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Submitted via [www.regulations.gov](http://www.regulations.gov)

Acting Director Gary Frazer  
U.S. Fish & Wildlife Service  
MS PRB/3W  
5275 Leesburg Pike  
Falls Church, VA 22041

**Re: Endangered and Threatened Wildlife and Plants; Endangered Status for the Eastern Regal Fritillary, and Threatened Status With Section 4(d) Rule for the Western Regal Fritillary. Docket No. FWS-R6-ES-2023-0182**

Dear Acting Director Frazer,

The Petroleum Association of Wyoming and Western Energy Alliance (collectively, the Associations) have reviewed the U.S. Fish & Wildlife Service's (USFWS) proposal to list the Western Regal Fritillary (WRF) as threatened under the Endangered Species Act (ESA). The USFWS's proposal is not supported by data but by broad assumptions and extrapolations, and as such, the USFWS should withdraw this proposal and direct its efforts on collecting species-specific data, determining potential future impacts and suitable habitat, and identifying conservation efforts. The Associations also encourage the USFWS to consider credible evidence that not only do the oil and natural gas activities have minimal initial impacts to the WRF, but the industry can quickly aid in the conservation of this species. Activities of the oil and natural gas industry should be included as exempt in the proposed 4(d) Rule.

The Petroleum Association of Wyoming represents the state's oil and natural gas industry including production, midstream processing, pipeline transportation, and oil field service companies. The Association also represents affiliated companies offering oil and gas related legal, accounting, oilfield services, and consulting services. Eighty-five percent of the oil and gas companies operating in Wyoming are classified as small businesses.

Working with a vibrant membership base for over 50 years, Western Energy Alliance stands as a credible leader, advocate, and champion of independent oil and natural gas companies in the West. Our expert staff, active committees, and committed board members form a collaborative and welcoming community of professionals dedicated to abundant, affordable energy and a high quality of life for all. Most independent producers are small businesses, with an average of fourteen employees.

### **USFWS Proposed Action is Based on Insufficient Data**

The USFWS states:

*Our review of the **best available scientific and commercial information** indicates that the western subspecies of regal fritillary meets the Act's definition of a threatened species.*

Contrast this confident statement to the following declaration from the USFWS in its Species Status Assessment (SSA), in the section titled “Summary of Major Uncertainties and Assumptions”:

*... many factors related to the species' habitat and population dynamics may be unknown, locally and rangewide. For example, the number of **current extant regal fritillary populations cannot be determined with accuracy**; extirpations and recolonizations occur annually, and there are no systematic surveys throughout the species' range. As a result of the **inability to quantify many habitat and demographic needs** and factors affecting the subspecies, **we used surrogates or other sources of the best available scientific information to help inform our SSA analyses**. Given the lack of consistent, rangewide demographic monitoring, **we relied on expert opinions to provide the best available information**.*

