

Trails and Invasive Noxious Weeds

Justin Stegall

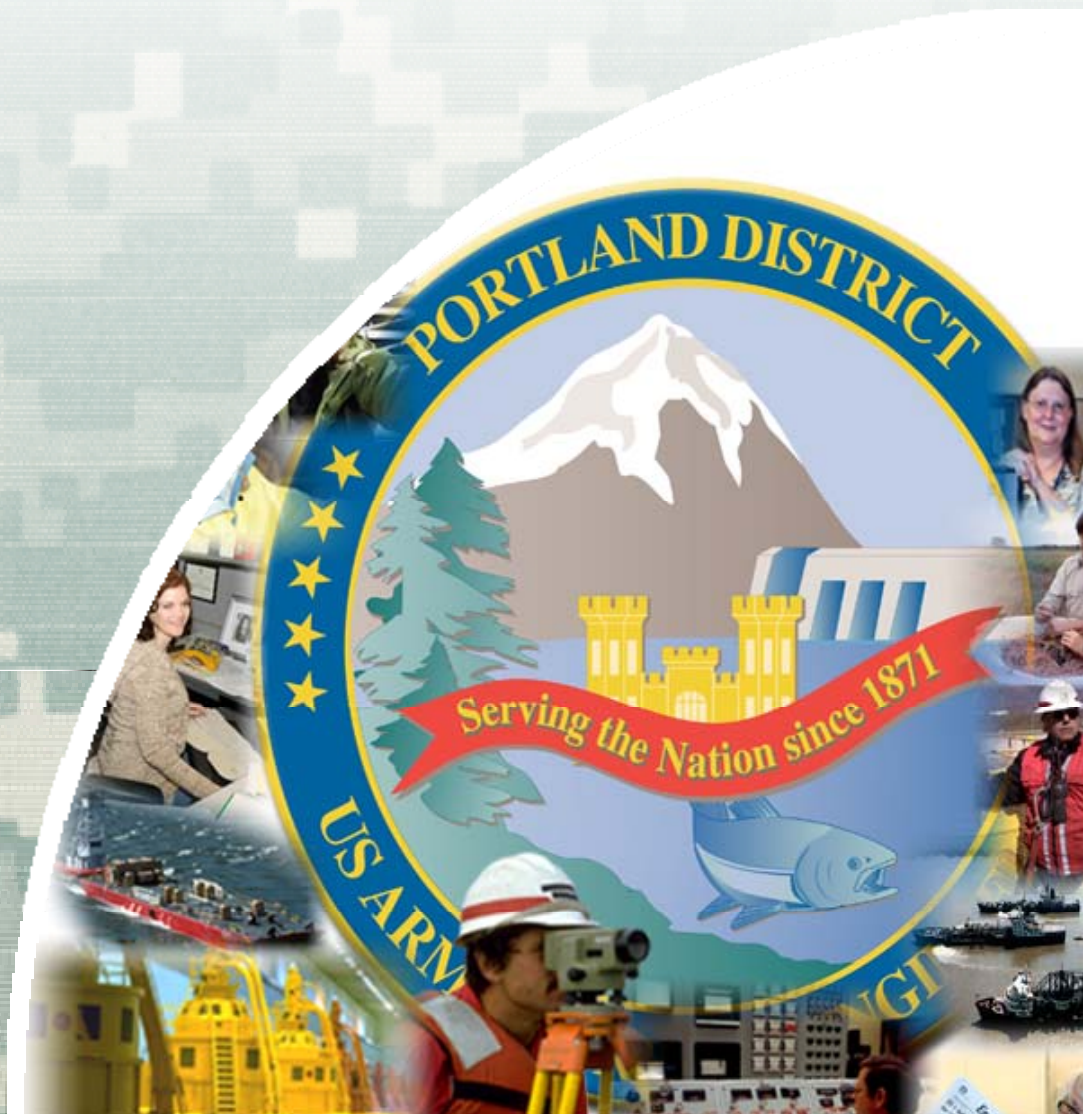
Natural Resource Manager

Rogue River Basin Projects

04 Sept 2013



US Army Corps of Engineers
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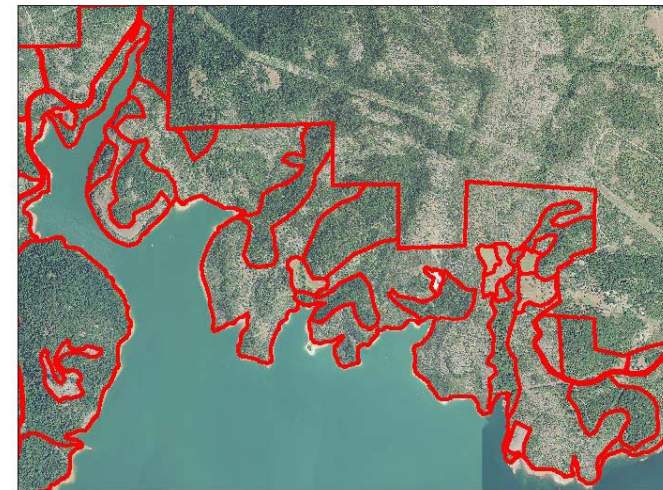
Trails and Invasives

- Weeds on USACE lands (including transport)
- Best management practices (prevention and treatment)
- Public outreach and invasive species cleaning stations
- Beyond USACE (what others are doing)
- What we can do every day



Weeds on USACE Lands

- Millions spent annually on invasives nationwide
- 80% of lands at Rogue Basin infected
 - Boundary surveys
 - Level one inventory
 - Occurrence in dispersed areas
 - Looked for commonality



Fawn Butte Level 1
Invasives Inventory



Weeds on USACE Lands



“Invasive species” defined:

an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health (EO 13112)

■ Common locations

- Road shoulders
- **Trails**
- Shorelines
- Campgrounds
- Stock piles or quarries, etc...



Weeds on USACE Lands



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- Stock piles or quarries, etc...

DISTURBED AREAS



Weeds on USACE Lands

- Why are trails important?
 - Unique accessibility issues
 - Use of specialized equipment
 - Both land and water based trails
 - Create breaks in habitat
 - Animals tend to follow them
 - Maintained disturbed areas
 - May stay within or traverse watersheds
 - Visitors use them year-round



Seed/Propagule Transport Vectoring

■ Natural

- Wind dispersal
- Water (streams, tides, ponds, stormwater)
- Animals

■ Anthropogenic

- Boots
- Clothing
- Pets
- Recreation gear (bicycles etc...)



Seed/Propagule Transport Vectoring

- Anthropogenic cont...
 - Off road vehicles ORV's
 - Four wheelers, side-by-sides, etc...
 - Snow machines or snowmobiles
 - Other vehicles
 - Cars and trucks
 - Ranger, maintenance, contractors
 - Includes heavy equipment and water craft
 - Back-hoe, tractors, power barrow, air boats, canoe, trailers, etc...



Best Management Practices Prevention

