Background:

Feral swine are an invasive species common on installations and other DoD lands in the southwestern, south-central, and southeastern United States. Increasing in population, these aggressive invasive species can have dramatic negative impacts on the local natural ecosystem, including posing potential harm to threatened and endangered plants and animal species. Feral swine interfere with military readiness by causing damage to lands and other infrastructure assets necessary for training and other critical operations. They may also cause direct harm to Warfighters through injury or disease.

Natural resource managers must create invasive species management plans based on multiple site-specific and often uncertain criteria, making it difficult to select the optimal course of action. Ad hoc decision making may miss crucial elements of the problem that contribute to the success or failure of the selected countermeasure. Given the potential risks to mission effectiveness, as well as other environmental and economic threats posed by feral swine, there is the need for a decision making framework that will assist natural resource managers assess and implement effective courses of action to manage these risks.

Feral Swine Populations 2014
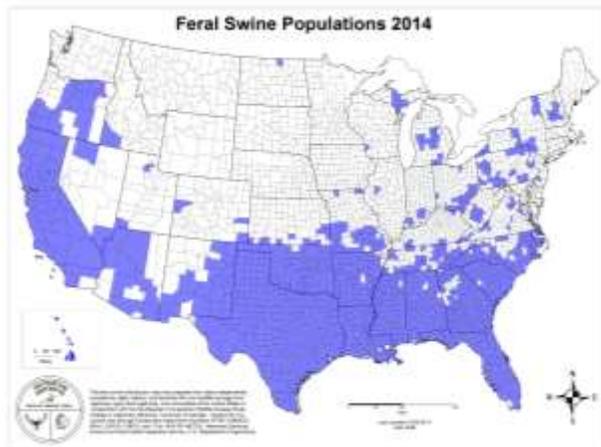
Objective:

The objective of this effort is to (1) understand the characteristics of successful feral swine control programs, and (2) based on this knowledge, provide natural resource managers with a decision support tool to select the most effective countermeasures given their particular site-specific constraints and available resources. This tool will provide decision makers with a structured way to consider specific attributes which contribute to these complex choices.

Summary of Approach:

The first task involved performing an assessment of previous feral swine management programs. This meta-analysis focused on understanding what countermeasures were taken, the impacts that feral swine have had on DoD lands, and the resultant expansion (or contraction) of pig populations on DoD lands. This allowed for developing a list of the most frequently used countermeasures as well as the important variables associated with these countermeasures. The second task was to develop a decision tool. This tool uses multi-criteria decision analysis, enabling it to compare various criteria (i.e. financial investment, environmental impact).

Combining these countermeasure-criteria scores with ratings of the decision maker's values allows the model to compute utility scores for each countermeasure. These scores are then displayed on a results page which allows the user to see side by side comparisons of the countermeasures. Furthermore, the contributions that the various criteria make towards each countermeasure are displayed in a stacked bar chart. This allows the user to not only understand how the countermeasures rank against each other, but more importantly where the strengths and weaknesses of these countermeasures lie.

Benefit:

This tool contributes to more informed decision making from land managers, enabling them to prepare for any weaknesses in the decision they choose. By using this tool periodically throughout the eradication campaign, the decision maker is able to develop adaptive strategies against the invasive species at hand.

Accomplishments:

The first accomplishment is the decision tool, which can be used by management to assist in determining the best countermeasure for their site-specific situation, allowing for the decision maker to understand the tradeoffs between alternative solutions (countermeasures). Additionally, a peer reviewed journal article on the decision tool was published in the journal *Science of the Total Envieonment*.

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