

## **Appendix 2.1**

### **ELICITATION MATERIALS**

## King Rail Expert Interviews

These interviews have been planned to meet two primary research objectives:

- Develop predictive models of KIRA population distribution at the ecosystem and refuge levels that can inform the establishment of refuge-specific habitat and population objectives for KIRA conservation
- Define and quantify temporal and spatial characteristics of expertness, and the influence of expertness on model stability and model uncertainty.

### DISCUSSION-BASED INTERVIEWS

#### *Part 1: Background Questions*

##### **Spatial and temporal extent of relevant work experience:**

1. How long have you worked in secretive marsh bird habitats?
2. How long have you worked in Atlantic Coastal Plain marsh habitats?
3. How long have you been working in ENCSEVA marsh habitats?
4. How long have you worked at this refuge?

##### **Sources of King Rail knowledge (e.g. primary literature, field observations, colleagues):**

5. What sources have primarily contributed to your knowledge of King Rail?

##### **Spatial and temporal extent of local species or habitat survey efforts:**

6. On the map, indicate areas that you visit monthly, seasonally, annually, or less frequently.
7. On the map, indicate areas that you have surveyed for birds using point count, transect, or other passive listening methods.
8. On the map, indicate areas that you have surveyed for secretive marsh birds using call-broadcast surveys.

##### **Familiarity with model data sources:**

*On scale of 0 (uncomfortable - never seen such data) to 10 (comfortable - work with such data regularly)*

9. How comfortable are you at identifying familiar features in these DOQQs?
10. How comfortable are you at identifying familiar features in these GIS products?

##### **Familiarity with King Rail in your refuge:**

*On scale of 0 (not confident - never seen/heard a KIRA) to 10 (very confident - see/hear KIRA regularly in predictable places)*

11. How confident are you that you could go out during the breeding season and see/hear a KIRA at the first place you searched (using callback)?
12. How confident are you that you could go out during the winter season and see/hear a KIRA at the first place you searched (using callback)?

##### **Suitability of model approach:**

*On scale of 0 (strongly disagree), 5 (neutral), and 10 (strongly agree)*

13. How strongly do you agree that KIRA distribution reflects selection for or against visible, mappable habitat characteristics?
14. How strongly do you agree that you can identify at least some of these important habitat characteristics accurately?

## ***Part 2: Discussion of Microhabitat and Landscape***

### **Describe local King Rail migratory characteristics**

15. Do you believe KIRA reside year-round in your refuge?
16. Do you see/hear KIRA with equal frequency in winter and breeding seasons?
17. Do you see/hear KIRA in same locations in winter and breeding seasons?
18. Do you ever observe KIRA in any non-marsh habitat in the breeding season?
19. Do you ever observe KIRA in any non-marsh habitat in the winter season?

### **Ascertain experts' confidence in survey method and local habitat suitability**

20. If you were to set up 10 test plots for callback surveys in your best KIRA habitat (separated by at least 400m to ensure no repeat sampling of the same bird) and go out in the peak of breeding season on an ideal sampling day, at how many of the 10 sites would you expect to get a KIRA response?
21. If you surveyed each of those 10 sites 10 times over the breeding season, how many times would you expect to hear a KIRA at the best site? And at the worst site?

### **Predict univariate habitat correlations**

22. Brainstorm to identify measurable and/or mappable variables with which KIRA occurrence seems positively correlated.\*
23. Brainstorm to identify measurable and/or mappable variables with which KIRA occurrence seems negatively correlated.\*

*\*Where an expert did not identify variables drawn from the literature search (Question 24), they will be specifically questioned about whether they believe KIRA respond to such gradients.*

24. In your experience on your refuge, all other things being equal, have you noticed the probability of detecting KIRA to change in relation to any of the following:
  - Distance to roads (road type, road density?)
  - Distance to open water (size?)
  - Distance to flowing water
  - Topographic heterogeneity (scale?)
  - Vegetative heterogeneity (species, dominance?)
  - Patch size
  - Patch context (urban, forest, agriculture)
  - Tidal vs Non-tidal
  - Edge to area ratio

*For each variable that could be directly or indirectly (via proxy data) mapped within GIS, experts were asked to define a response curve. An example dialogue follows. This example is a composite of several experts responses to illustrate the general flow of discussion.*

**Example univariate predictor-response interview:**

Expert: "KIRA need open water. There is a strong positively correlation."

