

31 March 2003

Correspondence Control Unit
Attention: Information Quality Complaint Processing
U.S. Fish and Wildlife Service
1849 C Street, NW, Mail Stop 3238-MIB
Washington, DC 20240

Dear Sir/Madam:

This request for Correction of Information is submitted under Section 515(a) of the Treasury and General Government Appropriations Act of 2001 (P.L. 106-554), Office of Management and Budget (OMB) published guidelines (67 FR 8452, February 22, 2002), and the Department of Interior/U.S. Fish and Wildlife Service's Information Quality Guidelines (2002).

The Requester's point of contact information is:

Terry L. Bashore, Ph.D
Chief Ecologist and Range Liaison
Ranges, Airfields, and Airspace Operational Requirements Division
HQ ACC/DORP
205 Dodd Blvd. Suite 101
Langley AFB, VA 23665-2789
DSN 574-3967 or (757) 764-3967
FAX: DSN 574-6009 or (757) 764-6009
<mailto:Terry.Bashore@langley.af.mil>

Description of Information to Correct: The U.S. Fish and Wildlife Service's published notice to list slick spot peppergrass (*Lepidium papilliferum*) as endangered (67 FR 46441- 46450, July 15, 2002).

Explanation of Noncompliance: The following scientists have reviewed the listing document and made extensive comments regarding the lack of adequate reliable science: **Terry L. Bashore, Ph.D**, Chief Ecological Scientist, HQ ACC/DORI, Langley AFB, VA. USFWS considers him an independent expert reviewer for the listing of *L. papilliferum* (Attachment 8). Dr Bashore's comments are those numbers 1 through 42. **David R. Huff, Ph.D**, Associate Professor of Plant Genetics, Department of Crop and Soil Sciences, Pennsylvania State University, University Park, PA, 16802 (Attachment 7). **Charles R. Lee, Ph.D**, CPSS, Research Soil Chemist, U.S. Army Corps of Engineers, Waterways Experimental Station, Vicksburg, MS (Attachment 3). **Robert Lichvar, Ph.D**, Botanist, U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Hanover NH 03755-1290 (Attachment 1). **Steven D. Warren, Ph.D**, Center for Environmental Management of Military Lands, Colorado State University, Fort Collins, CO 80523-1490 (Attachment 9). **Antonio J. Palazzo, M.S.**, Research Agronomist, U.S Army Corps of Engineers Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover NH 03755-1290 (Attachment 10).

A brief summary of Expert comments is presented below. It is important to note that a commenter's silence on listing statements does not imply agreement; rather the commenter elected not to address that issue. Full text of the Experts comments may be read in the attachments:

1. Lack of scientific evidence to support or reject any of these claims (Bashore, Huff, Lee, Palazzo, and Warren)
2. HII needs scientific peer review of this new approach before it can be used for listing endangered species (Lee, Warren, and Bashore)
3. Whether this taxon is best treated at the species level or submerged under *L. montanum* at this time is not possible to determine without further rigorous investigation. (Lichvar, Lee, Huff, and Warren)
4. Inaccurate, confusing, and misleading presentation of listing arguments (Huff, Warren, and Bashore)
5. Lack of sufficient population surveys to support or reject arguments of population decline (Bashore, Lee, Huff, and Warren)
6. Lack of scientific data to warrant listing of the species (Bashore, Huff, and Warren)

The enclosed comments and attachments clearly show that the listing document does not meet the Quality, Utility, Objectivity guidelines. The listing document is not accurate or reliable because there are mere conclusions. Furthermore, there appears to some level of bias since there is no level of peer review. Most of the data was not developed using sound statistical and research methods, nor is it reproducible.

Effects of the alleged Error: It is clear from the listing document that data and information is being used to bias a decision towards listing slick spot peppergrass as endangered when there is no scientific evidence to support that determination.

Recommendation and Justification: Rewrite the notice to list slick spot peppergrass (*Lepidium papilliferum*) to reflect enclosed comments (Air Force comments and attachments). Abide by U.S. Fish and Wildlife Service's Information Quality Guidelines in order to meet the Quality, Utility, and Objectivity standards. Justification: high-level peer review.

Scientists have personal views on issues and to lesser extents the methods used to substantiate assertions; however, in this instance the science provided does not warrant listing. This is the thrust of our arguments. Perhaps at some later time, after more rigorous review, the listing consideration may be definitively answered. Clearly at this time a conclusion that listing is warranted cannot be supported by evidence that has been subjected to any credible peer evaluation or even simple solid science.

