



Department of Defense Integrated Vector Management

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Disclaimer

The views and opinions expressed in this presentation do not necessarily represent the Department of Defense or any other Department or Agency of the United States Government.



AFPMB Mission

Ensure military installations and Warfighters have the most effective disease vector control and pest management capabilities to prevent adverse effects on personnel, weapons systems, supplies & equipment, and installations, using risk reduction and environmentally sound techniques to maximize readiness.



AFPMB Mission Tasks

- Develop and recommend policy
- Provide scientific guidance
- Coordinate exchange of information
- Prevent adverse effects of pests and disease on DoD operations
- Ensure environmentally sound and effective integrated pest management programs

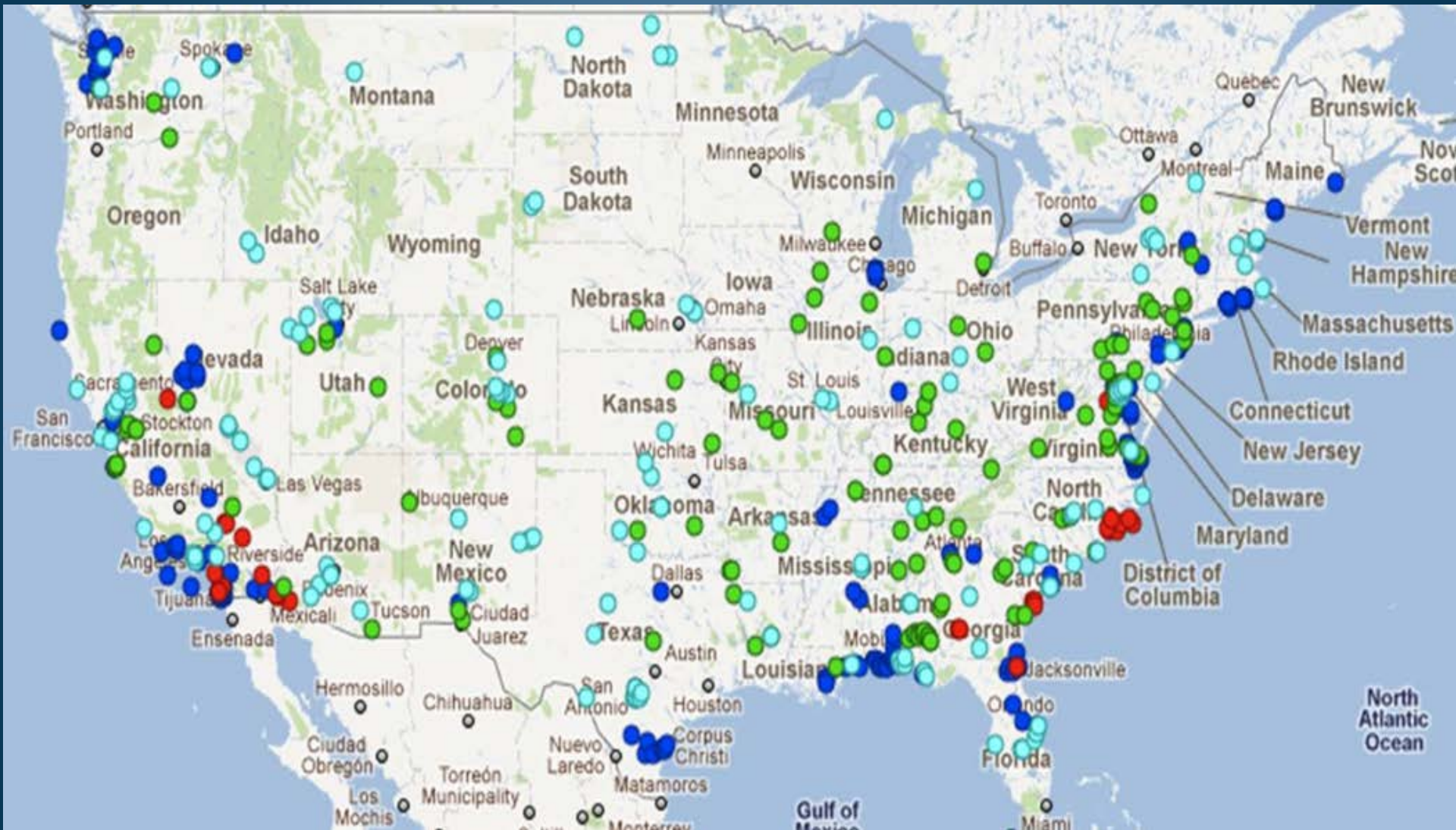


DoD Pest Management Policy

- Department of Defense Directive 4715.1E, Environment, Safety and Occupational Health
- Department of Defense Instruction 4150.07, DoD Pest Management Program
- Department of Defense Manual 4150.07, DoD Pest Management Training and Certification



