# Appendix C

*Goodnoe Hills Eagle Take Permit*

*Resource Equivalency Analysis Summary*

# 1. Overview

This appendix provides details on the Resource Equivalency Analysis (REA) we developed to estimate the number of high-risk power poles that would need to be retrofitted to offset the predicted loss of golden eagles. The REAs outlined in this Appendix were executed for the specific purpose of estimating the number of high-risk power pole retrofits that would need to be implemented, should a permit be issued under either action alternative, in order to offset the authorized take at PacifiCorp's repowered Goodnoe Hills Wind Project (Project) at the ratio specified in each Alternative.

Our REA is based on a modeling approach used in natural resource damage assessments to ensure that environmental impacts are mitigated. It is a tool used to account for environmental debits, in this case predicted eagle fatalities, and credits, in this case high-risk power pole retrofits. As described in the ECP Guidance (USFWS 2013), the REA operates under assumptions derived from the current understanding of golden eagle and bald eagle life history. These assumptions are utilized to help calculate direct losses, indirect losses, total debits, productivity of mitigation, and total credits owed to achieve no net loss. Additional information, including assumptions inherent in the REA that are not fully explained here, can be found in our ECP Guidance (Appendix G. *Examples Using Resource Equivalency Analysis to Estimate Compensatory Mitigation for the Take of Golden and Bald Eagles from Wind Energy Development*).

## 1.1. REA Model Runs

For this Project, we ran the REA for both action alternatives. **REA MODEL RUN #1** depicts a range of compensatory mitigation requirements under Alternative 2 and **REA MODEL RUN #2** depicts a range of compensatory mitigation requirements under Alternative 3. Under each model runs, we assume that the permittee chooses to create their own compensatory mitigation program, rather than use an in-lieu fee program. REA model runs for an in-lieu fee program are not presented in this Appendix, since PacifiCorp has indicated they will not be using such a program.

Since the Service is offering some flexibility for the permittee to implement varying retrofit longevities (e.g. 10 years or 30 years) and mitigation schedules (e.g. offsetting all authorized take upfront or offsetting it in 5-year increments), these REA runs calculated the amounts of mitigation that would be required across ranges of those longevities and schedules. In the document below, **10-yr Longevity** denotes outputs that assume a 10-year retrofit longevity is achieved at all poles, while **30-yr Longevity** denotes outputs that assume a 30-year retrofit longevity is achieved at all poles. Additionally, **One-Time Mitigation Schedule** denotes outputs that assume the applicant has chosen to offset all authorized take for all 30 years of the permit at

the outset, while **Incremental Mitigation Schedule** denotes outputs that assume the applicant has chosen to offset only the first five years of authorized take, with a corresponding requirement to offset take in at least 5-year intervals for the remainder of the permit tenure. With retrofit longevities and mitigation schedules not yet decided, the outputs from these REAs reflect a range of high-risk power poles that may ultimately be approved by the Service under each action alternative.

For both REA model runs presented here we assumed that a permit, if issued, would be issued in 2021 and that all poles retrofitted at the outset would be fixed before the beginning of the golden eagle breeding season in 2023. If an **Incremental Mitigation Schedule** is selected, we further assumed that future mitigation requirements would be provided in 5-year increments – to be implemented by the end of calendar years 2027, 2032, 2037, 2042, and 2047, following each 5-year check-in. *Note: These assumptions may not hold true if PacifiCorp changes course and chooses to utilize an in-lieu fee program to satisfy their compensatory mitigation requirement. Such a choice would likely change the assumptions discussed above by increasing the amount of time it would take to complete mitigation. This would slightly increase the compensatory mitigation required.*

Each of the REA runs below calculated the following:

1. The total debit in bird-years associated with the increased hazardous area resulting from the repowering of turbines at the Project, assuming a **One-Time Mitigation Schedule** (Tables 3 and 6) and an **Incremental Mitigation Schedule** (Tables 4 and 7). Take from this increased hazardous area is required to be offset with compensatory mitigation over the course of the permit tenure in each Alternative.
2. The relative productivity of mitigation for 10-yr and 30-yr retrofit longevities (Tables 8 through 10) and,
3. The credits owed (i.e. number of high-risk power poles retrofitted) needed to offset the total debit at a the mitigation ratio specified in each Alternative, assuming both 10-yr and 30-yr retrofit longevity and a range of mitigation schedules (Tables 11 through 18). Credits owed are presented under two distinct mitigation schedules – one assuming all debits for the 30 year permit tenure are offset prior to the 2023 breeding season (**One-Time Mitigation Schedule**), and another assuming debits for the first five years ONLY are offset by the 2023 breeding season, and remaining debits will be offset incrementally at every 5-year administrative check-in (**Incremental Mitigation Schedule**).

