region has been declared a World Heritage Area, partly on the basis of its unique geomorphology and well-developed lakes and

there remains considerable doubt as to the ability to rehabilitate the plant communities to a structure, composition and complexity resembling that which is currently present...(it is of) high conservation value

wetlands” (p.307)

- “dune water bodies at Shoalwater Bay should be considered as very significant both regionally and nationally” (p.310)
- At-risk fish species in these unique dune lakes, include Oxleyan Pygmy Perch and the Ornate Rainbowfish
- Arthington found that the earth science values and water body for the SWB dune systems and lake regarding their link to the evolution of Australian flora, importance to understanding Australian natural history, aesthetic values, “the presence of rare, endangered or uncommon flora, fauna, communities, ecosystems, natural landscapes” all rated a “Very High” for conservation
- Arthington predicts, from past ecological surveys, that the SWBTA would yield many as yet unrecognised species if a through survey were conducted of its freshwater systems (p.328)



Many high profile endangered species live in or visit Shoalwater Bay:

Dugong

Shoalwater seagrass meadows form one of the remaining food habitats for the endangered dugong – the use of sonar, turbulence and potential toxic spills put dugong at risk. The dugong is suffering from population decline in many parts of its range.

Dugong are found in greater numbers in Australian waters than anywhere else in the world. Dugong numbers halved in the decade

between 1990 and 2000. There are currently about 4000 dugong in Australian waters, which is where they are concentrated. Shoalwater Bay is important dugong habitat in Queensland due to its large north-facing

aspect, making it an ideal site for seagrass to grow.



The Great Barrier Reef Marine Park Authority note that seagrass decline and subsequent dugong decline after flood events. However, in the Shoalwater Bay area where dugong numbers have declined in recent years, studies since 1995 have shown that there has not been a major loss of seagrass since the 1980s.” Could military activity be the differing factor in Shoalwater dugong decline?

The UN 2002 Report on Dugong recommends that remaining dugong habitats in Australia be protected. Dugong are already under pressure, hence their endangered status, from habitat loss and accidental death by boating collisions and in fishing nets.

In 2003 the US DoD were taken to court by environmentalists in Okinawa, Japan for the expansion plans for the US base there onto a nearby reef which would have threatened the Okinawa dugong population. The US DoD wanted to landfill coral reef and build a military base with 2,600m runway, aircraft hangers, large fuel storage tanks and many other facilities. Only court action and the adverse publicity it occasioned forced them to withdraw. Is this the action of a responsible environmentally sensitive organisation?

Green Sea Turtle

Shoalwater Bay is an absolutely vital breeding habitat for the endangered Green Sea Turtle (right): it has the highest concentration in the world of this declining species; this is their premier breeding habitat. The population of Green Turtles is thought to be declining worldwide.

Turtles are sensitive to sonar emissions undersea and could be susceptible to naval use of sonar in the same way as cetaceans and dugong.

Former US DoD military dump sites in the Pacific are listed as a threat to green sea turtles in the Recovery Plan for US Pacific Populations of the Green Turtle.

Whales

Whales and other cetaceans, (such as humpbacks pictured above), frequent the Coral Sea and Shoalwater Bay where training exercises take place. In 2007 the well-publicised presence of the rare white humpback whale Migaloo during the TS07 games indicates that whale presence is likely to occur. Both the US and Australian vessels use Low Frequency Active Sonar, which are known to cause beachings, brain haemorrhages and ear injuries in cetaceans and whales in particular.

The military commissioned Public Environment Reports use their own assessment tool, which is not based on conventional environmental planning tools. The lack of objectivity in using a military purpose-built assessment tool calls into question its scientific validity.

Nonetheless, the military rate as 'medium to high' the risk of activities they undertake at Shoalwater Bay including aircraft and vessel movements, underwater explosions which could lead to accidents, oil spills and clearing.

Given the danger of global warming to the diverse biota of Queensland, it is important to



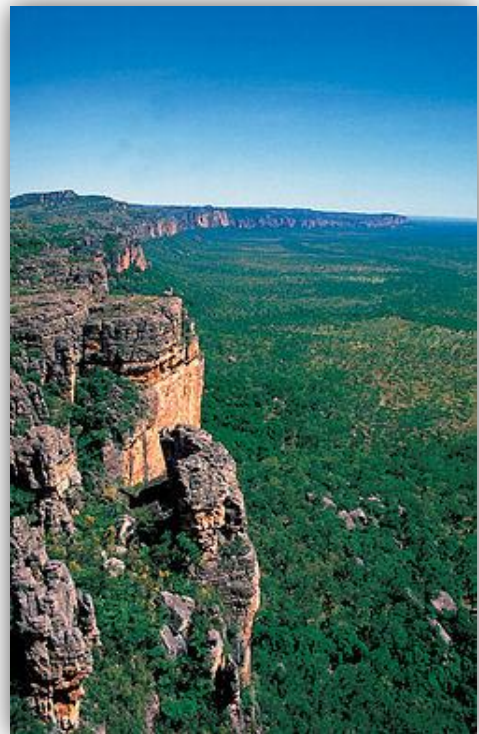
protect places of significance from further risk. Habitat loss is the most significant threat to biodiversity in Queensland, making the protection of the SWB region imperative. We contend that military activities, for the many reasons listed in this document, are not compatible with biodiversity protection. They are particularly not compatible with the SWBTA region due to the number of significant, endangered and vulnerable species living there.

The prevailing opinion of scientists examining Shoalwater Bay seems to indicate that its biodiversity and ecological values make an excellent candidate for World Heritage protection and national park status. The only barrier to this seems to be the presence of the military.

2.3 Mt Bunday Training Area

Mt Bunday Training Area (pictured below) is a 100000ha site located 115km south east of Darwin between the Mary River and Kakadu National Park. It was acquired by the military in 1988 and used for training since 1992.

Tunstall, Orr and Marks (1998) conducted a survey of the vegetation and soil of the MBTA. In 1998 it was used by the ADF about 36 weeks of the year, but this use will increase substantially now that it has been made available to the US military stationed in Darwin (numbering 1150 in 2013, but expected to increase). Of environmental note is the location of the Wildman River catchment (registered on the National Estate for its importance to nearby wetlands), the proximity of Kakadu National Park and the Mary River floodplain (Tunstall, Orr and Marks 1998). High temperatures and humidity for most of the year make it a tropical climate. Monsoonal rain in summer results in flooding, bushfires in winter dry season. Mixed dry woodlands and grasslands characterise the flora, with some small regions of “semi-deciduous monsoon forest” are found in sheltered areas (Tunstall, Orr & Marks 1998).



Aurecon (2012) notes: “Eight EPBC listed threatened species have been recorded on Mount Bunday Training Area, including the Gouldian Finch, Red Goshawk, (eastern) Partridge Pigeon, Masked Owl, Northern Quoll, Goldenbacked Tree-rat, Bare-rumped Sheath-tail Bat; and Freshwater Sawfish... There is one registered and one recorded Indigenous sacred site at Mount Bunday Training Area, with 117 archaeological sites recorded” “Live firing of weapons (gunnery, bombing, missiles and rockets)... Emergency dumping of fuels and jettisoning of stores” are two of the risky possibilities at Mt Bunday.

Since the stationing of US marines in Darwin in 2012 on a permanent basis, it is expected that US-Australian exercises, (Named Gold Eagle) at Mt Bunday will be a regular occurrence.

2.4 Delamere Range Facility & Bradshaw Field Training Area

Delamere

Located 80 nautical miles southwest of RAAF Base Tindal (which itself is 330 kilometres south of Darwin), is the RAAF's principal air weapons range. Delamere is an area of high rainfall during summer, but also on the edge of the dry arid inland region, thus it has a mixture of these vegetation types. It is the catchment area for a number of ephemeral streams and wetlands that are habitat to a number of endangered and threatened including the Gouldian Finch (pictured below), Purple Crowned Fairy Wren (pictured right), Northern Quoll, Sheathtail Bat and Gulf Snapping Turtle which the Department of Defence's Public Environmental Report (2013) lists as a matter of national environmental significance. Credit must be given to the thoroughness with which the Department of Defence has noted these environmental values.



There are no environmental limitations placed on military activities there, except for an Indigenous Land Use Agreement (2011) which gives title to the land to the indigenous people (including the impact area which will be contaminated). However, the land is still occupied by the defence forces, so title is relatively meaningless.

In 2005 the Australian government made an agreement to allow the US to practise long range bombing raids at Delamere, particularly using the B-52 Stratofortress bomber. The US have been bombing Delamere since 1992. The 2010 agreement to station US marines in the Northern Territory has escalated the use of Delamere and other Australian bases by US forces despite claims by the government that such developments do not constitute a "base" and "the United States has not proposed establishing a permanent base in Australia" (Nautilus Institute 2008).

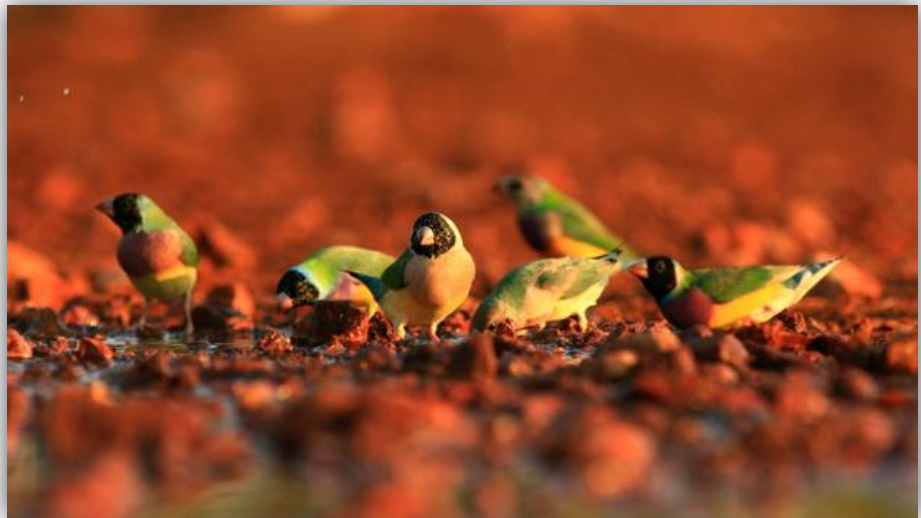
Bradshaw

Bradshaw Field Training Area is located near Timber Creek within the Victoria River region of the Northern Territory, north of the Delamere facility. It is used for live firing and live bombing by Australian and US troops and houses 500 troops at the base. Fuel and maintenance operations add to the potential for environmental damage. Bradshaw is used by the now 1150 US troops stationed in Darwin (Minster for Defence media release, 14 June 2013).

Aurecon notes: “Three habitats within Bradshaw Field Training Area are considered core fauna habitats: rocky slopes and gullies with monsoon forest, streams and riparian habitats associated with rocky hills, and grasslands and swamps. Bradshaw is considered part of a regional environmental corridor linking with Gregory National Park and is part of a broader link to the Kimberley region” (2012 p.102). The Aurecon 2012 report notes that a population of endangered Gouldian Finch (below) is located in the live firing zone at Bradshaw, as well as other endangered species common with Delamere.

