480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Gull Lake
Wright Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Fry Lake
Woman Lake
Narrow Lake
Okanse Lake
Trout Lake
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Whitemud Lake
Otatakan Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

O:\CA\CAOAK300-OAK\MIS-FS1-Project\2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\TerrestrialBird_HSM_HSI_Models\MXD_Maps\PalmWarbler_HSM_Results_2.mxd

LEGEND

- Project Development Area
- Local Study Area for Wildlife and Wildlife Habitat
- Regional Study Area for Wildlife and Wildlife Habitat
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

Palm Warbler – Relative Habitat Suitability Percentage (based on climate and landcover)

High Suitability : 100 %

Low Suitability : 0 %

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.
- Relative Habitat Suitability model is based on the Boreal Avian Modelling (BAM) Species-Specific Habitat Suitability Maps for Boreal-Breeding Passerine Species.

Datum: NAD83
Projection: UTM Zone 15N

0 5 10 20 30 40 50 Kilometres

FIRST MINING GOLD

WSP

SPRINGPOLE GOLD PROJECT

Palm Warbler Habitat Suitability Model Results Summary Map

PROJECT N°: ONS2104

FIGURE:

SCALE: 1:500,000

DATE: June 2024

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Wright Lake
Gull Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Fry Lake
Woman Lake
Narrow Lake
Okanse Lake
Trout Lake
Joyce Lake
Perrigo Lake
SLATE FALLS NATION
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Otatakan Lake
Whitemud Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

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LEGEND

- Project Development Area
- Local Study Area for Wildlife and Wildlife Habitat
- Regional Study Area for Wildlife and Wildlife Habitat
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

Northern Waterthrush – Relative Habitat Suitability Percentage (based on climate and landcover)

High Suitability : 100 %

Low Suitability : 0 %

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.
- Relative Habitat Suitability model is based on the Boreal Avian Modelling (BAM) Species-Specific Habitat Suitability Maps for Boreal-Breeding Passerine Species.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Northern Waterthrush Habitat Suitability Model Results Summary Map

PROJECT N°: ONS2104 | **FIGURE:**

SCALE: 1:500,000 | DATE: June 2024

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Gull Lake
Wright Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Fry Lake
Narrow Lake
Woman Lake
Okanse Lake
Trout Lake
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Whitemud Lake
Otatakan Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

LEGEND

- Common Nighthawk - Moderate to High Habitat Suitability Areas
- Project Development Area
- Local Study Area for Wildlife and Wildlife Habitat
- Regional Study Area for Wildlife and Wildlife Habitat
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Common Nighthawk Suitability Analysis Results Summary Map

PROJECT N°: ONS2104

FIGURE:

SCALE: 1:500,000

DATE: April 2024

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Gull Lake
Wright Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Fry Lake
Woman Lake
Narrow Lake
Okanse Lake
Trout Lake
Joyce Lake
Perrigo Lake
SLATE FALLS NATION
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Little Trout Lake
Lake St. Joseph
Doran Lake
Slate Lake
Whitemud Lake
Otatakan Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

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LEGEND

- Project Development Area
- Local Study Area for Wildlife and Wildlife Habitat
- Regional Study Area for Wildlife and Wildlife Habitat
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

Olive-sided Flycatcher – Relative Habitat Suitability Percentage (based on climate and landcover)

High Suitability : 100 %

Low Suitability : 0 %

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.
- Relative Habitat Suitability model is based on the Boreal Avian Modelling (BAM) Species-Specific Habitat Suitability Maps for Boreal-Breeding Passerine Species.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Olive-sided Flycatcher Habitat Suitability Model Results Summary Map

PROJECT N°: ONS2104 | **FIGURE:**

SCALE: 1:500,000 | DATE: June 2024

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Gull Lake
Wright Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Kasagin Lak
Fry Lake
Narrow Lake
Woman Lake
Trout Lake
Okanse Lake
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Otatakan Lake
Whitemud Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

Q:\CA\CA\OAK300-OAK1\MIS-FS1-Project\P2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\TerrestrialBrd_HSM_HSI_Models\MXD_Maps\BaldEagle_HSI_Analysis_Results_2.mxd

LEGEND

- Bald Eagle - Moderate to High Habitat Suitability Areas
- Project Development Area
- Local Study Area for Wildlife and Wildlife Habitat
- Regional Study Area for Wildlife and Wildlife Habitat
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Bald Eagle Habitat Suitability Analysis Results Summary Map

PROJECT N°: ONS2104

FIGURE:

SCALE: 1:500,000

DATE: June 2024

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Gull Lake
Wright Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Fry Lake
Narrow Lake
Woman Lake
Trout Lake
Okanse Lake
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Otatakan Lake
Whitemud Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

X:\CA\CAOAK300-OAK\MIS-FS1-Project\P2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\TerrestrialBird_HSM_HSI_Models\MXD_Maps\Grouse_HSI_Analysis_Results.mxd

LEGEND

- Grouse - Moderate to High Habitat Suitability Areas
- Proposed Mine Feature
- Project Development Area
- Local Study Area for Wildlife and Wildlife Habitat
- Regional Study Area for Wildlife and Wildlife Habitat
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Grouse Habitat Suitability Analysis Results Summary Map

PROJECT N°: ONS2104 | FIGURE:

SCALE: 1:500,000 | DATE: July 2024

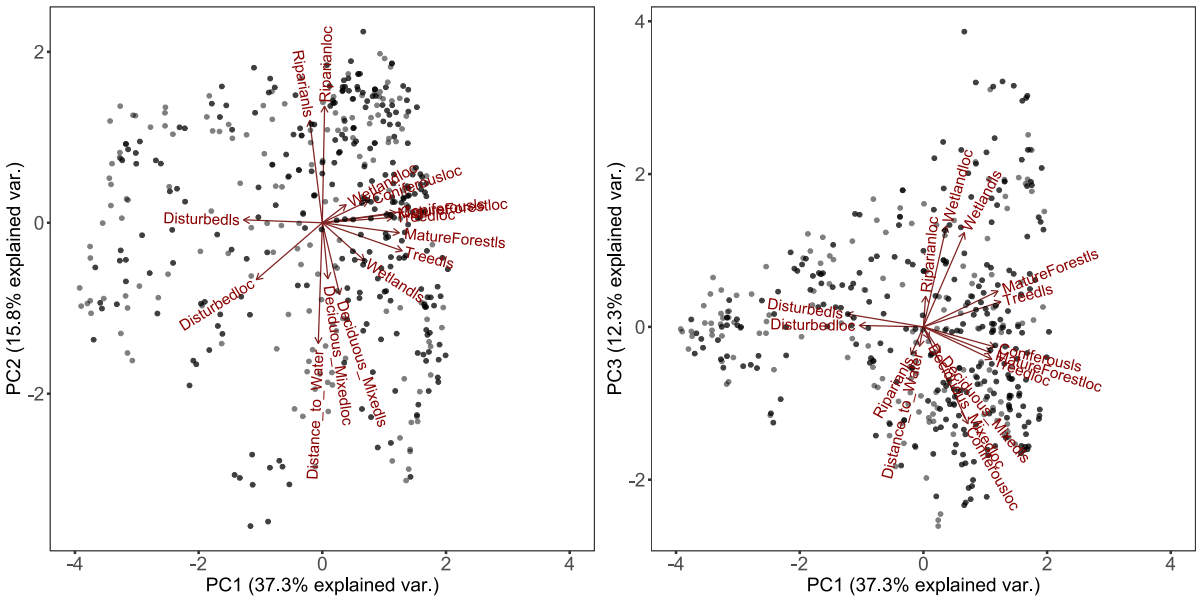

Figure 6.12-28: Biplots from a principal components analysis of habitat variables measured at two spatial scales. Variables ending in "loc" were measured at the local scale (within a 150 m radius circle around each point) and those ending in "ls" at the landscape scale (within a 5 km radius circle around each point).

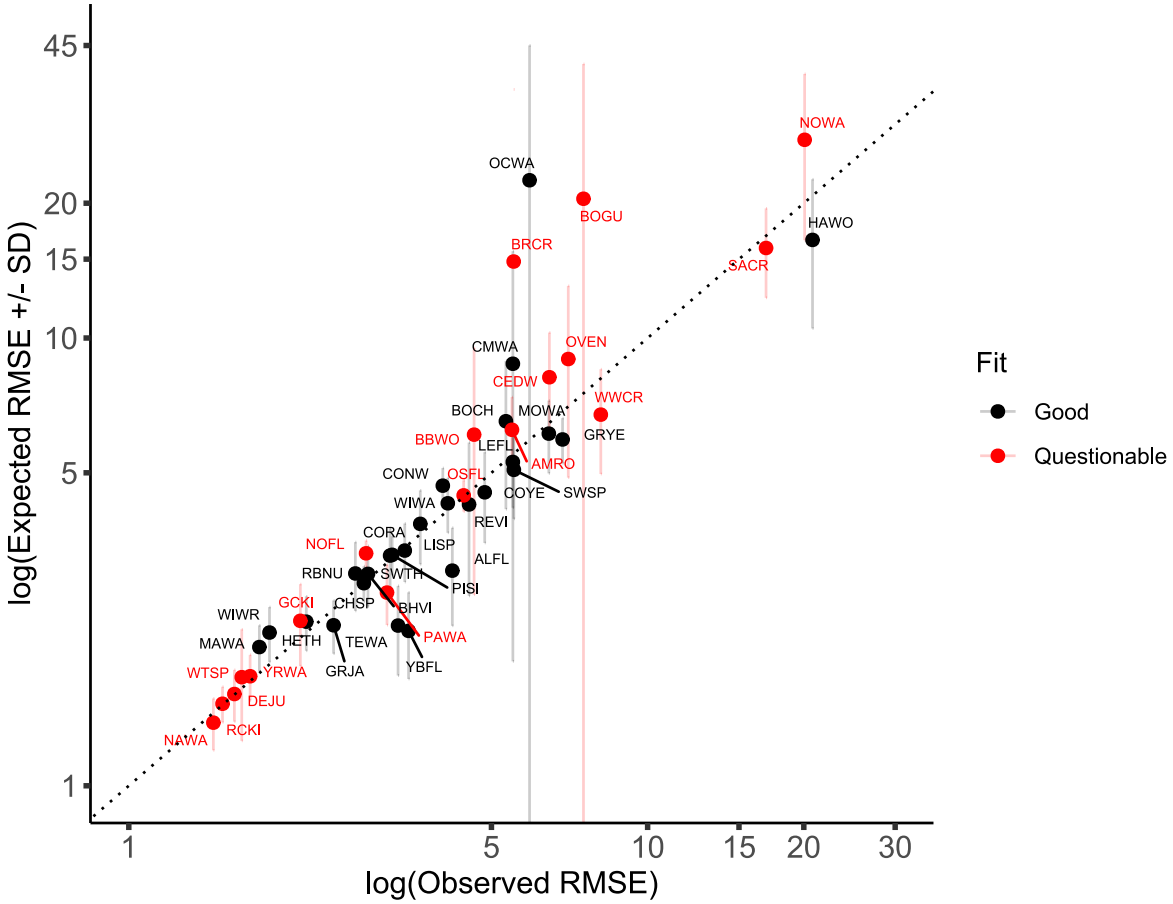

Figure 6.12-29: K-fold cross-validation results for the best-fitting density model for each species with sufficient data to model. The Expected RMSE is the mean (± standard deviation; SD) of the RMSEs obtained through k-fold validation on a large (80%) subset of the data. The Observed RMSE is calculated from the remainder of the data. Points are labelled by their corresponding species which are identified by their four-letter code. Model fit is indicated by colour.