Table 1. Summary of Annual Permitted Take Calculations under both action alternatives for the increased hazardous area that requires compensatory mitigation for Golden Eagles. Values in yellow were used as inputs into each REA.

| | Annual Fatality Prediction | Permit Tenure | # Eagles to be Offset[1] | Annual Permitted Take[2] |
|---|---|---|---|---|
| **Alternative 2** (REA MODEL #1) | 0.88 | 30 | 27 | 0.9 |
| **Alternative 3** (REA MODEL #2) | 0.79 | 30 | 24 | 0.8 |

[1] This is derived by multiplying the Annual Fatality Prediction by the Permit Tenure, and then rounding up to the nearest whole integer.

[2] This is derived by dividing the Eagles to be Offset by the Permit Tenure, and is the input for Annual Predicted Take in each REA. *Note: this value may not be the same as the Annual Fatality Prediction, as it divides the eagles to be authorized,* ***after*** *rounding up to the nearest integer.*

# 2. Model Results

## 2.1. Total Debit Calculation

The total debit is the same regardless of the anticipated longevity of retrofits; however, it varies by the mitigation schedule. Specifically, if a **One-Time Mitigation Schedule** is chosen, all 30 years of authorized take will be offset at the outset. However, if an **Incremental Mitigation Schedule** is chosen, only the first 5 years of authorized take will be offset at the outset, with additional compensatory mitigation to be implemented immediately following future administrative check-ins until all authorized golden eagle take has been offset.

### 2.1.1. REA MODEL RUN #1: ALTERNATIVE 2 – ANNUAL PERMITTED TAKE = 0.9

Table 2. Single year debit

| Source of Bird Years | Present Value Bird-Years |
|---|---|
| Direct Loss: | 4.56 |
| Indirect Loss Subtotal (1st Gen + 2nd Gen): | 4.64 |
| ▪ *Indirect Loss – 1st Generation* | *(3.28)* |
| ▪ *Indirect Loss – 2nd Generation* | *(1.36)* |
| **Total Debit (Direct + Indirect)** | **9.20** |

Table 3. Debit for One-Time Mitigation Schedule

| | |
|---|---|
| Start Year of Take | 2021 |
| Debit Present Value Bird-Years | 9.20 |
| **Year** | **Present Value Bird-Years** |
| 2021 | 9.20 |
| 2022 | 8.93 |
| 2023 | 8.67 |
| 2024 | 8.42 |
| 2025 | 8.17 |
| 2026 | 7.93 |
| 2027 | 7.70 |

| Start Year of Take | 2021 |
|---|---|
| Debit Present Value Bird-Years | 9.20 |
| **Year** | **Present Value Bird-Years** |
| 2028 | 7.48 |
| 2029 | 7.26 |
| 2030 | 7.05 |
| 2031 | 6.84 |
| 2032 | 6.64 |
| 2033 | 6.45 |
| 2034 | 6.26 |
| 2035 | 6.08 |
| 2036 | 5.90 |
| 2037 | 5.73 |
| 2038 | 5.56 |
| 2039 | 5.40 |
| 2040 | 5.24 |
| 2041 | 5.09 |
| 2042 | 4.94 |
| 2043 | 4.80 |
| 2044 | 4.66 |
| 2045 | 4.52 |
| 2046 | 4.39 |
| 2047 | 4.26 |
| 2048 | 4.14 |
| 2049 | 4.02 |
| 2050 | 3.90 |
| **Total Present Value Bird-Years for 1:1 ratio** | **185.68** |
| **Total Present Value Bird-Years for 1.2:1 ratio** | **222.82** |

Table 4. Debit for first 5 years of Incremental Mitigation Schedule

| Start Year of Take | 2021 |
|---|---|
| Debit Present Value Bird-Years | 9.20 |
| **Year** | **Present Value Bird-Years** |
| 2021 | 9.20 |
| 2022 | 8.93 |
| 2023 | 8.67 |
| 2024 | 8.42 |
| 2025 | 8.17 |
| **Total Present Value Bird-Years for 1:1 ratio** | **43.39** |
| **Total Present Value Bird-Years for 1.2:1 ratio** | **52.07** |

