

# Army and DoD Focus in Managing the Spread of Invasive Species.

What are the concerns, and how are they being studied?



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# Military Dispersal of Invasives

➤ Man-induced dispersal is of primary concern because invasive species or their reproductive structures can be disseminated across large areas by vehicles or other equipment, or on clothing. This is especially likely during military training exercises where equipment and personnel are moved across large geographical areas in short periods of time.

➤ Many exercise participants or war-fighters are unaware of the potential troublesome conditions that can arise if organisms are transported to continental United States (CONUS) locations.



# DoD First Response to Executive Order: Focus on OCONUS Invasives

ERDC/EL TR-07-8

Environmental Laboratory



US Army Corps  
of Engineers®  
Engineer Research and  
Development Center

Legacy Resource Management Program

## Transfer of Invasive Species Associated with the Movement of Military Equipment and Personnel

Alfred F. Cofrancesco, Jr., David R. Reeves,  
and Daniel E. Averett

July 2007



Approved for public release; distribution is unlimited.

The significant monetary and environmental impact that invasive species are having around the world has focused the responses of many agencies to this problem.

In response to the Executive Order, the Legacy Resource Mngt Program funded, and ERDC developed, a report that provides a general overview of the current process that exists to clean, inspect, and regulate the movement of invasive species through ports of embarkation and debarkation.



Aircraft prepared at Camp Doha  
for shipment through the port.

# US Army's Conventional Tank Bath (Central Vehicle Washing Facility)



# Is the CVWF Adequate?

(To prevent spread of invasives)

- Not all locations have a tank bath
- Most wash racks lack containment
- Usually located near motor pool...may not be useful for vehicles moving *within* post
- Designed to remove soil (surrogate for seeds)
- A separate FY10 study will test CVWF effectiveness

# Is there a risk from invasive species within the U.S.?

- The executive order is NOT restricted to outside the country.

## Example:

- The US Forest Service has already recognized invasive species as a potential risk and developed a means to respond to it.



- USFS has instituted rules requiring that vehicles entering and leaving forest fire management areas are to be washed to help minimize such transfer from one National Forest to another.
- USFS is now researching and preparing system specifications for contracted cleaning of vehicles moving from one area to another.

# Forest Service Response to Executive Order



Almost every major forest fire attack plan includes requirement that all vehicles be washed going in and out of fire zone

USFS contracts for relocatable wash systems similar to this

# One CONUS Study

“Evaluating the Potential for Vehicle Transport of Propagules of Invasive Species”

(Interagency SERDP project - Montana State University PI)



Bozeman, MT



ERDC-CERL



San Dimas Lab



CDF Academy





# Project Objectives

- Acquire data on soil adhering to vehicles driven off road, and to evaluate several relocatable commercial vehicle cleaning systems for:
  - **Cleaning system Efficacy** – *amount of debris removed from the vehicles and equipment over a certain time period, compared to total amount of debris that could be removed from them.*
  - **Waste Containment** – *contract system's ability to contain the waste from the cleaning system*
  - **Seed Viability Effects** – *number of viable seeds remaining in the system waste compared to the known quantity of seed each system processed.*

## The Big Question

- Do the findings show the potential need to require vehicle cleaning when moving between different CONUS installations?