- Recreation/dispersed areas
 - Encourage certified weed free
 - Horse feed and fire wood
 - Interpretive materials
 - Educate your visitors
- Maintenance
 - Use weed free when available
 - Soils or fill materials, rock, and seeds
 - Clean equipment, gear, and PPE
- Prevention is key



Best Management Practices Treatment

- Utilize an integrated pest management approach to blend treatment methods (ER 1130-2-540)
 - Non-chemical habitat manipulation
 - Mechanical
 - Chemical
 - Cultural (education)

IPM
Integrated Pest Management



Best Management Practices Treatment



- Non-chemical habitat manipulation (hand pulling)
 - Volunteer events with partners
 - National Public Lands Day
 - Local fishing and hunting clubs, watershed associations, friends groups
 - Boy and Girl Scouts of America
 - Trade camp sites for trail maintenance
 - Service projects
 - High schools
 - Internships including AmeriCorps



Best Management Practices Treatment

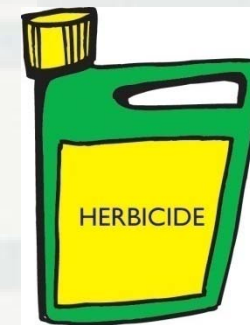
■ Mechanical

- Rough mowing, weed eating, chain saws



■ Chemical

- Herbicides
 - Very powerful results when used appropriately
 - Label is the law
 - Certification requirements
 - Not for annual maintenance
 - State and federal laws
 - Section 402 CWA



Best Management Practices Treatment



■ Cultural (prevention)

• Education

- Empower your visitors
- Public outreach
 - Use your bulletin boards, visitor centers, parks and campgrounds
- PAO
- Invasive cleaning stations



Public Outreach

- Federal executive order 13112



- Outlines the plan for dealing with invasives
- Section 2 (2)
 - **Prevention**, detection and response, monitoring, restoration of natives, research, **and education**
- Combine both goals into one station



Public Outreach

A graphic for a public outreach campaign. It features a silhouette of a person walking a dog on a forest path. The person's backpack, the dog's fur, and their shoes are shown with small yellow and green icons of invasive plants and animals. The background is a lush green forest. Text is overlaid on the right side of the graphic.