### 2.1.2. REA MODEL RUN #2: ALTERNATIVE 3 – ANNUAL PERMITTED TAKE = 1.067

Table 5. Single year Debit

| Source of Bird Years | Present Value Bird-Years |
|---|---|
| Direct Loss: | 4.05 |
| Indirect Loss Subtotal (1st Gen + 2nd Gen): | 4.12 |
| ▪ *Indirect Loss – 1st Generation* | *(2.91)* |
| ▪ *Indirect Loss – 2nd Generation* | *(1.21)* |
| **Total Debit (Direct + Indirect)** | **8.18** |

Table 6. Debit for One-Time Mitigation Schedule

| | |
|---|---|
| Start Year of Take | 2021 |
| Debit Present Value Bird-Years | 8.18 |
| **Year** | **Present Value Bird-Years** |
| 2021 | 8.18 |
| 2022 | 7.94 |
| 2023 | 7.17 |
| 2024 | 7.48 |
| 2025 | 7.26 |
| 2026 | 7.05 |
| 2027 | 6.85 |
| 2028 | 6.65 |
| 2029 | 6.45 |
| 2030 | 6.27 |
| 2031 | 6.08 |
| 2032 | 5.91 |
| 2033 | 5.73 |
| 2034 | 5.57 |
| 2035 | 5.40 |
| 2036 | 5.25 |
| 2037 | 5.09 |
| 2038 | 4.95 |
| 2039 | 4.80 |
| 2040 | 4.66 |
| 2041 | 4.53 |
| 2042 | 4.39 |
| 2043 | 4.27 |
| 2044 | 4.14 |
| 2045 | 4.02 |
| 2046 | 3.90 |
| 2047 | 3.79 |
| 2048 | 3.68 |
| 2049 | 3.57 |
| 2050 | 3.47 |
| **Total Present Value Bird-Years for 1:1 ratio** | **165.05** |
| **Total Present Value Bird-Years for 2:1 ratio** | **330.10** |

Table 7. Debit for first 5 years of Incremental Mitigation Schedule

| Start Year of Take<br>Debit Present Value Bird-Years | 2021<br>8.18 |
|---|---|
| **Year** | **Present Value Bird-Years** |
| 2021 | 8.18 |
| 2022 | 7.94 |
| 2023 | 7.71 |
| 2024 | 7.48 |
| 2025 | 7.26 |
| **Total Present Value Bird-Years for 1:1 ratio** | **38.56** |
| **Total Present Value Bird-Years for 2:1 ratio** | **77.12** |

## 2.2 Relative Productivity of Mitigation Calculation

The relative productivity of mitigation per pole (Table 8) is the same regardless of the model run or mitigation schedule (i.e. the same across alternatives in this EA). This value is used to determine the total mitigation credit for each retrofit longevity.

Table 8. Avoided Loss per power pole retrofit over one year.

| Source of Bird Years | Present Value Bird-Years per pole |
|---|---|
| Avoided Direct Loss: | 0.018 |
| Avoided Indirect Loss Subtotal (1st Gen + 2nd Gen): | 0.018 |
| ▪ *Indirect Loss – 1st Generation* | *(0.013)* |
| ▪ *Indirect Loss – 2nd Generation* | *(0.005)* |
| **Total Credit per power pole (Direct + Indirect)** | **0.036** |

This credit (per power pole) in Table 8 is used to calculate the total Present Value Bird-Years for both 10-year retrofit longevity and 30-year retrofit longevity, below (Tables 9 and 10).

Table 9. Relative Productivity of Mitigation with 10-yr Longevity

| Start Year of Mitigation<br>Credit Present Value Bird-Years | 2022<br>0.036 |
|---|---|
| **Year** | **Present Value Bird-Years per pole** |
| 2022 | 0.036 |
| 2023 | 0.035 |
| 2024 | 0.034 |
| 2025 | 0.033 |
| 2026 | 0.032 |
| 2027 | 0.031 |
| 2028 | 0.030 |
| 2029 | 0.029 |
| 2030 | 0.028 |
| 2031 | 0.027 |
| **Total Present Value Bird-Years** | **0.314** |