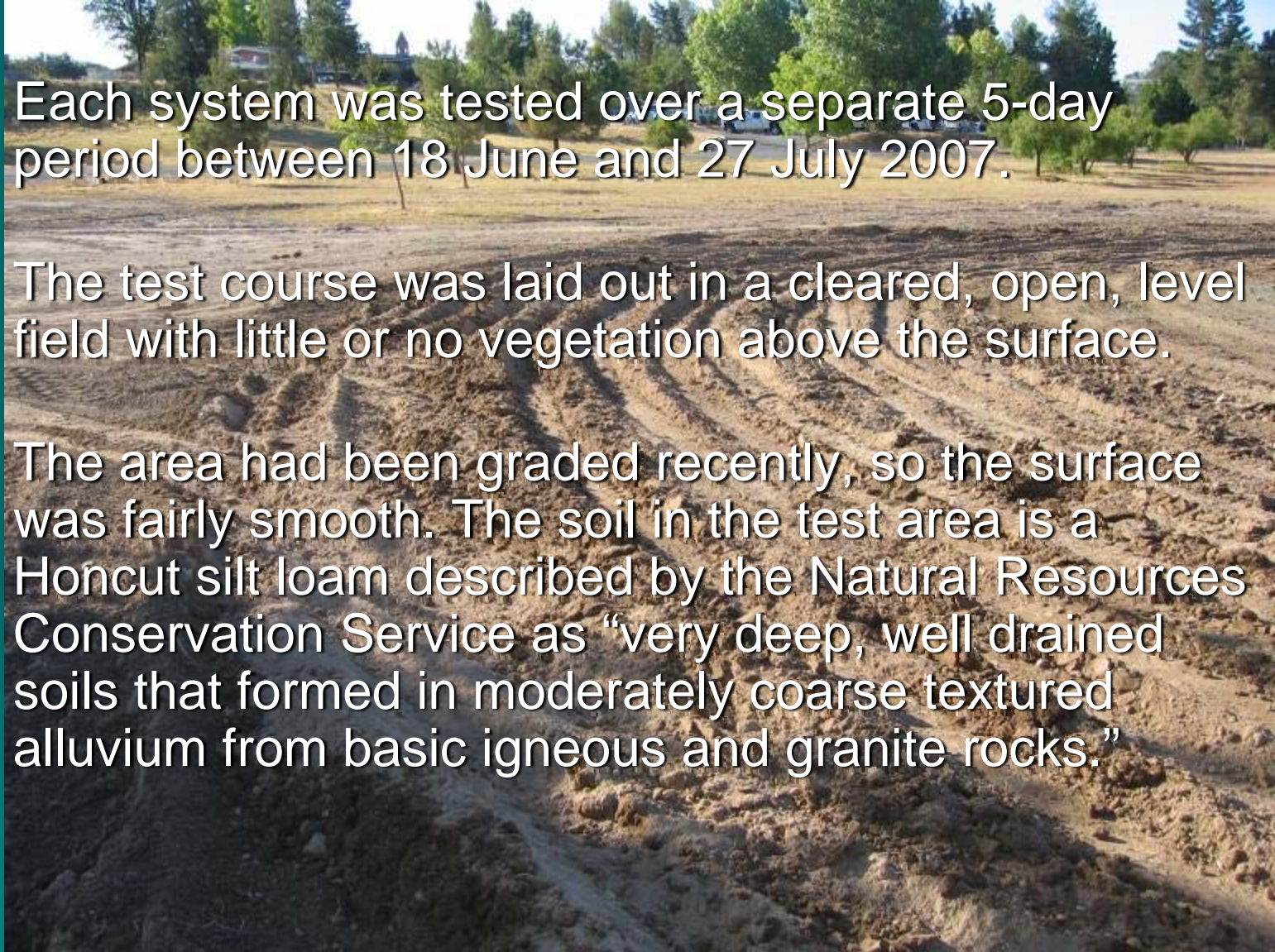
# Test Location – 2007 Study



SDTDC and CERL formed a working partnership with Cal Fire, whose cooperation permitted researchers to stake out a test course, a travel route, and a solid, paved cleaning location. All testing took place at Cal Fire Training Center in Lone, CA.

# Site

- Each system was tested over a separate 5-day period between 18 June and 27 July 2007.
- The test course was laid out in a cleared, open, level field with little or no vegetation above the surface.
- The area had been graded recently, so the surface was fairly smooth. The soil in the test area is a Honcut silt loam described by the Natural Resources Conservation Service as “very deep, well drained soils that formed in moderately coarse textured alluvium from basic igneous and granite rocks.”



# Vehicles Used

In this USFS-focused phase of the study, three types of vehicles were used:

- **Wildland (Class 3) Fire Engines** (two were used for test cycles)
- **Light 4x4 vehicles** (two pickup trucks and 1 sport utility vehicle [SUV])
- **Bulldozer** (one Cat D6R high track bulldozer).



# Procedure

- Vehicles were cleaned meticulously prior to driving at set speed around the predefined course and then washed by wash unit.
- Wheeled vehicles were driven 15m through a fabricated mud bog and then 2.75 times around the figure-8 course before returning them to the washing area on the helipad. Total distance: 1720m (1.07 miles)
- At the end of the process the vehicles were stripped down and cleaned again to quantify the amount of debris missed by commercial wash units.
- To quantify how much seed was lost in the wash and filtering system process, a known amount of soil and seed were placed in a water trough and taken into the wash unit's filtering system. Samples were left over-night and filtered according the individual unit's protocol. Waste samples were collected and germination was later recorded at MSU.