DoD Installations



● Air Force

● Army

● Marines

● Navy



Lyme Disease in Military Personnel

Lyme Disease in Active Component, Reserve/Guard, and Other Beneficiaries from 2005-2014

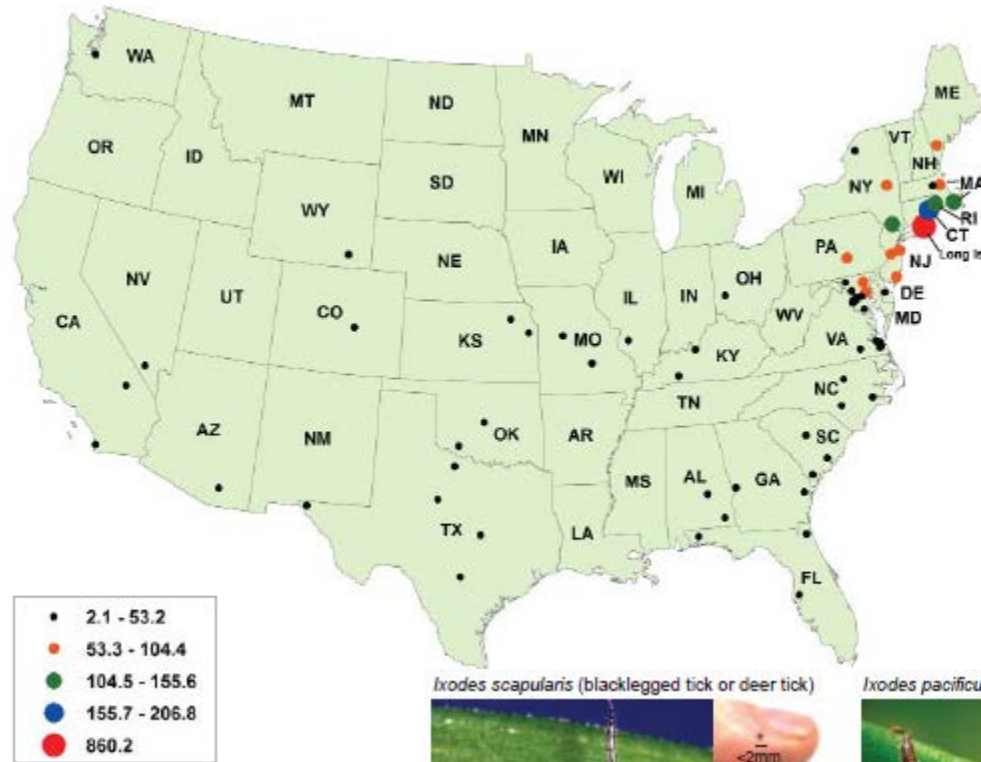
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	TOTAL
	Total Count	Total Count	Total Count	Total Count	Total Count	Total Count	Total Count	Total Count	Total Count	Total Count	Total Count
Army	59	73	122	127	126	114	174	141	143	102	1,181
Active Component	42	47	71	78	75	70	112	87	78	69	729
Reserve / Guard	17	26	51	49	51	44	62	54	65	33	452
Navy	9	90	22	42	33	23	34	74	34	34	335
Active Component	9	30	16	36	26	21	29	71	29	32	299
Reserve / Guard	-	-	6	6	7	2	5	3	5	2	36
Marine Corps	12	13	24	21	14	15	23	35	25	17	199
Active Component	12	11	23	16	8	10	19	28	24	10	161
Reserve / Guard	-	2	1	5	6	5	4	7	1	7	38
Air Force	36	29	36	54	50	47	80	52	56	45	485
Active Component	26	21	25	35	38	35	59	39	42	24	344
Reserve / Guard	10	8	11	19	12	12	21	13	14	21	141
Coast Guard	10	8	17	21	15	9	16	15	18	10	139
Active Component	10	8	17	21	13	9	14	15	16	8	131
Reserve / Guard	-	-	-	-	2	-	2	-	2	2	8
MHS Overall	489	522	636	897	814	725	898	93	882	668	7,465
Active Component	99	117	152	186	160	145	233	24	189	143	1,664
Reserve / Guard	27	36	69	79	78	63	94	7	87	65	675
MHSbeneficiaries*	363	369	415	632	576	517	571	617	606	460	5,126
Unknown**	378	325	461	556	722	637	673	653	687	661	5,753