\\ Sign //
Terry L. Bashore, Ph.D
Chief Ecologist and Range Liaison

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evaluation of comprehensive, technical information regarding the status and habitat requirements for a species throughout its range, whether it supports or does not support a position being proposed as an official agency position; (4) use primary and original sources of information as the basis for recommendations; (5) retain these sources referenced in the official document as part of the administrative record supporting an action; (6) collect, evaluate, and complete all reviews of biological, ecological, and other relevant information within the schedules established by the Act, appropriate regulations, and applicable policies; and (7) require management-level review of documents developed and drafted by Service biologists to verify and assure the quality of the science used to establish official positions, decisions, and actions taken by the Services during their implementation of the Act. [59 FR 34271 (July 1, 1994)]

3. **Cause and effect** – The biotic or abiotic pathways by which a specific action bring about a specific change.
4. **Comprehensive inventories** - Surveys that are designed to describe the attributes of the total population.
5. **Empirical data** – Data that was obtained using the scientific method or documented repeatable observation.
6. **Field data** – Data obtained in the natural environment using the scientific method or documented repeatable observation.
7. **Peer Review** – An independent review of the technical and scientific aspects of a document by individuals recognized as subject matter experts by professional society.

III. Specific Comments. The remainder of this document focuses on statements made in the Notice to List document and our comments to those statements.

1. Notice Statement (page 46441, column 3, Para 2, line 1): Of 88 known occurrences of *Lepidium papilliferum*, 70 are currently extant (exist), 13 are considered extirpated (extinct), and five are historic (i.e., plants have not been relocated; location information is based on collections made between 1911 and 1974) (Moseley 1994; Mancuso 2000; Shelly Cooke, Idaho Conservation Data Center (ICDC), pers. comm., 2002, ICDC 2002). **Comment:** We reviewed the references above and found that several "facts" derived from the cited manuscripts were taken out of context. For example, Moseley (1994) reports that 21 populations are known to be extirpated, 38 occurrences are known to be extant and 7 have not been revisited recently and are considered historical. There are 32 more reported occurrences in 2002 than in 1994, of which 8 occurrences became un-extinct, and 2 historic occurrences were relocated. If the Service is using the ICDC (2002) as the "best available scientific and commercial data" then this data

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base represents an 84% increase of occurrences since 1994 in spite of the alleged impacts; hardly a case for endangerment.

A comprehensive inventory of *L. papilliferum* throughout its range has never been conducted. Another statement from Moseley (1994) suggests that within the core of its range on the western Snake River Plain, additional populations will certainly be discovered, as not all suitable habitats has been inventoried. Likewise, suitable habitat in the vicinity of the two disjunctive occurrences in Bannock and Owyhee counties have not been thoroughly inventoried where additional populations will almost certainly be found. Accordingly, Moseley (1994) clearly stated that inventories for *L. papilliferum* have never even been conducted throughout its habitat range in neighboring Oregon.

The Notice further states, "Although surveys are conducted yearly, funds are insufficient for the BLM to cover all of the grazing allotments throughout the species' range (J. Klott, pers. comm., 2002)." BLM lands make up about 75% of Owyhee County, ID.

The use of the term **occurrence** provides little information on population size. Eighty-eight occurrences may be important if there is only 1 or 2 individuals/occurrence, but this is not the case with *L. papilliferum* where an occurrence can have 1000's of individuals, e.g., Element of Occurrence #027, ICDC (2002).

In Summary: The "best available scientific and commercial data, ICDC (2002)" reports an 84% increase of occurrences since 1994 in spite of the alleged impacts. Comprehensive and scientifically valid inventories of *L. papilliferum* have not been conducted. There is no empirical or field-tested proof to suggest that the population size of *L. papilliferum* is decreasing, in spite of alleged adverse habitat impacts. Several of the factual statements from cited reference material in the Notice to List were taken out of context.

2. Notice Statement (page 46441, column 3, Para. 2, line 22): The number of *L. papilliferum* individuals at each extant occurrence ranges from 1 to 3,000 (Mancuso 2000; ICDC 2002).

Comment: There are numerous cited references referring to information contained in the Idaho Conservation Data Center (ICDC). ICDC is presented as being a factual database which, by its own admission it is not. ICDC Distribution of Special Status Vascular and Nonvascular Plants by County; (July 2002) has a disclaimer that states it is not a scientific data base (http://www2.state.id.us/fishgame/info/cdc/plants/plants_by_county.htm.) and reads as follows:

The quantity and quality of data collected by the ICDC are dependent on the research and observations of many individuals and organizations. In most cases, these data are not the result of comprehensive or site-specific field surveys; many natural areas in Idaho have never been thoroughly surveyed. For these reasons, the ICDC cannot

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provide a definitive statement on the presence, absence, or condition of biological elements in any part of Idaho. ICDC reports summarize the existing information known to the ICDC at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

ICDC Distribution of Special Status Vascular and Nonvascular Plants by County; July 2001 Disclaimer further reads as follows:

Known Occurrences. The species listed under each county represent known occurrences based on historic herbarium specimens or field surveys or both. They do not represent potential distributions.