Predefined course is prepared



Vehicle drives the course at a set speed



Vehicle is washed by wash unit for 5 minutes



# Quantify how much soil was removed by the wash contractor





# Vehicles were stripped down and cleaned again

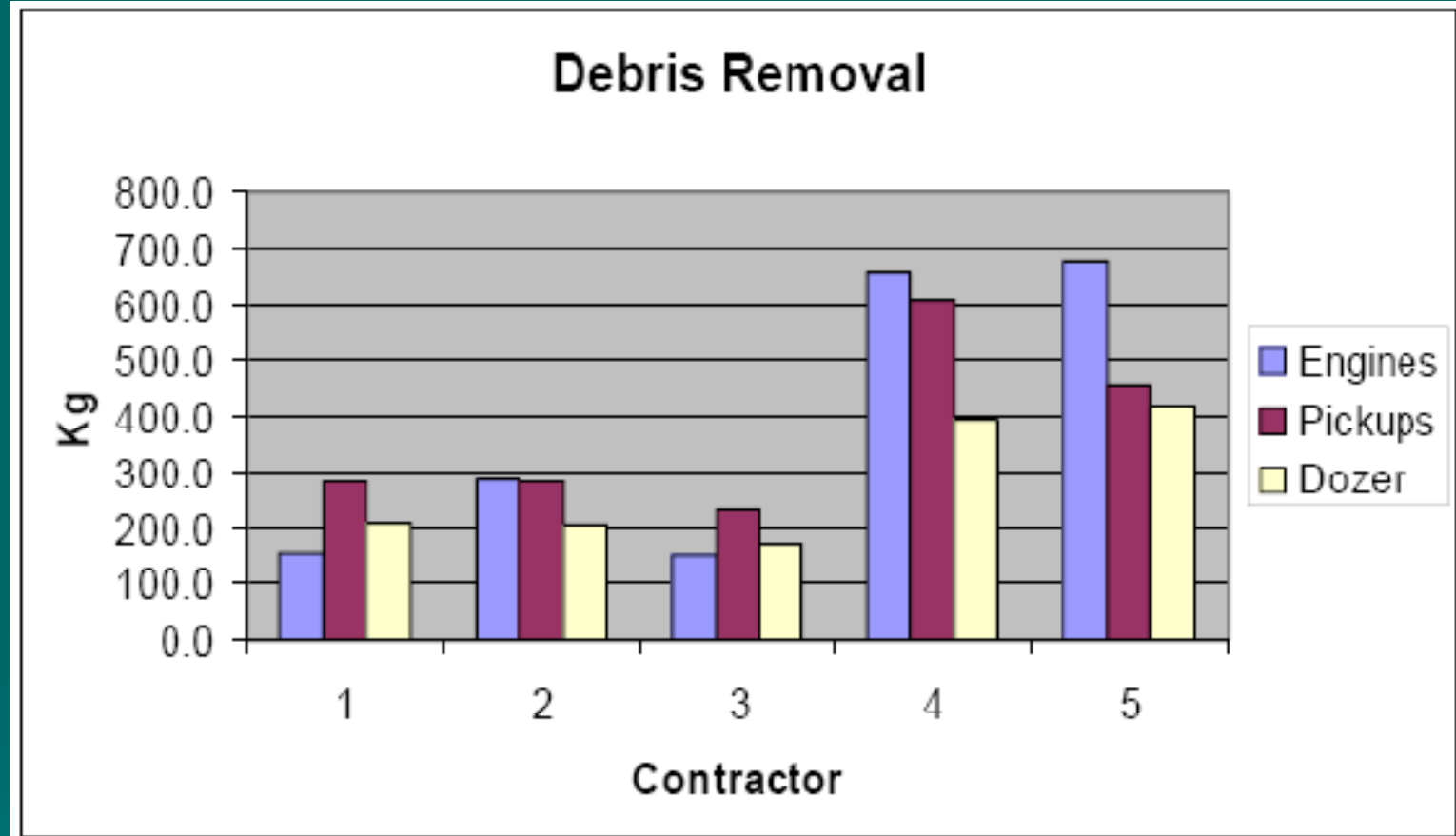


## Quantified the amount of debris missed by commercial wash units



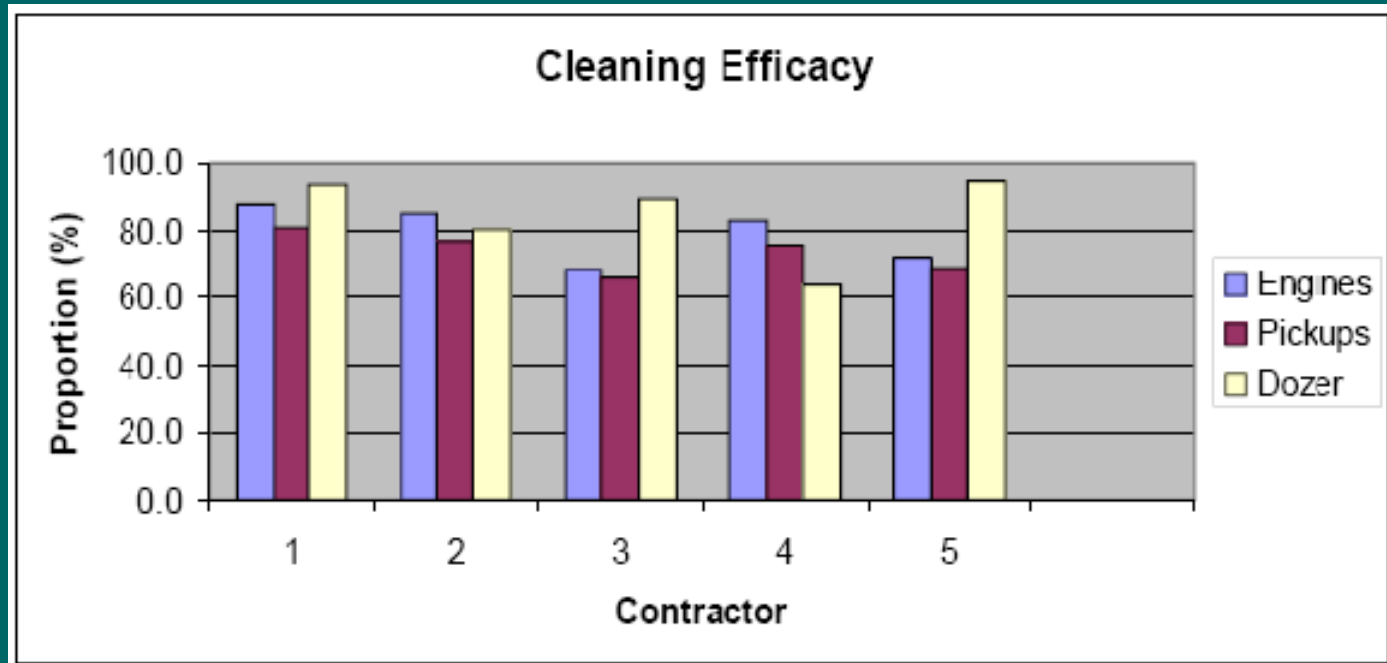
Waste samples were collected and germination was recorded at MSU

# Debris Removed



- As the test progressed, the vehicles picked up more debris from same course, apparently related to increases in the amount of water applied to the course for dust abatement. Therefore, the later contractors had a much larger mass of debris to remove, in some cases more than 4 time as much.

# Cleaning Efficacy



- The total (100%) was the amount contractors removed plus that which the research crew removed in the post wash.
- Even the most effective system could not remove more than 88% of debris from the wheeled vehicles, and the poorer ones only 65%.
- If more time had been allowed, the results would likely have been better; however it was decided to standardize vehicle washes at 5 minutes each to reflect fire-incident conditions in the field.
- This is also approximately the time allocated per vehicle by the Army in its washing facilities

# Conclusion

- The best systems removed from 80-90% of soil from the vehicles.
- **HOWEVER**, these were all systems believed to be the best of their types, with experienced operators.