MSMR Vol. 22 No. 3 - March 2015



Lyme Disease Rates in Military Members

FIGURE 1. Incidence rates* of Lyme disease among active component service members by unit location,^b 2004–2013



Others:

- Powassan
- Alpha Gal (meat allergy)
- Ehrlichiosis
- Tularemia
- Babesiosis
- Rocky Mnt SF
- Relapsing fever

Ixodes scapularis (blacklegged tick or deer tick)



CDC/James Gathany

Ixodes pacificus (western blacklegged tick)



CDC/James Gathany

Amblyomma americanum (lone star tick)



CDC/James Gathany

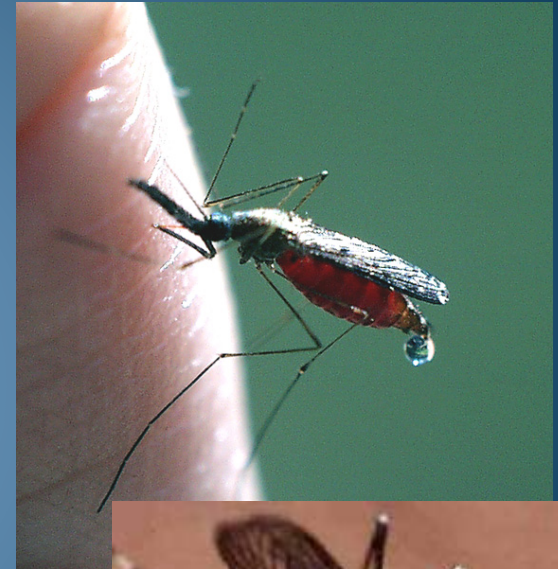


So How do we Protect them?





By managing these?





Cutaneous Leishmaniasis

Tick-bite allergies



From these?

Powassan encephalitis

Rocky Mountain spotted fever

Onchocerciasis
St. Louis encephalitis

Zika

Yellow Fever

Rift Valley Fever
Plague

Ehrlichiosis

Filariasis

Dengue

Bartonellosis
Q fever

Tick-Borne Encephalitis

Malaria
Chagas

La Crosse encephalitis

Mucocutaneous Leishmaniasis
Lyme Disease
Tick paralysis

West Nile virus
Eastern Equine encephalitis

Human Babesiosis
Sand Fly Fever Group

Chikungunya
Trypanosomiasis
Visceral Leishmaniasis
Human Granulocytic Anaplasmosis