Don't give invasive species a free ride!

Invasive plants and animals will hitch a ride on you, your equipment, or your pets as a way to invade new areas. Left unchecked invasive species can degrade your public lands and waters causing irreversible damage.

Preventing the spread of invasive noxious species is everyone's responsibility.

How you can help!

Please use this cleaning station to remove seeds, plant parts, and mud from boots, clothing, and pets.

For more information on noxious and invasive species please call 541-878-225 and ask for a park ranger.



US Army Corps of Engineers
Portland District

- Thought provoking

- Challenges visitors to action



Public Outreach Invasive Cleaning Stations



- Use partnerships for regional continuity
- Potential partners include:
 - Non-for profit, county, state, and federal
 - USFS, BLM, Nature Conservancy, State Parks, watershed associations



Public Outreach Interpretation



- Utilize visitor centers for public outreach
- Post invasive information on bulletin boards
 - Trail heads, access points, boat ramps, camp grounds
- Jr. Ranger and campfire programs
- Employee news magazines





Story and photos by Chad Stuart, Rogue River Basin Project

A colorful oddity at two of Lost Creek Lake's most popular trailheads is designed to capture visitors' attention and deliver an important message:

"Don't give invasive species a free ride."

The message is part of an ongoing battle that the Corps faces at its lands and waters every day – the battle against invasive species.

"Invasive species are defined as alien species that do or are likely to cause economic or environmental impact or harm to human health," said Willamette Valley Project botanist Wes Messinger. "Invasive species impact

nearly all groups within the Corps, whether it's a park choked with ivy, a forest understory blanketed by false brome grass or an intake clogged with zebra mussels."

According to Corps headquarters, around \$100 million in operations and maintenance funds are spent annually on invasive species. At the Rogue River Project alone, 25 confirmed land-based invasive species infect nearly 80 percent of the more than 9,000 acres of land.

"Every year we are waging a battle against invasive species. We mow, pull, cut and spray the most notorious invaders to try and gain headway on project lands," said Justin Stegall, natural resource specialist at the Rogue River Basin Project. "It's a slow

process, but our efforts on the ground are beginning to see some headway at our most critical and rare habitats."

"We cannot win the war without education playing a critical role, and that is where our new cleaning stations come into play," said Stegall. "But we have also taken it one step further and asked visitors to step up and take action."

Federal Executive Order 13112 outlines the battle plan for dealing with invasive species. The goals within the document drove the Natural Resource staff at the Rogue Project to plan, develop and build the invasive cleaning stations from scratch.

"In the EO it states that to control invasive species, education and

prevention are two important factors," said Stegall. "We wanted to combine both of these goals from the EO into one station."

The cleaning station looks like a standard bulletin board with an interpretive message.

"What set it apart are the message and tools for cleaning your clothes and pets," said Park Ranger Edward Amerson of the Rogue River Basin Project. "Of course the green-blue background sure pulls the eye toward the poster and creates awareness."

Humans play a key role in the spread of invasive species. Hikers and dog walkers can be unintentional taxis, which can have dire consequences to both public and private lands across America. For example, visitors hiking any of the 30 miles of trails at Lost Creek Lake may unknowingly pick up an unwanted seed attached to their pant legs, shoes or pets. That seed can then be brought home and begin to grow in their lawns, gardens and property.

The reverse is also true. Plants can and have been brought onto Corps land in this manner.

The cleaning stations have a boot scraper to clean mud and unwanted seeds off a visitor's shoes. Two whisks brush clean seeds from pants, shirts, backpacks and pets.

"It is possible that every time a hiker or dog walker leaves or enters Corps lands, they are carrying hundreds of seeds that could sprout and grow," said Stegall. "These cleaning stations are an important tactic to call awareness to the possible threat and impact of invasive species."