A population of the Gouldian Finch is known to be present on the Mt Thymanan and Ikymbon areas in Bradshaw Field Training Area. Known habitat is located within a High Explosive Impact Area

In addition Bradshaw has 10 sites of Australian historic heritage listed on the Register of National Estate relating to early European activities and occupation in the area and Aboriginal sacred sites listed on the National Heritage List and an Indigenous Land Use Agreement exists.



2.5 Townsville Field Training Area

230,000ha of land 50km west of Townsville, the Townsville Field Training Area (TFTA) has been used for military actions since 1967 (Crowe in Barton 1994). The TFTA includes a live firing and impact zone for bombing and firing of missiles, including areas with UXO. It is adjacent to many small farms. The “Dotswood” homestead in the TFTA is on the National Heritage list.

Lieutenant Colonel Peter Crowe says of the early manifestation of the TFTA, the High Range Training Area, that “by the mid 1980s, excessive use of the relatively small...training area was leading to the creation of an environmental embarrassment...exacerbated by the inability to rest the worn areas” and increased rural settlement adjacent (in Barton 1994 pp.16). Grazing and mining have also impacted the TFTA.

The climate and elevation of the TFTA lends itself to high rainfall with savannah woodlands and some rainforest areas on the Paluma range. Biologically important riparian areas characterised by paperbark species, blue gum and casuarina at the Star River and Keelbottom Creek which are permanent rainforest

streams. The Australian Centre for Tropical Freshwater Research in 1991 analysed the high biological diversity of TFTA including 51 mammal and 188 bird species (Pearson in Barton 1994 pp.28).

2.6 Kojarena and North West Cape

Kojarena

Located 30km from Geraldton, Kojarena Defence Satellite ground Station is used by the Australian Defence Force to intercept (spy) on other nations as part of the ECHELON system. In 2007 it was expanded with a second site for the use of the US military (MOU 2007). This expanded function coordinates US military operations in the Middle East and Asia, making this the most significant military encroachment into Australia since signing of the Pine Gap Treaty of 1966. Its capabilities include intercepting all phones on the 3G network.

In 2002 the Daily Telegraph alleged that intercepted conversations between the International Transport Federation, the Maritime Union and the crew of the Tampa helped former PM John Howard formulate his 'children overboard' campaign.

Academic Richard Tanter from the Nautilus Institute summarises the Kojarena ground station:

Under an agreement initiated in 2007, Geraldton figures in the US-Australia partnership in the Wideband Global SATCOM system, which provides Australian access to the principally US-funded constellation of at least seven (and possibly nine) high-capacity global war-fighting communications satellites. Under the agreement, Australia funded the sixth satellite, due to be launched in 2012-13. The first three satellites were launched between 2007 and 2010, and Australia gained operational access by June 2010.

North West Cape Located near Exmouth in WA, the Naval Communication Station Harold E. Holt transmits communications to the US Navy and the Royal Australian Navy with 13 radio towers using Very Low Frequency (image below). Tower Zero is the biggest and most powerful radio tower in the Southern



Hemisphere. The land was leased to the US in 1963. It is operated by Raytheon Australia, a branch of the arms manufacturing corporation.

The electromagnetic radiation emitted by this and other bases like it has been noted in locations where the military operate such facilities, including Sicily, Virginia and Hawaii. Senator Scott Ludlam notes in a 2013 dissenting report that, "North West Cape continues to be of concern to environmentalists due to concerns over the possible ecological impact of very low frequency communications given it is located directly adjacent to Ningaloo Reef, Western Australia's

precious marine sanctuary.” The base is also adjacent to the Cape Range National Park.

In 2008 the surveillance towers were thought responsible for causing interference with autopilot in commercial jet operations that saw a Qantas plane plunge 650ft in seconds (Shears 2008). Diesel and asbestos pollute the site, with the US and Australia yet to agree on who is responsible for the clean-up.

2.7 Pine Gap

Pine Gap (right), 18kms from Alice Springs in the Northern Territory, was established in 1970 has been used by the US for intercepting satellite communications and coordinating military activities in both gulf wars. It is one of three important Australian locations used in US warfare. It houses and employs over 800 people and is the biggest facility in the ECHELON ground station network. Like the WA bases, Pine Gap intercepts telephone calls in addition to its role in directing ballistic missiles and weapons development. Its existence is pivotal to US war making.

Attention has been drawn to the part Pine Gap plays in US wars by several protests and in 2005 six people entered the base, triggering the first ever use of the 1952 *Defence Special Undertakings Act*. They were freed with a fine, however the Commonwealth prosecutor appealed that decision, hoping to make an example to them of Australia’s willingness to prosecute its own citizens to protect US interests.

3.0 Risk factors of military activity

3.1 Pollutants

Practically every activity carried out by the military has the potential to cause pollution. The military acknowledged for the first time in 2010 that live firing can result in contamination and this is given slight coverage in the 2012 AURECON Public Environment Report.

The ADF answered a question on notice from Green Senator Scott Ludlam that, “the quantity of ordnance used during the (Talisman Saber) exercise is not disclosed”, so it is not possible to estimate the real risk that

munitions damage and contamination might pose. However, Pearson and Barton’s 1994 environmental assessments of Australian training areas noted the need to monitor groundwater for metal contamination and the importance of “event sampling” – as events such as floods or exercises can stir up and redistribute contamination. With some Australian military bases and training areas in use for a century, contamination by heavy metals (such as lead, widely used in shell casings in the past) is likely. A true assessment of the pollution risk needs to consider past as well as current activities.



Right: Abrams tanks starting fires at Mount Bunday in 2009. "Each round costs a whopping \$33,000" (Source: NT News).



The M1A2 version of the Abrams tanks is made with depleted uranium (DU) armour, a radioactive source that when struck gives off a fine powder of radioactive material that is inhaled by troops and contaminates the environment. DU has been identified as a source of ongoing ill health in US veterans of the Gulf wars and Bosnia where DU was used extensively in tanks and missiles, causing increased levels of skin diseases, lung conditions and cancers. More than seven years after exposure, veterans exposed to DU were still excreting elevated levels of uranium in their urine (McDiarmid et al 2000).

The ADF have assured us that depleted uranium munitions are not used by Australian forces or in joint exercises. However, because of the claims to 'interoperability' with US forces made by the ADF, it is highly likely that both US and ADF troops are using the same kinds of munitions, within the limits of Australia's obligations to international treaties that ban cluster munitions and the use of depleted uranium munitions. The US, of course, are not signatories to these two treaties.

The 2011 Public Environment Report prepared for the TS11 games states that "US Forces operating in Australia are subject to Australian military and civil environmental regulations, as well as US Military environmental rules and regulations" (AECOM 2010 p8). This claim is disingenuous, as not only is the US military exempt from a raft of US environmental rules, Australia's foremost environmental law, the *Environmental Protection and Biodiversity Conservation Act* (1999) exempts military activities from the rigorous Environmental Impact Assessments (EIA) expected of other activities in protected areas and elsewhere. The US and ADF commission a Public Environment Report prior to each exercise, however these reports hold no legal or regulatory power.

potential for munitions contamination is tacitly recognised by the Defence departments remediation programs in Mulwala (Victoria), Marrangaroo (New South Wales) and Coolumboola (Queensland)

Past by joint military activities have seen the intentional introduction of toxic materials such as red phosphorus marine markers, the release of seawater ballast containing introduced species and the intentional disposal of ship-board waste at sea. Training exercises in Shoalwater Bay have included the accidental loss of grenades, bombs lost at sea, bogged vehicles, the shooting of wildlife and the discovery of skinned animals, oil and chemical spills as reported incidents.

Do munitions pollute?

The military dispute the pollution effects of their exercises. The 2010 Public Environment Report (AECOM 2010) claims that, “Studies of the residues from high explosives has been found that less than 1% of the explosives used remains, with the majority of explosive compounds consumed in the explosion (Hewitt, et al., 2003)” (p.53). In a study by the same lead author quoted by AECOM (2010), Hewitt, Jenkins, Walsh, Walsh & Taylor (2005) point to bias in their study in that, “the dispersion of particles of unconsumed high explosives material is heterogeneous, which makes it difficult to ensure an accurate estimate of the total residue” and that it, “cannot be considered highly accurate” (Hewitt et al 2005, p891).

The Hewitt study also says that blow-in-place detonation, partial detonation and unexploded ordnance (UXO) are greater risks. The study cited only examined RDX and TNT and does not assess the other chemicals and metals used in the production of munitions. Nor does it assess the potential accumulation of years of live firing residues, from year round exercises by the multiple armies that use Australian training areas, even at a minimal “1%” residue.

The Hewitt study cited by AECOM is but one study that by its own admission is not definitive or accurate. It is not representative of the extent of the risk of contamination from the production, use, storage and

long term ranges the soil contamination of TNT could be as high as 14.3%, which “are potentially significant distributed point sources of contamination to groundwater”

disposal of munitions. Latham (2000), Pennington & Brannon (2002), Hewitt, Jenkins, Walsh, Walsh & Taylor (2005), Amato, Alcaro, Corsi, Della Torre, Farchi & Focardi (2006), Rosen & Lotufo (2007), Pennington, Hayes, Yost, Crutcher, Berry, Clarke & Bishop (2008a), Pennington, Silverblatt, Poe, Hayes, & Yost (2008b), Pascoe, Kroeger, Leisle & Feldspausch (2010) and Sanderson, Fauser, Thomsen, Vanninen, Soderstrom, Savin, Khalikov, Hirvonen, Niiranen, Missiaen, Gress, Borodin, Medvedeva, Polyak, Paka, Zhurbas & Feller (2010) are a few of the many studies that have found military contamination from live firing, blow-in-place detonation, military dumping and UXO.

Indeed a study by Clausen, Robb, Curry, and Korte (2003) found that the activities typically carried out on a military range (training area) resulted in the contamination of Camp Edwards, (Mass.) and that the same problems should be expected at other military ranges. Pennington et al (2008b) cite research that indicates in long term ranges the soil contamination of TNT could be as high as 14.3%, which “are potentially significant distributed point sources of contamination to groundwater” (2008 pp.534).

Of particular interest to this critique is a study by Baver (2006) of the contamination legacy of 60 years of US military exercises at Vieques, an island 13 km east of Puerto Rico in the Caribbean. Despite the end of live firing exercises at the Vieques base and the withdrawal of the US military from the island, ill health and environmental contamination continue. Depleted Uranium, perchlorate, RDX, TNT and many heavy metals contaminate the site, that encompasses two thirds of the island, and affect food production, human health and environmental health. Not only did the 60 years of exercises physically destroy mangroves and waterways, and leave physical scars on the countryside, it also left behind TNT, NO₃, NO₂, RDX, Teteryl,

napalm, perchlorate, mercury, lead, PCBs and DU, much of which can never be cleaned up and continue to contaminate and poison. In addition, the traditional fishing grounds have been rendered dead by “ghost nets” ripped by naval ships. Residents have disproportionately high rates of illnesses like cancer, hypertension and liver disease on the island.

The potential for munitions contamination is tacitly recognised by the Defence departments remediation programs in Mulwala (Victoria), Marrangaroo (New South Wales) and Coolumboola (Queensland). At Mulwala soil contamination includes lead, sulphate, nitrate, mercury, and asbestos. A toxic water plume of nitrate, sulphate and ammonia at unsafe levels continues to stream at Mulwala, having taken 40 years to reach its current location. Pollution happening today may take a long time to be detected. At Marrangaroo the clean-up of WW2 mustard gas, phosphorus markers, practice bombs and asbestos located 20 burial sites and was overseen by the UN Chemical Weapons Convention. At Coolumboola the clean-up of mustard gas, phosphorus and high explosives continues and the site was assessed as having a “very high probability” of UXOs. Chromium, copper, nickel and PCBs were detected in groundwater at Coolumboola. It is thought that burial sites of munitions and UXOs are still to be detected there. There are 1223 sites with UXO in Australia, affecting nearly 600,000 properties.