Japanese encephalitis
Venezuelan Equine encephalitis

Crimean-Congo Hemorrhagic Fever
Tick-Borne Relapsing Fever

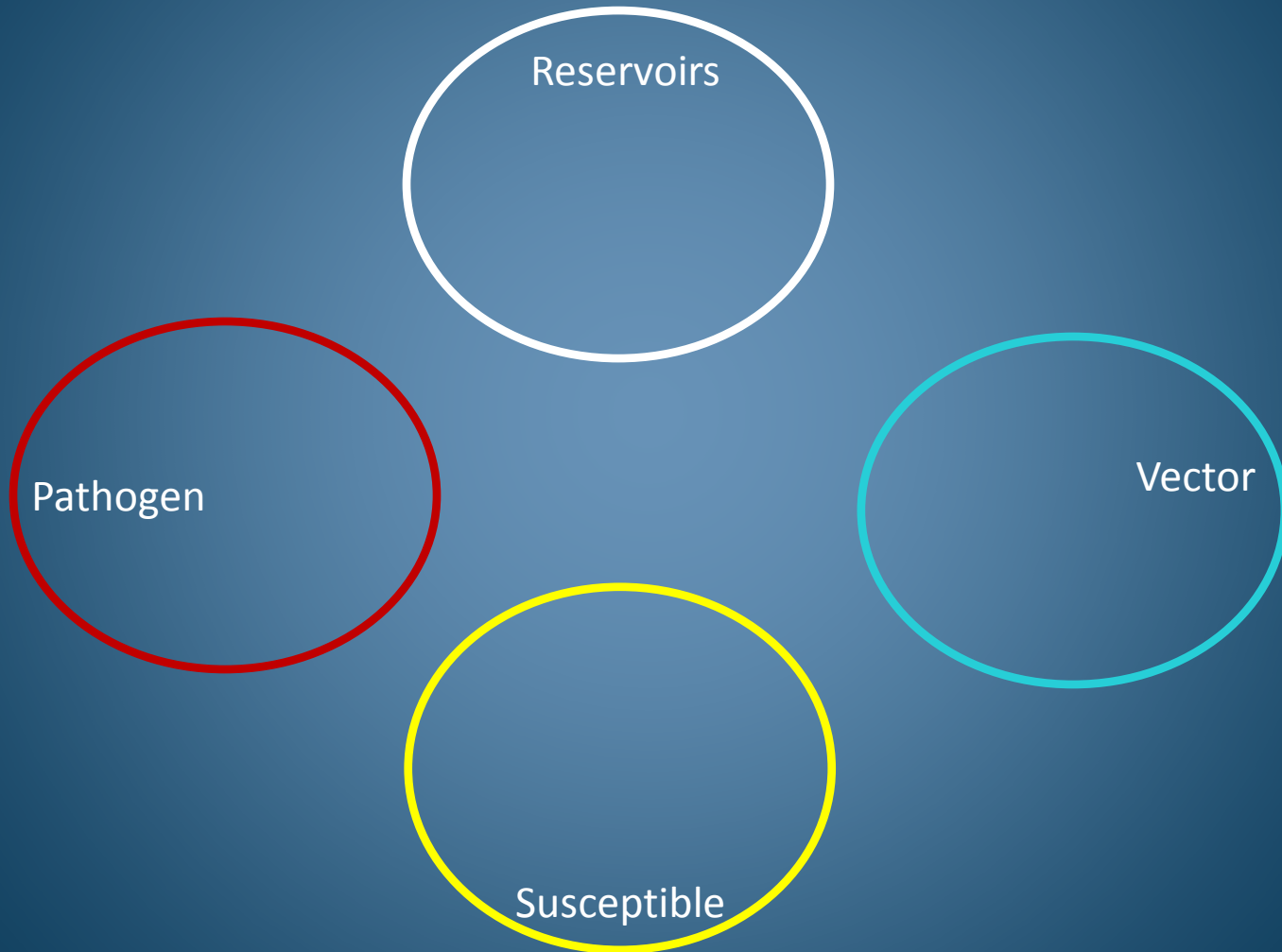


So how do we do that?

- Understand the disease transmission cycle.
 - What are the reservoir host(s)?
 - Sylvatic vs urban cycles?
 - Can the pathogen be trans-ovarial transmitted?
 - When is transmission more likely to occur?



Disease Transmission Cycles





So how do we do that?

- Understand the disease transmission cycle.
- We implement integrated pest management to use all appropriate technology and management techniques to bring about an effective degree of pest prevention and suppression in safe, environmentally sound and cost effective manner.
- Implementation of personal protective and control measures are effective against more than one vector.



Implementation

- Service Specific Regulations/Guidance for Pest Management
- Pest Management Professionals
 - Services
 - Combatant Commands
- Installation Pest Management
 - Installation IPM Coordinator
 - Integrated Pest Management (IPM) Plans
 - Pesticide Management Reporting
 - Certified Applicators
 - Coordination with Integrated Natural Resources Management Plans
 - Coordination with Federal, State and local partners