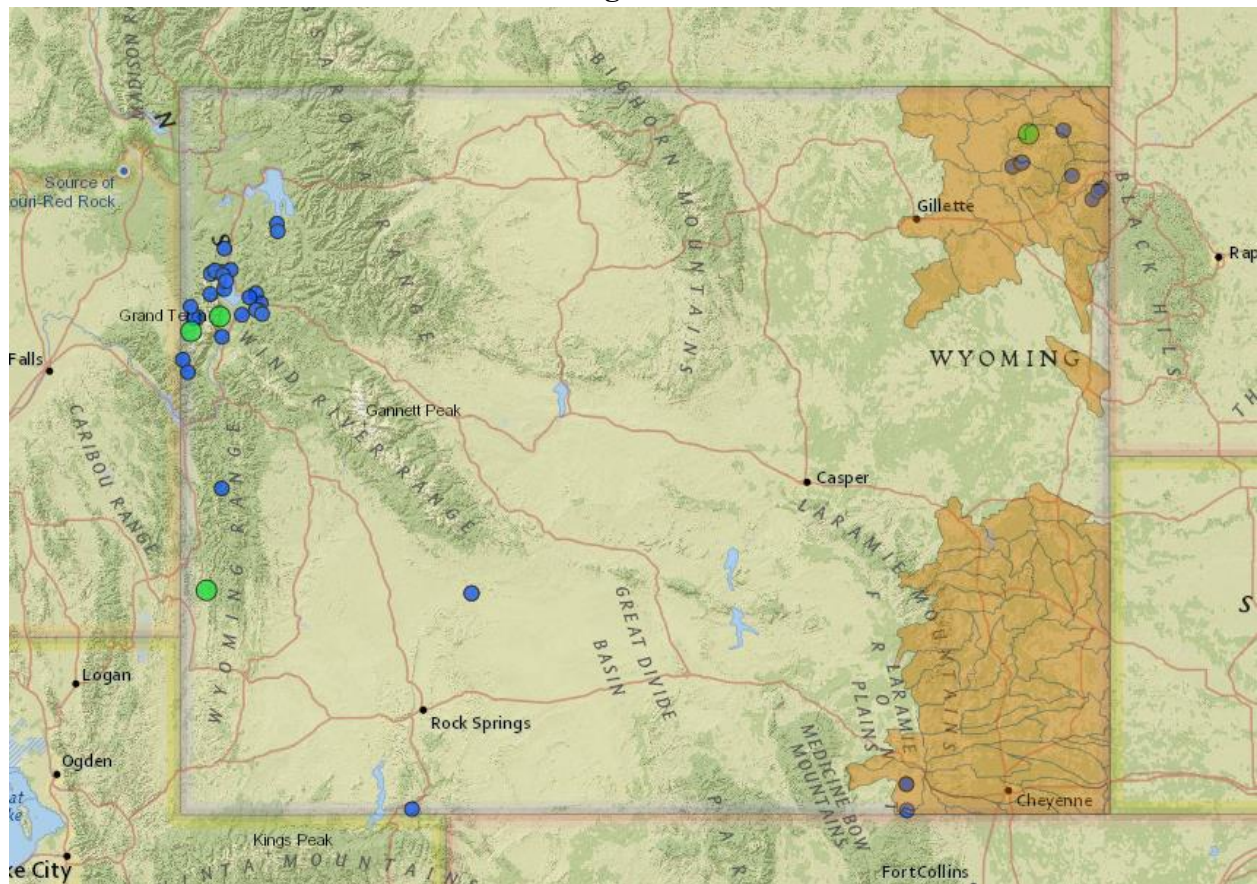
The USFWS's claim that this proposed decision is based on scientific and commercial data is, in fact, not true. At best, this claim is misleading because most of the data is not of WRF but of surrogate species. This greatly concerns the Associations. Listing of any species should be done with the best available science for that species when it is determined there is a true need for additional protections. It seems in this instance the USFWS does not actually know much about the health of this species or its habitat, making a listing alarming. There are real world implications to species listings and the Associations hope the USFWS isn't making these decisions flippantly.

For example, the SSA offers that “as with many insect species, there may be substantial changes in numbers from one year to the next, perhaps at an order-of-magnitude level,”; that population

dynamics “are difficult to evaluate, measure, and predict,”; and that “metrics of wild populations such as survival rates, emigration and immigration rates, and hatching success are not known.” Furthermore, the SSA states some adult WRF can “roam far beyond study area boundaries” while also admitting the WRF occupies portions of 15 U.S. states. USFWS’s statements that the WRF has an “overall boom-and-bust nature” and that factors such as fecundity rates, hatching rates, survival rates at any life stage, and recruitment rates, “may be highly variable within and between years and by local area or region” all should logically compel the USFWS to gather more data and commission more scientific analysis to better understand these unknowns before jumping to a threatened listing. The uncertainties regarding WRF population projections render them all but unusable until better data are available.

Looking specifically at Wyoming, it appears there is little evidence there is true habitat for the WRF. **Figure 1** below reflects data from the Wyoming Natural Diversity Database (WYNDD) on September 24, 2024. As explained later in this letter, the Associations believe that violets may stand as the most consequential flora species for WRF because they are the sole habitat needed for WRF larvae to grow. Data were collected from WYNDD on the actual observations of all the violet species identified in Wyoming, seen as the blue and green dots. These violet data points are overlaid with the estimated WRF range, seen by the areas shaded in orange.