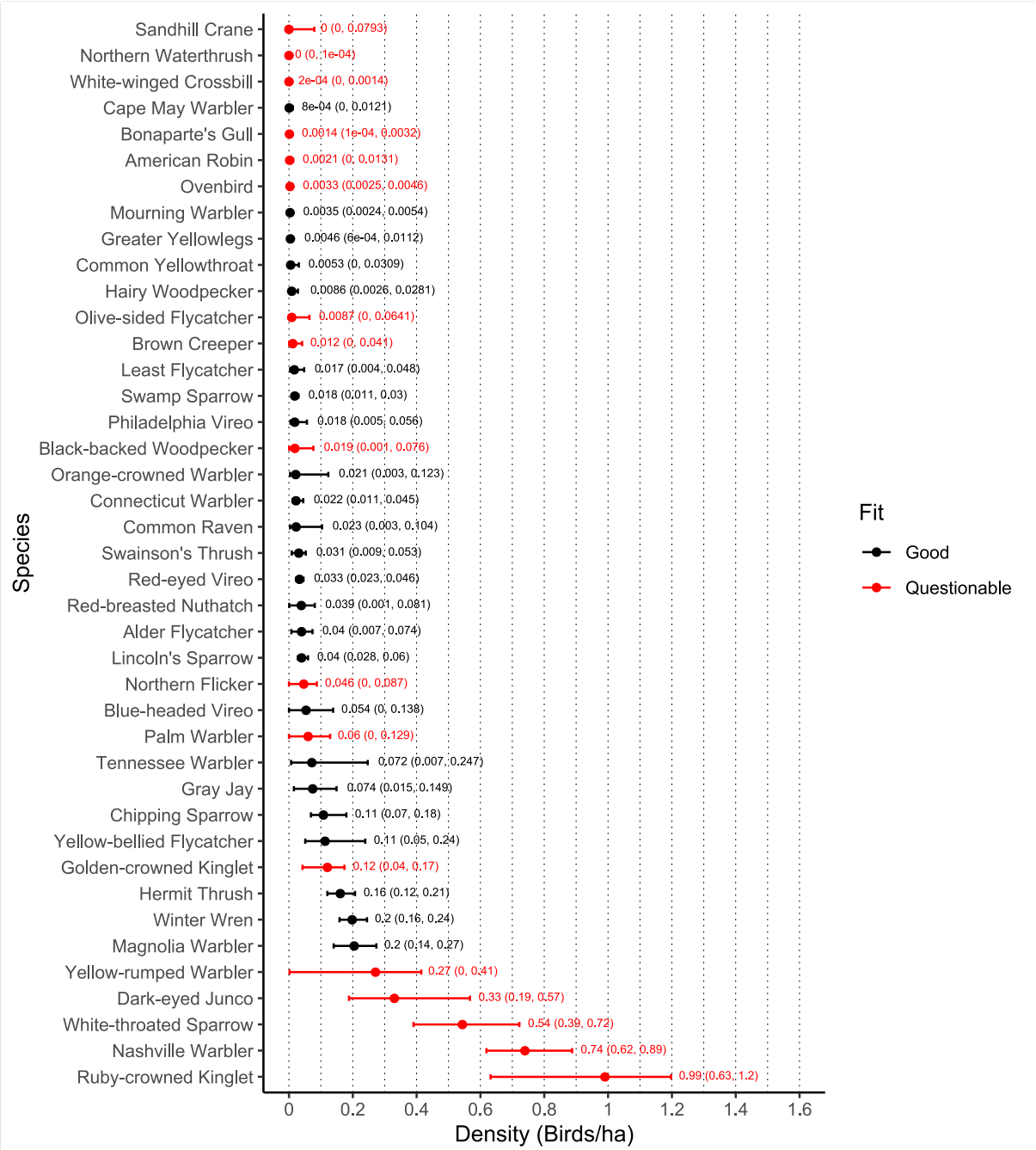

Figure 6.12-30: Average density for each species predicted by the best-fitting models across both years and treatments at average levels of the habitat covariates. Confidence intervals were obtained through hierarchical bootstrapping to incorporate the error in detection probability for the species. Model fit is indicated by colour.

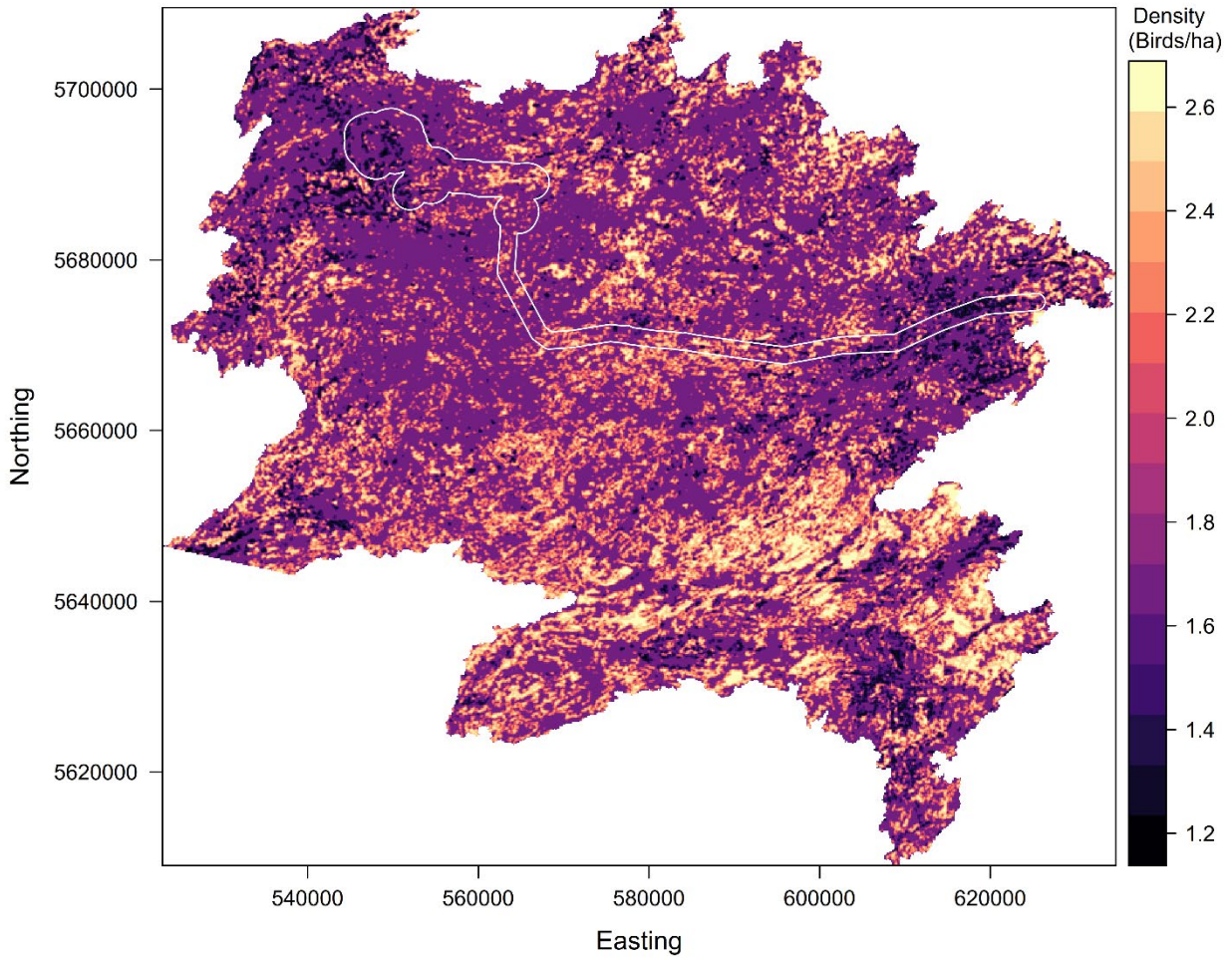

Figure 6.12-31: Predicted density surface across the RSA for Ruby-crowned Kinglet, one of the most abundant bird species, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

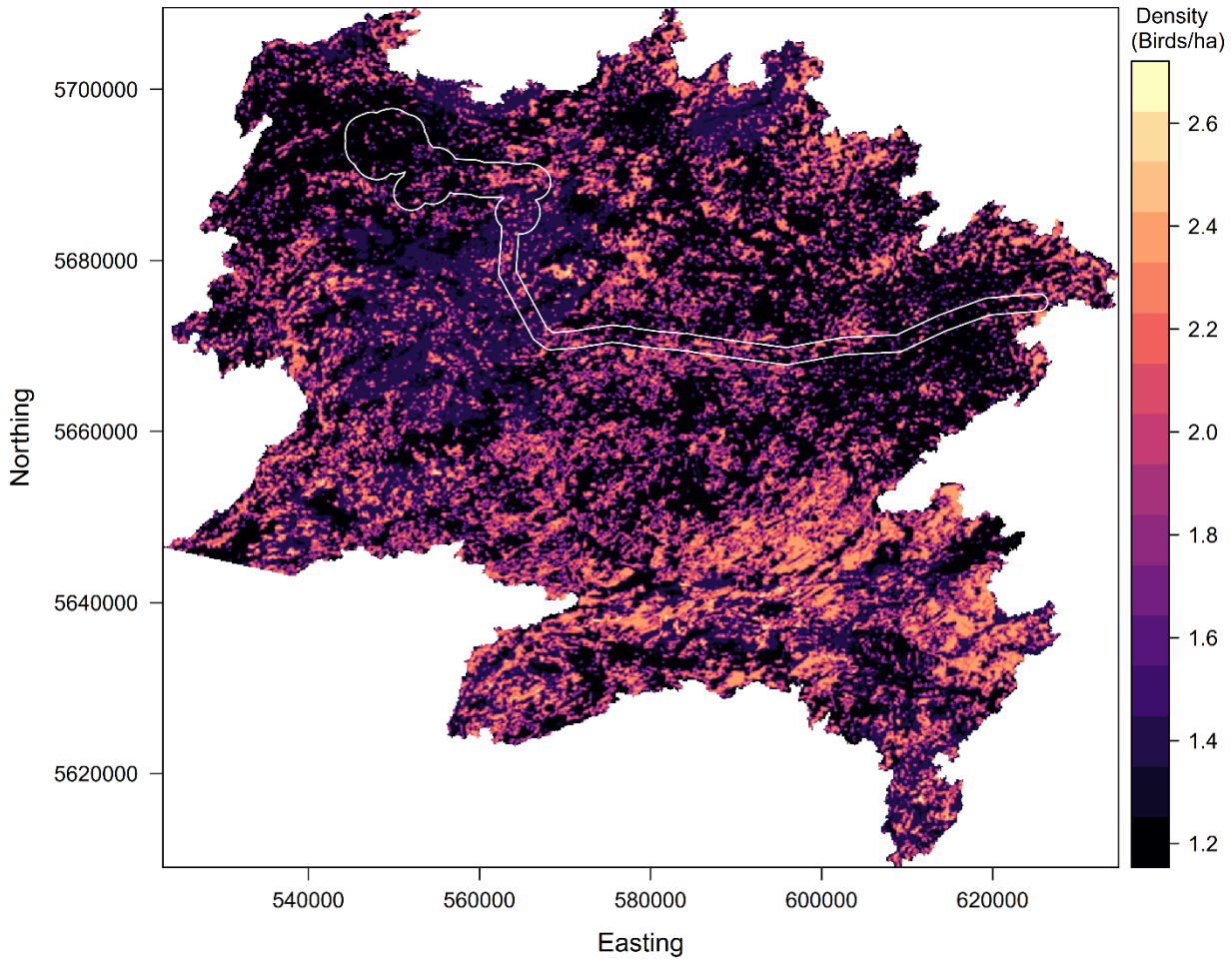

Figure 6.12-32: Predicted density surface across the RSA for Nashville Warbler, one of the most abundant bird species, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