Capabilities

➤ Installations

- IPM Plans
- Certified applicators – DoD or contractors

➤ Operational Support

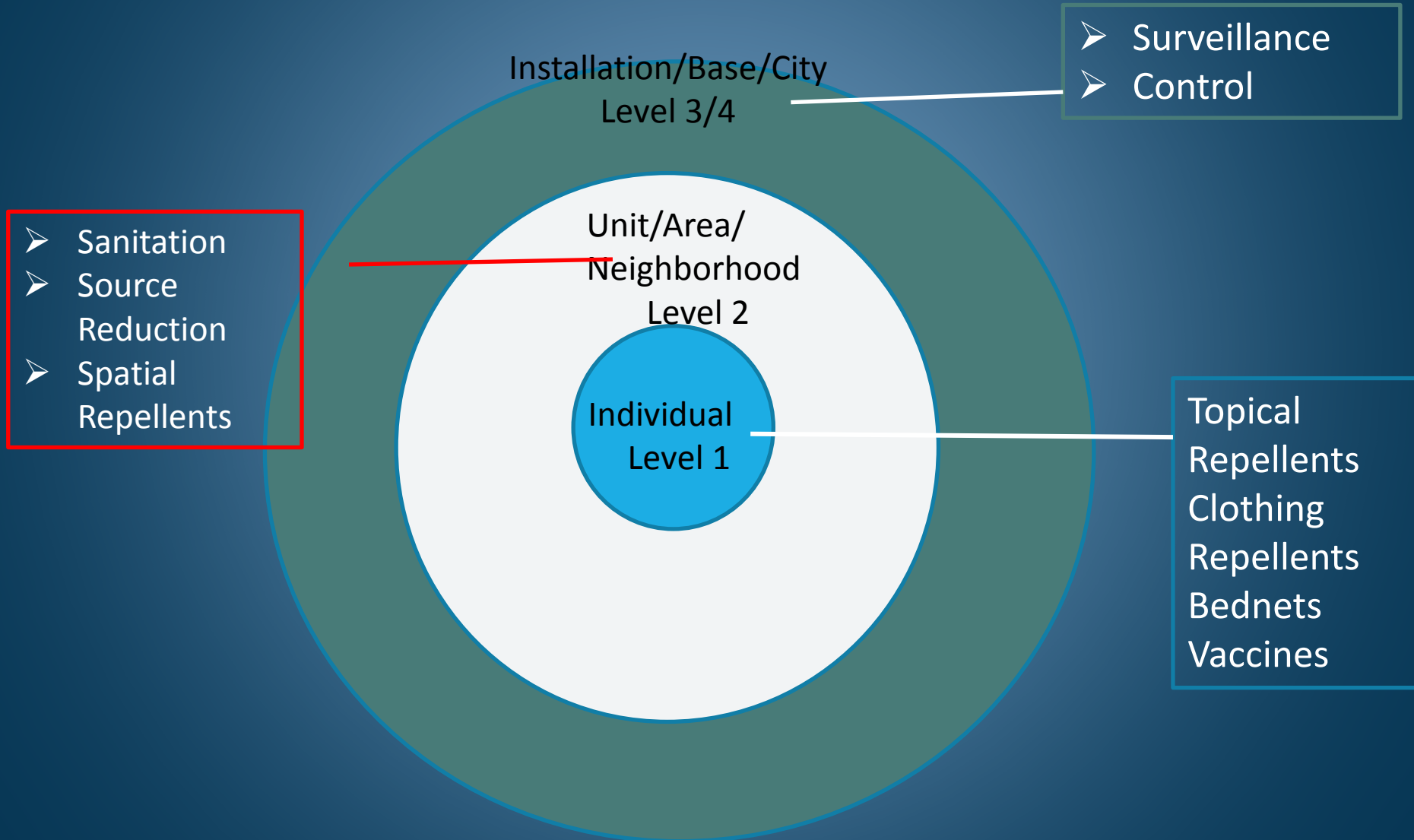
- Military certified applicators
- Policy to use pesticides registered under FIFRA
- Application equipment – hand cans, backpack sprayers, ULV, foggers, etc...

➤ Aerial Spray

- 910th Airlift Wing



Layers of Vector Borne Disease Protection





Entomology Systems

- **Vector Borne-Disease Threat Assessment System**
 - Vector ID, Pathogen ID, Detection Devices,
- **Pest Management Control Systems (Area)**
 - IPM tools and knowledge, area control
- **Personal Bite Protection System (Individual)**
 - Repellents, bite protection fabric, bed nets
- **Data Collection, Analysis, Management and Decision**
 - Surveillance data, pesticide reporting, predictive modeling, disease outbreak ID



Bio-Surveillance Initiative

- How does vector surveillance data integrate with human surveillance data?
- Objective is to:
 - be able to predict areas at risk of specific VBD
 - Be able to identify human cases and relate that back to control/PPM to break transmission.



Pest Management Threats

- Loss of EPA registered public health pesticides
- Invasive species
- Emerging/Reemerging VBD
- Pesticide resistance
- Compliance with personal bite protection
- Loss of experience and leadership both civilian and military.