"I think it's a great idea," Carolina Martin said, as she stopped to clean her son Wade and family dog Katie. "I wish I had something like this where I grew up ... then maybe there would not

Steps to prevent invasive species:

- ◆ Inspect and clean footwear, clothes and other personal items before leaving or entering a work site or trail.
- ◆ Clean equipment like hand tools, heavy equipment, boats and trailers before and after a job.
- ◆ Properly dispose of invasive species seeds or cuttings.
- ◆ Don't transport plants, seeds or firewood more than 50 miles unless clean of invasive species.

be so many problems with unwanted plants that take over."

Another visitor ending a day hike said as she brushed off her pants and shoes, "It's unique. I have never seen anything like it."

The cleaning station design has been presented to the Jackson County Weed Board, of which Stegall is the Corps representative. The response has been overwhelmingly positive.

The Nature Conservancy and U.S. Bureau of Land Management want to put a similar design and message at the extremely popular hiking destination at Table Rock. Oregon State Parks wants to put the cleaning station at Valley of the Rogue Park. Jackson County Parks

and other Corps of Engineers operating projects have all expressed interest in this design as well.

"I think it speaks to the widespread nature of this problem across our District and region. It is something that touches almost everyone, whether they are a federal employee, landowner or outdoor enthusiast," said Stegall.

Invasive species are a problem that impacts everyone, but also something everyone can help with.

Stegall said, "By taking simple steps to clean your clothes, equipment and personal items, whether at home or at work, we can start winning the battle on invasives, and ultimately the war." □



May - June 2012 Corps'pondent 17



What Others are Doing

- Invasives.org - Why should I care about invasive species
 - <http://www.invasive.org/101/HikerBikerCamper.html>
- PlayCleanGo.org - Useful prevention tips for campers, trail users, homeowners, and field workers
 - <http://www.playcleango.org/takeaction.html>
- InvasiveSpeciesInfo.org - USDA site with links and resources
 - <http://www.invasivespeciesinfo.gov/news/whatyou.shtml>
- U.S. Forest Service - Short film on invasives and natural resources
 - <http://www.fs.fed.us/invasivespecies/prevention/playingSMART.shtml>



What Can We Do?

- Education (part of IPM)
 - Includes both the public and employees
 - Learn to recognize infestations
 - Work/coordinate with maintenance staff
 - Avoid working in infested areas if possible or remove invasives from the site prior to beginning work
 - Start work in un-infested areas first and move into infested
- Identify and report infestations
- Check and clean your equipment, PPE, boots, and gear between work sites and preferably before leaving an infested area



References

- EO 13112 Invasive species
<http://www.gpo.gov/fdsys/pkg/FR-1999-02-08/pdf/99-3184.pdf>
- ER 1130-2-540 Environmental Stewardship operations and maintenance
http://publications.usace.army.mil/publications/eng-regs/ER_1130-2-540/toc.htm
- ER 200-2-3 Environmental compliance policies
http://publications.usace.army.mil/publications/eng-regs/ER_200-2-3/
- CECW-ZA USACE Invasive Species Policy
- National Invasives Policy and Plan



How does the military approach invasive species management?

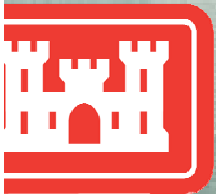
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Champaign, IL



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What are Invasives?

And why do we care?

- Defined as any non-native species with potential to cause economic, environmental or health problems
 - Includes, plants, animals, fishes, etc.
- The invading species may cause changes which affect native and endangered species
- Executive Order 13112 (1999) tasked all Federal agencies to manage their properties so as to minimize the chances of spread of these species



How Did Agencies Respond?

A couple of examples

- DoD had been strongly criticized for inadequate cleaning procedures following Desert Storm actions in SW Asia
 - Efforts focused on in-theater cleaning of vehicles to be retrograded
- Forest Service had been criticized for introducing invasive weeds during forest fire activities
 - Work focused on developing portable cleaning systems which could be deployed to fire response camps