- Many of the systems actually being used by the USFS likely do not achieve these levels of soil removal in field use.
- This means large amounts of soil are routinely **NOT** removed during cleaning stops at forest fire sites.

# What does this mean?

- Determine whether the findings show the significance of enforcing vehicle cleaning when moving between different CONUS installations.
  - There ARE systems that could be used to remove soil and other debris from vehicles moved from different training areas
  - BUT efficacy is much less than 100%; while the process would reduce the risk of seed transport, it would not eliminate it.

# 2008 Research Program

- Instrumented a combined arms scout platoon from the 163<sup>rd</sup> Brigade, Montana ARNG
- Recorded samples of each vehicle type during a week-long FTX at Orchard Training Area, Boise, ID
- Cleaned vehicles before and after participating in the exercise
- Saved debris removed, and quantified seed recovered for species and germinability
- Mapped terrain where vehicles actually operated as recorded by GPS, and identified vegetation types
- Related seed removal to duration and distance moved in each vegetation type to develop risk ratings.

# 2008 Field Studies



Scout platoon vehicles in line  
to be washed post-exercise

Orchard TA, Idaho

10 June 2008



# 2008 Field Studies



Vehicles being cleaned after an FTX at Orchard TA, Idaho. June 10, 2008

Thank You!

Questions?