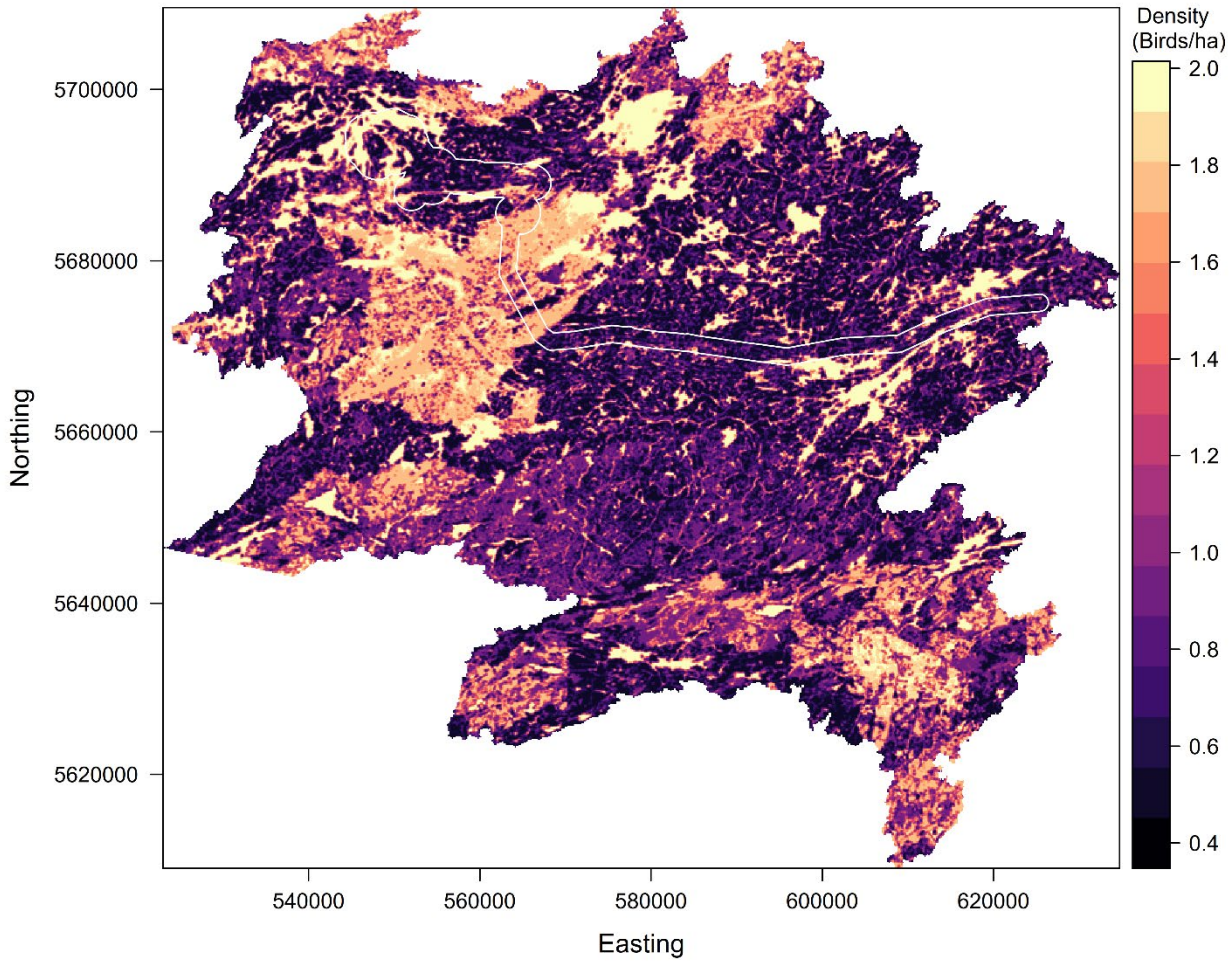

Figure 6.12-33: Predicted density surface across the RSA for White-throated Sparrow, one of the most abundant bird species, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

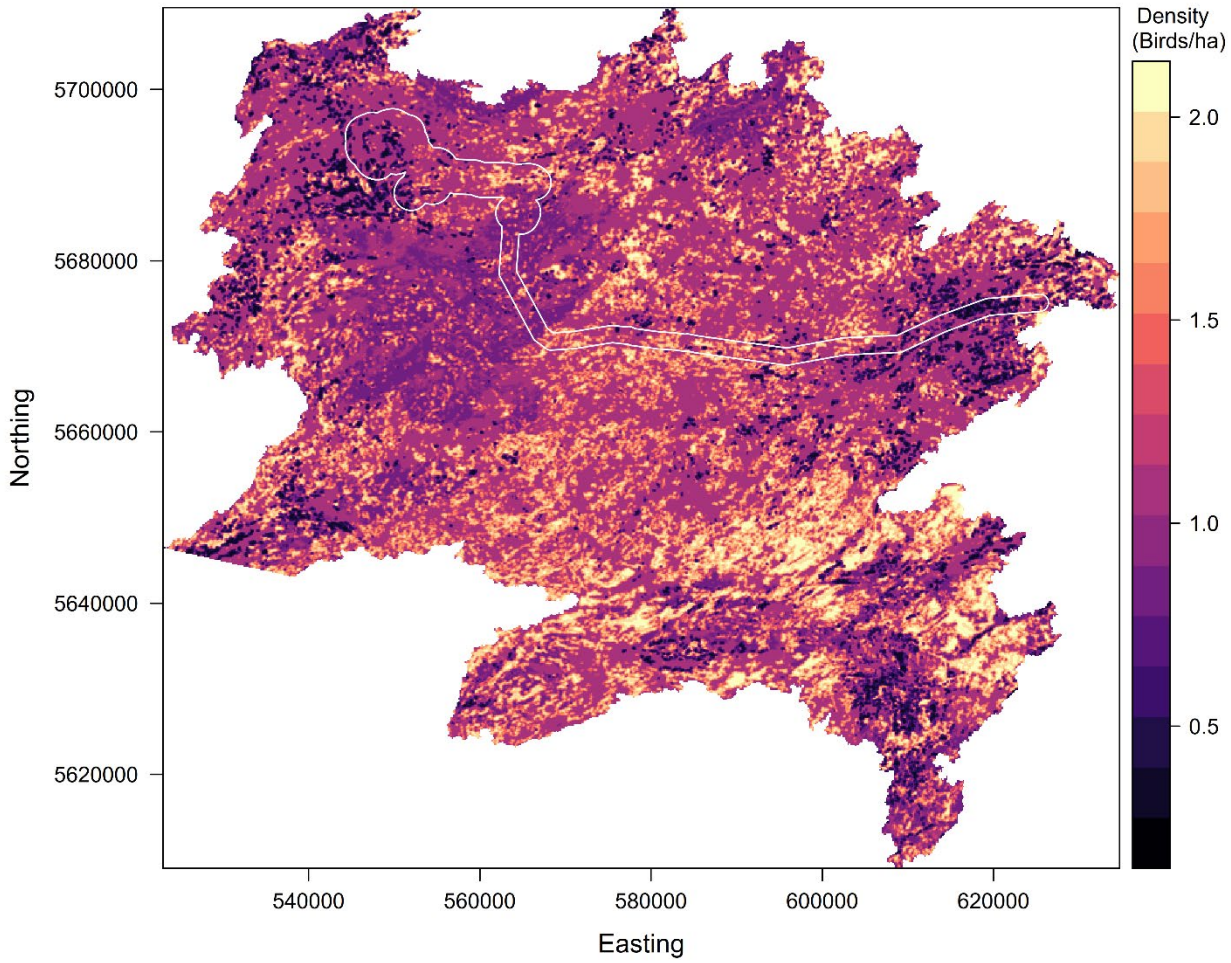

Figure 6.12-34: Predicted density surface across the RSA for Dark-eyed Junco, a forest species, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

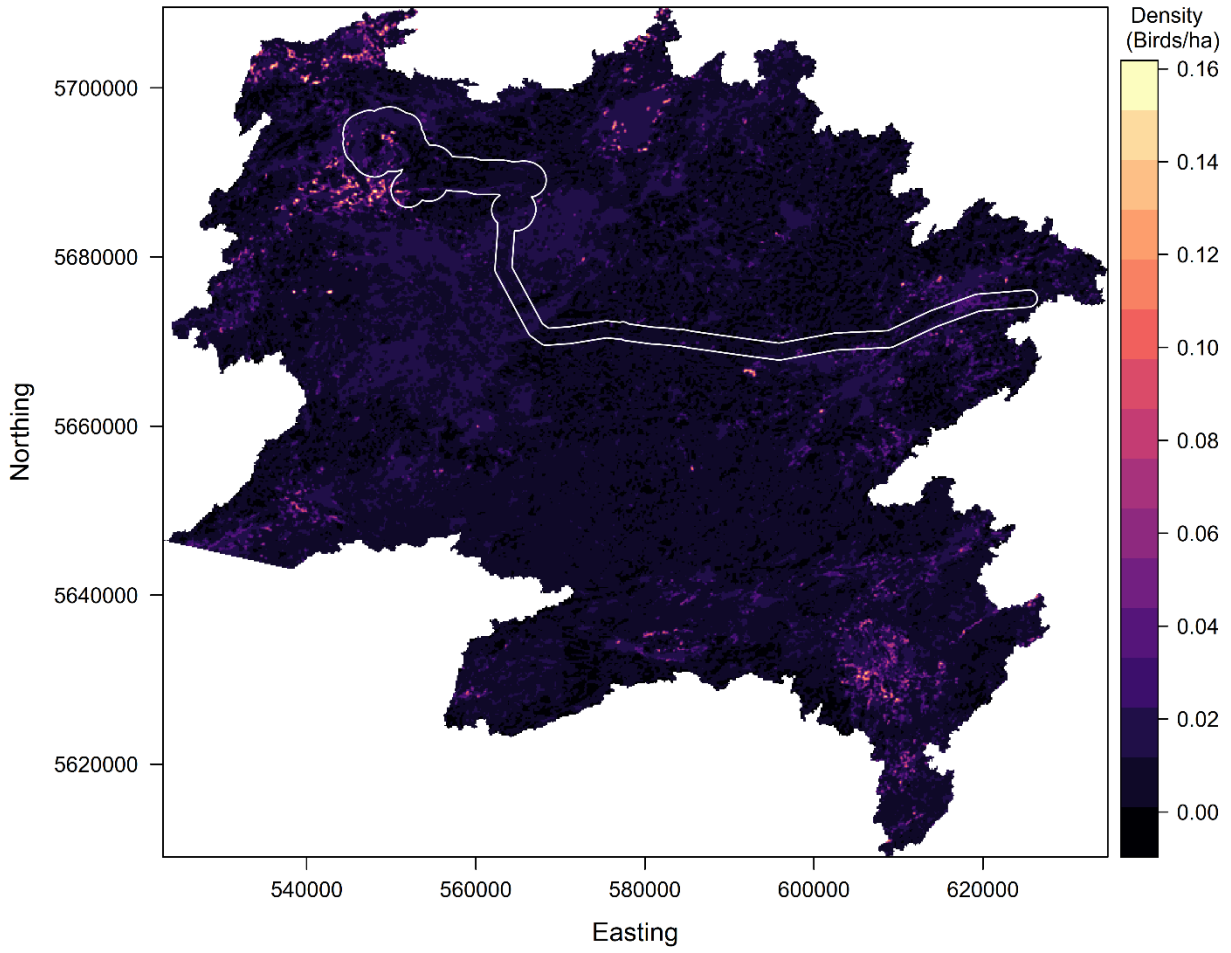

Figure 6.12-35: Predicted density surface across the RSA for Ovenbird, a forest species, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