DoD Entomology Research



Military Entomology R&D



Vector
Surveillance



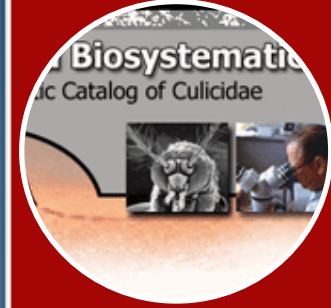
Bite Prevention



Vector Control



Pathogen
Detection &
Biosurveillance



Vector
Identification

Leading innovation



DoD Entomology Research Historical Success

- Conquest of yellow fever in Cuba and Panama.
- Entomological conquest of malaria and scrub typhus in WWII through the use of clothing repellents and DDT → significant advantage against the Japanese in the Pacific Theater.
- Partnership with the USDA-ARS
 - 1941- 1st aerosol valve with pressurized spray-can system
 - 1943 - Insecticidal use to control plague, typhus and malaria in WW2
 - 1947 - **Development of DEET insect repellent**
 - 1949 - Sterile Insect Technique (Screw worms)
 - 1970 - Ultra Low Volume (ULV) insecticide space spray
 - 1977 - Bacteria biolarvicide (Bti) for mosquito control
 - 1977 - Monomolecular layer larvicides
 - 1978 - **Permethrin-impregnated fabrics for uniforms**





Deployed Warfighter Protection Research Program (DWFP)



Delivering products that protect the warfighter from vector-borne diseases

The Deployed Warfighter Protection (DWFP) Research Program is a Defense Health Program (DHP) initiative managed by the Department of Defense's Armed Forces Pest Management Board (AFPMB). The AFPMB oversees the development and fielding of new management tools against vectors such as mosquitoes and sand flies that transmit pathogens and against other pest species that can negatively impact military operations at home and abroad.

THREATS



Mosquitoes



Sand flies



Filth flies

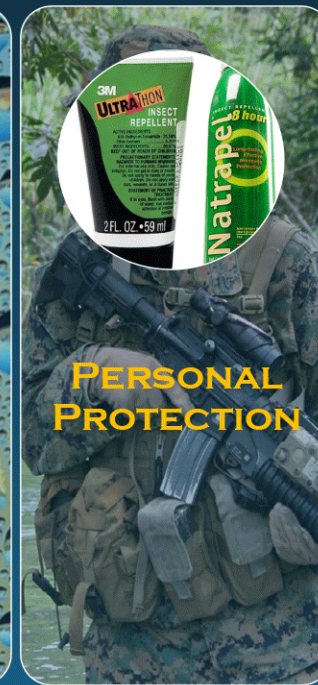
Mosquitoes - malaria, dengue and chikungunya fever
Sand flies - leishmaniasis, sand fly fever and bartonellosis
Filth flies - bacterial diarrhea

MAJOR THRUST AREAS

Develop novel insecticide chemistries or formulations to control mosquitoes and other insect disease carriers.



Develop personal protection products to protect against mosquitoes and other insect disease carriers.



Develop new or improved insecticide application technology to enable safe and effective disease vector management.



"...this will be a long war if, for every division I have facing the enemy, I must count on a second division in hospital with malaria and a third division convalescing from this debilitating disease!"

--Gen. Douglas MacArthur, 1943

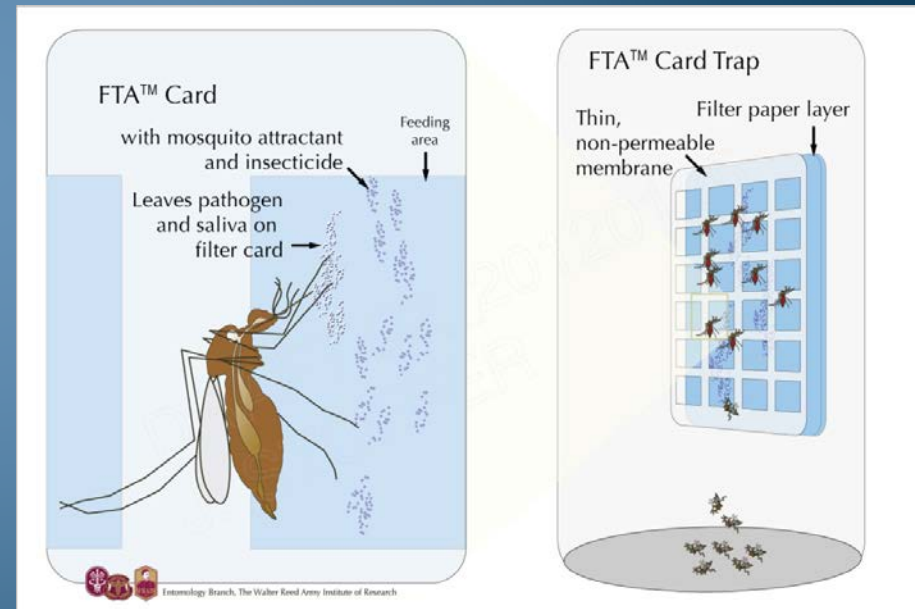


Innovative Data Collection Solutions

Autonomous mosquito trap
(Collects, identifies, transmits)