Military Dispersal of Invasives

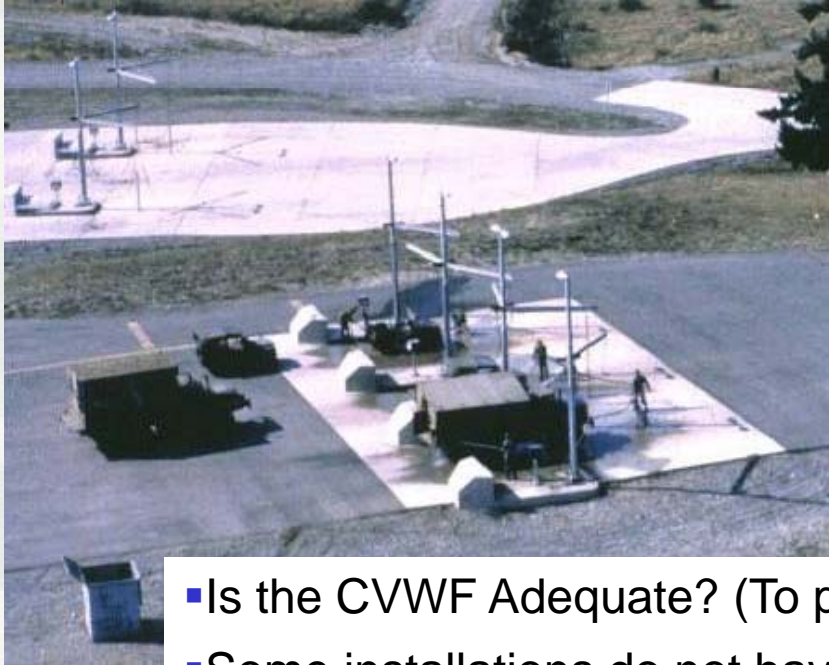
What is the risk here?

- Military-facilitated dispersal is a 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
- Either within or outside the US
- 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.



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

Invasive species were not one of the design criteria



- Is the CVWF Adequate? (To prevent spread of invasives)
- Some installations do not have one
- Usually located near motor pool, may not be useful for vehicles moving within post
- Designed to remove soil (surrogate for seeds)
- Most regular wash racks lack containment
- Procedures do not address aquatics



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

- Remembering that Executive Order 13112 is NOT restricted to risks from *outside* the country...

Example:

- The US Forest Service 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 using our studies to prepare system specifications for contracted cleaning of vehicles moving from one area to another.



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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



Our CONUS Study

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

(Interagency SERDP project - Montana State University PI)



US Army Corps
of Engineers.

ERDC-CERL



Bozeman, MT



San Dimas, CA



CDF Academy



Test Location

CALFIRE Academy, Lone California

A Cooperative Study



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Project Objectives #1

- 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.*

Underlying DoD-relevant Question

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



Evaluated Performance of 5 Commercial Wash Units

- Do they meet their design purposes?
 1. Remove soil from equipment?
 2. Reduce risk of seed transport?
- Do different washing systems differ in performance?



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.