Additionally, Mancuso (2000) data is based on transect surveys at one point in time. These numbers should be presented as sampling data with confidence intervals. There is no analysis of annual population variance or population cycles. *L. papilliferum* is a species whose numbers flux annually. Data from Idaho Army National Guard Orchard Training Area's weather station, in association with a *L. papilliferum* population study, showed that spring precipitation had an important effect (IDARNG 1998). In years with dry spring months, few *L. papilliferum* plants were present. In years with wet springs, many plants were seen. Numbers of Orchard Training Area *L. papilliferum* plants counted in an annual census varied from 7,000 in 1991 to 135,000 in 1995. Based on Mancuso (2000) one is led to believe that the total population was between 88 and 210,000 individuals, which is not true since the total population was not censused.

In Summary: Any factual statements or citations attributed to the ICDC database cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of Idaho nor to species potential distributions; and thus should not be used as a basis for listing *L. papilliferum*. Mancuso (2000) data is misrepresented.

3. Notice Statement (page 46441, column 3, Para. 3, line 9): As a result of habitat loss and degradation, the documented extirpation rate of *Lepidium papilliferum* populations is the highest known of any Idaho rare plant species (Moseley 1994).

Comment: This is a misleading statement. What Moseley (1994) said was "This documented rate of extirpation is unprecedented for any of Idaho's rare flora, however, the actual (i.e., undocumented) rate has probably been much higher during the past century. The cause of this decline can be attributed to the pervasive loss and degradation of the sagebrush-steppe ecosystem on the western Snake River Plain, through conversion to irrigated agriculture, urban/suburbanization, and exotic annual grasslands following severe overgrazing in the 1800's." NOTE: Moseley based his statement on 1994 data, not 2002 data presented in this Notice to List. The 1994 conclusions are not applicable to

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2002 data since the *L. papilliferum* occurrences are reported to be increasing (see Notice Statement #1 comments).

The reference to *L. papilliferum* as being "rare" is a qualifying designation by the state of Idaho, not a quantifying statement (see Notice Statement #2 and 42 comments). As such, scientific statements about population size, occurrence or rarity cannot be made with any degree of certainty nor can confidence intervals be applied to the estimates.

In Summary: The use of Moseley's statement of "documented rate of extirpation is unprecedented" is false because it is based on data from 1994 and not from newer information documented 2002. For example, 32% of the population was extirpated in 1994 compared to 15% in 2002; and 2 historic occurrence have reappeared since 1994 (7 in 1994 vs. 5 in 2002) meaning they were not extirpated to begin with.

4. Notice Statement (page 46441, column 3, Para. 3, line 14): The historical (undocumented) loss of *L. papilliferum* may have been even higher during the early 1900s (Mancuso et al. 1998) due to the widespread loss and degradation of sagebrush-steppe habitat in southwestern Idaho as a result of urbanization, livestock grazing, and irrigated agriculture (Moseley 1994).

Comment: The above statement "The historical (undocumented) loss of *L. papilliferum* may have been even higher during the early 1900s" is totally meaningless. If something is undocumented, than scientifically you cannot draw any conclusions. The term "may" also has no scientific value. Loss of habitat due to urbanization, over grazing and irrigation (and other reasons) has been shown to reduce population numbers for other species in other ecosystems. Unfortunately, there are no empirical and/or field data demonstrating any cause and effects relating to a significant decline of the *L. papilliferum* population. Indeed, there is some evidence that *L. papilliferum* may be a pioneer species that does well in disturbed areas (see Notice Statement #14 comments). This species continues to be found in an ecosystem that has been overgrazed (Moseley 1994, Mancuso 2002) and irrigated areas in Nampa, ID (Henderson 1900).

In Summary: Statement is not substantiated by empirical or field data.

5. Notice Statement (page 46441, column 3, Para. 4, line 7): Rollins (1993) based his justification on physical features that *L. papilliferum* possesses and *L. montanum* does not, such as: (1) Trichomes (hairlike structures) occurring on the filaments of stamens (part of flower that produces pollen), which is unique among all North American *Lepidium* species; (2) all the leaves on *L. papilliferum* are pinnately divided, whereas *L. montanum* has some leaves that are not divided; and (3) the shape of the silique (seed capsule) is different from that of *L. montanum*, and it has no wings, or even vestiges of wings, at its apex (end of the capsule), which also differs from that of *L. montanum* (Moseley 1994).