Table 10. Relative Productivity of Mitigation with 30-yr Longevity

| Start Year of Mitigation | 2022 |
|---|---|
| Credit Present Value Bird-Years | 0.036 |
| **Year** | **Present Value Bird-Years per pole** |
| 2022 | 0.036 |
| 2023 | 0.035 |
| 2024 | 0.034 |
| 2025 | 0.033 |
| 2026 | 0.032 |
| 2027 | 0.031 |
| 2028 | 0.030 |
| 2029 | 0.029 |
| 2030 | 0.028 |
| 2031 | 0.027 |
| 2032 | 0.027 |
| 2033 | 0.026 |
| 2034 | 0.025 |
| 2035 | 0.024 |
| 2036 | 0.024 |
| 2037 | 0.023 |
| 2038 | 0.022 |
| 2039 | 0.022 |
| 2040 | 0.021 |
| 2041 | 0.020 |
| 2042 | 0.020 |
| 2043 | 0.019 |
| 2044 | 0.019 |
| 2045 | 0.018 |
| 2046 | 0.018 |
| 2047 | 0.017 |
| 2048 | 0.017 |
| 2049 | 0.016 |
| 2050 | 0.016 |
| 2051 | 0.015 |
| **Total Present Value Bird-Years** | **0.721** |

## 2.3. Calculating Mitigation Credit Owed

The number of retrofitted power poles that would be required under each Alternative is calculated by dividing the Total Debit (in Present-Value Bird Years), by the Relative Productivity of the Mitigation (in Present-Value Bird Years).

### 2.3.1. REA MODEL RUN #1: (ALTERNATIVE 2)

Table 11. Credit Owed assuming One-Time Mitigation Schedule and 10-yr Longevity

| Calculation Step | Amount | Description |
|---|---|---|
| Total Debit for 1:1 ratio | 185.68 | Present Value Bird-Years |
| Total Debit for 1.2:1 ratio | 222.82 | Present Value Bird-Years |
| Divided by Relative Productivity of Lethal Electric Pole Retrofitting | 0.314 | Avoided loss of Present Value Bird-Years/Pole |
| = Credit Owed | 591.66 | Poles to be retrofitted to achieve no net loss of golden eagle |
| **= Credit Owed** | **709.99** | **Poles to be retrofitted to achieve 1.2:1 ratio (mitigation:fatalities)** |

Table 12. Credit Owed assuming One-Time Mitigation Schedule and 30-yr Longevity

| Calculation Step | Amount | Description |
|---|---|---|
| Total Debit for 1:1 ratio | 185.68 | Present Value Bird-Years |
| Total Debit for 1.2:1 ratio | 222.82 | Present Value Bird-Years |
| Divided by Relative Productivity of Lethal Electric Pole Retrofitting | 0.721 | Avoided loss of Present Value Bird-Years/Pole |
| = Credit Owed | 257.50 | Poles to be retrofitted to achieve no net loss of golden eagle |
| **= Credit Owed** | **309.00** | **Poles to be retrofitted to achieve 1.2:1 ratio (mitigation:fatalities)** |

Table 13. Credit Owed assuming Incremental Mitigation Schedule and 10-yr Longevity

| Calculation Step | Amount | Description |
|---|---|---|
| Total Debit for 1:1 ratio | 43.39 | Present Value Bird-Years |
| Total Debit for 1.2:1 ratio | 52.07 | Present Value Bird-Years |
| Divided by Relative Productivity of Lethal Electric Pole Retrofitting | 0.314 | Avoided loss of Present Value Bird-Years/Pole |
| = Credit Owed | 138.25 | Poles to be retrofitted to achieve no net loss of golden eagle |
| **= Credit Owed** | **165.90** | **Poles to be retrofitted to achieve 1.2:1 ratio (mitigation:fatalities)** |

Table 14. Credit Owed assuming Incremental Mitigation Schedule and 30-yr Longevity

| Calculation Step | Amount | Description |
|---|---|---|
| Total Debit for 1:1 ratio | 43.39 | Present Value Bird-Years |
| Total Debit for 1.2:1 ratio | 52.07 | Present Value Bird-Years |
| Divided by Relative Productivity of Lethal Electric Pole Retrofitting | 0.721 | Avoided loss of Present Value Bird-Years/Pole |
| = Credit Owed | 60.17 | Poles to be retrofitted to achieve no net loss of golden eagle |
| **= Credit Owed** | **72.20** | **Poles to be retrofitted to achieve 1.2:1 ratio (mitigation:fatalities)** |