Vehicle is washed by wash unit for 5 minutes



Quantify how much soil was removed by the wash contractor

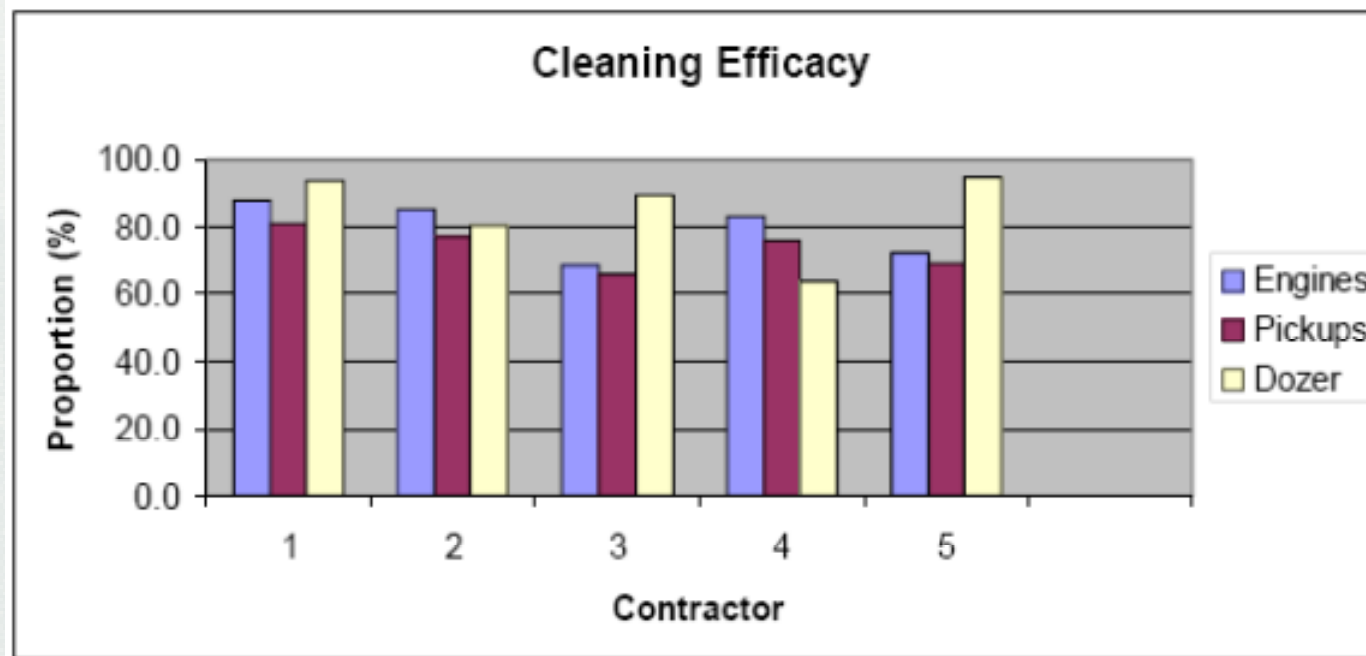


Vehicles were stripped down and cleaned again



Quantified the amount of debris missed by commercial wash units

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's washing facilities



Results and Conclusions:

- The best systems and best operators removed from 80-90% of soil from the vehicles.
- Some, though, achieved < 70% soil removal
- HOWEVER, these were all systems believed to be the best of their types, with experienced operators
- Re-washing does benefit to a point
- Six-minute wash may be optimum for efficiency
- USFS *has* no performance specs, so many of the systems actually being used by the USFS likely do not achieve this level of soil removal.
- This means large amounts of soil are routinely *NOT* removed during cleaning at forest fire sites.



What does this mean?


- Do the findings show the potential value of enforcing vehicle cleaning when moving among different CONUS installations?
 - **There ARE systems available that could be used to remove soil and other debris from vehicles moved among different training areas**
 - **BUT efficacy is much less than 100%;**
 - **The process would reduce the risk of seed transport, but would not eliminate it**
- Is this level of removal a great enough benefit to require inter- (or intra-) installation cleaning procedures?
- Now preparing recommendations for new procedures for the Army