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Comment: Although the taxonomy and morphology of *L. papilliferum* may not be a critical element in its listing, it is important to note that Rollins (1993) points out that when using phenotypic characters for taxonomic purposes that "In most incidents where particular characteristics are used, the genetic background is unknown. To have a genetic evaluation of all taxonomic characters utilized would be ideal." Lichvar (2002, Attachment 1) reviewed Rollin's work on *L. papilliferum* at the Gray Herbarium and reports that *L. papilliferum* appears to be closely related to *L. montanum*, and that *L. montanum* appears to have problematic taxonomic interpretations within many of its varieties which could effect the taxonomic status of *L. papilliferum*.

In Summary: *L. papilliferum*'s taxonomic status is problematic and warrants further testing.

6. Notice Statement (page 46442, column 1, Para. 2, line 18): The primary seed dispersal mechanism is probably gravity, although wind and water may have a minor role (Moseley 1994).

Comment: Moseley (1994) does not present evidence or cite scientific authority for this statement. The term "probably" has no meaning without a stated value and confidence limits. Thus, the use of "probably" in this case is synonymous with the term "unknown". Seed dispersal is directly related to gene flow within a population. As such, the mechanisms of seed dispersal must be known before any consideration can be given to the non-scientific Notice Statement of "Habitat fragmentation has also likely resulted in reduced gene flow between populations (Mancuso 1998), thus inhibiting dispersal and recolonization of potentially suitable habitat areas." Terms like "likely" and "potentially" are scientifically meaningless. Mancuso does not offer any data or scientific authority to show that there is a relationship between habitat fragmentation and gene flow.

To suggest that habitat fragmentation is a mechanism of inhibiting gene flow without discussing other alternatives biases the argument for listing. As an example, Dr. Susan Meyers (Attachment 2, e-mail from USAF contractor) reports 100 *L. papilliferum* seeds weigh anywhere from .035 to .05 grams (0.00035 to 0.0005 grams/seed). It is very easy to demonstrate (T. Bashore, USAF Chief Ecological Scientist for Ranges and Airspace) that a non-exertive oral puff of air can displace *L. papilliferum* seeds from a resting position. *L. papilliferum* exists in a windy environment. The Mt. Home AFB Weather Flight, for the period 1 July through 18 July 2002, when *L. papilliferum* seeds were being released into the environment, issued 10 wind advisories (25-34 mph) and 2 wind warnings (35-49 mph). Additionally, "dust devils" moving across *L. papilliferum* habitat can have wind speeds in excess of 70 mph and a vertical column extending 100s if not 1000s of feet (USAF Weather Flight, Langley AFB 2002) are not uncommon and would serve as a seed dispersal mechanism. Effects of wind on the dispersal of pollen is also unknown.

In Summary: Notice Statements are speculative and scientifically unsubstantiated. This information does not support the Services' hypothesis that habitat fragmentation inhibits

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gene flow. There is insufficient data to conclude that seeds are not dispersed long distances by wind.

7. Notice Statements (page 46442, column 1, Para. 3, line 13): Non-native species frequently associated with *L. papilliferum* include *Bromus tectorum* (cheatgrass), *Sisymbrium altissimum* (tumble mustard), *Ranunculus testiculatus* (bur buttercup), *Lepidium perfoliatum* (clasping pepperweed), and *Agropyron cristatum* (crested wheatgrass) (Moseley 1994; Mancuso and Moseley 1998).

Comment: Ecologically the term "associated" implies an interaction between or among species. No species association indices or niche overlap indices are presented, thus the term associated can only mean, "are found in the same system."

In Summary: Misuse of the ecological term "association".

8. Notice Statement (page 46442, column 1, Para. 4, line 1): *Lepidium papilliferum* is restricted to small areas, similar to vernal pools, known as slickspots (also called mini-playas or natric sites).