### 2.3.2. REA MODEL RUN #2: (ALTERNATIVE 3)

Table 15. Credit Owed assuming One-Time Mitigation Schedule and 10-yr Longevity

| Calculation Step | Amount | Description |
|---|---|---|
| Total Debit for 1:1 ratio | 165.05 | Present Value Bird-Years |
| Total Debit for 2:1 ratio | 330.10 | Present Value Bird-Years |
| Divided by Relative Productivity of Lethal Electric Pole Retrofitting | 0.314 | Avoided loss of Present Value Bird-Years/Pole |
| = Credit Owed | 525.92 | Poles to be retrofitted to achieve no net loss of golden eagle |
| **= Credit Owed** | **1,051.84** | **Poles to be retrofitted to achieve 2:1 ratio (mitigation:fatalities)** |

Table 16. Credit Owed assuming One-Time Mitigation Schedule and 30-yr Longevity

| Calculation Step | Amount | Description |
|---|---|---|
| Total Debit for 1:1 ratio | 165.05 | Present Value Bird-Years |
| Total Debit for 2:1 ratio | 330.10 | Present Value Bird-Years |
| Divided by Relative Productivity of Lethal Electric Pole Retrofitting | 0.721 | Avoided loss of Present Value Bird-Years/Pole |
| = Credit Owed | 228.89 | Poles to be retrofitted to achieve no net loss of golden eagle |
| **= Credit Owed** | **457.78** | **Poles to be retrofitted to achieve 2:1 ratio (mitigation:fatalities)** |

Table 17. Credit Owed assuming Incremental Mitigation Schedule and 10-yr Longevity

| Calculation Step | Amount | Description |
|---|---|---|
| Total Debit for 1:1 ratio | 38.56 | Present Value Bird-Years |
| Total Debit for 2:1 ratio | 77.12 | Present Value Bird-Years |
| Divided by Relative Productivity of Lethal Electric Pole Retrofitting | 0.314 | Avoided loss of Present Value Bird-Years/Pole |
| = Credit Owed | 122.89 | Poles to be retrofitted to achieve no net loss of golden eagle |
| **= Credit Owed** | **245.77** | **Poles to be retrofitted to achieve 2:1 ratio (mitigation:fatalities)** |

Table 18. Credit Owed assuming Incremental Mitigation Schedule and 30-yr Longevity

| Calculation Step | Amount | Description |
|---|---|---|
| Total Debit for 1:1 ratio | 38.56 | Present Value Bird-Years |
| Total Debit for 2:1 ratio | 77.12 | Present Value Bird-Years |
| Divided by Relative Productivity of Lethal Electric Pole Retrofitting | 0.721 | Avoided loss of Present Value Bird-Years/Pole |
| = Credit Owed | 53.48 | Poles to be retrofitted to achieve no net loss of golden eagle |
| **= Credit Owed** | **106.97** | **Poles to be retrofitted to achieve 2:1 ratio (mitigation:fatalities)** |

# 3. Summary

## 3.1. REA MODEL RUN #1: (Alternative 2)

As illustrated above, the actual number of poles needed to offset authorized take under Alternative 2 will depend on the retrofit longevity proposed for each selected power pole and the mitigation completion schedule proposed by the applicant. Recall that, under Alternative 2, the Service would require that a 1.2:1 mitigation to fatality ratio be achieved.

If the applicant chooses a **One-Time Mitigation Schedule** (i.e. proposes to offset all authorized take across all 30 permit-years prior to the beginning of the 2023 breeding season) under Alternative 2 the Service would require, that either:

a. 710 high-risk power poles be retrofitted with a 10-year retrofit longevity by the beginning of the 2023 breeding season (Table 11), or
b. 309 high-risk power poles be retrofitted with a 30-year retrofit longevity by the beginning of the 2023 breeding season (Table 12).

In other words, under a **One-Time Mitigation Schedule**, the number of poles ultimately approved by the Service could be as low as 309 poles (if 30-year retrofit longevity is achieved for all poles) or as high as 710 poles (if 10-year retrofit longevity is achieved for all poles). It is also possible that the permittee proposes to achieve a 10-year retrofit longevity at some selected poles, and a 30-year retrofit longevity at others. In this case, the number of poles required to offset take at the required ratio of 1.2:1 would be somewhere between 309 and 710 poles.