Saliva capture



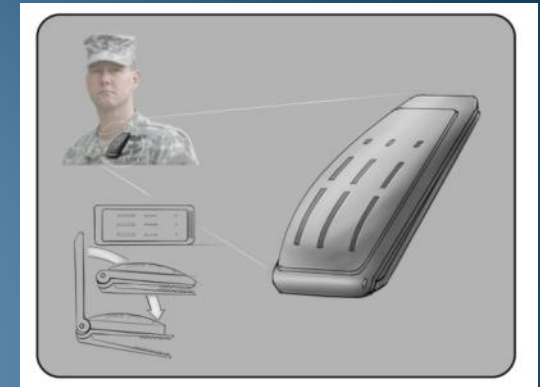
Flying syringe” blood collection





Innovative Prevention and Control Solutions

- Use mosquitoes to carry insecticides to hard to reach areas
- Universal bite prevention
- Create selection pressure to drive zoophagic behavior
- Attractive Toxic Sugar Baits (ATSBs)



How can we use their own behaviors to implement targeted effective prevention and control?







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for Energy, Installations, and Environment
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Aerial Spray Operations

Next Board Meeting

**2018 DoD Triennial Pest Management Workshop
March 19-23, 2018 (TX)**

We are using DTIC's DoDTechSpace service for online collaboration workspaces for each committee. Please make sure you sign up for a DTIC account and request access to the workspace from your committee's ex officio.

- [Workshop Information](#)
- [Workshop Invitation](#)
- [Workshop Registration Form](#)
- [Workshop Approval Letter](#)

Contingency

We provide support to DoD personnel on any pest management issue in any situation. We also provide rapid accurate responses to questions regarding all aspects of pest management and maintain the website to meet the needs of our customers. [Read more>>](#)



Pesticides and Pesticide Reporting

- Standard Pesticides Available to DoD Components and All Federal Agencies - (CAC access only)
- DoD Contingency Pesticides - (CAC access only)
- DoD Pest Management Materiel Other Than Pesticides - (CAC access only)
- DD Form 1532/DD Form 1532-1, Monthly/Daily Pest Management Report

Deployed War-Fighter Protection

The Deployed War-Fighter Protection research program (DWFP) is an initiative to develop and validate novel methods to protect United States Military deployed abroad from threats posed by disease-carrying insects. [Read more>>](#)



Zika Virus Preparation

- [Aircraft Disinsection EPA section 18 Authorization - CAC Access only](#)
- [Aedes Control in Preparation for Zika](#)
- [Aedes Vector Control Pocket Guide](#)
- [Contingency Pest Management Guide - CAC](#)

Installations

The Environmental Biology section works in cooperation with the military services' pest management, natural resources and operations programs to support DoD policy development and consultation [Read more>>](#)



What's New

- [2018 Workshop Information March 19-23, 2018 \(TX\)](#)
- [Stray and Feral Animals - A DoD Solution](#)
- [TG14 - Personal Protective Equipment for Pest Management Personnel](#)

---Aircraft Disinsection---

- [Technical Guide 4: Disinsection of Military Aircraft](#)
- [Aircraft Disinsection Section 18 EPA Authorization](#)
- [Aircraft Disinsection Training](#)

External Links

- [DoD Pesticide Hotline](#)
- [DoD Insect Repellent System](#)
- [Army Public Health Center](#)
- [Navy Entomology Center of Excellence](#)
- [The Walter Reed Biosystematics Unit](#)
- [Environmental Protection Agency - OPP](#)
- [USDA - Agriculture Research Service](#)
- [CDC - President's Malaria Initiative](#)
- [IR-4 Program](#)
- [Innovative Vector Control Consortium](#)
- [World Health Organization - IVM Program](#)

DoD Entomology



Living Hazards Database



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Publications

- Disease Vector Ecology Profiles
- DoD Issuances
- Living Hazards Database
- **Technical Guides**
- Training Resources

CAC Protected Content

- AFPMB Policy and Procedures
- Board Minutes and Staff Reports
- Contingency Guidance
- Pesticide and Equipment Lists
- Memorandums of Understanding/Agreement (MOUs/MOAs)

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DoD Entomology



Training and Certification

- Course Listings
- Course Descriptions



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Technical Guides

TG Overview

As a unit of the AFPMB, ISD (Information Services Division) collects, stores and disseminates published and unpublished information on arthropod vectors and pests, natural resources, and environmental biology important to the DoD.