Comment: The above statement simply is not true, as *L. papilliferum* has often been found in disturbed areas other than those defined as slick spots. Even as far back as the turn of the century, Henderson (1900) writes that the plants are "growing amongst species of *Artemisia* and *Bigelovia* on the plains about Nampa, southern Idaho, July 30, 1897. The same plant [*L. papilliferum*] was collected by Miss Mulford at the same place July 1, 1892. As the plants were nearly as much advanced as were mine, the difference in season is to be accounted for by my plants having been collected near an irrigation ditch, where they flowered late into the summer." Although the number of plants observed was not quantified, the Idaho Rare Plant Observation Reports cite numerous occurrences of the plant along newly bladed (e.g. highly disturbed) 50-mile road segments. The USAF (2002 a.) has also documented *L. papilliferum* growing along a road berm NOT associated with slick spots (Photo 1). Likewise, Burkhardt (2001) states that most annual species in the Cruciferae family, especially peppergrasses, are disturbance or pioneer species that thrive in disturbed soil. Their ecological role is that of pioneer species on disturbed sites and there is no scientific evidence to suggest *L. papilliferum* has a different function (Burkhardt 2001).

In Summary: *L. papilliferum* will grow in disturbed areas and is not restricted to the small ecologically distinct areas known as slick spots. There is insufficient scientific evidence to suggest that *L. papilliferum* is not a disturbance species.

9. Notice Statement (page 46442, column 2, para.1, line 3): The restricted distribution of *L. papilliferum* is likely a product of the scarcity of these extremely localized, specific soil conditions, and the loss and degradation of these habitat areas throughout southwestern Idaho.

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Comment: Comments to Notice statement # 8 already attests that *L. papilliferum* is not restricted to "slick spots". Likewise, the term "scarcity" is undefined. Even if *L. papilliferum* were restricted to "slick spots" (which it is not), a review of the soil maps for Owyhee County and the Army National Guard Orchard Training Range (NRCS 2001) shows that slick spots are not particularly uncommon as there are approximately 51,142 acres (79.9 square miles) of slick spots scattered within a total of 3,945,862 acres. Slick spots occupy 1.33 percent of Owyhee County and 1.22 percent of Orchard Training Range. Thirty-one of 216 soil series in Owyhee County and 11 of 30 Orchard Training Range soil series have slick spot inclusions. This does not include acreage in Ada, Canyon, Elmore, Gem, Bannock, and Payette Counties, Idaho, or similar soil type acreage in Oregon and Nevada.

In Summary: Potential and/or existing habitat is not "scarce" or limits the continued existence of *L. papilliferum*.

10. Notice Statement (page 46442, column 2, Para. 2, line 1): Flowering individuals represent only a portion of the population, with the seed bank contributing the remainder, and apparently the majority, in many years (Mancuso and Moseley 1998).

Comment: Fundamental to population studies (if total population numbers are unknown) is random population sampling of age structure, age-specific mortality, survivorship, and life expectancy. These data are used to construct life tables. Life tables provide the vital statistics for calculating population growth performance (Dubin and Lotka 1935, Deevey 1947, and Birch 1948). *L. papilliferum* population numbers are unknown because estimates of population size have only been made on the above ground plants that do not necessarily reflect absolute population levels (Moseley 1994) since seed banks have not been empirically surveyed. Mancuso et al. (1998) notes that estimating numbers of above ground plants is by itself not a reliable measure for evaluating population and species viability. As noted by Moseley (1994), most of the suitable habitat still has not been surveyed for *L. papilliferum* and the ICDC database cannot provide a scientific valid statement on the presence, absence, or condition of biological elements in any part of Idaho nor to species potential distributions. Without scientifically sound population studies, of which none are presented in the Notice to List, statements about population increase, decrease, stability or size cannot be made.

In Summary: Without population studies, including seed bank information, there is little if any basis for proposing *L. papilliferum* to be listed as endangered.

11. Notice Statements (page 46442, column 2, Para. 4, line 1): The displacement of native plants by nonnative species is a major problem in sagebrush-steppe habitats of the Intermountain region (Rosentreter 1994; Ann DeBolt, Bureau of Land Management (BLM), pers.comm., 1999). Widespread grazing by livestock in the late 1800s and early 1900s severely degraded sagebrush-steppe habitat, enabling introduced annual species (especially cheatgrass) to become dominant over large portions of the Snake River Plain (Yenssen 1980; Moseley 1994). The invasion of cheatgrass has shortened the fire

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frequency of the sagebrush-steppe from between 60 to 110 years, to less than 5 years as it provides a continuous, highly flammable fuel through which a fire can easily spread (Whisenant 1990; Moseley 1994; Mancuso and Moseley 1998). The result has been the permanent conversion of vast areas of the former sagebrush-steppe ecosystem into nonnative annual grasslands. An estimated 2 to 2.43 million ha (5 to 6 million ac) of sagebrush-steppe in the western Snake River basin has been converted to nonnative annual vegetation dominated by cheatgrass and *aeolatherum caput-medusae* (medusahed) (Noss et al. 1995), primarily due to continued overgrazing and fire. The continued cumulative effects of overgrazing and fire suppression permit the invasion of nonnative plant species into slick spot habitats (Rosentreter 1994). *Lepidium papilliferum* populations typically decline or are extirpated following the replacement of sagebrush-steppe habitat by nonnative annuals.