**Figure 1**

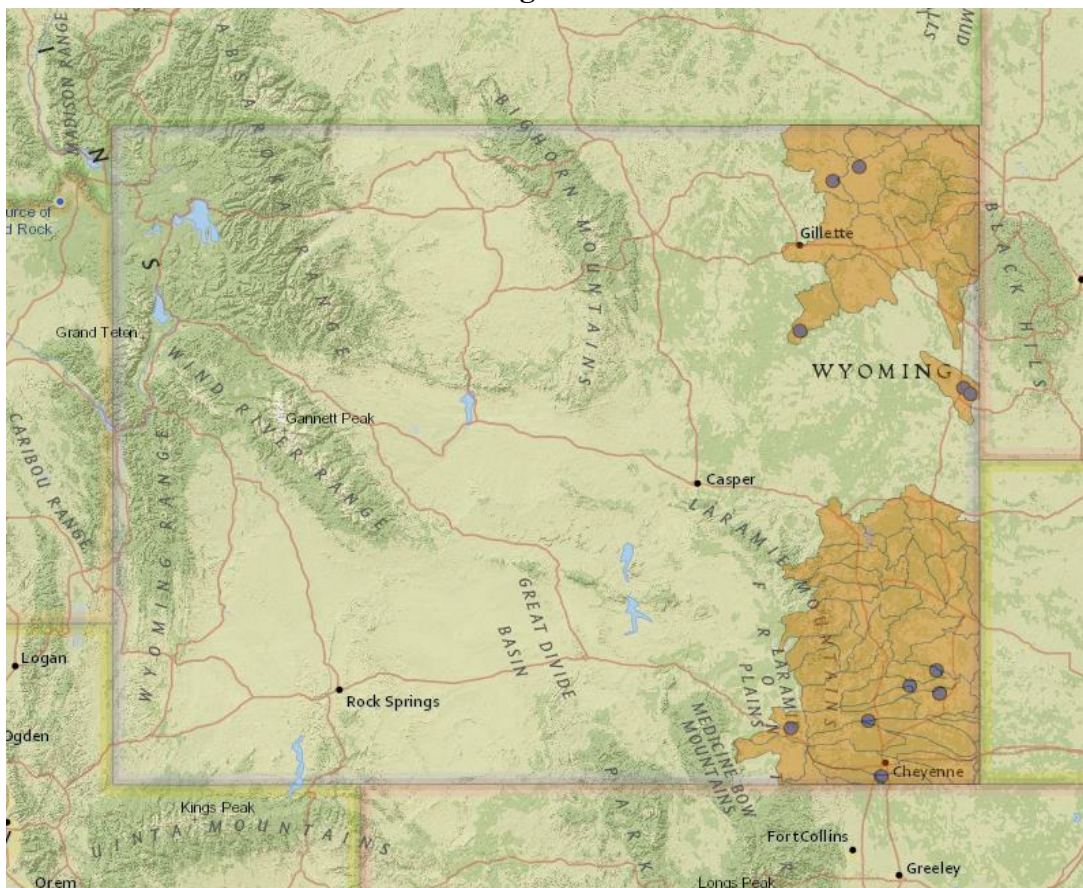


There does not seem to be a great occurrence of violets in the WRF presumed range across Eastern Wyoming.

Next, the Associations observed additional data from WYNDD on the actual occurrences of WRF in Wyoming. As seen in **Figure 2**, there have been exactly 11 observations of this species in Wyoming, mostly collected in 2019.

As noted in the SSA, WRF have a range of up to 100 miles. Perhaps the furthest westward observation was just north of Laramie, WY. As the crow flies, Laramie is approximately 70 miles from the border of Nebraska, well within the estimated flight range of the WRF.