Most TGs are guidance on specific pest management and disease vector control topics designed to help rather than enforce, and are not DoD policy. However, those cited in DoD policy issuances do carry the weight of DoD policy. DoD pest management policies may be found in DoD Instruction 4715.1, "Environmental Security," DoD Instruction 4150.7, "DoD Pest Management Program," other DoD directives and instructions, and implementing component directives/instructions/regulations.

TGs

- TG 2 - Integrated Pest Management in Child Development Centers and Schools, November 2016
- TG 3 (CAC access only) - Feral Animal Risk Mitigation (FARM) in Operational Areas, January 2017
- TG 4 (CAC access only) - Disinsection of Military Aircraft, March 2017
- TG 6 - Delousing Procedures for the Control of Louse-borne Disease During Contingency Operations, November 2011
- TG 7 (CAC access only) - Installation Pesticide Security, August 2003
- TG 11 - Hydrogen Phosphide Fumigation with Aluminum Phosphide, March 2013
- TG 13 - Dispersal of Ultra Low Volume (ULV) Insecticides by Cold Aerosol and Thermal Fog Ground Application Equipment, July 2011
- TG 14 - Personal Protective Equipment for Pest Management Personnel, September 2017
- TG 15 - Pesticide Spill Prevention and Management, August 2009
- TG 17 (CAC access only) - Military Handbook - Design of Pest Management Facilities, August 2009
- TG 18 - Installation Pest Management Program Guide, March 2013
- TG 20 - Pest Management Operations in Medical Treatment Facilities, December 2012
- TG 21 - Pesticide Disposal Guide for Pest Control Shops
- TG 22 - Guidelines for Testing Experimental Pesticides on DoD Property, June 2001
- TG 23 (CAC access only) - Contingency Pest Management Guide, September 2012
- TG 26 - Tick-Borne Diseases: Vector Surveillance and Control, November 2012
- TG 27 - Stored-Product Pest Monitoring Methods, November 2015
- TG 29 - Integrated Pest Management in and around Buildings, August 2009
- TG 30 - Filth Flies: Significance, Surveillance and Control in Contingency Operations, October 2011
- TG 31 - Guide for Agricultural Preparation of Military Gear and Equipment for Redeployment, January 2017
- TG 34 - Bee Resource Manual with emphasis on The Africanized Honey Bee, November 2013
- TG 36 - Personal Protective Measures Against Insects and Other Arthropods of Military Significance, November 2015
- TG 37 (CAC access only) - Integrated Management of Stray Animals on Military Installations, May 2012
- TG 38 - Protecting Meal, Ready-to-Eat Rations (MREs) and Other Subsistence During Storage, November 2015
- TG 39 - Guidelines for Preparing DoD Pest Control Contracts Using Integrated Pest Management, February 1997
- TG 40 (CAC access only) - Methods for Trapping and Sampling Small Mammals for Virologic Testing, September 1995 (Reviewed March 2013)
- TG 41 - Protection from Rodent-borne Diseases with special emphasis on occupational exposure to hantavirus, December 2013
- TG 42 - Self-Help Integrated Pest Management, April 2015
- TG 44 - Bed Bugs - Importance, Biology, and Control Strategies, March 2012 (Supplemental Information)
- TG 45 (CAC access only) - Storage and Display of Retail Pesticides, November 2012
- TG 46 (CAC access only) - DoD Entomological Operational Risk Assessments, April 2011
- TG 47 - Aedes Mosquito Vector Control, March 2016
- TG 48 (CAC access only) - Contingency Pest and Vector Surveillance, November 2013
- TG 49 - Sand Flies (Diptera: Psychodidae: Phlebotominae): Significance, Surveillance, and Control in Contingency Operations, January 2015

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DoD Entomology



Training and Certification

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- Course Descriptions

Social Media

[Images](#)[Twitter](#)[FB](#)[YouTube](#)



Armed Forces Pest Management Board

Technical Guide No. 26

TICK-BORNE DISEASES: VECTOR SURVEILLANCE AND CONTROL



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For Installations and Environment
Armed Forces Pest Management Board

November 2012



Other DoD Websites

➤ Army Public Health Center

- <https://phc.amedd.army.mil/topics/envirohealth/epm/Pages/default.aspx>

➤ Navy Entomology Center of Excellence

- <http://www.med.navy.mil/sites/nmcphc/nece/Pages/default.aspx>

➤ Walter Reed Biosystematics Unit (WRBU)

- <http://www.wrbu.org/>



Questions