Comment: This series of statements implies a cause and effect relationship when in fact there is no empirical or field-tested proof that such relationships exist. This is demonstrated by analyzing each statement.

- a. The displacement of native plants by nonnative species is a major problem in sagebrush-steppe habitats of the Intermountain region (Rosentreter 1994; Ann DeBolt, Bureau of Land Management (BLM), pers.comm., 1999). – **One cannot state that displacement of native plants by nonnative species in general applies to *L. papilliferum* without specific *L. papilliferum* empirical or field-tested data. Ludwig and Reynolds (1988) note that interspecific associations can be positive, negative, or absent. There are techniques to measure association between pairs or multiple species such as those suggested by Hubalek (1982), Schluter (1984) and Pielou (1972). No studies are reported for the association between *L. papilliferum* and nonnative species.**
- b. Widespread grazing by livestock in the late 1800s and early 1900s severely degraded sagebrush-steppe habitat, enabling introduced annual species (especially cheatgrass) to become dominant over large portions of the Snake River Plain (Yensen 1980; Moseley 1994). – **However, there is no empirical or field-tested evidence to show that severely degraded sagebrush-steppe habitat is beneficial, neutral or detrimental to *L. papilliferum*.**
- c. The invasion of cheatgrass has shortened the fire frequency of the sagebrush-steppe from between 60 to 110 years, to less than 5 years as it provides a continuous, highly flammable fuel through which a fire can easily spread (Whisenant 1990; Moseley 1994; Mancuso and Moseley 1998). – **This may be true, but there is no empirical or field-tested documented relationship between fire cycles and *L. papilliferum*.**
- d. The result has been the permanent conversion of vast areas of the former sagebrush-steppe ecosystem into nonnative annual grasslands. An estimated 2

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to 2.43 million ha (5 to 6 million ac) of sagebrush-steppe in the western Snake River basin has been converted to nonnative annual vegetation dominated by cheatgrass and aeniatherum caput-medusae (medusahead) (Noss et al. 1995), primarily due to continued overgrazing and fire. – **There is no data presented to evaluate the percent of slick spot soils lost. For example: Owyhee County contains 3,710,266 acres of which there are 31 soil types containing 49,486.26 acres of slick spot soils (NRCS Soil Survey 2001) or 1.33% of the total county acreage. Thus vast acreage of non- slick spot soil could be disturbed and not effect *L. papilliferum*.**

- e. The continued cumulative effects of overgrazing and fire suppression permit the invasion of nonnative plant species into slick spot habitats (Rosentreter 1994) – **Nowhere in Rosentreter (1994) is it stated that continued cumulative effects of overgrazing and fire suppression permit the invasion of nonnative plant species into slick spot habitats.**
- f. *Lepidium papilliferum* populations typically decline or are extirpated following the replacement of sagebrush-steppe habitat by nonnative annuals. **This is a conclusion without empirical or field-tested studies.**

In Summary: There is no empirical or field-tested data to support the statement that *Lepidium papilliferum* populations typically decline or are extirpated following the replacement of sagebrush-steppe habitat by nonnative annuals.

12. Notice Statement (page 46442, column 3, Para. 2, line 6): Although some *Lepidium papilliferum* may temporarily persist in spite of these restoration seedings, most occurrences support small numbers of plants (fewer than five per slickspot) and long-term persistence data are unavailable (Mancuso and Moseley 1998)

Comment: This statement is presented to lead the reader to believe that restoration is problematic, when what Mancuso and Moseley (1998) actually said was “Another aspect of wildfire is rehabilitation/restoration efforts. Drill-seeding and plantings dominated by crested wheatgrass cultivars are common on many fire restoration projects. Although populations of slick spot peppergrass are known to persist in seedings, long-term data are missing.” There is no distinction between effects of fire and restoration. Scholten (2000) reports: “although there is a measurable amount of mechanical impact from drill seeding [to slick spots], it did not affect *L. papilliferum* densities, flowering, and non-flowering, nor class size. Also, drill seeding did not impact seed production.” This is in contrast to significant differences they found among some size classes of *L. papilliferum* between drilled and control sites (Scholten and Bunting 2001). Scholten and Bunting (2001), however, conclude that a subsequent year of data would be advisable to validate and confirm the conclusions of the 2001 study.

In Summary: This Statement is misleading since Scholten and Bunting (2001) is not validated or confirmed.