Ballast Water

Ballast is a known mechanism for the transfer of exotic species into Australian waters. This risk is not peculiar to military vessels however, but it compounds the number of risks being introduced by the presence of US vessels in environmentally sensitive areas.

Sea dumping of shipboard waste

After TS05 games, shipboard generated domestic waste was found washed ashore on the Sunshine coast at Mudjimba and on the Sunshine Coast. Apparently it is the policy of the US navy to dispose of their waste in this manner, and the bag was accompanied by a letter that verified this policy. The waste included plastic

debris and paper. In January 2006, a US nuclear powered aircraft carrier, the USS Ronald Reagan which visited Australia on its maiden voyage, was found to have left a trail of rubbish in Moreton Bay during a short visit to the port of Brisbane.



Dolphin alleged to have been poisoned by dumped munitions. Source: Marine Mammal Stranding Center, New Jersey

Entanglement in marine debris can restrict an animal’s movement, causing starvation, bodily infections, the amputation of limbs and drowning. The Australian Department of Environment and Heritage lists the Green Turtle as one species particularly vulnerable to

the dangers of marine debris. Harmful marine debris has been listed as a key threatening process under the Environmental Protection and Biodiversity Conservation Act 1999. Disposing of plastics at sea is totally prohibited by the International Convention. Despite this, the EPBCA excludes “marine debris resulting from the legal disposal of garbage at sea”, which we presume includes the U.S Navy.

Sea dumping of munitions

The US Army now admits that it secretly dumped millions of kilos of nerve and mustard agents into the sea, along with 400,000 chemical-filled bombs, land mines and rockets and more than 500 tons of radioactive waste – either tossed overboard or packed into the holds of scuttled ships. Records of the locations of the alleged 26 sea dump sites are scanty.

Both the ADF and the US DoD have dumped chemical weapons and radioactive ships at sea up until the 1970s. The Clean Ocean Action group claim that “When mustard gas is exposed to seawater, it forms a concentrated gel that lasts for at least five years, killing or contaminating sea life. When released in the ocean, nerve agent lasts up to six weeks, killing every organism it touches before breaking down into its non-lethal chemical components.” (2006).

3.1.1 Perchlorate

Perchlorate, the primary ingredient in rocket fuel, is the chemical causing the most concern worldwide with regards to the US DoD's operations. It has been found contaminating groundwater in 42 US states as a result of its use at rocket test sites, military bases, and perchlorate-production plants. It has been linked to thyroid problems, birth defects and newborn development. A recent study has found perchlorate is even contaminating the US food supply and that 'safe' level standards are inadequate.



The source of perchlorate anion in drinking water supplies is primarily associated with releases of by defence contractors, military operations, and aerospace programs. Ammonium perchlorate is used as a solid oxidant in missile and rocket propulsion systems. It is readily dissolved in water and “very persistent in the environment due to the high activation energy associated with its reduction” (Urbansky 2002 pp. 188). It is an endocrine disruptor that can affect thyroid gland functions, where it inhibits the uptake of iodide and lowers thyroid hormone production (Muhki et al 2004). The resulting hypothyroidism can lead to goitre, but is associated with a decrease in metabolism, inflammation and cancer.

Perchlorate concentrations may accumulate in the food chain and it is readily spread in rain (Martinalango et al 2006, Theodorakis et al 2005). Theodorakis et al (2005) found that bioaccumulation in fish led to levels 4 times that in the water. It is also passed on to infants via breast milk where it could cause developmental effects dependant on thyroid hormones including: increased toxicant sensitivity, hearing, reading and language deficits, gross motor skill deficits, memory and learning impairment, and increased hyperactivity and impulsiveness especially if the fetus is exposed in the first 12 weeks (Kirk 2006). Because of the many possible sources of perchlorate exposure (water, food, dairy and breast milk), Kirk found the current US drinking water standard of 24.5 ppb inadequate.

In seaside areas (such as SWBTA) perchlorate can contaminate sea grass and sea weed. Martinelango et al (2006) found contamination in 11 species of seaweed in waters also contaminated by military release of perchlorate off the coast of Northeastern Maine. The contamination was highest in Laminaria digitata, a species commonly used in kelp tablet iodine supplements.



The environmental fate of munitions chemicals

In Martinelango's study the highest seawater concentrations of perchlorate, at Seadrift and Corpus Christi in Texas, San Diego in California and Nantucket in Maine are located in places with extensive military installations. Groundwater contamination was also an issue in those areas.

- 100 years of US military use of sites at Camp Edwards, Cape Cod, Mass. Has resulted between 140-300µg/L perchlorate groundwater contamination (as well as significant levels of TNT, RDX, HMX, Tetra benzene and toluene compounds) (LeBlanc and Vrobesky 2008 pp.9).
- Some of the very worst perchlorate pollution in the US has been on the sites of munitions manufacturers. For example, Aerojet rocket manufacturing tested at a maximum level of 640,000ppb, with 260ppb in the local water supply for Rancho Cordova. This should be of concern to Australian sites where these activities are currently carried out.

3.1.2 Other Contaminants

Explosive and munitions chemicals can affect the health of plants, animals and the ecosystem. Many are carcinogenic, mutagenic or acutely toxic. Many are resistant to degradation and bioaccumulate. They can be ingested via air, food, water or skin contact. Incomplete detonation of munitions and unexploded ordnance are a source of pollution in military lands worldwide. About 16 million hectares of US military land is estimated to be so contaminated.

- **White Phosphorus** is a particularly cruel form of weapon that not only burns the skin of people it touches (like napalm), it also poisons them. However, it is not proscribed by the international community. Human Rights Watch says, "White phosphorus munitions cause particularly severe injuries, including chemical burns down to the bone. Wounds contaminated by white phosphorus can reignite days later when bandages are removed, produce poisoning that leads to organ failure and death, and lead to lifetime health problems" (Goose & Docherty 2012). The military claim it is used to illuminate targets, but it also creates indiscriminate human casualties while it does so. In 2011 a coalition of human rights groups failed to get the Fourth Review conference on conventional Weapons to agree to ban incendiary weapons including white phosphorus. Red and White Phosphorus are used for marine markers and incendiary bombs, white phosphorus has been used in the making of napalm.



Left: White phosphorus falls on a town in Afghanistan 2009

White Phosphorus was found responsible for the contamination of the estuarine environment at Eagle River Flats near Fort Richardson base, Alaska, U.S.A. The fishing grounds of local Alaskans were destroyed and thousands of water birds killed, "every year for almost two decades" according to the Military Toxic Project. They also say UXO (unexploded ordnance) "may exist in, on, and/or under up to 2 million acres of lands and waters outside the current boundaries of the base."

An eyewitness account by a local fisherman indicates that white phosphorus has been used at SWBTA. Phosphorus marine markers are reputed to have washed ashore in Yeppoon near the SWBTA on two occasions in the months after the TS05 games. The marine markers were reported in the media to be red phosphorus, MK58 type. Eyewitnesses say the ADF was slow to respond to the presence of the unexploded marker in a populated area. However, there was a fast response from the PR department, which led to misinformation being told the media, who reported the marker disposed of prematurely. The presence of potentially explosive and dangerous military equipment on a populated beach is intolerable to the local population and presents a clear risk, especially to vehicles that drive on that beach. The marker incidents also increase the mental stress to people living in the area.

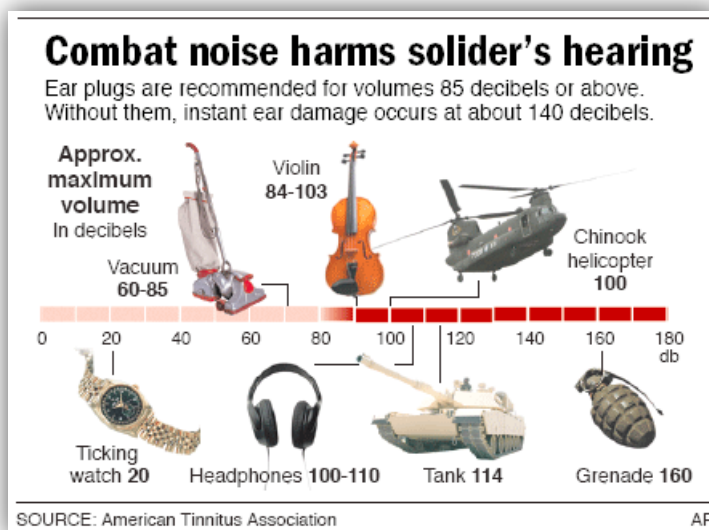
- **TNT** (trinitrotoluene) is another commonly used explosive that is toxic, used in bombs and gunpowder. In one US base in Cheatam, Virginia, TNT contamination is largely responsible for the pollution of the entire food chain of the York River, and rendered local crabs, fish and oysters inedible. The US Navy, who owned that site since 1942, denied the problem for some years, although they banned military personnel from swimming there. It is not yet remediated. TNT can persist in the environment for decades, it breaks down into a nitroammonium compound that is highly toxic to animals, plants and microorganisms. Humans exposed to TNT in groundwater may experience anaemia, liver problems and possibly cancer. Penetration of nitroaromatic compounds through the skin is a major concern for the military because of their ability to rapidly penetrate the skin. Exposures at or below 0.5 mg/m³ have been reported to cause destruction of red blood cells. Deaths from anaemia and hepatitis were reported in TNT workers prior to the 1950s.
- **RDX** (Royal Demolition Explosive or 1,3,5-hexahydro-1,3,5-trinitrotriazine) is another explosive compound, used in almost all military explosive compounds. Areas polluted with TNT are also polluted with RDX in US military sites. RDX is carcinogenic, toxic to all life and degrades slowly and leaches into groundwater. Human poisoning is similar to that of TNT: anaemia, hepatitis and central nervous system affects.
- **Mercury** used in lubricating oils used in military equipment. Mercury is toxic to plants, animals and humans. It bioaccumulates in the muscles of animals and can lead to poisoning of higher order predators and humans.
- **Lead** was widely used in bullet casings worldwide and still used in the US and Australia. Inorganic lead is found in storage batteries, bullets, munitions primers, soft metal alloys (solder), lubricants, structural paints (especially marine and bridge applications, but also older residential paints); cable and wire insulation covering, plumbing, and solder. Historical pollution of lead casings will still exist in live-firing areas.
- **Depleted Uranium** DU is used in the construction of Abrams tanks as well as tank-penetrating missiles and 'bunker busters'. DU is responsible for an epidemic of birth defects in the former theatres of war in Iraq and Afghanistan due to extensive use by the US in Gulf War I and II.

While the Australian military deny possessing any DU and say that the US will not use it in training here, Australia has purchased DU rounds in the past according to Hansard.