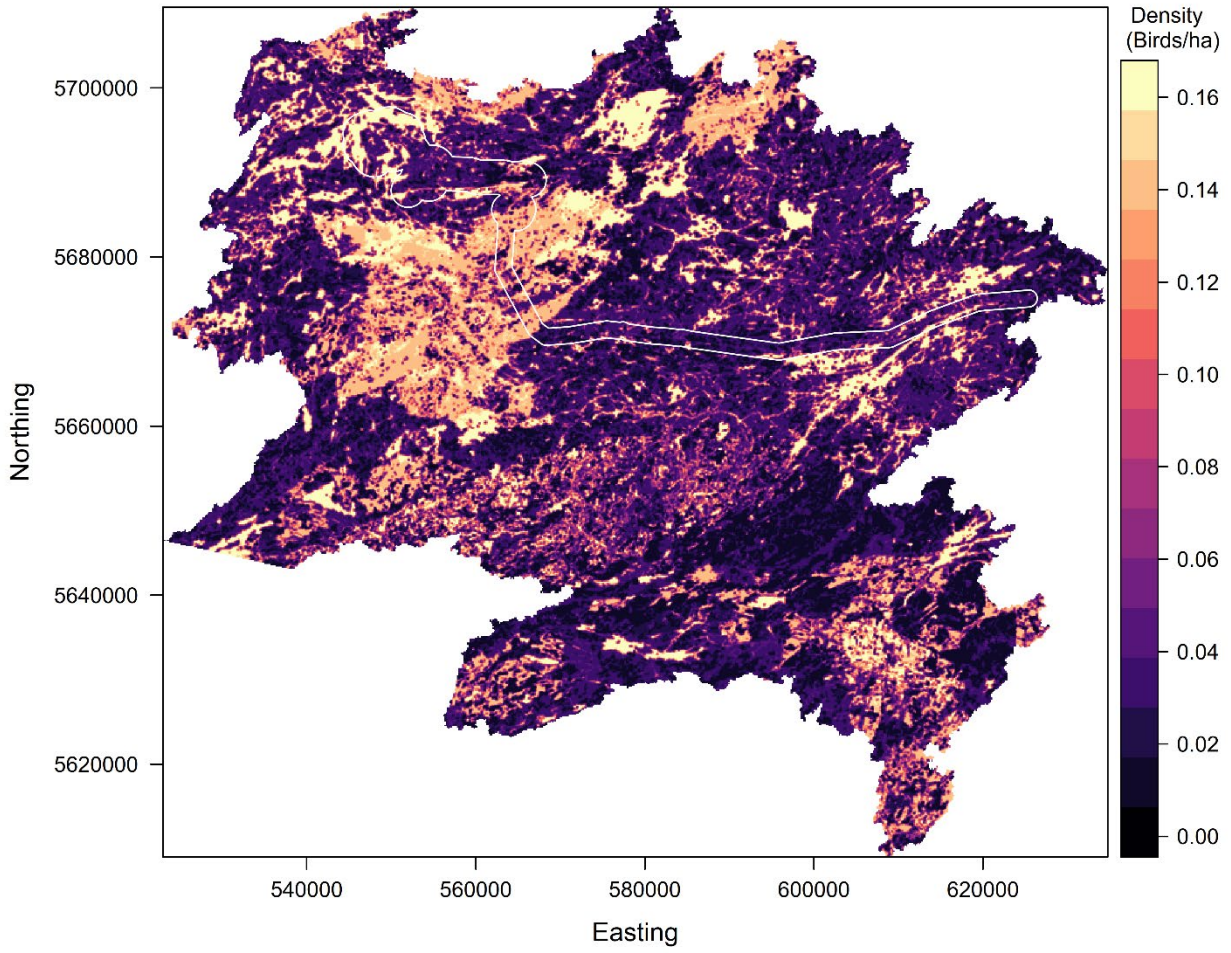

Figure 6.12-36: Predicted density surface across the RSA for Red-eyed Vireo, a forest species, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

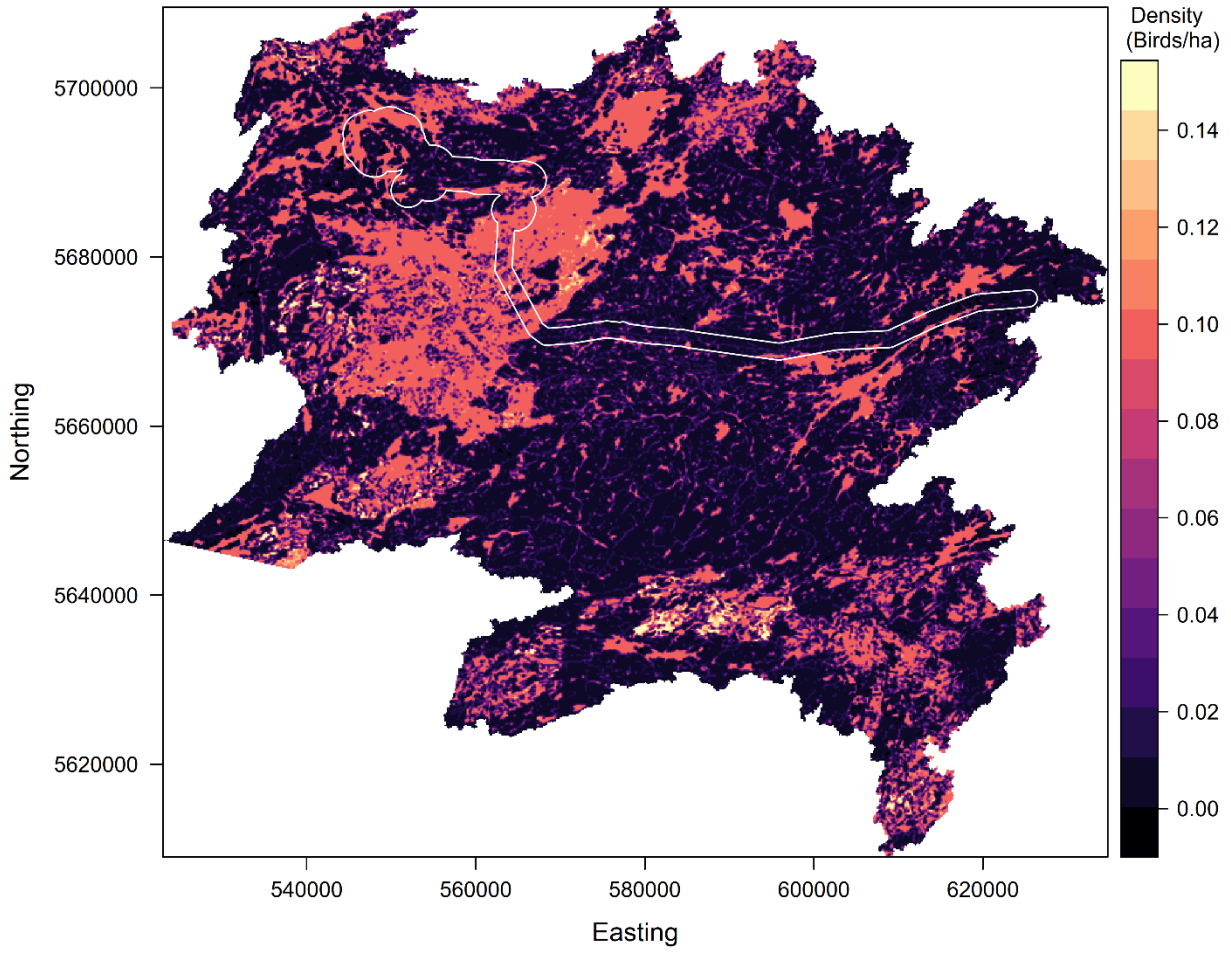

Figure 6.12-37: Predicted density surface across the RSA for Common Yellowthroat, a wetland species, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

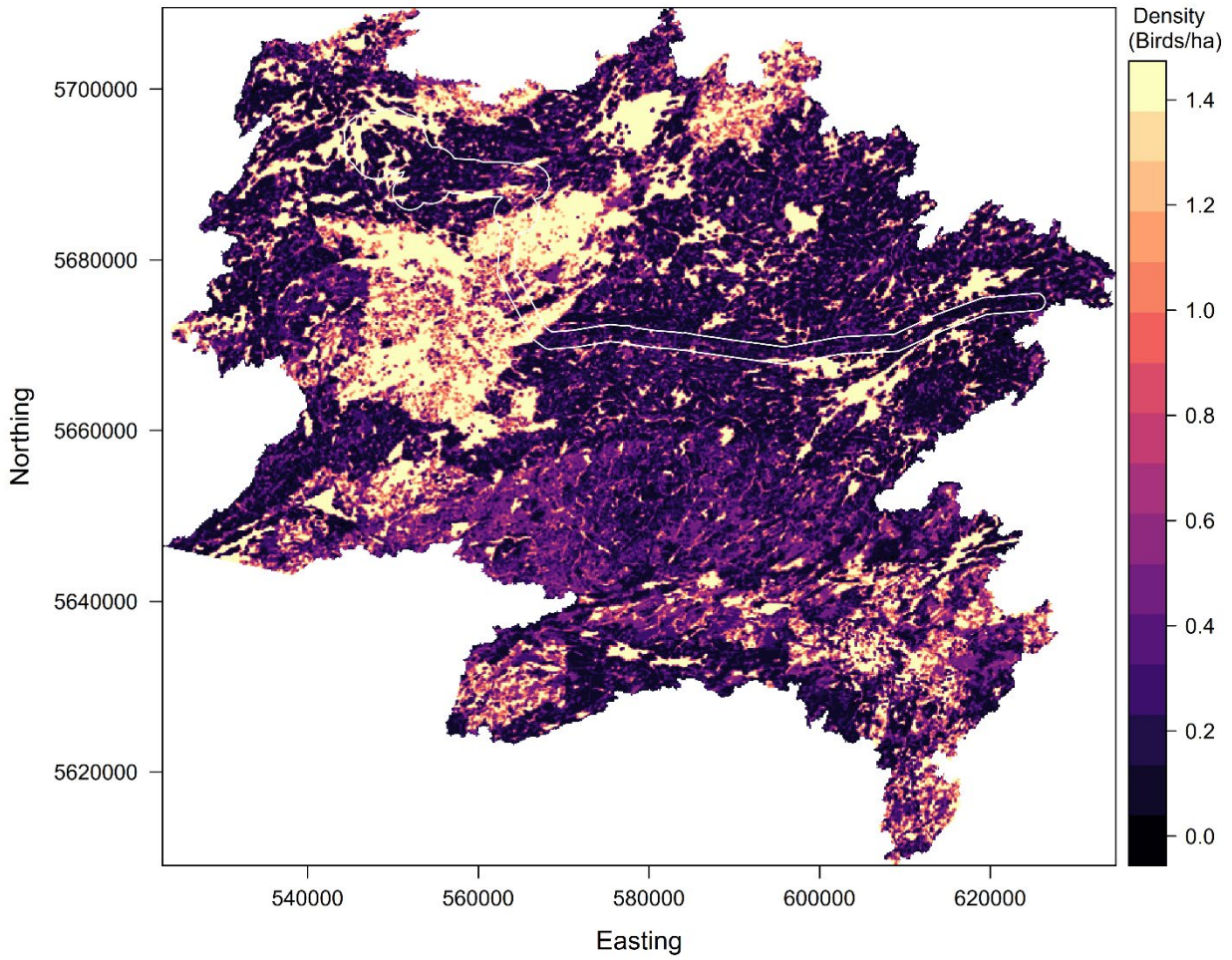

Figure 6.12-38: Predicted density surface across the RSA for Palm Warbler, a wetland species, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