**Figure 2**



What Figure 1 and Figure 2 show is that Eastern Wyoming is likely not suitable habitat for the WRF, at least not during its early lifecycle when the WRF is most dependent upon violets. It would appear the observations in Wyoming may be more coincidence, the result of an adult flying from the east in search of nectar-bearing flora, or simply taken by the wind. As supported by Selby (2007), along the western boundary of the species' range, shortgrass prairies dominate and are among the driest habitats occupied by the species. While regal fritillary observations

occur there, these areas seem to represent marginal sites that do not support large or persistent regal fritillary populations (1).

Further, the USFWS noted the following observations in the SSA, indicating “As a result, care must be taken when determining habitat suitability based solely on observations of adults. Regal fritillary adults may be able to move across the landscape in response to changing conditions in order to locate resources, while as larvae, they are generally limited to the area in which they hatched (2). The latter is more difficult to detect; few studies document specific details regarding regal fritillary larvae habitats.” (2, 3, 4)

The Associations have concerns about the lack of species-specific data being used in this process, but our concerns are compounded by the incredible lack of data to support consideration of habitat or repopulating species within Wyoming. Likewise, we are concerned about the lack of data that affect another oil and natural gas state within the WRF range, i.e., Colorado, for which the USFWS admits that, “records are relatively few there.”

On the other hand, the other major oil and natural gas state is North Dakota, yet it has some of the best data. The SSA notes that, “North Dakota, recently conducted statewide pollinator surveys with annual sampling in every county from 2017 to 2019” and that “regal fritillaries were detected in most of them.” As such, North Dakota jumped from historical observations in three counties to 43 counties, including counties north of Interstate 94. While the USFWS suggests climate change as a possible explanation, the simple act of more thorough observation could be an explanation as well. Table 4 of the SSA shows wide swings between current and historical habitat in several states in both directions, which indicates that quality surveying across the full range is necessary. The USFWS is right to note in the SSA that the lack of standardized surveys is a problem. The Associations suggest that USFWS cannot confidently make a decision on whether to list or not to list before first conducting the comprehensive surveying across multiple years that North Dakota has done. Perhaps similar observational surveys would indicate more robust populations.

Lacking the necessary data to make an informed decision, the USFWS instead relied upon modeling and broad assumptions to fill in the gaps. There is a concern that the breadth of the modeling – duration of anticipating impacts, land conversion rates and more – provides too much opportunity for manipulation of results and the ability to lead to a conclusion that was pre-decisional.

First, the USFWS identifies large-scale land conversion as the greatest threat to the WRF, primarily the result of prior agricultural activities. The WRF need an undefined amount of contiguous landscape for its various life stages. Wholesale land conversion reduces their ability to find suitable habitat within more manageable flight ranges. To estimate future impacts, the

USFWS considered three scenarios: 1) a continuation of current conversion putting at risk 2 percent of additional land suitable for agriculture; 2) moderately increased conversion putting at risk 30 percent of suitable land; 3) and a significant conversion putting at risk 70 percent.

This seems too broad a spectrum to consider. Is there truly a scenario where 70 percent of the land available for agriculture will be converted for that use? This seems exaggerated and allows the USFWS to incorporate a risk that appears very unlikely to occur. Further, including this conversion percentage gives the USFWS more ability to artificially incorporate impacts into the future sustainability of the species, prompting a higher likelihood of a listing.

Further, the USFWS's decision to project impacts to the WRF out to 2075 seems far too distant. The USFWS backs this duration by noting it is commensurate with the timeframe within which they have historical data on the WRF. That is an insufficient argument. As expressed by the USFWS, it does not have robust data on the WRF and is instead relying on observations from other species to inform its analyses. Given this, a shorter future timeframe would be more appropriate and enable the service to gather species-specific data that could then be used for longer-term projections. The USFWS has fewer direct data to base its estimates from, meaning longer duration projections have a higher likelihood of misrepresenting actual outcomes. Shorter duration projections would give a higher confidence. It is also an inadequate argument for the USFWS to use a 50-year duration in this instance simply because it uses a similar timeframe in decisions for other species. Some adjustment must be made based on the quality and quantity of data available, both of which are severely lacking in this instance.