- **Plutonium, Beryllium, Tritium and other nuclear products** While not expected to be a problem on Australian soils, plutonium contamination from US military activities is an ongoing problem in the US. 5000 gallons (litres) of plutonium amongst other contaminants leached into the soil at the Rocky Flats site where nuclear weapon parts were manufactured by the US government between 1952-1992. It continues to pose a risk to environment and health via groundwater and surface water. Careless storage and disposal has led to hundreds of leaking drums, pipelines, underground storage tanks, landfills and contaminated buildings. Plutonium is not excreted from the body and leads to cancers. While the surface was cleaned up (soil removed to Idaho and New Mexico), the contamination below 1m and in groundwater remains.
- **Practice ammunition**, sometimes called 'green' munitions, practice munitions are by no means environmentally benign. They use the same kinds of metal casings as real ammunition and still require toxic propellants to be fired. Practice munitions can contain antimony, barium, lead, magnesium, red and white phosphorus and a number of other incendiary compounds that can contaminate. Practice bombs are still capable of causing considerable physical damage on impact.
- **Synergistic effects** Exposure to one or more pollutants can lead to Multiple Chemical Sensitivity. The Weston report (1997) found many other pollutants that exceeded safe levels at Clark Air Base in the Philippines including: Aldrin, Dieldrin, Petroleum hydrocarbons, Lead, Polychlorinated Hydrocarbons(PCBs), Lindane, Hexachlorobenzene.

3.2 Noise

Noise is a risk factor to troops, private citizens and fauna alike. The noise generated at take-off of military aircraft from Rockhampton has been measured at 97 decibels inside houses two kilometres from the airport. Noise levels of 30 decibels interfere with sleep, 50 decibels will interrupt conversations, and prolonged exposure to 85 decibels can cause hearing damage.



The military recognise the risk of "psychological harm to marine fauna" (AECOM 2010 p.61) is of concern to the military. This disingenuous claim is contradicted by the practice of undersea detonation and the use of sonar during military exercises. The military admit

that marine animals will have to be moved away, however the report does not detail how this will be achieved. Shoalwater Bay is particularly affected by these practices due to the presence of endangered sea life including dugongs and green sea turtles.

On 19th October 2010 Senator Scott Ludlam asked military personnel and The Great Barrier Reef Marine Park Authority in parliament to explain how dugong and other species would be protected from this activity. GBRMPA representative Dr Reichelt told him that “The military are required to do an extensive clearing operation of wildlife”, literally ushering or scaring them out of the area. The GBRMA representative had no idea whether or how smaller species could be protected from underwater detonations, but he considered the 2 hectare area in question “a small area”.

3.3 Physical damage

Physical damage to the earth always accompanies military activities. War is perhaps the most catastrophic physical damage the environment can undergo, but bases and training areas are also sources of environmental degradation.

Many conflicts have been characterised by military strategies that included the destruction of resources in a “scorched earth” policy. During the Vietnam war over 40% of the land was sprayed with defoliants, combined with bombing and tank incursions on steep terrain which took decades to recover (Demarais et al, 1999). A 227kg bomb can create a hole 14m in diameter, 9m deep. Vietnam is still pock-marked with such craters. Two gulf wars have eradicated or contaminated much of the natural resources of Afghanistan and Iraq, where oil wells were deliberately targeted by both sides.

Training areas seek to imitate the natural conditions of war. Tracked vehicles cause devastating erosion. Demarais et al (1999) described the effect of two years of tank manoeuvres at Fort Carson (Colorado), where 40% of the land surface had been impacted after just six training rotations. Impacts on soil and flora impact burrowing and ground dwelling animals and may change community composition. Soil structure can be disturbed to the extent that erosion potential by other means (wind and rain) is exacerbated. Wind



erosion was a problem in Afghanistan after the Gulf War as a result of vehicles and bombing distributing other contaminants, such as depleted uranium and heavy metals, over a wide area increasing their potential to “enter the food web” (Demarais et al 1999 pp.388). Soil compaction is an effect of tank manoeuvres, especially on damp soil (Demarais et al 1999).

Left: Ground Zero of target area on Townshend Island, SWBTA (Tunstall & Marks 1997)

Demarais et al lists the training related physical damage to the environment at SWBTA:

...engineering activities, movements of tracked vehicles and fire...construction of tank traps and other earthworks, sandbag and timber constructions, vegetation clearing, felling trees for obstacles, barbed wire emplacements and road demolition. Vehicle traffic results in soil compaction and denudation. Lands adjacent to major camps and defensive positions are typically cleared of woody vegetation using bulldozers and hand tools. Manoeuvres by tanks...result in crushing vegetation, soil compaction, and soil displacement...Additional damage results from camp sites, tracked vehicles, bombing, naval demolition and timber harvest. (Demarais et al 1999 pp. 390).

Demarais et al (1999) also note that the frequency of fires has increased as a result of training activities, and could have “detrimental effects” on the vegetation succession stage (favouring more common species over those rarer late-succession species).

In a 1997 Department of Defence funded study, Tunstall and Marks assessed the “off-road” impacts of the US-Australian Joint Exercises Tandem Thrust '97 exercises at Shoalwater Bay. The need for development of an adequate way to measure impacts was highlighted by this study, because of the increased impacts expected from “an exercise under foreign control in a World Heritage listed waters and on Australian Heritage Listed land” (Tunstall & Marks 1997 p.2).

The areas impacted will change across exercise scenarios and thus can't be predicted. Tunstall & Marks found, “Measurement of every impact impracticable” due to the size of the area. However, some common damage patterns detected included “a corridor 500m either side” of roads (1997 p4), Tunstall & Marks admit that the accuracy of their measures was decreased by the actual implementation of their study being delayed by military approval and lacking time to purchase necessary hardware or distribute the proforma they developed.

Tunstall & Marks noted that “few of the bombs landed on the cleared parts of the targets, thereby unnecessarily extending the area of impact, and making difficult the location of Unexploded Ordnance (UXO)” (1997 p.6). The problem of UXO as a source of risk and contamination is noted elsewhere in this report. Bombs were a significant source of physical damage to the SWBTA during TT97:

Ground detonation of 500lb bombs produced a crater 1m deep and 4m wide...with shell fragments damaging surrounding trees (and) soil disturbance...in a circle of around 15m diameter (Tunstall & Marks 1997 p.6).

Right: Impact of multiple 2000lb bombs on Townshend Island SWBTA (Tunstall & Marks 1997)



While they recorded off road impacts as “insignificant” in this study, it should be noted that only physically obvious damage that was accessible to them was included in the study. TT97 included the participation of 21,000 troops, while Talisman Saber exercises since 2005 have included up to 30,000 troops, the construction of more infrastructure in 2008 (to mimic a gulf-war village theatre of war) and has included ship to shore bombing runs. During TS97 an 8000 tonne warship was sunk offshore for use as target practice, and at least one emu was shot on purpose by troops.

An eyewitness account by local fisherman Ronny Toon, who has worked in the Shoalwater Bay area of over 20 years, indicates that he has seen extensive damage to mangroves which he attributes to the use of white phosphorus, used for signalling, screening, and incendiary purposes. He was told, upon inquiry, by then Senator Robert Hill that the damage was due to drought, an assessment seemingly not based on an understanding of mangrove ecology (Toon 2007, personal communication).

The military consider the risk of aircraft crashes as very low. However, accidents do happen. In January 2006 the USS Ronald Reagan, visited the port of Brisbane. On their return journey from participation in manoeuvres in Australian waters a US FA-18 Hornet strike fighter plane crashed in the ocean 200km SE of Brisbane. No attempt was made to retrieve the \$37m aircraft and the public was not made aware of the potential environmental contaminants contained within that ship. During the TS07.

Barton’s 1994 assessment of TFTA claims that, “defence force training personnel also believe that, in some cases, good training practices and good environmental practices coincide” (p.3). However Cannon (in Barton 1994) says that “the land may take a long time to recover from the impact of military use” (p.3)

While the military often claim that military use has saved some areas from the damage caused by grazing, expert participants at a 1994 workshop examining the TFTA agreed that “grazing combined with military activities was likely to result in considerable degradation” (Barton 1994 p.7).

3.4 Use of sonar

Active and passive sonar are used by submarines. Mid to Low Frequency Sonar is associated with whale beaching, brain haemorrhaging in cetaceans and disruption to the breeding cycle of many species.

Prior to the 2001 Tandem Thrust exercises, Pat O’Brien, spokesperson for the Wildlife Protection Association of Australia asked: "Will the US Navy or the ADF be using or testing in Australian waters experimental low frequency sonar technology... We understand that this program involves the use of technology similar to a type

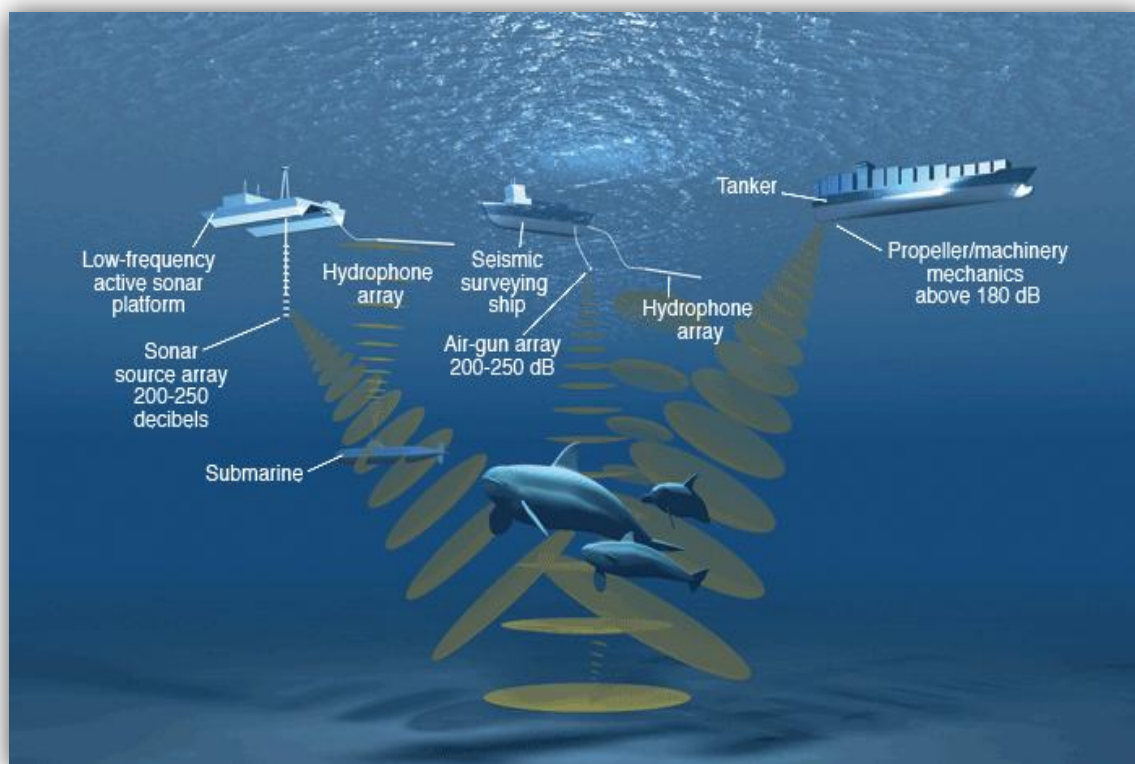


that has previously been linked to the stranding of sperm whales, sea turtles, and other endangered marine species." In response the military at first said that low-frequency sonar would not be used but in a later reply admitted it will be "limiting the use of low-frequency sonar to water depths greater than 40m".