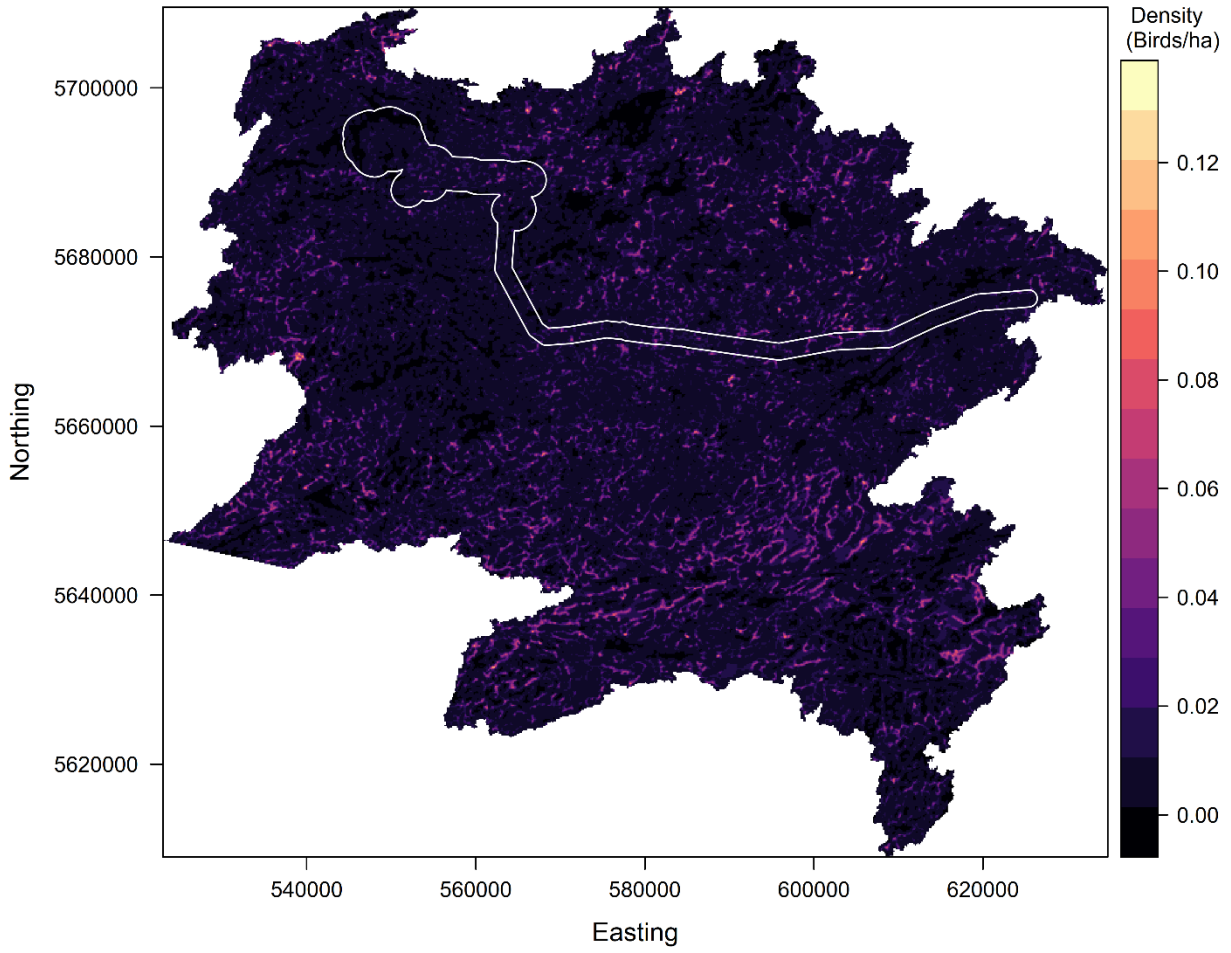

Figure 6.12-39: Predicted density surface across the RSA for Greater Yellowlegs, a shorebird species, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

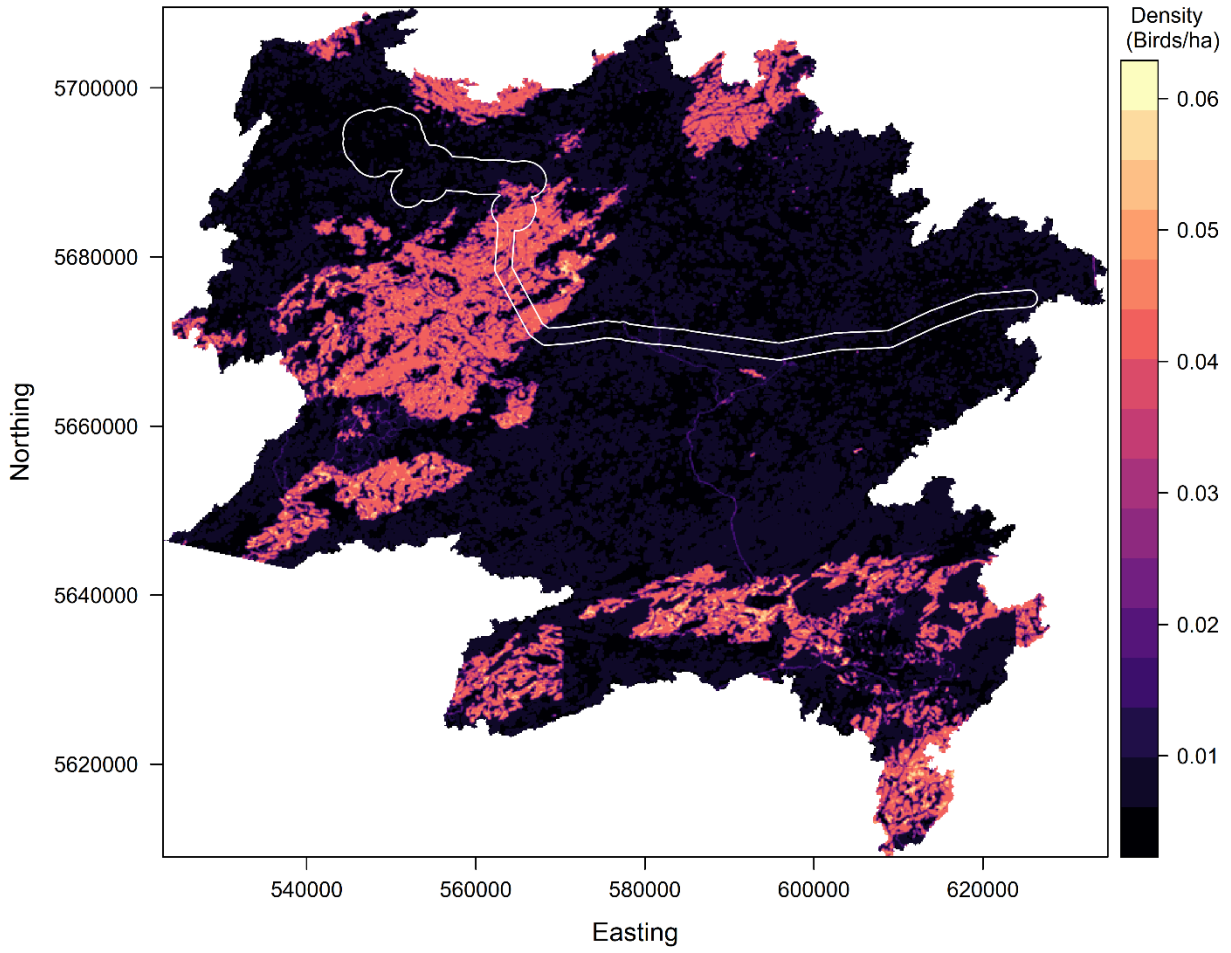

Figure 6.12-40: Predicted density surface across the RSA for Olive-sided Flycatcher, a species at risk, modelled from point count surveys. The density surface was calculated based on average levels of the temporal and weather covariates. The LSA is delineated in white. Some areas of the RSA could not be mapped due to FRI and Far North data layers missing information in these areas.

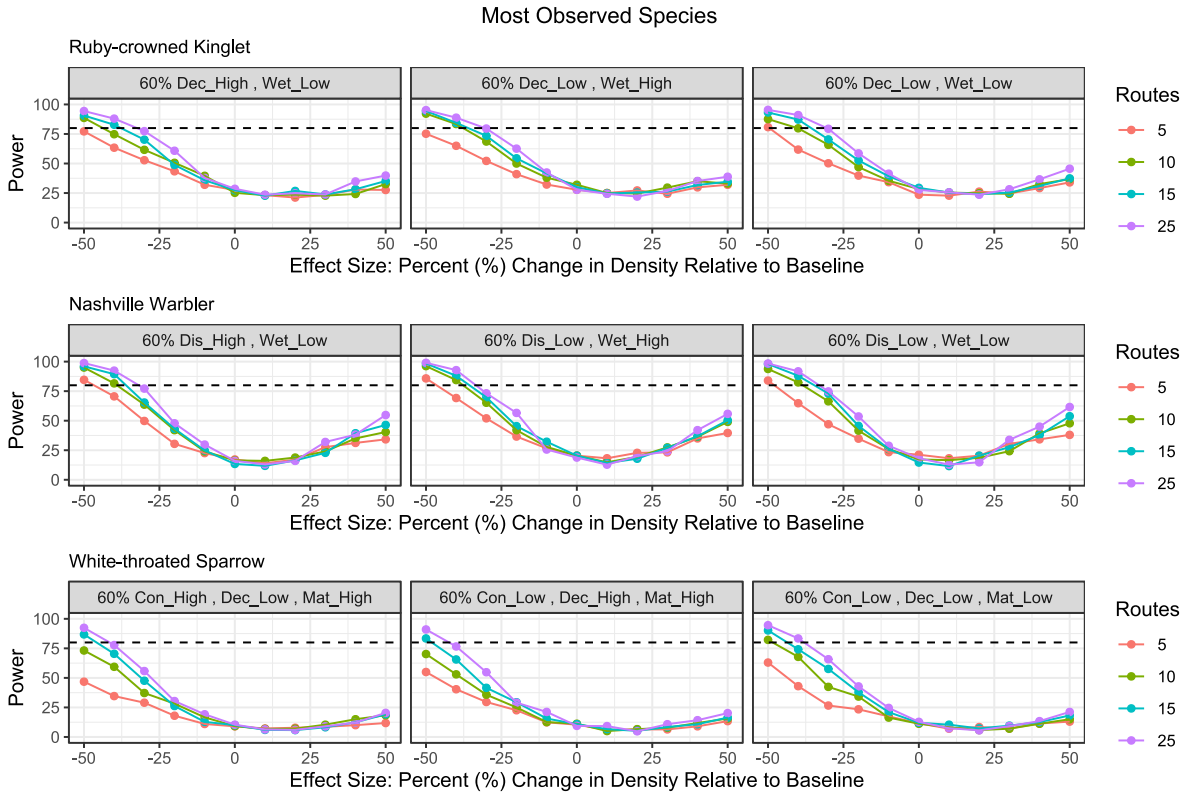

Figure 6.12-41: Power to detect a percent change in density from baseline within the LSA for the three most observed species. Power to detect a percent change in density (-50% to +50%) from baseline within the LSA for a hypothetical new year of breeding bird point count surveys for the three most observed species. Simulations were completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Dec = Deciduous / Mixed Forest, Wet = Wetland, Dist = Disturbed Habitat, Con = Coniferous Forest, Mat = Mature Forest.