Interviewer: "When you mention open water, are you referring to the area of the open water or the distance from open water?"

Expert: "Mostly distance. Area doesn't seem quite as important."

Interviewer: "You're thinking distance matters on a scale of miles... yards... feet...?"

Expert: "Probably yards"

Interviewer: "Could you give your best guess at what distance, even if it seemed like great habitat otherwise, I'd be too far from water to find KIRA – that if I went and did 10 call back surveys under good conditions, I'd not be likely to hear one in even 1 of the 10 surveys?"

Expert: "I've never heard a KIRA beyond about 300 yards from water, they're usually within a few feet of the edge."

Interviewer: "So, if I call >300 yards "far" and say they will generally be undetected beyond that distance, could you give me a sense of what you'd define as the best distance, the distance where I'd be most likely to hear a KIRA?"

Expert: "Like I said, they are mostly at the edge. I find nests most often about 10-20 feet in, so probably survey stations within 50 feet have the best chance of getting a KIRA response."

Interviewer: "So, if I define 0-50 feet as "near" and took you out to what appeared to be ideal KIRA habitat, how many times in 10 survey visits do you think I'd hear a KIRA?"

Expert: "If it's breeding season when they're most vocal, maybe 7/10 surveys"

Interviewer: "And what about the intermediate habitat – the area between 50 feet and 300 yards? If you were to survey along that transect perpendicular to the water's edge, would you have pretty equal probability of hearing a KIRA, say if you did 10 surveys at 100 yards and 10 surveys at 200 yards?"

Expert: "No, I've read somewhere that they have about a 100 m typical daily movement distance, so you'd probably be more likely to hear them at the closer point. But really I wouldn't expect them to be going deep into the marsh unless it had a lot of plunge pools or raceways."

Interviewer: "So if I surveyed each point 10 times, you'd expect me to hear a KIRA how many times? I need your best estimate."

Expert: "I really am not sure.... Maybe 4/10 at the 100 yards and 1/10 at the 200 yards."

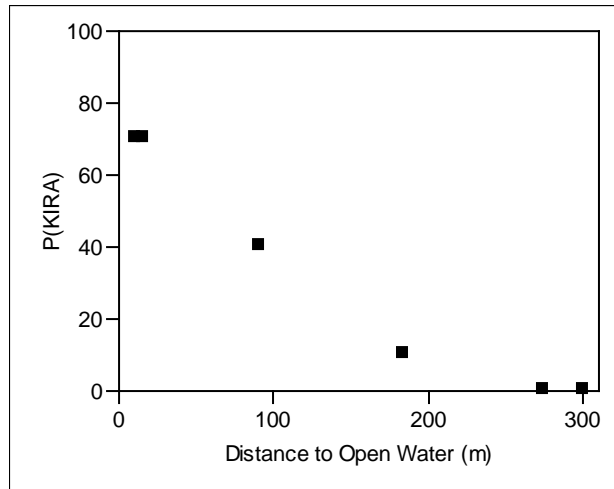


Figure 1. Sample product of expert interview showing probability of detecting a KIRA along a mappable, univariate environmental gradient.

**Rank the predictor variables based on how strongly they drive King Rail distribution patterns**

25. Of the variables we have discussed, which 5 would you identify as the most important or as having the strongest influence of your probability to detect KIRA within your refuge?
26. Of those 5, which 2 would you identify as the most important or as having the strongest influence of your probability to detect KIRA within your refuge?

**Ascertain the need to calibrate expert responses based on their understanding of detection probability and occupancy.**

27. On your refuge, do you think KIRA relative detection rates are a good proxy for relative abundance?
28. When a King Rail is present, what do you believe is the probability of detecting that bird using the call-back survey method?