It is for these reasons that the Associations question the objectiveness and confidence of the USFWS decision. Minute adjustments to inputs into these models could result in wild swings in outputs.

The USFWS has stated in the SSA that it does not have any immediate concerns about the health of the WRF or its habitat<sup>1</sup>, thereby raising serious doubts about the efficacy of moving forward with a listing now. It would seem more reasonable for the USFWS to determine it does not have the best available science and commercially available data to make a decision. If concerns remain, it can issue a "warranted, but precluded" status for this species, offering the USFWS time to orient resources and find answers to these many questions. Collaborative efforts can commence between federal and state governments and other appropriate stakeholders to collect additional information and determine what, if any, conservation actions should be put into effect.

The Associations recommend this proposal be withdrawn. There is time to collect species-specific data, determine potential future impacts, determine suitable habitat and identify

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<sup>1</sup> FR Notice, page 63900: "indicating that enough suitable habitats currently remain such that dispersals and recolonizations help maintain the landscape-level metapopulation structure for the western regal fritillary."

conservation efforts. Moving forward with its current proposal stands to create significant, and perhaps unwarranted, impacts on the oil and natural gas industry.

### **Oil & Natural Gas Activities Must be Included in Proposed 4(d) Rule**

The USFWS is proposing to exempt activities within the livestock industry. The USFWS determined that while several of livestock activities, “*may have some minimal level of take of the western regal fritillary, [they] are not expected to rise to the level that would have a negative impact (i.e., would have only de minimis impacts) on the western subspecies' conservation.*” In lieu of a withdrawal from its current course, the Associations believe there is sufficient, credible evidence to also include oil and natural gas activities as exempt under the proposed 4(d) Rule.

The USFWS gives nod to this fact in its SSA, stating:

*For some energy development projects, if the footprint is small and native grasslands remain intact with necessary resources in adjacent areas, the action may incur impacts similar to highways – loss of some habitat and addition of new mortality risks, but unlikely to completely displace populations or preclude regal fritillary occupation of nearby suitable habitats. This may be the case for projects like oil/gas drilling...and their associated infrastructure.*

Activities of the oil and natural gas industry do fragment the landscape, but that fragmentation has declined by as much as 70 percent and reclamation activities can be more tailored to elicit outcomes specific to certain species and their habitats.

Current practices allow for multiple wells to be drilled on one well site, as compared to past practices which required one well per pad. Wells are also being drilled horizontally for miles, allowing for more production per acre of disturbance. This trend in the oil and natural gas industry is resulting in lessening surface disturbances – with fewer acres and a more consolidated disturbance footprint.

Horizontal and directional drilling change the disturbance, fragmentation and activity profiles associated with modern oil and natural gas development (6). In 2014, a single horizontal well could replace 8 to 16 vertical wells depending on spacing. Horizontal drilling requires average initial disturbances of 4.05 to 4.86 hectares for the well pad and takes approximately 3 to 4 months to construct, drill, and complete, assuming one well pad. Conversely, each vertical well pad averages 1.62 to 2.02 hectares in size and takes 1 to 2 months to construct, drill, and complete (6).

A full section development with horizontal wells could be developed by multiple wells on 1 to 2 pads over the course of 6 to 12 months, with 4.05 to 9.71 hectares of disturbance. Vertical development of a section would require 8 to 16 wells on 8 to 16 pads over the course of 8 to 32 months, with a total disturbance of 12.9 to 32.4 hectares. A similar reduction in linear disturbance is expected with this shift in oil and gas natural drilling technology. Roads, power lines, and product pipelines often are associated with individual well pads (6).

In 2012, the percentage reduction in landscape disturbance due to the shift from vertical to directional and horizontal drilling was as much as 70 percent (approximately 6,100 ha disturbed, rather than 20,700 ha), not including the associated reduction in road, pipeline, and power line disturbance and fragmentation. Advancements in technology provided a significant reduction in footprint and fragmentation in the oil and natural gas industry (6). This trend has only continued since the study was published, as the percentage of horizontal wells continues to increase and their laterals have extended from one to as far as three miles. Technological advancements significantly reduce the overall disturbance footprint, allowing for contiguous WRF habitats to remain largely intact.