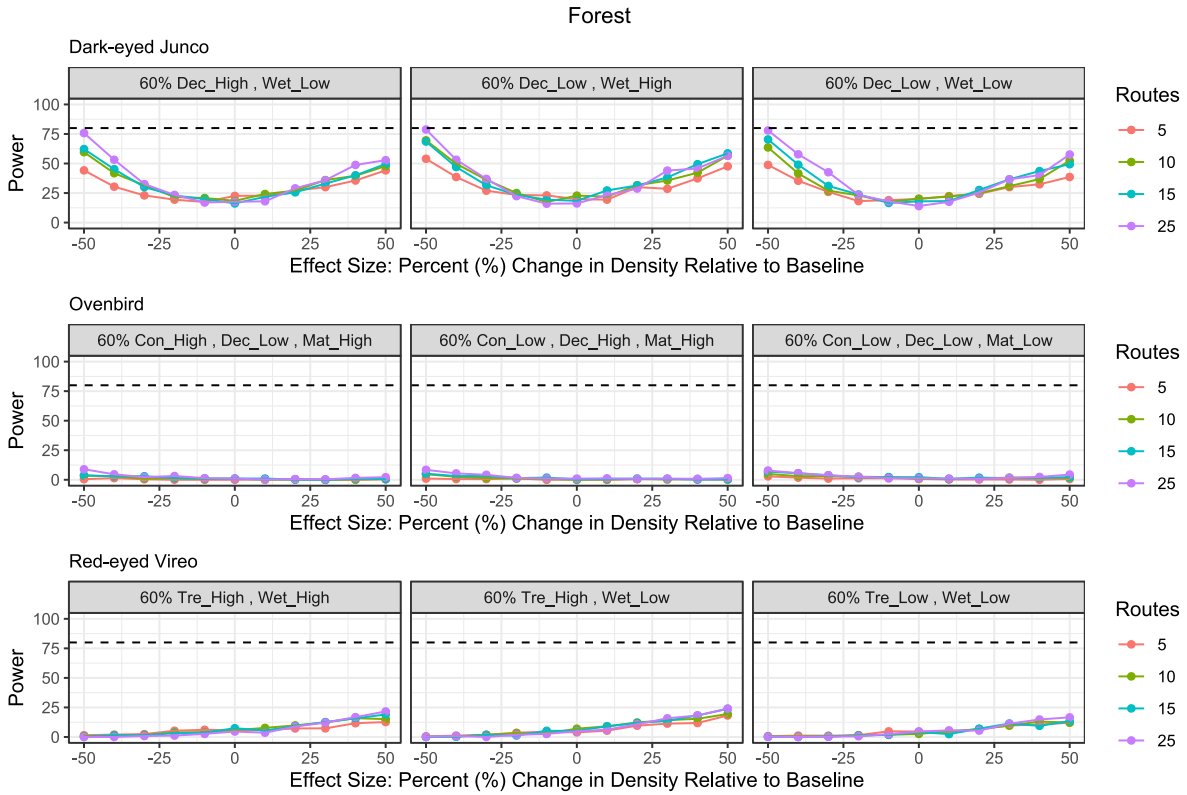

Figure 6.12-42: Power to detect a percent change in density from baseline within the LSA for the three forest proxy species. Power to detect a percent change in density (-50% to +50%) from baseline within the LSA for a hypothetical new year of breeding bird point count surveys for the three forest VCs. Simulations were completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Dec = Deciduous / Mixed Forest, Wet = Wetland, Tre = Treed Habitat, Con = Coniferous Forest, Mat = Mature Forest.

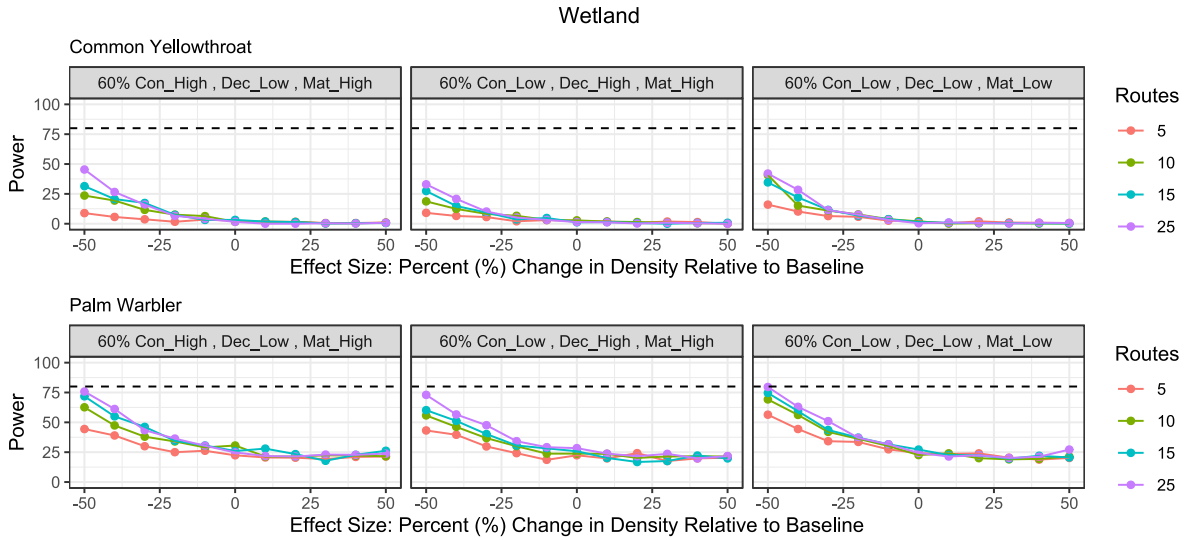

Figure 6.12-43: Power to detect a percent change in density from baseline within the LSA for the two wetland proxy species. Power to detect a percent change in density (-50% to +50%) from baseline within the LSA for a hypothetical new year of breeding bird point count surveys for two wetland VCs. Simulations were completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Dec = Deciduous / Mixed Forest, Con = Coniferous Forest, Mat = Mature Forest.

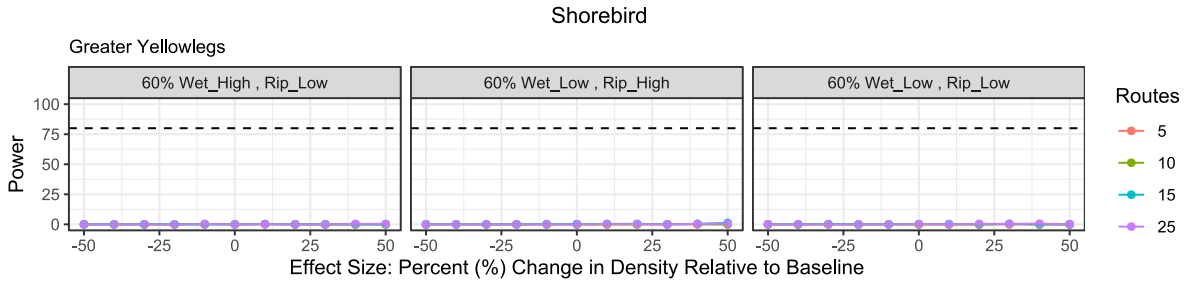

Figure 6.12-44: Power to detect a percent change in density from baseline within the LSA for the shorebird proxy species. Power to detect a percent change in density (-50% to +50%) from baseline within the LSA for a hypothetical new year of breeding bird point count surveys for a shorebird VC. Simulations were completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Wet = Wetland, Rip = Riparian Habitat.

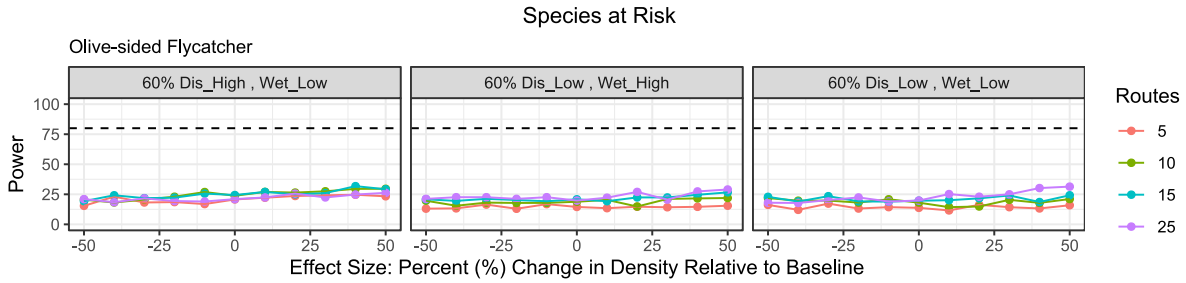

Figure 6.12-45: Power to detect a percent change in density from baseline within the LSA for the special concern proxy species. Power to detect a percent change in density (-50% to +50%) from baseline within the LSA for a hypothetical new year of breeding bird point count surveys for a special concern VC. Simulations were completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Wet = Wetland, Dist = Disturbed Habitat.

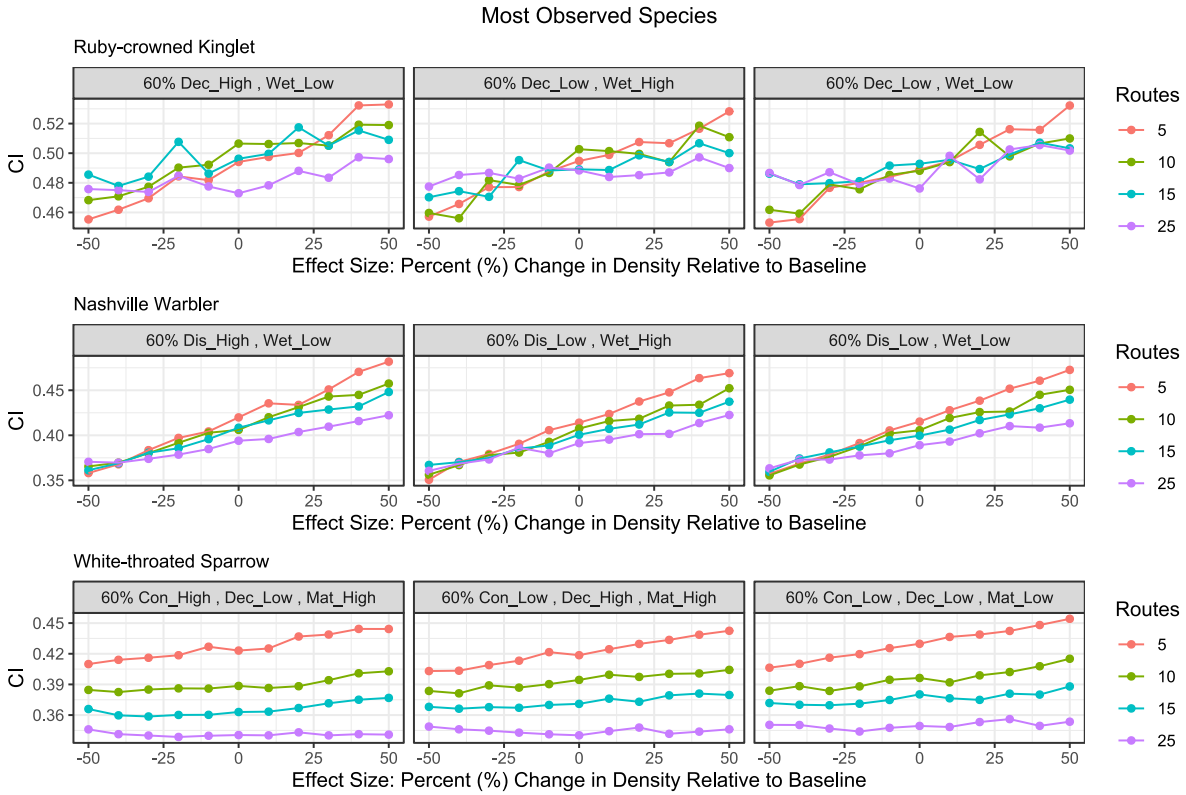

Figure 6.12-46: Confidence intervals for the predicted density for the three most observed species. Confidence intervals for the predicted density inside the LSA at the reference levels of the predictor variables averaged across all years for the three most observed species. Predictions were obtained from simulations completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Dec = Deciduous / Mixed Forest, Wet = Wetland, Dist = Disturbed Habitat, Con = Coniferous Forest, Mat = Mature Forest.

