

## Notre Dame's STAIRcrayfish

Follow steps 1-4. Model accuracy data and management threshold examples for each model are included below.

1. Determine your thresholds for both the random forest model (RFM) and logistic regression model (LRM) using the model accuracy figures on pages 2 and 3, respectively.
2. Examine the [species assessments table](#) (hyperlink to species assessment table) for the species of interest. If the species is present, record the RFM probabilities. If an RFM probability is not available, record the LRM probability for that invasion step (i.e., established or invasive) and proceed to step 4. If an LRM probability is not available, proceed to step 3.
3. Calculate the LRM probability for established or invasive using the following relevant formula:

$$\text{Established probability} = \frac{1}{1 + e^{-(-0.6619 + 0.2473 * \text{ClutchScaled})}}$$

*where ClutchScaled is the species' maximum clutch size (i.e., number of eggs per clutch) divided by the maximum carapace length measured in millimeters*

$$\text{Invasive probability} = \frac{1}{1 + e^{-(-3.549715 + 0.007770 * \text{ClutchMax})}}$$

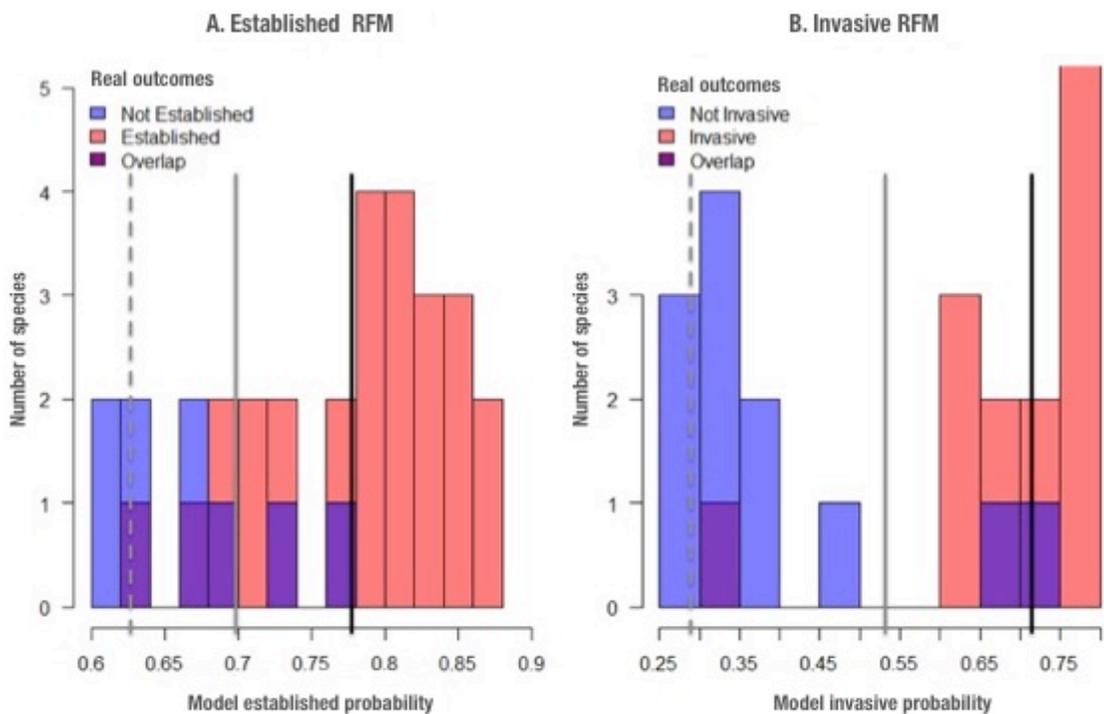
*where ClutchMax is the species' maximum clutch size (i.e., number of eggs per clutch)*

Record all sources used to determine ClutchScaled and ClutchMax.

4. Compare the recorded and/or calculated probabilities to your pre-determined thresholds. Probabilities greater than your threshold probabilities denote undesirable risk.

## RFM Accuracy

Figures A and B show the real outcomes relative to RFM established and invasive probabilities. The thresholds that most accurately distinguished between established vs. not-established and invasive vs. not-invasive are represented by the solid grey line and are 0.697 and 0.535, respectively. The thresholds that allow for correct classification of all species that would become established or invasive are represented by the dotted grey line and are 0.629 and 0.288, respectively. These thresholds may include some non-invaders as well. The thresholds represented by the solid black line would miss some of the species likely to become established or invasive but would never classify a safe species as a risk. These thresholds are 0.776 and 0.719, respectively.



## LRM Accuracy

Figures A and B show the real outcomes relative to LRM established and invasive probabilities. The thresholds that most accurately distinguished between established vs. not-established and invasive vs. not-invasive are represented by the solid grey line and are 0.724 and 0.521, respectively. The thresholds that allow for correct classification of all species that would become *established* or *invasive* are represented by the dotted grey line and are 0.497 and 0.065, respectively. These thresholds may include some non-invaders as well. The thresholds represented by the solid black line would miss some of the species likely to become established or invasive but would never classify a safe species as a risk. These thresholds are 0.893 and 0.684, respectively.