Additional poles would be required if the permittee chose to implement an **Incremental Mitigation Schedule** (i.e. offset authorized take for the first 5 years of the permit tenure prior to the beginning of the 2023 breeding season, and provide compensatory mitigation at 5-year intervals for the remaining tenure of the permit). Under this schedule the Service would have the ability to update fatality predictions and authorized take numbers at every 5-year check-in; however, we do not know how predictions, authorizations, or mitigation requirements might change at these check-ins. Thus, we must assume here that the take authorization and corresponding compensatory mitigation requirements remain unchanged throughout the permit tenure. With this assumption in place, the Service would require, at a 1.2:1 mitigation to fatality ratio, that either

a. 166 high-risk power poles be retrofitted with a 10-year retrofit longevity by the beginning of the 2023 breeding season (Table 13) and 166 more high-risk poles be retrofitted (with a 10-year retrofit longevity) by the end of calendar years 2027, 2032, 2037, 2042, and 2047 – for a total requirement of 996 high-risk poles, or
b. 73 high-risk power poles be retrofitted with a 30-year retrofit longevity by the beginning of the 2023 breeding season (Table 14) and 73 more high-risk poles be retrofitted (with a

30-year retrofit longevity) by the end of calendar years 2027, 2032, 2037, 2042, and 2047 – for a total requirement of 438 high-risk poles.

In other words, under an **Incremental Mitigation Schedule**, the number of poles ultimately approved by the Service, to offset all authorized take, could be as low as 438 high-risk poles (if a 30-year retrofit longevity is achieved for all poles) or as high as 996 high-risk poles (if a 10-year retrofit longevity is achieved for all poles). Of course, it is possible that the permittee proposes to achieve a 10-year retrofit longevity at some selected poles, and a 30-year retrofit longevity at others. In this case, the number of poles required to offset take at the required ratio of 1.2:1 would be somewhere between 438 and 996 poles.

It is likely that the permittee will elect to provide their compensatory mitigation in an **Incremental Mitigation Schedule** in hopes that site-specific eagle fatality monitoring will provide additional data that will reduce their fatality prediction and take authorization over time; thus, resulting in a reduced compensatory mitigation requirement over the tenure of the permit. Should such reductions occur, and if they are substantial, PacifiCorp could end up providing less compensatory mitigation than is listed in the ranges above and in Table 2 of the associated EA. It is impossible to predict how take authorizations may change over time without future post-construction monitoring data in hand. Therefore, we have assumed that the fatality prediction and take authorization remain unchanged under this **Incremental Mitigation Schedule**.

Whatever the retrofit longevities and mitigation schedules proposed by the permittee, the Service will approve the number and location of all poles in order for them to count as offsetting compensatory mitigation.

## 3.2. REA MODEL RUN #2: (Alternative 3)

As under Alternative 2, the actual number of poles needed to offset authorized take under Alternative 3 will also depend on the retrofit longevity proposed for each selected power pole and the mitigation completion schedule proposed by the applicant. Recall that, under Alternative 3, the Service would require a 2:1 mitigation to fatality ratio be achieved.

If the applicant chooses a **One-Time Mitigation Schedule** (i.e. proposes to offset all authorized take across all 30 permit-years prior to the beginning of the 2023 breeding season) under Alternative 3 the Service would require, that either:

a. 1,052 high-risk power poles be retrofitted with a 10-year retrofit longevity by the beginning of the 2023 breeding season (Table 15), or
b. 458 high-risk power poles be retrofitted with a 30-year retrofit longevity by the beginning of the 2023 breeding season (Table 16).

In other words, under a **One-Time Mitigation Schedule**, the number of poles ultimately approved by the Service could be as low as 458 poles (if 30-year retrofit longevity is achieved for all poles) or as high as 1,052 poles (if 10-year retrofit longevity is achieved for all poles). It is

also possible that the permittee proposes to achieve a 10-year retrofit longevity at some selected poles, and a 30-year retrofit longevity at others. In this case, the number of poles required to offset take at the required ratio of 2:1 would be somewhere between 458 and 1,052 poles.