The military claims that, "Australia and the US are committed to environmental stewardship and take the need to protect marine mammals from the effects of underwater sound sources very seriously" (AECOM p10). This is simply untrue: the US Navy has exemptions from acts that protect endangered species, including whales, to allow their use of sonar.

Dr Marsh Green, at the Ocean Mammal Institute says that, "low-frequency (LFAS) and mid frequency sonar can have a source level of 240 dB, one trillion times louder than sounds whales have been shown to avoid"

In 2008, US environment groups took the US Navy to the Supreme Court to stop them using sonar during the TS07 games in Hawaii, saying, "intense sound waves can harm or even kill 37 species of marine mammals, including sea lions and endangered blue whales, by interfering with their ability to navigate and communicate" (New Scientist, Nov 12, 2008). The Navy won, although two high court judges made statements of opposition to the decision: "In her written dissent, Justice Ginsburg cited the substantial and irreparable harm to marine mammals, saying sonar has been linked to mass strandings and haemorrhaging around the brain and ears" (New Scientist Nov 12, 2008).



Above: Sound bombardments affecting whales (Source: Spectrum.ieee.org)

The impact of even a small risk would be great if it affected even one member of an endangered species totalling in the hundreds, such as Right Whales and Grey Whales (IWC 2010). In reality, unless an affected animal washes up on shore somewhere, it is unlikely that the military can guarantee that they have not killed cetaceans, or that their use of sonar has not non-lethally injured the many creatures that live in the Coral Sea and the Great Barrier Reef Marine Park.

Public Environment Report assessments of risk reduction measures regarding sonar are inadequate given the nature of active sonar and its ability to travel great distances undersea. In recent years the US Navy has developed LFS that operates at lower frequencies and travels further (SURTASS-LFS). The proposal

Military claims that they are, “committed to environmental stewardship and take the need to protect marine mammals from the effects of underwater sound sources very seriously” is simply untrue: the U.S. Navy has exemptions from acts that protect endangered species, including whales, to allow their use of sonar

regarding active sonar to suspend sonar transmissions if whale is sighted is inadequate given the extensive distances that sonar can travel undersea.

Importantly for the SWBTA is the use of active sonar in the oceans near the bay. Sonar is known to effect cetaceans, and dugongs also respond to sonar. Sonar is believed to be responsible for the deaths of whales and dolphins worldwide, the loud noises frightening the animals, causing brain haemorrhages and 'the bends'.

The American Cetacean Society (ACS) says, “The US Navy, in developing and testing its SURTASS-LFA (Surveillance Towed-Array Sensor System - Low-Frequency Active, called "LFA" for short) sonar system, was caught bypassing domestic

environmental laws and taken to court by environmental groups”. ACS says the US Navy has the capacity to ensonify 80% of the world's oceans. Dr Marsha Green, for the Ocean Mammal Institute says that, “low-frequency (LFAS) and mid-frequency can have a source level of 240 dB, which is one trillion times louder than the sounds whales have been shown to avoid” (Green 2001).

The Great Barrier Reef Marine Park Authority cite, “detonations of explosives, the use of live munitions and the use of active sonar and other acoustic devices” as threats to marine life in the area.

Sonar and ocean noise has also been found to affect fish, injuring or killing them by vibrating their swim bladders, reducing catches and affecting the viability of eggs.

The risk sonar poses is acknowledged. Once again, the precautionary principle should apply and the use of sonar should be ceased. The proposal to suspend sonar use if a whale is sited within 1,000-4000 yards from a ship is, therefore, inadequate for the protection of the animals and these environments.

3.5 Nuclear risks

It is common knowledge that the US has a significant nuclear arsenal at sea; Australia can refuse to allow entry to nuclear-capable vessels and to train with them.

Training with a nuclear-capable military, using its nuclear-capable systems, is training for nuclear war, whether or not the existence of the warheads is confirmed. There have been numerous accidents and sinkings of nuclear submarines worldwide, including non-destructive accidents with US nuclear submarines.

Understanding that “for security reasons, it has been the long-standing policy of the United States Government to never confirm or deny the presence of nuclear weapons on board their ships.” (p58), we are alarmed at the potential firepower and political implications of training with the military equipment listed in the PER.

The list of weapons and equipment that “may be utilised during TS13” (AURECON 2012 p.13) leaves no doubt that Talisman Saber 2013 will leave Australia at risk of being perceived as “saber rattling” in the Pacific. The long list includes:

- Ohio Class submarines** nuclear-powered submarines used by the United States Navy. They are armed with nuclear warheads and Tomahawk cruise missiles.
http://en.wikipedia.org/wiki/Ohio-class_submarine

http://en.wikipedia.org/wiki/Ohio-class_submarine
 - Los Angeles Class Submarine** a nuclear-powered fast attack submarine that forms the backbone of the U.S. Navy's submarine force...carry 25 torpedo-tube-launched weapons and all boats of the class are capable of launching Tomahawk cruise missiles.
http://en.wikipedia.org/wiki/Los_Angeles_class_submarine Los Angeles class submarine
 - Nimitz-class aircraft carrier** there are ten of these supercarriers in service with the United States Navy. 333 m long they are the largest ships in the world. Carries 90 aircraft primarily F/A-18E/F Super Hornets and F/A-18C Hornets. In addition to their aircraft, the vessels carry short-range defensive weaponry for anti-aircraft warfare and missile defense.
http://en.wikipedia.org/wiki/Nimitz-class_aircraft_carrier
- M1A1 Abrams tanks** Both the Australian and US forces possess M1A1 Abrams tanks and these are listed under both countries' potential inventory. American Abrams tanks are DU armoured, meaning they are encased with a mesh made of Depleted Uranium (DU), or Uranium 238 a toxic and radioactive heavy metal, which can put human health and the environment at risk. While exercise Public environment Reports states that no DU munitions are to be used in Talisman Saber, it would be misleading to suggest that DU itself will not be present if US Abrams tanks are used, Defence must clarify if American DU armoured Abrams tanks will be used.
- Ticonderoga class cruiser** These guided missile cruisers are multi-role warships. They launch Tomahawk cruise. Its LAMPS III helicopter support and sonar allow it to perform anti-submarine missions. Ticonderoga class ships are designed to be elements of carrier battle groups, amphibious assault groups, as well as performing missions such as interdiction or escort.

http://en.wikipedia.org/wiki/Ticonderoga_class_cruiser

Boeing F/A-18E/F Super Hornet and F/A-18F Twin-engine carrier-based fighter aircraft. The Super Hornet has an internal 20 mm gun and can carry air-to-air missiles and air-to-surface weapons. The Royal Australian Air Force (RAAF), which has operated the F/A-18A as its main fighter since 1984, ordered the F/A-18F in 2007 to replace its aging F-111 fleet. RAAF Super Hornets entered service in December 2010. http://en.wikipedia.org/wiki/Boeing_F/A-18E/F_Super_Hornet

A larger nuclear-based accident could be catastrophic for humans and wildlife alike – it is our understanding that no nuclear preparedness has been considered specifically for Talisman Saber, nor is Talisman Saber deemed a “nuclear action” by the Environmental Protection and Biodiversity Conservation Act (1999). While agreements and regulations for nuclear ship visits are in place, the fact that these visits and activities do not trigger required assessment under the EPBC means that the EPBC is fundamentally flawed.

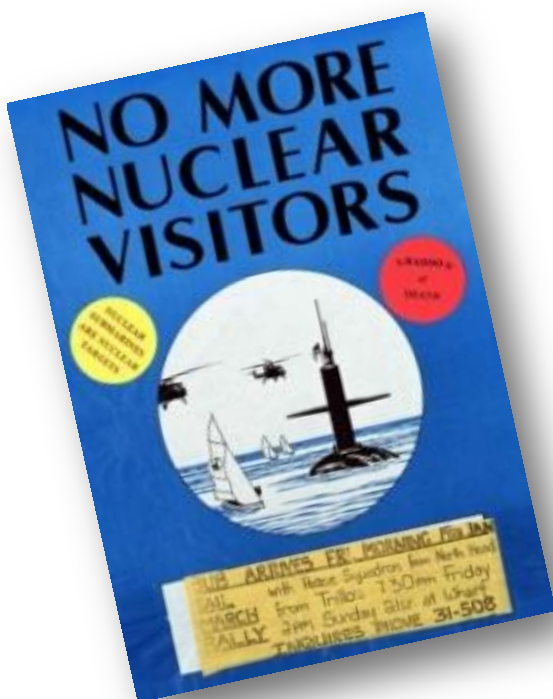
In Tokyo, Japan 2006 radiation was detected in the waters around nuclear powered submarine, the US Honolulu. The US navy continues to deny this and maintains they have a good record. Some Japanese ports see the risk of nuclear accident from visiting US warships so great that they hold nuclear leak drills to test their preparedness.

In 1989, the Senate Standing committee on Foreign Affairs Defence and Trade inquiry into nuclear powered ships visiting Australia found that risk assessment based on past record of accidents could not be used as a predictor of future accidents. This calls for the precautionary principle to be applied: the risk is real - the lack of past accidents does not rule out a future accident.

Right: Visits from US nuclear warships banned by New Zealand in 1987.

There have been at least 10 serious peacetime accidents involving US nuclear submarines on the public record. As recently as March 2005 a US nuclear submarine was involved in an undersea crash that killed crew members. A witness to the 1989 Senate inquiry found that the paucity of reported accidents involving nuclear submarines was probably due to, “tight secrecy surrounding sensitive military information” and “it

would take blind faith to believe that disaster and near disasters as yet undisclosed, had not occurred in NPW reactors”. In fact, media outlets site incidents in the many hundreds.



3.6 Human health and safety

3.6.1 Noise

Exposure to high frequency sounds came from weapons, vehicles and jet engines. A single exposure of, “impulse noise with peak levels exceeding approximately 140 dB SPL” can cause deafness or progressive hearing loss (Humes et al 2006, p4). Some sources of high levels of noise that exceed 140 dB include: pistols, machine guns, grenades, anti-tank missiles, howitzers, rocket launchers, (Humes et al 2006, p81). Lower levels of noise from vehicles and aircraft (helicopters, tanks, personal carriers etc.) can cause damage from prolonged exposure, sometimes over years. Other military-related factors that can contribute to hearing loss include head injuries, whole body vibrations and chemical exposures.

This level of exposure is also a risk to citizens living adjacent to military facilities. Noise and vibrations have been a risk and ongoing nuisance in many places where US bases are sited.

The local communities can draw some comfort from the claim that “Shoalwater Bay Training Area Standing Orders specify that flying directly over the Byfield, Stockyard Point and Marlborough communities be avoided and restrictions from flying over sensitive fauna areas noted as Pelicans Rock, Kenss Island and Bay Island” However, during past TS games this edict has not been followed and military representatives have been less than understanding of the needs of the local community regarding noise, telling them that, “they should live near a base” and that there is “no sympathy” for them (Bishopric 2007, personal communication).