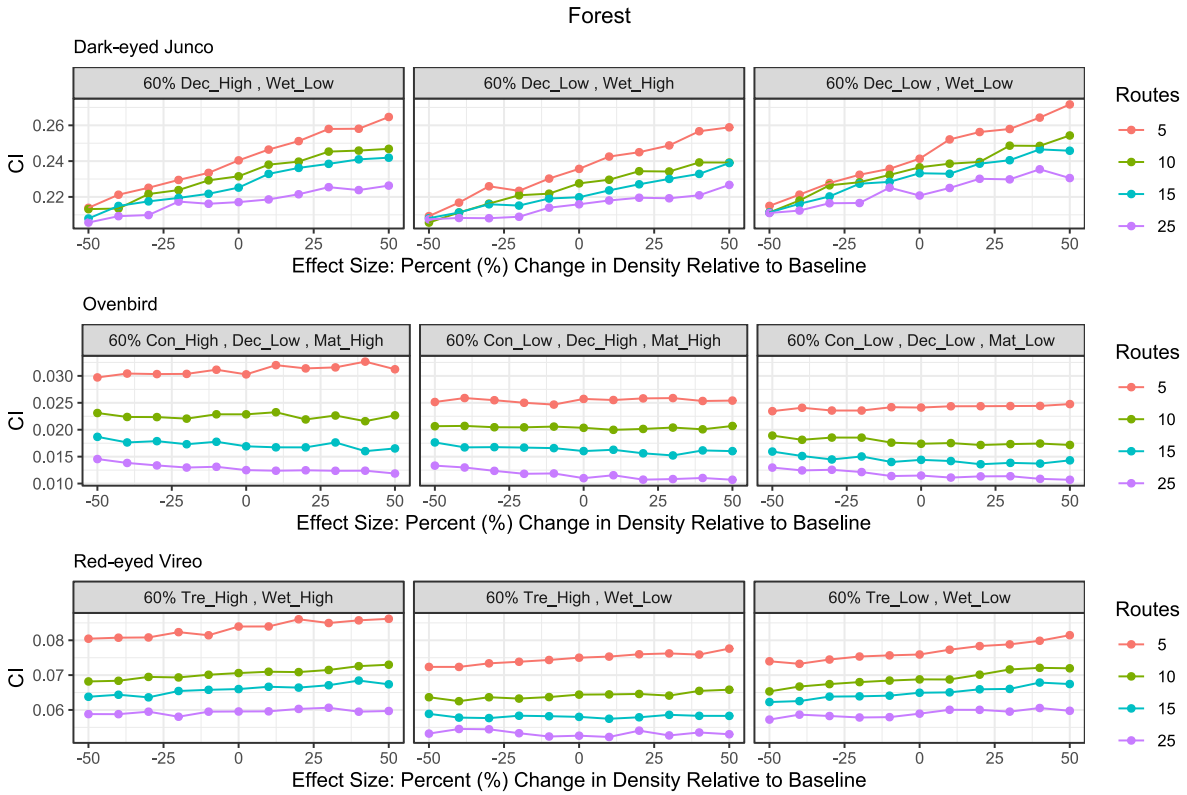

Figure 6.12-47: Confidence intervals for the predicted density for the three forest proxy species. Confidence intervals for the predicted density inside the LSA at the reference levels of the predictor variables averaged across all years for three forest VCs. Predictions were obtained from simulations completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Dec = Deciduous / Mixed Forest, Wet = Wetland, Tre = Treed Habitat, Con = Coniferous Forest, Mat = Mature Forest.

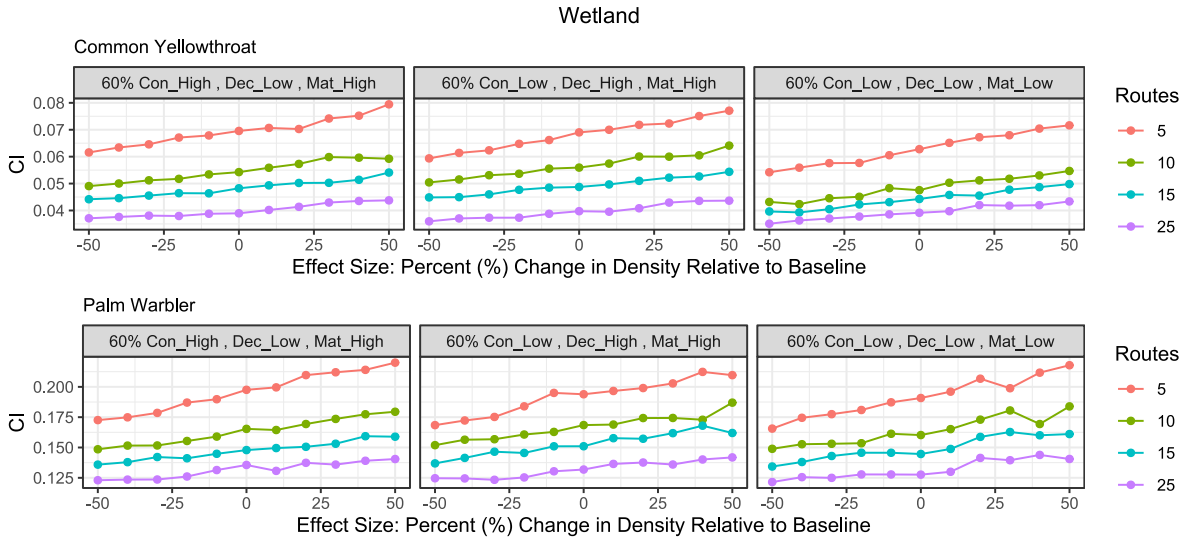

Figure 6.12-48: Confidence intervals for the predicted density for the two wetland proxy species. Confidence intervals for the predicted density inside the LSA at the reference levels of the predictor variables averaged across all years for two wetland VCs. Predictions were obtained from simulations completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Dec = Deciduous/Mixed Forest, Con = Coniferous Forest, Mat = Mature Forest.

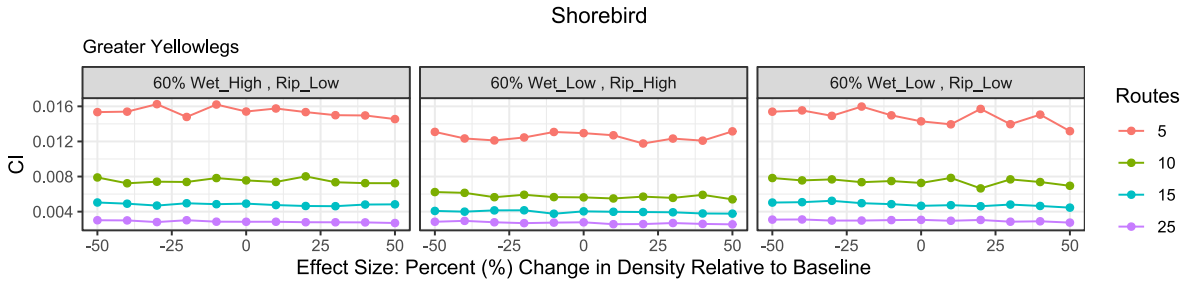

Figure 6.12-49: Confidence intervals for the predicted density for the shorebird proxy species. Confidence intervals for the predicted density inside the LSA at the reference levels of the predictor variables averaged across all years for a shorebird VC. Predictions were obtained from simulations completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Wet = Wetland, Rip = Riparian Habitat.

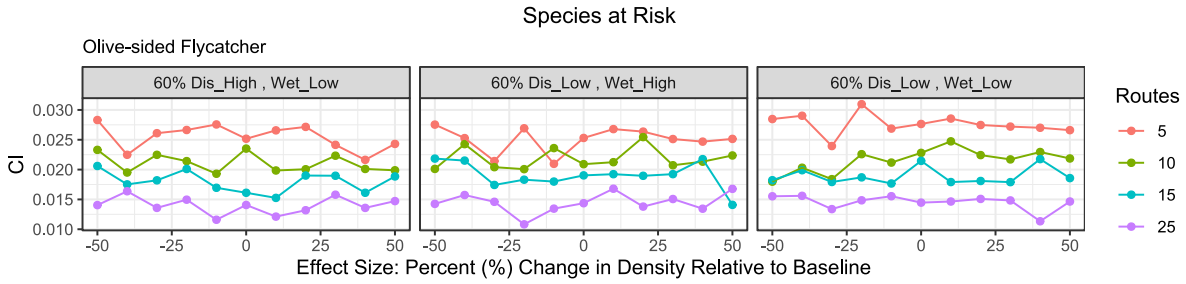

Figure 6.12-50: Confidence intervals for the predicted density for the special concern proxy species. Confidence intervals for the predicted density inside the LSA at the reference levels of the predictor variables averaged across all years for a SAR VC. Predictions were obtained from simulations completed for various levels of effect size, sample size, and habitat. Each panel for a given species represents the habitat targeted during sampling. Habitat names are abbreviated as follows: Wet = Wetland, Dist = Disturbed Habitat.

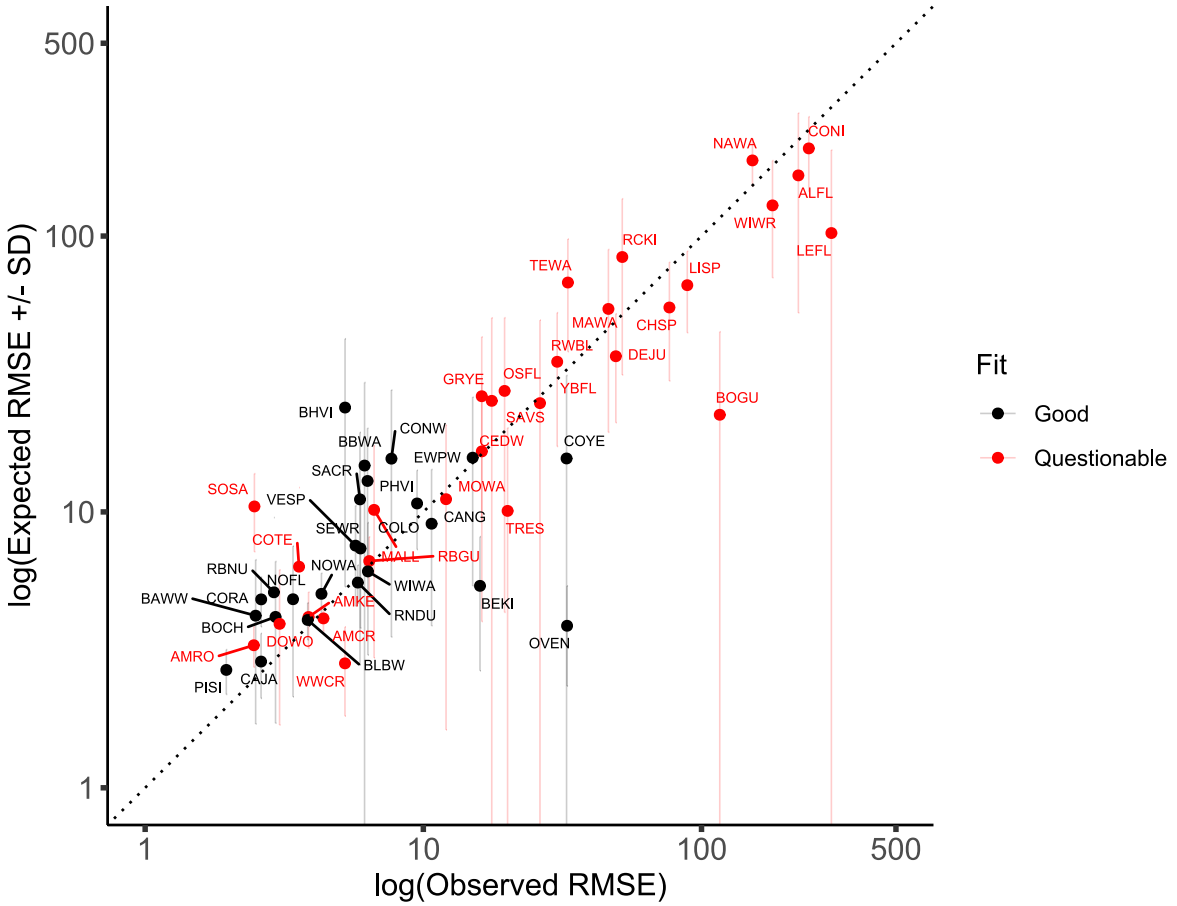

Figure 6.12-51: K-fold cross-validation results. K-fold cross-validation results for the best-fitting acoustic activity model for each species with sufficient data to model. The Expected RMSE is the mean (± standard deviation; SD) of the RMSEs obtained through k-fold validation on a large (80%) subset of the data. The Observed RMSE is calculated from the remainder of the data. Points are labelled by their corresponding species which are identified by their four-letter code. Model fit is indicated by colour.