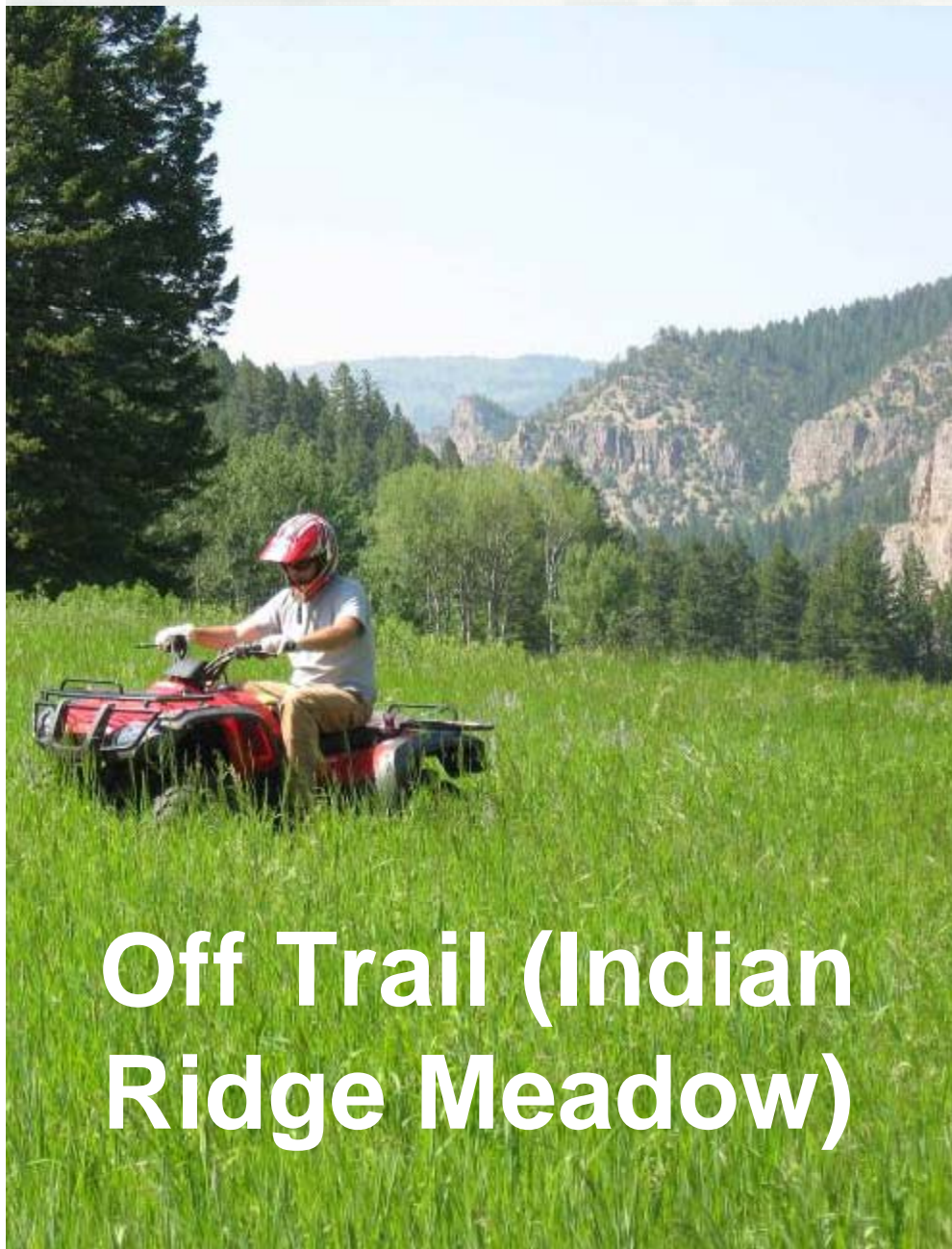
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Another Off-road Vehicle Type: ATV

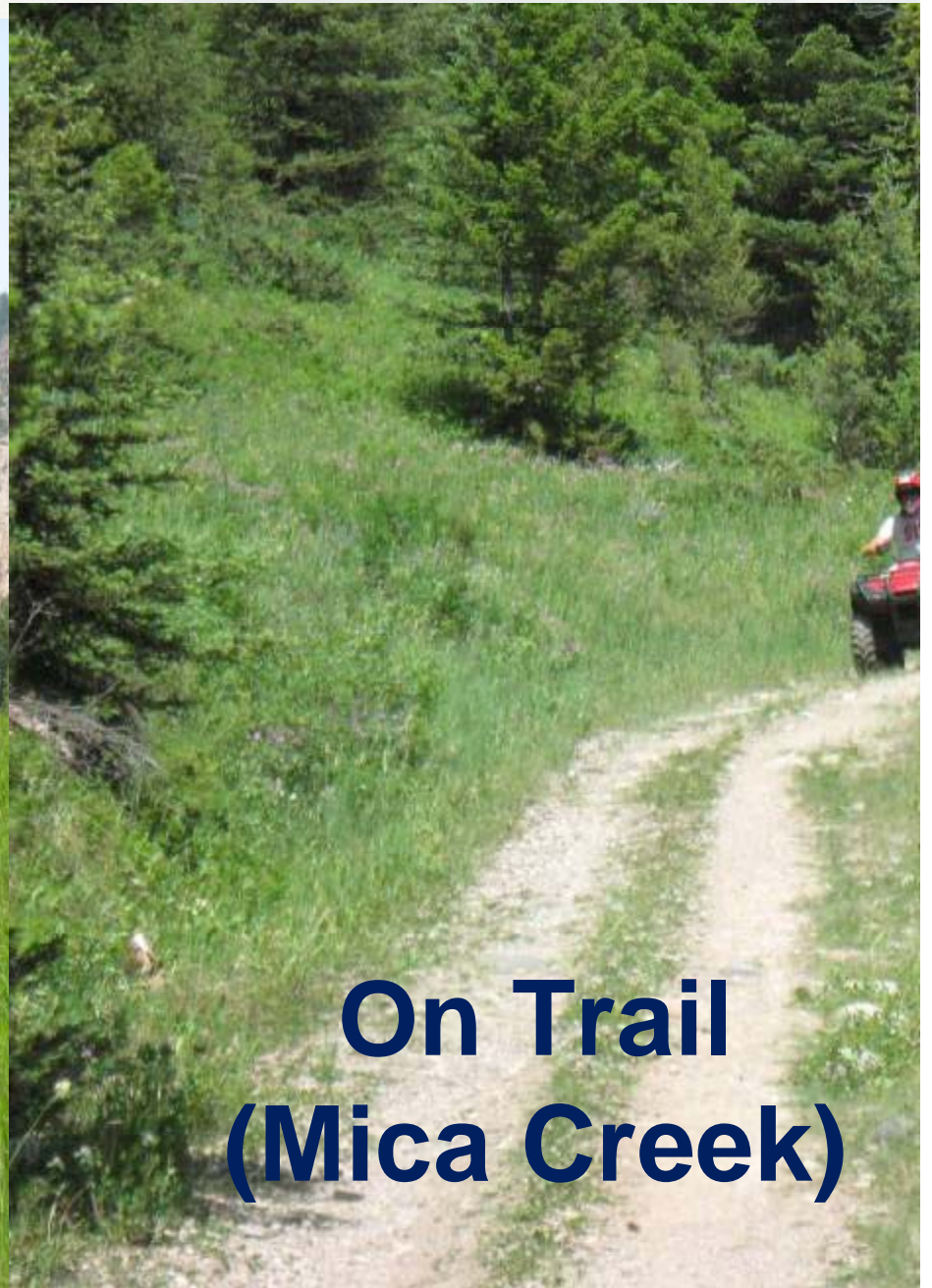
Goal: Evaluate how season and terrain may influence the potential of ATVs to transport seeds