In addition to overall lessening land disturbance, much of the initial disturbance in the oil and natural gas industry goes through interim reclamation within one year of initial disturbance. The Converse County Oil & Gas Project Area in Wyoming encompassed 1.5 million acres. However, its associated Environmental Impact Statement (EIS) estimated that total surface disturbance would be 53,000 acres. For this project, only 3.5 percent of the total development area is expected to experience initial surface disturbance. This is indicative of the small fragmentation profile of oil and natural gas development as opposed to any kind of wholesale land conversion profile.

What is further important to consider, the Converse County EIS also estimated (based on requirements for development) that after initial reclamation occurred, surface disturbance would be lowered to 21,000 acres. That is a 60 percent reduction in surface disturbance, usually within one year after initial disturbance. This results in disturbance of only 1.4 percent of the entire project area, a truly small footprint.

Another example of the industry's footprint can be observed from the Pinedale Anticline Natural Gas Project. Of this project's initial 2,140 hectares of surface disturbance, primarily from pipelines, roads and well pads, 1,485 hectares were placed into interim reclamation. A 69 percent decrease from the initial disturbance ensured large areas of land were in various stages of reclamation soon.

While fragmentation may contribute to declines in biodiversity when it is synonymous with habitat loss (Haila 2002), other conceptual models show different results (Fahrig 2003). More



recent meta-analysis examining 381 significant responses to habitat fragmentation showing 290 (76 percent) were positive (Fahrig 2017).

It is typical for 70-80 percent of initial surface disturbance associated with well pads to begin interim reclamation shortly after initial development, whereas the entirety of pipeline rights-of-way begin reclamation within one growing season of pipeline burial. Practitioners can be intentional with the seed mixes and reclamation treatments, meaning reclamation efforts can be viewed as a form of ‘assisted succession.’ By understanding successional pathways, operators have the ability to increase native plant diversity and create resilient ecosystems with their reclamation efforts. For example, reclaimed sites within the Jonah Infill project area average 16.1 native species compared to reference areas which contain an average of 9.6 native species (5).

It can now be shown that reclamation practices associated with oil and natural gas development in Wyoming can result in better habitat than reference sites (5, 7, 8, 9, 10). Reclaimed habitat can be more suitable for the WRF, as well as other insect and wildlife species, than reference sites. Similarly, the same results could be expected upon final reclamation, leaving WRF habitat in a better position during and after development than if the development had never occurred. The initial disturbance created by oil and natural gas activities should constitute a *de minimus* impact that quickly turns into a benefit for WRF conservation.

In Wyoming, natural gas well pads undergoing ecological reclamation are typically judged by comparing recently disturbed sites which have been seeded with an approved seed mix to adjacent reference sites and by determining how these sites are progressing based upon existing regulatory frameworks. Curran, et al (5, 7) found that reclaimed well pads had significantly higher insect abundance and diversity than adjacent reference systems in the first one to three years post seeding in both the Pinedale Anticline and Jonah Infill natural gas fields. The studies show that reclaimed well sites contained 2.82 to 21.45 times more insects than the surrounding reference sites. In essence, it was shown that reclamation efforts at the field-wide scale can result in spatial and temporal mosaics to benefit pollinators across the entire growing season.

In addition to increasing insect habitat, it should be noted that reclaimed sites within the Jonah Infill average 16.1 native species compared to reference areas which contain an average of 9.6 native species (5). These studies on young reclamation sites align with a recent meta-analysis suggesting ecosystem restoration efforts often positively benefit pollinators (11).

Giving cause for hope, more recent research in the Pinedale Anticline showed that positive benefits of reclamation to insects are durable, lasting for at least 12 years. This study examined well pads reclaimed between 5-12 years ago and found that these well pads saw more abundance of insects (76.5 percent on reclaimed vs. 23.5 percent on reference sites). It also found reclaimed sites had a higher number of insect species than reference sites (86.3 percent vs 44.8 percent,

respectively) (9). Furthermore, in a first of its kind study, reclamation efforts associated with pipeline rights-of-way were examined and showed that out of 931 individual insects captured on reclamation areas and reference sites, 82 percent were found in the reclamation area compared to 18 percent in the reference (10).