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13. Notice Statement (page 46442, column 3, Para. 3, line 1): In 1997, an effort was initiated by the ICDC to develop an ecological integrity index for assessing and monitoring *Lepidium papilliferum* habitat in southwestern Idaho (Mancuso and Moseley 1998). This monitoring includes the following components: (1) an Integrity Condition Rating to assess the overall habitat condition, which includes those attributes associated with the slickspot microsite and the shrub-steppe habitat. Integrity Condition Ratings are ranked as "good", "fair", or "poor"; and (2) an Occurrence Viability Rank which provides a scale to assess the prospects that an occurrence will persist over time, and includes factors affecting the viability and defensibility of the occurrence (Mancuso 2001).

Comment: The use of the Mancuso and Moseley's (1998) ecological integrity index (Habitat Integrity Index – HII) for assessing and monitoring *Lepidium papilliferum* habitat cannot be used to justify listing *L. papilliferum* for the following reasons:

- a. The index has not been authoritatively peer reviewed nor has it been published as anything but in-house "gray" literature. Mancuos (2000, pers. comm at *Lepidium* Technical Review Committee meeting) acknowledged that the HII is problematic.
- b. That the conservation of slick spot peppergrass is largely dependent on conserving its sagebrush-steppe habitat is an assumption with no empirical or field-tested data backing it up. *L. papilliferum* status as a pioneer/climax species is yet to be determined.
- c. That large blocks of the original sagebrush-steppe ecosystem on the western Snake River Plain and nearby foothills have been converted to crop agriculture or urban/suburban centers may be a true statement, but no empirical or field data is offered to show that the *L. papilliferum* was significantly impacted. No data is presented to determine what percent of *L. papilliferum* habitat was affected.
- d. That most of the remaining regional sagebrush-steppe is in an impoverished ecological condition due to intensive use dating back to the late 1800's may also be true, but there is no empirical or field-tested data to document that *L. papilliferum* is dependent on no cattle grazing or a climax "healthy" sagebrush ecosystem.
- e. That monitoring habitat focuses on the most important factor responsible for the decline of slick spot peppergrass, namely, the loss of high quality habitat due to perturbations in the sagebrush-steppe ecosystem of the western Snake River Plain. This statement is without any empirical or field-tested data documenting a cause and effect relationship; and *L. papilliferum* is not declining (see Notice Statement #1 comments).
- f. The basic assumption underlying the HII is that habitat integrity equates to *L. papilliferum* habitat quality is not supported by empirical or field-tested evidence.

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- g. Impact value scores may overly bias the supposed actual effects. For example: 1 cow track carries as much scoring weight as a 12 inch deep tire track driven across the entire length of a slick spot.
- h. Mancuso (2002) and others continue to assume that ecosystem degradation is the primary cause of *L. papilliferum* rarity. He states, "It is a Candidate species for federal listing under the Endangered Species Act largely because much of its original sagebrush-steppe habitat has been destroyed or seriously degraded over the past century"; however no empirical or field-tested data is ever offered. This assumption may be false and a reason why Mancuso (2002) reports, without explanation, that "habitat improvement" has occurred to a few sites.
- i. A Habitat Integrity Index was developed to better evaluate plant survivability. Insufficient data have been collected to make a determination of reduced survivability at this time. Scientific peer review of this new approach is required before it can be used for listing endangered species (Lee 2002 Memorandum for the Record Attachment 3).

In Summary: All reference to the Habitat Integrity Index (HII) should be removed from the Notice to List because it is not scientifically supported by empirical or field-tested data nor has it been peer reviewed; therefore HII cannot be used to justify the listing of *L. papilliferum*. S. Bunting (e-mail communication 2001) writes, "I am not familiar with this model. I have slight familiarity with a wildlife habitat suitability model but I think that these are different models. I do not know of anyone here at U of I [University of Idaho] who has reviewed the habitat integrity index model (Attachment 4).

14. Notice Statement (page 46443, column 2, Para. 4, line 1): Most sagebrush-steppe habitat that has not been converted to cropland in southwestern Idaho has been degraded by wildfire, livestock grazing and trampling, the invasion of nonnative plant species, and off-road vehicle use; these factors continue to threaten all remaining habitat for *Lepidium papilliferum* (Moseley 1994; Mancuso and Moseley 1998; ICDC 1999; Mancuso 2000).