- Conducted in Gallatin National Forest
- Real-time GPS data collected while ATVs were operated
- Trials conducted off-trail and on-trail, late spring and fall of 2008
- Montana Noxious Weed Trust Fund Grant 

number 2008-005



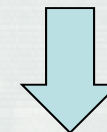
Off Trail (Indian Ridge Meadow)



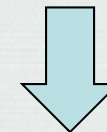
On Trail (Mica Creek)

Methods

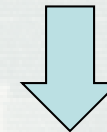
(Seed Collection)



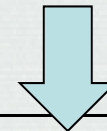
8 loops, 2 miles each,
GPS tracked



Collect seed



Repeat 3x for 3 replicates



Repeat again on the trail



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- Soil material potted
- Plants counted and identified
 - AND
- Seed material collected from mat
- Weighed, subsampled, seeds identified and total seed numbers estimated



Summary

- ATVs are capable of picking up large amounts of seed
- More seed picked up off-trail than on-trail
 - 1700 – 5,500 per mile off trail
 - 21 – 400 per mile on trail
- More seed picked up in fall season than late spring/early summer
- Other Questions:
 - How far are seeds transported?
 - What about horses, mtn. bikes, people, and animals?



Overall Conclusions

- Significant CONUS risks exist
- Wash units do remove soil and plant material
 - Seed disposal practices need more care
- Not clear how good BMPs really are
- Vehicle type plays a role in the amount of seed moved
 - Tracked vehicles have greater potential
 - Any off-road vehicle has high risk
- Season has a big effect on seed movement
 - There are high-risk seasons
- ~~Other studies could assist in quantification~~



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What should the Army do?

- No clear data available on highest risk CONUS locations
 - or on risk *within* a large installation
- Becomes a Garrison Commander's headache
- Is the cost of remediation (e.g. weed control) worth the cost of running a vehicle cleaning program?
- CVWF not well suited to this need.
- Requiring construction equipment to be cleaned before entering may be a low-hanging fruit



More Information

- Public Works Technical Bulletin 200-1-131 - 30
June 2013

Non-native Invasive Species Management Guidance

[http://www.wbdg.org/ccb/browse_cat.php?o=31
&c=215](http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215)



- US Forest Service. 2008. “Comparison of Vehicle Washing Systems: Prepared for US Forest Service.” Technology and Development Program – 5100 Fire Management; 0841-1808–SDTDC. Washington, DC: US Department of Agriculture, Forest Service.

[http://www.nwccg.gov/branches/et/etc/subcommi
ttees/equipment/mobile_equipment.htm](http://www.nwccg.gov/branches/et/etc/subcommittees/equipment/mobile_equipment.htm).



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