Although the Pinedale Anticline and Jonah Infill natural gas fields are located in western Wyoming, findings from those studies are positive and could be replicated elsewhere, especially since both fields are located in significantly harsher environments than eastern Wyoming. It should be expected that companies operating in other parts of Wyoming would have similar or even more successful results in their reclamation. This industry could assist in developing more suitable and enduring habitat for the WRF than currently exists.

The oil and natural gas industry's successes in this area must be considered as the USFWS finalizes its review.

Further, both Colorado and Wyoming are on the "western fringes" of the range and are "relatively sparsely occupied" by the WRF. The SSA indicates that sparse distribution of the species is due to the features of the shortgrass prairie and precipitation levels or lack thereof on the western fringes, not due to oil and natural gas activity. On the other hand, the other state with significant oil and natural gas activity within WRF range, i.e., North Dakota, has shown significantly increased WRF observations. (SSA Table 4 and related discussion). The statuses in these three oil and natural gas states indicate that a 4(d) exemption for the industry would be appropriate. There is no evidence provided and only a cursory mention on page 99 that oil and natural gas activity is impacting the species.

Similar to the USFWS conclusion for exempting livestock operations in its proposed 4(d) Rule, activities of the oil and natural gas industry should be excluded due to their ability to both have an initial *de minimus* impact on the species as well as potential post-reclamation benefits.

### **Implementation Needs Far More Clarity**

If the USFWS decides both that they will continue with listing of the WRF and do not exempt activities of the oil and natural gas industry, they must acknowledge and further define the currently inadequate implementation protocols of listing this species. The Federal Register notice states at FR 63902 that "*Section 4(f) of the [Endangered Species] Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species.*" However, the information provided does not indicate any progress on development of conservation or recovery plans. Developing these materials after listing will cause significant and unnecessary disruption to oil and natural gas operations. It is imperative these plans are in place before a listing occurs, if the USFWS continues to pursue listing.

Section 7(a)(4) of the ESA requires federal agencies to confer with the USFWS on any action which *is likely* to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of critical habitat. This is a broad directive. Not only does interpreting how it would function leave much unknown, but also complications are compounded by the USFWS decision to not designate critical habitat at this time.

The lack of designation of critical habitat seems to eliminate the boundaries within which compliance is required. There is no indication of where the USFWS may determine an action will “likely” have an impact to the species. According to the SSA and other information, and adhering to the regulatory definition of critical habitat, it would seem that violets are most important to the WRF through its life. Violets are presently the only known plant species that support WRF during their larval stage. Violets must be present in an adequate level of abundance and distribution in order to ensure that at least some of the larvae that survive winter ultimately find violets on which to feed. Upon adulthood, the WRF can travel long distances and support itself off a variety of nectar-bearing flowers and during their entire life, seem to shelter more in tall vegetation, which is more abundant across the range.

Similarly, WRF accompany violets during the May-July period before venturing off. It would seem, from the information available, that any interaction with listing of this species could be tailored around times of the year when WRF are dependent upon violets. Further, as noted in the SSA, in Western states whose climates are drier, “riparian zones and other relatively wet habitats, such as spring-fed wetland sites that support both more mesic violet species and nectar sources may be the sole means by which regal populations exist.” More evidence of species distribution would increase the ability for the USFWS to determine what constitutes critical habitat and develop conservation plans around those areas, reducing uncertainty in implementation.

At present, companies cannot predict where they will interact with this species or its habitat and, once it is determined they have, there is no indication of what will then be required. Any action that may have an effect on the species or its habitat requires consultation with the USFWS. The Associations are concerned about the lack of identifying implementation provisions and that it will be put off until after a listing. In this instance, activities in the oil and natural gas industry would be stalled until Section 7 consultation processes are developed. At present, there is no indication of what would prompt a Section 7 consultation – what times of the year, in what locations, what information would need to be collected in a survey, what possible mitigation activities would be and more. These questions are not presently answered and are presumably not easy questions to answer. We have great concern that if the USFWS does not get this information in place before a listing is finalized, it could have protracted consequences for this industry.