Additional poles would be required if the permittee chose to implement an **Incremental Mitigation Schedule** (i.e. offset authorized take for the first 5 years of the permit tenure prior to the beginning of the 2023 breeding season, and provide compensatory mitigation at 5-year intervals for the remaining tenure of the permit). Under this schedule the Service would have the ability to update fatality predictions and authorized take numbers at every 5-year check-in; however, we do not know how predictions, authorizations, or mitigation requirements might change at these check-ins. Thus, we must assume here that the take authorization and corresponding compensatory mitigation requirements remain unchanged throughout the permit tenure. With this assumption in place, the Service would require, at a 2:1 mitigation to fatality ratio, that either

a. 246 high-risk power poles be retrofitted with a 10-year retrofit longevity by the beginning of the 2023 breeding season (Table 17) and 246 more high-risk poles be retrofitted (with a 10-year retrofit longevity) by the end of calendar years 2027, 2032, 2037, 2042, and 2047 – for a total requirement of 1,476 high-risk poles, or
b. 107 high-risk power poles be retrofitted with a 30-year retrofit longevity by the beginning of the 2023 breeding season (Table 18) and 107 more high-risk poles be retrofitted (with a 30-year retrofit longevity) by the end of calendar years 2027, 2032, 2037, 2042, and 2047 – for a total requirement of 642 high-risk poles.

In other words, under an **Incremental Mitigation Schedule**, the number of poles ultimately approved by the Service, to offset all authorized take, could be as low as 642 high-risk poles (if a 30-year retrofit longevity is achieved for all poles) or as high as 1,476 high-risk poles (if a 10-year retrofit longevity is achieved for all poles). Of course, it is possible that the permittee proposes to achieve a 10-year retrofit longevity at some selected poles, and a 30-year retrofit longevity at others. In this case, the number of poles required to offset take at the required ratio of 2:1 would be somewhere between 642 and 1,476 poles.

It is likely that the permittee will elect to provide their compensatory mitigation in an **Incremental Mitigation Schedule** in hopes that site-specific eagle fatality monitoring will provide additional data that will reduce their fatality prediction and take authorization over time; thus, resulting in a reduced compensatory mitigation requirement over the tenure of the permit. Should such reductions occur, and if they are substantial, PacifiCorp could end up providing less compensatory mitigation than is listed in the range above and in Table 2 of the associated EA. It is impossible to predict how take authorizations may change over time without future post-construction monitoring data in hand. Therefore, we have assumed that the fatality prediction and take authorization remain unchanged under this **Incremental Mitigation Schedule**.

Whatever the retrofit longevities and mitigation schedules proposed by the permittee, the Service will approve the number and location of all poles in order for them to count as offsetting compensatory mitigation.

## 3.3. PUTTING IT ALL TOGETHER

Table 19 summarizes results across both action Alternatives and mitigation strategies, and presents the ranges of power poles that will be required under both 10-yr and 30-yr retrofit longevities. As noted above, the actual number of poles approved by the Service may be between the ranges specified for each Alternative and mitigation schedule.

Table 19**.** Summary of Fatality Predictions, Authorized Take, and Retrofitted Power Poles required to offset take of golden eagles at the increased hazardous area from repowering of Goodnoe Hills Wind – by Alternative and mitigation schedule. Numbers in yellow depict a range of high-risk poles that will be required to offset take under each Alternative and mitigation schedule, depending on the retrofit longevity chosen.

| | Annual Fatality Pred. | Take Needing to be Offset During Permit Tenure | Total Poles to be Retrofitted, assuming 10-yr retrofit longevity[1] | Total Poles to be Retrofitted, assuming 30-yr retrofit longevity[1] |
|---|---|---|---|---|
| **Alt 2, One-Time Mitigation** | 0.88 | 27 | **710** | **309** |
| **Alt 2, Incremental Mitigation[$]** | 0.88 | 27 | **996** | **438** |
| **Alt 3, One-Time Mitigation** | 0.79 | 24 | **1,052** | **458** |
| **Alt 3, Incremental Mitigation[$]** | 0.79 | 24 | **1,476** | **642** |

[1] Required to offset 30-years' worth of authorized take at a 1.2:1 mitigation to fatality ratio under Alternative 2, or a 2:1 mitigation to fatality ratio under Alternative 3. Values have been rounded up to the nearest whole number.
[$] if PacifiCorp decides not to provide all compensatory mitigation up front, and instead elects to provide compensatory mitigation every 5 years throughout the permit tenure (assuming the fatality prediction and take authorization does not change at the 5-year check-ins).