A single exposure of, “impulse noise with peak levels exceeding approximately 140 dB SPL” can cause deafness or progressive hearing loss

3.6.2 Sexual assault

Incidents of sexual and interpersonal violence are a problem within the troops and in the civilian community where troops are stationed. The US Department of Defense estimates about 19,000 sexual assaults within the military per year. A 2005 inquiry found that “harassment recorded by cadets and midshipmen include using derogatory terms for female cadets and midshipmen; making offensive gestures; continuing to ask for dates or sex after repeatedly being told no; offering to trade a professional favour, such as a good evaluation, for sexual acts; and retaliating against women for refusing sex or dates” (DoD 2005 p.21). Research indicates that rapes and sexual are more often than not, unreported. The US Department of Veteran Affairs says only 20% of women report; other studies have found even less report. Thus these figures could easily be ten times larger.



Anecdotal reports indicate that there is a significant increase in sexual assaults, drink spiking, crime and public drunkenness in the area where troops participating in the Talisman Saber war games recreate. Despite the anecdotal reports, a 2012 report commission by the Department of defence found that there was a “moderate” risk of sexual assault of civilians as a result of US military presence in their community and devote just two paragraphs to the issue (Noetic Solutions p.20).

Substantially more effort should be made to protect women and to reign in the behaviour of troops. We should not be exposing women to this kind of threat.

In 2011 the ADF claimed that there is no evidence that sexual assault is a problem in the presence of US and Australian troops participating in military exercises in the Shoalwater Bay and Robertson barracks regions (Rockhampton, Yeppoon, Darwin). However, the statistics of sexual assaults within the ADF and the US military suggest otherwise. They do not acknowledge this risk and there is no mechanism to have this risk publicly acknowledged or acted upon.

BaseWatch, a community group opposing US forces in Darwin note that:

Foremost among our concerns is any social impact on our city. Recently, a report labelled as a ‘social impact assessment’ of the first tranche of 250 Marines identified sexual assault as one of only two associated hazards with a significant risk rating. BaseWatch are aware of a small but significant number of incidents of sexual assault, and other crimes, committed by US service people on R&R here in Darwin. We’re aware of similar experiences elsewhere around the country, and at US bases around the world, particularly the litany of sexual assaults in Okinawa, including a very recent case of rape... including one incident where it has been suggested that deficiencies of the SOFA contributed to a total failure of perpetrators of gang rape facing any legal consequence. (BaseWatch 2013).

The data suggests that one US service member is sexually assaulted every 20 minutes and that one American citizen is sexually assaulted every two minutes (Zengerle 2013)

3.6.3 Other public risks

The military, even in peace time, pose a significant risk to civilians living near them.

At Shoalwater Bay local residents are concerned about potential groundwater pollution from explosives in the water catchment for Waterpark Creek, part of the water source for the town of Yeppoon. The drinking water of Yeppoon may be endangered by weapons use in the Dismal sector, as it forms part of the water catchment for the town and runs into Waterpark Creek. There are grounds for concern. Perchlorate, for example, commonly used in rocket fuel, has been detected in many groundwater sites where the US forces have practices bombing in both the US and worldwide.

The increasing human population in the Capricorn region will lead inevitably to increased conflict of land and sea use with the military. Many local inhabitants want to see the Shoalwater region better protected and do not want increased military activities in their region; their opinions should be of great importance in decision making.

Reported instances of conflict in recent years around the SWBTA include:

- the washing ashore of phosphorus marine markers (Bangalee Beach, 2006)
- the washing ashore of US naval garbage
- an incident where helicopter gun-ships menaced a family yachting in Shoalwater Bay (July 2006). Children were reported to have been made hysterical by the menacing nature of the helicopter gunship in question and the family forced to leave safe waters in bad weather. The army, although apologising to the family, has refused to provide safe harbour for boats caught in bad weather.
- incidents of stress caused by increased military activity in the adjacent towns of Byfield and Yeppoon: Byfield residents have long been forced to tolerate the seismic events associated with bombing runs in the nearby Dismal sector of the SWBTA. In one of the latter instances, when a local residents complain of noise from low flying helicopters was told by a ADF spokesperson that he had “no sympathy” for people who live near military facilities. This does not represent good PR or bode well for future residents of the region, and demonstrates the increasing tension between military uses and civilian uses of the area.



In 2005 Access Economics estimated the total economic contribution of tourism, commercial fishing, and cultural and recreational activity of the Great Barrier Reef at over \$3.5 billion per annum. They did not even attempt to estimate the ecosystem service that the Great Barrier Reef provides (mitigating pollution, providing spawning habitat for fisheries, absorbing carbon, etc.) because these costs are incalculable.

The Capricorn region is of much greater economic value as a tourist destination than as a military one. Considering the other pressures on the natural environment, non-destructive uses such as scuba diving and photography should be encouraged in preference to war games.

Unlike the military, genuine tourists are not generally associated with an increase in crime and sexual assault, nor do they blow things up.

3.7 Indigenous issues

All military exercises takes place on the lands and seas of Aboriginal and Islander First Peoples. It has long been Australian and US government practice to impose nuclear and military sites on indigenous people's land, limiting their access to sites and their right to practice their culture and heritage.

denial of access to and the destruction of traditional lands and seas is the destruction of culture and heritage and an infringement of the human rights of indigenous peoples

The land and seas at Shoalwater contain sites important to Darumbal culture and heritage. It is our understanding that the Darumbal people, traditional owners of the land at Shoalwater, although acknowledged to be the traditional custodians, have not been given native title to their land, which is designated a military exclusion zone, and are only allowed limited access to it.

We are concerned that the threat of losing access completely forces Traditional Owners of all sites used in Talisman Saber to submit to military use of their land or waters, without equitable debate.

We have experienced inadequacy or lack of priority placed on consultation with Traditional Owners. In fact, during the 2007 inquiry in the SWBTA expansion the ADF claimed Traditional Owners of the Shoalwater region were not consulted because they were not “contactable.” With several easily approachable and relevant organisations to facilitate contact, the ADF’s failure to make contact at that time can only serve to highlight a lack of effort or a lack of appropriate protocol.

The people of Guahan/Guam, the Marshall Islands and Hawaii are all experiencing the devastation of their ancestral lands through the US colonisation and militarisation of the Pacific. Strategically important Guahan/Guam, alone, is now 1/3 occupied by the US military.

Denial of access to and the destruction of traditional lands and seas is the destruction of culture and heritage is and infringement of the human rights of indigenous peoples dispossessed by military training areas and bases.

3.8 Risks to troops

Deafness

The risk to troops of ear damage, deafness and tinnitus is well recognised. A report by the US Institute of Medicine of the National Academies (Humes et al 2006), analysed the data from the medical records of 3500 veterans and found that hearing complaints were the third most common health problems (75000 of 2.5m veterans nationally). Sounds over 140 dB can cause hearing damage with only one exposure.

PTSD and Suicide

Around 50% more US troops have committed suicide than have died in Afghanistan. In the first 155 days of 2012 there were 154 suicides, the highest level in ten years (Associated Press 2012). It is thought the increase in suicides is linked to deployment in the Middle East, exposure to other troops who have been deployed and the high incidence of Post-Traumatic Stress Disorder.

While politicians are determining what is “best” for the country with a strategic eye to keeping on the good side of the U.S., Australian and US soldiers are suffering, being killed or killing themselves. 4429 US soldiers

and 20 Australian soldiers have died, thousands more have been injured in these unpopular wars. Iraq Body Count estimates over 100,000 civilians have been killed, while the Iraq War logs show that the US military lied about not keeping logs of civilian deaths, and as a result of these Wikileaks documents, the civilian toll is now about 150,000. Both citizens and soldiers alike are opposed to Australia's continued intervention in wars that the US has admitted are unwinnable.

In the U.S Army's 2007 report on the mental health of soldiers says that half of soldiers report feeling stressed and having alcohol, family and /or emotional problems.

More US troops have committed suicide since the beginning of the Iraq war than have died in the war. In the 2007 study it was found that with declining mental health, soldiers were more likely to endorse ill treatment of non-combatants, including torture (44% strongly agreed) (2007, p25). Less than half of troops in the same survey were likely to report colleagues killing, mistreating or stealing from non-combatants, despite ethics training.

As many as 6000 US soldiers killed themselves in 2010, while an estimated 10,000 more attempted or were talked out of it by counsellors. Many are suffering Post Traumatic Stress Disorder and Traumatic Brain Injury, which often leads to reckless behaviours including drugs and drinking, the breakdown of their families and more interpersonal violence in society in general. It is estimated by the Veterans Administration that fully 35 per cent of US military personnel deployed to Afghanistan and Iraq since 2001 are suffering from PTSD.

4.0 US military activities

4.1 The environmental and social track record of US forces worldwide

The US have more than 900 bases worldwide. Those bases, notes former Friends of the Earth International coordinator and Nigeria national, Nnimmo Bassey, always exist in a location of strategic economic interest to the US. We discuss just a few of them here.

The US DoD has been described as the world's biggest industrial polluters, given the toxic legacy that their bases and facilities have created worldwide. Project Censored estimates that "the US military generates 750,000 tons of toxic waste material annually, more than the five largest chemical companies in the US combined. This pollution occurs globally as the US maintains bases in dozens countries." The US DOD has sought exemptions from many important environmental laws in the US including the Migratory Bird Treaties Act, the Wildlife Act, the Endangered Species Act, the Clean Air Act and the National Environmental Policy Act. Hundreds of Superfund contaminated sites in the US are military.

Perhaps the worst cases of US military pollution offshore would be the cases of Vieques, Puerto Rico and Clark Air Base in Philippines. Both Vieques and Clark Air Base are now closed down and the full effects of their contamination can only be assessed after the military has vacated the premises. No compensation has

been offered to these communities devastated by US DoD toxins. Moreover, the US DoD is reluctant to compensate even US citizens for environmental pollution. One study has found that the US DoD is even polluting the national food supply. There are about 140 superfund listed US military sites. The Military Toxics Project estimates contaminated sites number in the several thousands in the US. The US Navy has estimated it would cost them US \$33b just to clean up the contaminated navy sites.

Contaminants on those sites include buried or sunken munitions (pictured above), unexploded ordnances,



spilled oil, fuel and solvents, toxic explosives compounds including TNT and perchlorate, heavy metals including lead and tungsten and corroding vessels and vehicles . Much of the pollution left globally by the US military is the result of day to day maintenance and training such as that which will occur in Australian training areas used by US forces.

The US Navy maintains a program of disposing of unwanted military vessels by sinking them. Once on the ocean floor, PCBs, iron, lead paint and anti-fouling paint all can leech into the ocean, fish, and food-chain.

4.1.1 Korea

The US once had 35 military installations in South Korea. Many are now closed while others are still in decommissioning, but only half are expected to return to South Korean sovereign control.

In 2012 28,000 US troops remain stationed in South Korea. The cities hosting these bases have plans to develop the land for residential and corporate use. The 23rd Chemical Battalion are expected to move back to Camp Stanley to undertake “nuclear, biological and chemical reconnaissance, equipment decontamination and consequence management assistance”, which will likely be necessary given the US record of base contamination.

However, the US are proposing new bases in South Korea, particularly on Jeju Island, where they intend to house 20-30 US and South Korea war ships in a posture towards China. Civil society opponents of the base are trying to challenge its legitimacy in the courts, citing the likelihood of increased conflict with China if it goes ahead. Protests successfully halted construction of the base in June 2011, however the threats to local livelihoods, the environment and democracy are still at stake according to locals. It is alleged that bribery and corruption have played a great part in the council permissions to build the base (Chomsky 2011).

4.1.2 Philippines

Clark Air Base was a US base in the Philippines for almost 100 years. In 1991 it became the site of an

airport, local military base and Clark Freeport Zone, a special economic and residential area.