## Conclusion

The Associations believe the USFWS is well ahead of itself in proposing to list the WRF. It simply lacks the data to do so and is filling in the gaps carelessly. Considering the western subspecies is not in imminent threat, the Associations implore the USFWS to not list this species but rather continue collecting necessary data. If not, there is a wealth of information about how the oil and natural gas industry has a minimal impact on, and even benefits the species, and therefore sufficiently supports its inclusion in the 4(d) Rule.

Sincerely,



Pete Obermueller  
President  
Petroleum Association of Wyoming  
2435 King Boulevard, Suite 140  
Casper, WY 82604  
(307) 234-5333



Kathleen Sgamma  
President  
Western Energy Alliance  
1660 Lincoln St., Suite 2175  
Denver, CO 80264  
(303) 501-1059

## References

- 1) Selby, G. 2007. Regal Fritillary (*Speyeria idalia* Drury): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region
- 2) McCullough, K., G. Albanese, and D. Haukos, David A. Novel observations of larval fire survival, feeding, behavior, and host plant use in the regal fritillary, *Speyeria idalia* (Drury) (Nymphalidae). 2017. *Journal of the Lepidopterists' Society*, 71(3):146-152.
- 3) Kopper, B. J., D. C. Margolies, and R. E. Charlton. 2001c. Notes on the behavior of *Speyeria idalia* (Drury) (Nymphalidae) larvae with implications that they are diurnal foragers. *Journal of the Lepidopterists' Society* 54(3):97-100
- 4) Ferster, B. and K. Vulinec. 2010. Population size and conservation of the last eastern remnants of the regal fritillary, *Speyeria idalia* (Drury) [Lepidoptera, Nymphalidae]; implications for temperate grassland restoration. *Journal of Insect Conservation* 14(1): 31-42.
- 5) Curran, M.F., Robinson, T.J., Guernsey, P., Sorenson, J., Crow, T.M., Smith, D.I. and Stahl, P.D. 2022a. Insect abundance and diversity respond favorably to vegetation communities on interim reclamation sites in a semi-arid natural gas field. *Land*, 11(4), p.527.
- 6) Applegate, Dave H. and Owens, Nick L. (2014) "Oil and Gas Impacts on Wyoming's Sagegrouse: Summarizing the Past and Predicting the Foreseeable Future," *Human-Wildlife Interactions*: Vol. 8: Iss. 2, Article 15.
- 7) Curran, M.F., Sorenson, J.R., Craft, Z.A., Crow, T.M., Robinson, T.J. and Stahl, P.D. 2022b. Ecological Restoration Practices within a Semi-arid Natural Gas Field Improve Insect Abundance and Diversity during Early and Late Growing Season. *Animals*, 13(1), p.134.
- 8) Sorenson, J.R. and Curran, M.F. 2024. Habitat Restoration following Oil and Gas Development on the Jonah Field in Sublette County, Wyoming. *White Paper* for Wyoming Reclamation and Restoration Task Force.
- 9) Curran, M.F., Allison, J., Robinson, T.J., Robertson, B.L., Knudson, A.H., Bott, B.M., Bower, S. and Saleh, B.M. 2024. Insect Abundance and Richness Response to Ecological Reclamation on Well Pads 5-12 Years into Succession in a Semi-Arid Natural Gas Field. *Diversity*. 16(324): 1-14.
- 10) Curran, M.F., Murphy, E., Robinson, T.J., Robertson, B.L., Knudson, A.H., Bott, B.M., Bower, S. Insect response to ecological reclamation activity along a pipeline right-of-way in a semi-arid natural gas field. *In preparation for Reclamation Sciences*.
- 11) Tonietto, R.K.; Larkin, D.J. Habitat restoration benefits wild bees: A meta-analysis. *J. Appl. Ecol.* 2018, 55, 582–590.