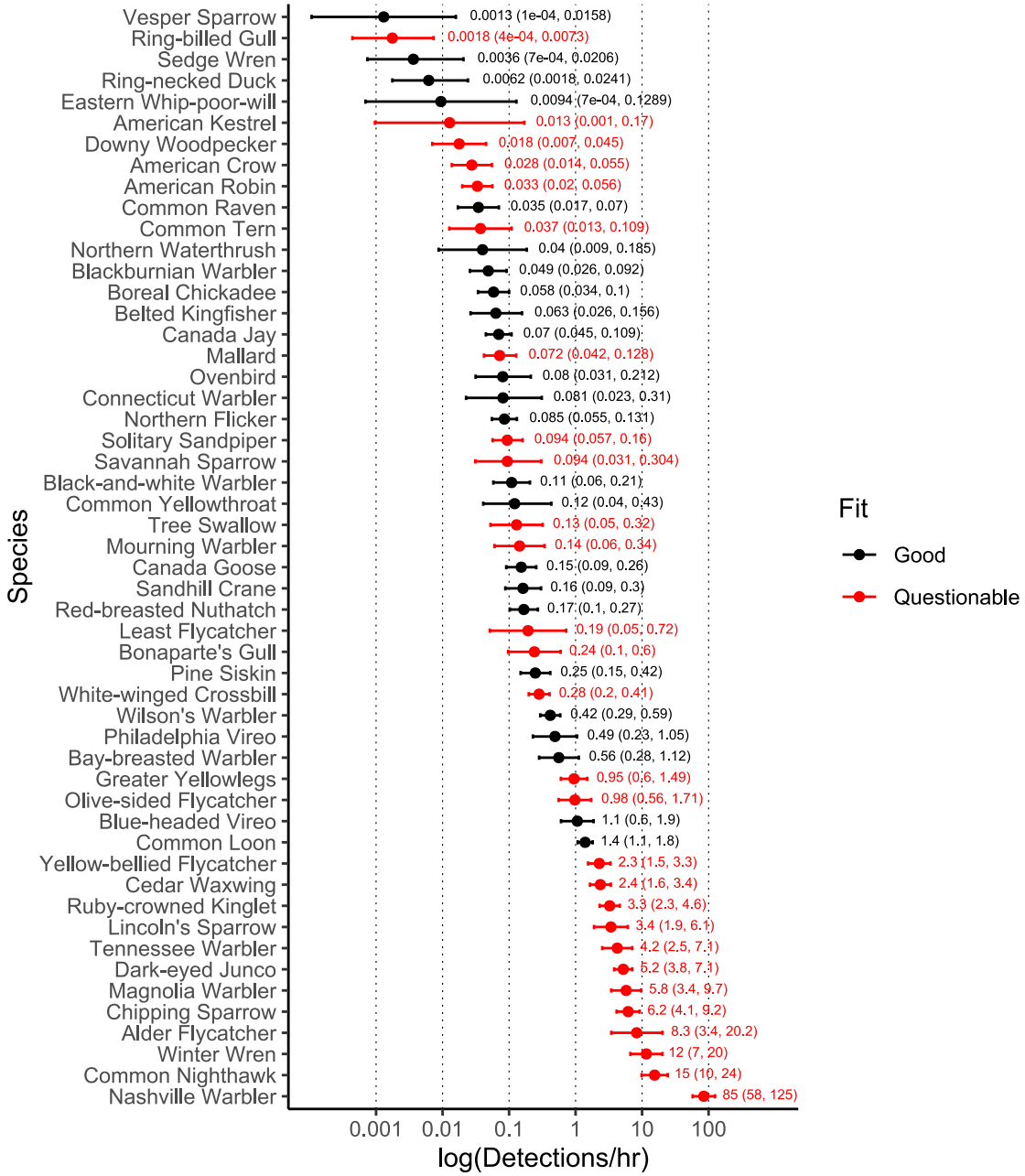

Figure 6.12-52: Average acoustic activity (detections/hr) during ARU recording periods. Average acoustic activity (detections/hr) during ARU recording periods for each species predicted by the best-fitting models across both years and treatments at average levels of the predictor covariates. Confidence intervals were estimated from standard errors of the predicted values. Model fit is indicated by colour.

Figure 6.12-53: Acoustic activity rate per week of the most frequently recorded bird species. Acoustic activity rate per week of the most frequently recorded bird species. Values are predicted average detection rate estimated by the best fitting models. Estimates were obtained for average levels of the habitat covariates (i.e., correcting for habitat variation). Values were scaled to the *maximum average detection rate for the species to help highlight its relative activity across the season.*

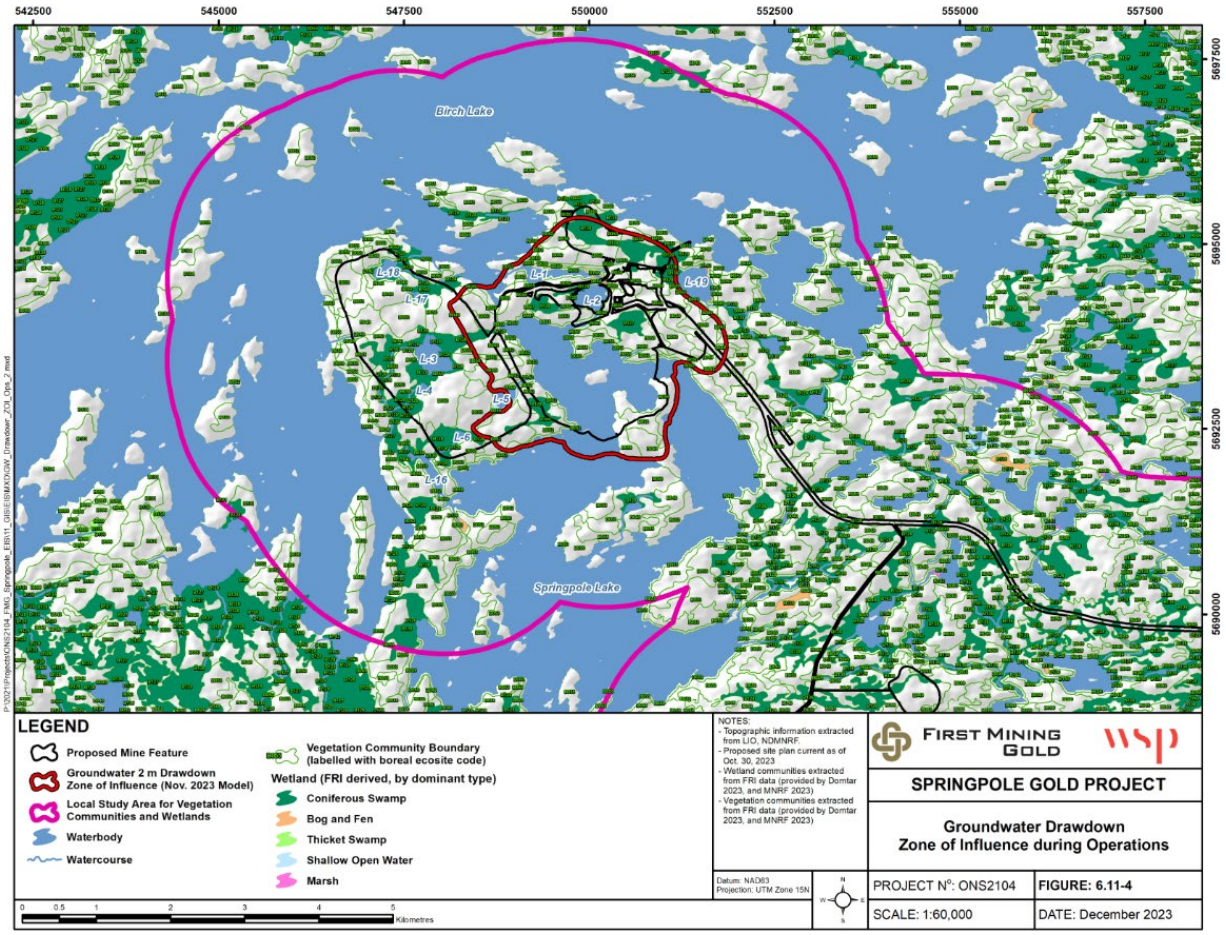

Figure 6.12-54: Groundwater Drawdown Zone of Influence during Operation

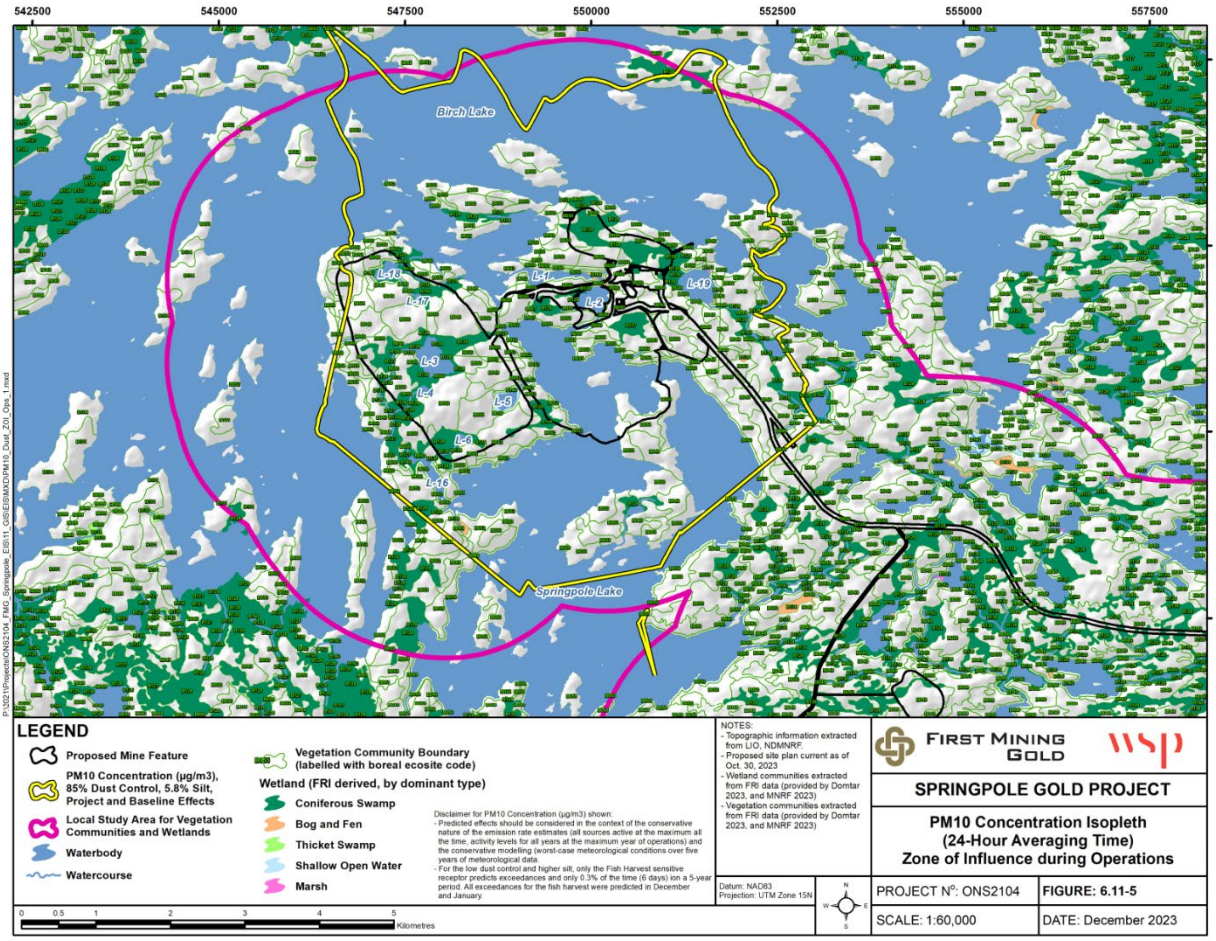

Figure 6.12-55: Air Exceedances

Figure 6.12-56: Noise Exceedances