Left: Greenpeace protests PCB contamination at Clark Air Base in 2010 (Source: GP Southeast Asia).

In the 1990s, after its closure, the Filipino government used the contaminated land to house victims of the Pinatubo eruptions because they did not know the extent of the contamination, resulting in illness and birth defects affecting hundreds of people. The site is now a suburb and

continues to cause illness from pollution left there by the US DoD over 30 years ago.

Residents living near the Clark Freeport show signs of chemical toxicity including mercury poisoning, leukaemia and other health problems. The United States denies responsibility for the remaining pollution or the health problems of locals.

Because of US and Philippine government denial of the problem, grass roots community groups such as Filipina/American Coalition for environmental Solutions (FACES) and People's Task Force for Base Clean-up (PTFBC) have formed to deal with the problem. FACES claim that Clark and Subic are, "contaminated with toxic solvents, pesticides, asbestos, heavy metals, unexploded ordnance and other hazardous substances" in 43 sites. While the US General Accounting Office, World Health Organization, Independent US and Philippine experts and the Department of Defense's internal reports recognise the pollution, US officials refuse to. Since 2000 two law suits brought by locals against the US military have been thrown out of US and Filipino courts.

PTFBC have worked to raise public awareness of the US military environmental crimes via book "Inheritors of the earth" which tells the stories of Clark Base pollution victims:

The continuing tragedy of poisoning and contamination in the former U.S. military bases at Clark and Subic is an active statement of the irresponsible and reckless way in which the United States conducted itself at the height of its military presence and dominance in the Philippines. The heartbreaking stories of babies dying and people suffering from leukaemia, mental disorders, weakened immune systems and various learning disabilities within and around the former bases represent an enduring legacy of toxic transgressions whose foremost and vulnerable victims are children...

Clark had 25-million-gallon storage facility for petroleum, oil, and lubricants and 200,000 square feet of ammunition. Clark was also used for bombing exercises, with the Crow Valley Bombing and Gunnery Range, a 42-mile Facility in the neighbouring province, located 14 miles from the base proper.

The US Navy also pumped 3.75 million gallons of untreated sewage into Subic Bay during their occupation of the site. They used fuel and chemicals to fight fires created by training exercises, which they poured directly into water sources. Underground chemical holding tanks leaked without monitoring. Garbage landfills and dumping grounds for unwanted ordnance included contamination with asbestos, heavy metals, oils, pesticides and PCBs.

In 1996, in the absence of government action, PTFBC conducted their own health survey of the Clark and Subic base areas. Testimony of locals revealed well water that smelt and tasted bad and caused stomach aches. Mothers had spontaneous abortions. People experienced hair loss and skin diseases, tumours and lung conditions disproportionate to what was usual. High rates of kidney and urinary tract infections and nervous system disorders mirrored those seen in people living near landfill sites (PTFCB 2000). An unpublished report in 1991 estimated that contaminants left by the military could take between 1 and 25 years to migrate into groundwater (Mandocdoc & David 2008, p.871).

The Weston report (1997) found many other pollutants that exceeded safe levels at Clark including: Aldrin, Dieldrin, Petroleum hydrocarbons, Lead, Polychlorinated Hydrocarbons(PCBs), Lindane, Hexachlorobenzene. PCBs (Polychlorinated biphenyls) were left behind by departing US troops. PCBs are known to cause fatigue, headaches, muscle weakness, joint aches, memory loss and impaired cognitive function (Ashford & Miller 1991, p.119).

In 2008 dieldrin was measured in groundwater at Clark at levels exceeding drinking water even after 16 years since the chemical was last used (Mandocdoc & David 2008). Aldrin was also detected. Dieldrin is a Persistent Organic Pollutant (POP) and known carcinogen that has been banned in numerous countries including the US. The study recognised that each rain event increases the level of dieldrin in groundwater and will be an ongoing problem for decades to come. Since 2003 the local area residents have stopped using well water due to contamination.

In 2010 a study of about 500 family records of people who had sheltered at Clark during the Pinatubo eruptions in 1991 found a link between the pollution with 76 deaths and 68 cases of illness.

4.1.3 Vieques

Of particular interest to this critique is a study by Baver (2006) of the contamination legacy of 60 years of US military exercises at Vieques, an island 13 km east of Puerto Rico in the Caribbean. The Vieques Naval Installation occupied two thirds of the island, dispossessing local indigenous Viequans. The US Navy estimates that between the 1940s - 2003, "more than 300,000 munitions items were fired from military training operations, including naval gunfire, air-to-ground bombing, and marine artillery fire. It was initially estimated that up to 9,000 acres of the property may be contaminated by munitions and explosives of concern (MEC) from these operations" (US Navy, 2010).

Despite the end of live firing exercises at the Vieques base and the withdrawal of the US military from the island, ill health and environmental contamination continue. Depleted Uranium, perchlorate, RDX, TNT and many heavy metals contaminate the site, that encompasses two thirds of the island, and affect food production, human health and environmental health. Not only did the 60 years of exercises physically destroy mangroves and waterways, and leave physical scars on the countryside, it also left behind TNT, NO₃, NO₂, RDX, Tetryl, napalm, perchlorate, mercury, lead, PCBs and DU, much of which can never be cleaned up and continue to contaminate and poison. In addition, the traditional fishing grounds have been rendered dead by “ghost nets” ripped by naval ships. Residents have disproportionately high rates of illnesses like cancer, hypertension and liver disease on the island.

In Vieques, Depleted Uranium was used extensively, leading to birth defects and high rates of leukaemia. Perchlorate contaminated the water table and ghost nets set adrift by massive naval vessels continue to devastate the fisheries. The Military Toxics Project says of Vieques:

Since 1940, the US Navy has used three-quarters of the island of Vieques, Puerto Rico for bombardment, munitions disposal, and other activities. There is strong evidence that heavy metals and other munitions toxins move in the air from the bombing range to the civilian areas. The toxic explosive compound RDX was found in drinking water supplies in civilian areas in the late 1970s. In 2000, excessive levels of mercury were found in the hair and fingernails of 45% of Vieques residents tested. Vegetables and plants growing in civilian areas are highly contaminated with lead, cadmium, and other heavy metals. From 1985-1989, Vieques children aged 0-9 were 117% more likely to contract cancer than children of the same age on the main island of Puerto Rico. Children aged 10-19 were 256% more likely to contract cancer. A 2001 study found that Vieques residents are 73% more likely to suffer from heart disease than residents of the main island, 64% more likely to develop hypertension, 58% more likely to have diabetes, and 18% more likely to be diagnosed with asthma.



Left: UXO await disposal, Vieques (Source: public.lantops-ir.org/sites/public/vieques).

The clean-up of contaminated land and water and disposal of UXO continues in Vieques to this day. The remediation of toxins from soil and water could take generations and continuing public education in the dangers of UXOs is a vital part of what will be a long process of recovery.

4.1.4 Guam

Guam or Guahan – the southernmost island of the North Mariana islands – a Non-Self Governing territory of the US is the traditional home of the Chamorro people. With the land 1/3 occupied by US military, the Chamorro people struggle to reclaim their land and keep their culture. Australian military agreements with the US support this occupation of Guahan; for example, US is permitted to conduct bombing practice over the NT that flies out of Guahan.



Chamorro rights advocates argue that as an “unincorporated territory” since 1898, the native inhabitants of Guam have no rights. They are occupied, a colony of the US. With a high poverty rate and little or any other work opportunities, Guam youth have a high rate of military recruitment. About 80,000 troops and their families are expected to be permanently stationed there, with President Barack Obama indicating this number will increase as US soldiers are moved out of

Okinawa (Japan) where local opposition has driven out some US uses. Anti-social and criminal behaviour by off-duty soldiers — including serious crimes such as armed robbery, rape and murder — is a significant social problem in Okinawa where US troops are not bound by local laws.

Environmentally, Guam is polluted with toxic and radioactive military waste from various wars, training exercises and ongoing US posturing in the northern Pacific.

4.2 Regional Insecurity

Saber rattling in the Pacific will not bring regional security and is not in Australia’s interests. As the U.S.’s key allies in the Pacific, Australia and Japan serve as local faces for US military might in its attempts to contain continental Asia and, in particular, posture towards nuclear weapons states China and Russia. It is our opinion that acting as a launch pad for and supporting US military operations has a destabilising effect on our region and beyond. U.S. military installations in Australia, such as Pine Gap, and US Sea Swaps (troop change-overs in WA) are used to target the Middle East, as are troops that have trained in past TS and other exercises..

Australia could take a step towards a peaceful Pacific by getting out from the of the US nuclear umbrella: closing US access to Australian facilities, closing US bases in Australia and stopping joint training.

“Interoperability” has been the catch-cry of those in the ADF and government who seek to justify more U.S.-Australian joint preparations for war. This begs the question: “Do we expect to be involved in more US wars?” and “Is it in our strategic interest?” Do we want to align ourselves with environmental pariahs and equip our defence forces with offensive and polluting weapons so that we might be better equipped to do their bidding?

The US are involved in unpopular and unjust wars, it behoves the Australian government and military to recognise that they serve the Australian people, and that 88% of them are opposed to our further involvement in US military actions. The US is in a unique position to change global dialogue to peace-making rather than increasing militarisation. As a key ally, Australia should be pushing for this rather than deepening its support for US military activity.

Australia continues to be involved in war and military occupation in Iraq and Afghanistan. There is little support in either the US or Australia for these occupations. Hundreds of thousands of citizens have rallied over recent years in opposition to these occupations. A 2009 poll found that 88% of Australians are opposed to our involvement in Iraq, and in November 2010, 50% of Americans are opposed.



Friends of the Earth opposes joint military training and operations with the US. We oppose the use of violence as a solution to global problems. We reject the continuing US lead “war on terror” believing, war itself to be terror. We believe that practising warfare, with the world’s largest nuclear – armed superpower, sends an aggressive signal to our neighbours and potential allies throughout the world. We question the benefits of “improving interoperability” with the U.S.

With Pine Gap, Australia is already home to one of the U.S.'s most strategic military satellite bases. Australia’s agreement to allow US bombing fly-overs over NT, US Sea Swaps and bombing practice in WA, three new US joint training facilities further entrenches Australia’s involvement in the US military machine, whether Australia is an open participant or not. For example, with only several hundred Australians troops deployed in Iraq and Afghanistan, it is clear that Australia’s greatest contribution to US military efforts is to act as a base for US military activity. Joint military exercises, such as Talisman Saber, further entrench Australia as an ally and a lily-pad for U.S. military aggression. This is not the direction we would like to see Australia take.

It would be tragic enough if the only – or even a majority of – casualties in modern warfare were military personnel, but, of course, the vast majority (upward of 90%) of casualties in the wars fought in recent times have been, and continue to be, civilians – mainly women and children...

War is something that can and should be avoided, primarily because it does not work... You would think by now we would have worked out that killing people and destroying their lives, homes, towns, and cities does not create peace. (Bickerton, 2012).

We believe Australia should be seeking peaceful solutions to conflict at home and overseas. Investing time, energy and resources into infrastructure that perpetuate war, rather than promoting peace, is a detriment to our community and world.

Despite attempts to disassociate these military exercises from their purpose and to portray them as eco-friendly training, the purpose of such joint exercises is to prepare the US and Australia for war.

The devastating environmental and social impacts of wars anywhere should not be overlooked. The environmental legacy of two Gulf Wars has included air, water and land contamination by depleted uranium, contamination from the oil well fires and oil spills, vehicle emissions, heavy metal contamination from missiles, dispersal of chemicals and other toxins

from bombing of domestic buildings and disturbance of the desert areas by military activities. human population invasion and occupation.

The effects have included increased cancers in humans, decline in fish and shrimp stocks in the Gulf and water contamination hampering recovery efforts. Human beings in the region still suffer post-traumatic stress syndrome from both the environmental contamination and the interpersonal violence they were exposed to. The first Gulf War is estimated to have affected the health of over 20,000 residents of nearby Saudi Arabia. While in Iran "black rain" was said to have resulted from oil fires. Iraq is reputed to have experienced a tenfold increase in birth deformities as a result of the use of Depleted Uranium. US troops claim similar effects from exposures.



Project Censored cites a report on Iraq of the United Nations Environmental Program [UNEP]'s Post-Conflict Assessment Unit "noted that the heavy Pentagon bombing and the movement of large numbers of Pentagon military vehicles and troops in Iraq "further degraded natural and agricultural ecosystems."

The UNEP Post-Conflict Assessment Unit report also observed that the Pentagon's intensive use of Depleted Uranium [DU] weapons. Significant levels of radioactive contamination were found at four sites in Baghdad in May 2003, by Christian Science Monitor reporter Scott Peterson (CSM, 5/15/03). Much of this

radioactive contamination was likely produced by the DU bullets fired into the centre of Baghdad at the Iraqi Ministry of Planning by the Pentagon's A-10 Warthog aircraft, Abrams tanks or Bradley fighting vehicles. According to the Monitor, Pentagon figures indicate that about 250,000 DU bullets were fired by A-10 Warthog aircraft in March and April 2003, leaving an estimated additional 75 tons of DU in Iraq, as a result of the Pentagon's attack. Local air pollution and soil contamination in Iraq also increased, as a result of the recent war. The Pentagon's bombing of Baghdad, for instance, ignited fires which toxic, black smoke that contained dangerous chemicals, which caused harm to Iraqi children and to Iraqi adults with respiratory problems, and further polluted Iraqi ecosystems. (Project Censored 2004).

The World conservation union (IUCN) says that in the first Gulf War alone an estimated 6-8 million barrels of oil were split, 600 oil wells set on fire.

Arguably any involvement in preparation for war is preparation for environmental degradation. Pretence to environmental sustainability of war and practice for war is spurious in this light. In addition, DU, white phosphorus and cluster munitions have been declared illegal by the United Nations and the continued use of it should not be tolerated in any of Australia's allied countries. These facts and the revelations of the Wikileaks documents indicate that the US military and politics alike are prone to illegal underhanded actions that contribute to conflict, turn nations against each other and promulgate deaths.

4.3 Secrecy and cover-ups

In 2003 the Bush administration placed a gag order on the EPA discussing perchlorate pollution, which was present in the groundwater of 42 US states and showing up in lettuce on the US market (Biocycle 2003). This is just one in a long line of military cover-ups of environmental and social injustices committed in peace-time.

The Australian Department of Defence do not conduct adequate consultation. Numerous organizations are working on the protection of areas such as the Coral Sea and Great Barrier Reef. The lands and seas of many Traditional Owner groups are impacted by the presence of troops and military exercises in Australia, and many individuals and organizations have in-putted in to previous public consultations around Talisman Saber and military developments. The Talisman Saber ‘consultation’ for instance, was limited to a non-contentious group of defence and government bodies: “Defence stakeholders” in the “risk assessment workshop” to prepare the PER are “Senior Environment Managers (SEMs), Regional Environment Officers (REOs), Defence Project Officers (DPOs) and key Australian Government Stakeholders, the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) and the Great Barrier Reef Marine Park Authority (GBRMPA).” (AURECON 2012 p. 10)

It appears that no local community, First People’s, arts, non-governmental political, social justice, women’s health (rape and crisis), student, academic, scientific or non-aligned environmental organizations were involved in the “risk assessment” or PER process. This is inadequate, cannot be called “community

despite numerous references to the Environmental Protection and Biodiversity Conservation Act, detailed description of flora and fauna in impacted environments and proposed risk management plans, Talisman Saber is not actually subject to an Environmental Impact Assessment

consultation” or even “stakeholder consultation”, and cannot possibly lead to non-biased assessment. A wider sphere of representation and a diversity of voices are necessary to ensure that the “risk assessment” activities and other aspects of “consultation” are not merely rubber-stamping exercises.

Furthermore, despite numerous references to the Environmental Protection and Biodiversity Conservation (EPBC) Act, detailed description of flora and fauna in impacted environments and proposed risk management plans, Talisman Saber is not actually subject to an Environmental Impact Assessment.

We submit that military activities are incompatible with environmental protection and the military scrutiny of military activity will be necessarily biased. The tendency of the military to less than full disclosure of their activities for security reasons, such as refusal to confirm the existence of nuclear weapons or the type of weapons used, means that we cannot make an informed assessment of

military activities on Australian soil, either by the ADF or visiting forces.

Defence say they are required to comply with various state and Commonwealth laws including:

- Environmental Protection and Biodiversity Conservation Act 1999

- Aboriginal and Torres Strait Islander Heritage Protection Act 1984
- Australian Heritage Council Act 2003
- Australian Maritime Transport Safety Authority Act 1990
- Defence Act 1903 and Defence Regulations 1952
- Environment Protection (Sea Dumping) Act 1981
- Great Barrier Reef Marine Park Act 1975
- Hazardous (Regulation of Exports and Imports) Waste Act 1989
- Native Title Act 1993
- Protection of the Sea (Civil Liability) Act 1981
- Protection of the Sea (Powers of Intervention) Act 1981
- Protection of the Sea (Prevention of Pollution from Ships) Act 1983
- Quarantine Act 1908
- Wet Tropics of Queensland World Heritage Area Conservation Act 1994

This is a misleading claim. While the military can claim that they are adhering legal requirements, they fail to mention that due to inter-governmental and interdepartmental agreements, Talisman Saber joint US exercises, for instance, the US-Australian treaty, the US military are primarily subject to US laws, not Australian ones. In addition, significant exercises like Talisman Saber do not require the preparation of ongoing bona fide Environmental Impact Statements or Assessments one would expect from actions that are covered under the EPBC. Indeed, it does not even require the preparation of a Public Environment Report. Without outside scrutiny, it is questionable how rigorously any local legislation could be applied on military exercises, in particular those with the US, and how prosecution or remediation would take place if a breach occurred.

The US military have exemptions from a raft of US environmental laws. They have a policy of disposing their waste at sea, of not disclosing the presence of nuclear weapons on board their vessels visiting our shores, of denying the damage of their chemicals on their own troops. Can we expect this military to treat Australian lands and waters with the same disrespect they show their own?

With regards to the applicability of Australian laws to US troops participating in exercises here, it seems that the discretion to apply those laws lies with the US. A March 2012 Parliamentary Library Briefing on the Australia/US Status of Forces Agreement 1963 states,

“Sub-article 8(1) provides that:

(1) Subject to the provisions of this Article:

(a) the military authorities of the United States shall have the right to exercise within Australia all criminal and disciplinary jurisdiction conferred on them by the law of the United States over all persons subject to the military law of the United States;

(b) the authorities of Australia shall have jurisdiction over members of the United States Forces and of the civilian component and dependants with respect to offences committed within Australia and punishable by the law of Australia.”

Australian law only applies to civilians and dependants that accompany US troops, not the US military themselves. The Defence has separated their activities in Australia from their purpose - war in this case nuclear-capable war. However, environmentally managed war rehearsals do not lead to environmentally friendly war. War and war games are not sustainable: war is an anathema to the environment respect to offences

In other words, Australian law only applies to civilians and dependants that accompany US troops, not the US military themselves. They reemphasise this fact in Sub article 8(2) “The military authorities of the United States shall have the right to exercise exclusive jurisdiction over persons subject to the military law of the United States with respect to offences, including offences relating to its security, punishable by the law of the United States, but not by the law of Australia” provided those crimes are punishable by US law (not Australian law).

The US reserves the right to exercise primary jurisdiction over and above that of Australian law, of note where offences are committed “in the performance of duty”. This legal loop hole calls into question every environmental and social claim to justice made by the visiting US military. The US military are exempt from a raft of their own countries environmental laws including clean air and water acts, and those that protect cetaceans from sonar. One cannot sue the US military for pollution in their own country, or anywhere. Given the privileged status of the US alliance amongst the two major parties, it is unlikely that prosecution for environmental crimes would gain any traction in the parliament.



5.0 Recommendations

To Friends of the Earth and the authors of this report the idea that the military can ever be 'sustainable' is an anathema.

We submit that war and war games are incompatible with environmental protection and that these activities are not only unconscionable, but should never be carried out in protected areas or near any human habitation. We submit that the Australian government has an obligation to do better on these issues.

We submit that war, and preparation for war are also incompatible with social justice, while military spending and environmental and social destruction detract from a nation's capacity to support health, education and social welfare for their own people. We believe that the increased reliance on US military interoperability aligns us irreversibly with US political interests – not the interests of the Australian nation and that the stepped up US-Australian military alliance can only be seen as a threat by our closest Asian neighbours and contribute to more friction, not peace.

Recommendations summary:

We recommend that Joint military exercises and citing of US military on Australian soil be discontinued. In particular we would like to see the cessation of war games in the Shoalwater Bay region, Great Barrier Reef Marine Park and the Coral Sea as a priority.

- The area comprising the Shoalwater Bay Defence Training Area should be designated a National Park of international significance and preserved for future generations of Australians. Its management should be handed back to the Darambal people. All lands and seas used for this (and other) military activity should be returned unconditionally to their Traditional Owners. This action would show the good faith of the ADF with regards to their environmental and social credentials.
- The precautionary principle should apply: if an activity cannot be proven to be safe, it should not go ahead. We submit, therefore, that the poor environmental track record of the US DoD should lead joint military activities with the US (anywhere) to be cancelled.
- We call on the ADF to release the types of weapons and vehicles used as well as all tests and environmental monitoring carried out on Australian military sites as a public interest
- All military activities pose significant risk to the environment and must be assessed with the scrutiny of other environmentally risky actions. All military activities must be rigorously assessed under the EPBC Act.
- Assessment of military activities should include social and economic impacts. Military activity impacts on communities. By attempting to ignore the human costs of military activities, Public Environment Reports or any other green washing attempts by Defence isolates training and bases from their actual purpose - the practising of war - which is designed to impact on human life. Humans are part of the environment, are impacted by it and impact upon it. An honest assessment of military activities must include social impacts.

- All military training and areas impact First Peoples in Australia and in the Pacific. It has long been Australian government practice to impose nuclear and military sites on indigenous people's land, limiting their access to sites and their right to practice their culture and heritage. It is of grave concern that the threat of completely losing access to their land may put some Traditional Owners in to a position of acquiescing to military use of their land without equitable options or debate.
- It is inappropriate to expose some of our last coastal wilderness areas, threatened and endangered species and heritage sites, to bombing, on-shore landing practise, the use of sonar, and potential radiological contamination from the use of nuclear powered ships for these military operations. Many of the training areas are environmentally significant areas and all have some environmental value.



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