Comment: While the above statement may or may not be true, this statement has no scientific basis. You cannot equate ecosystem impacts with individual population impacts. Some of the most basic biological information about *L. papilliferum* remains unknown. Amazingly, it remains unknown whether *L. papilliferum* is a pioneer, mid-seral, or climax species. A fundamental ecosystem concept is that pioneer or "disturbance species" abundance is enhanced when a climax ecosystem is disturbed. There is evidence to suggest that *L. papilliferum* is a disturbance species. Rollens (1993) cites Al-Shehbaz (1986) who points out that the weedy tendencies of some *Lepidium* species, coupled with the autogamous breeding system usually present, provides the necessary ingredients for ready survival of these species in an alien place. As mentioned above (see Notice Statement #8 comments), Henderson (1900) collected plants near an irrigation ditch; the Idaho Rare Plant Observation Reports show numerous occurrences along newly bladed road segments and the USAF has documented *L. papilliferum*

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growing along a road berm not associated with slick spots. Burkhart (2001) agrees that peppergrasses are disturbance species and that their ecological role is that of pioneer species on disturbed sites. He further states that there is no scientific evidence to suggest *L. papilliferum* has a different function. Overall, unless some basic biological information on the colonization ability of this species is known, one cannot imply a deleterious effect on *L. papilliferum* populations due to wildfire, livestock grazing and trampling, the invasion of nonnative plant species, off-road vehicle use or other habitat disturbing events.

This Notice Statement is falsely presented as being a factual cause and effect relationship. This is simply not true. Even Moseley (1994) explicitly states that more research is needed and any cause and effect links are purely anecdotal. He states "While we need more research on the subject, it is felt by most biologists familiar with *Lepidium papilliferum* and its habitat, that the micro sites supporting *Lepidium* are altered significantly following wildfire and subsequent conversion of sagebrush-steppe vegetation to annual grasslands." Moseley recognized the need for research and based his hypothesis on anecdotal evidence only. The term "felt" implies a hunch, guess, hypothesis, or some other term; but definitely not a scientific conclusion. Moseley also calls attention to "The persistence and the role of the seed bank in possibly reestablishing these populations at some point in the future is unknown and in need of research." Moseley (1994) further states "The ecological deterioration of sagebrush habitats containing *Lepidium* from ongoing livestock grazing has been observed. The most pernicious threat, however, is the continued loss of sagebrush habitats across the Snake River Plain from wildfire and exotic annuals." Moseley does not document through authoritative evidence that slick spots are deteriorated from ongoing grazing. Most importantly, Moseley (1994) concludes that there are no known past, existing or potential threats from disease, predation, or grazing.

In Summary: Impacts to ecosystems and impacts to populations are not the same. Evidence suggests *L. papilliferum* is a disturbance species, not dependent on unadulterated habitat. Without establishing direct cause and effect relationships, the impacts of wildfire, livestock grazing and trampling, the invasion of nonnative plant species, and off-road vehicle use cannot be considered factors threatening *Lepidium papilliferum* populations or habitat. Authoritative research and basic biological information is lacking.

15. Notice Statements (page 46443, column 3, Para. 3, line 1): Livestock affects on unique habitats such as slick spots are magnified in areas where nonnative plant invasions and altered fire regimes occur. Arid soils with inorganic crusting are more susceptible to impacts when soils are wet (Belnap et al. 1999). Slick spots are characterized by a near-surface distribution of soluble sodium salts, thin vesicular (small cavity) surface crusts, and shallow well-developed argillic (relating to clay mineral) horizons (Fisher et al. 1996). Slick spots often contain some surface water in the winter, spring, and after thundershowers (Fisher et al. 1996; James Klott, BLM, pers. comm., 2000). Water that is

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present for more than a day often will attract livestock to slick spots (J. Klott, pers. comm., 2000).

Livestock trampling of slick spots is one of the main disturbances to Slickspot micro sites (Mancuso 2001); especially in the spring (approximately April through June) when the soils are moist. Trampling by livestock can physically damage the vegetation that exists there and compact the soil, which greatly accelerates desertification processes (becoming more like a desert) through increased soil loss and water runoff (Moseley 1994; D. Quinney and Jay Weaver, Idaho Army National Guard (IDARNG), pers. comm., 1998; J. Klott, pers. comm., 2000; Popovich 2001). This can also lead to the loss of Slickspot integrity, particularly from winter through spring when standing water remains for a longer period of time after a rainfall (Belnap et al. 1999; BLM et al. in litt., 1999; Air Force 2000).

Comment: These statements are not scientifically based, are misquoted, or taken out of context. Taken one at a time:

1. "Livestock affects on unique habitats such as slick spots are magnified in areas where nonnative plant invasions and altered fire regimes occur." - **Unfortunately, there is no scientific authority to back this statement.**
2. "Arid soils with inorganic crusting are more susceptible to impacts when soils are wet (Belnap et al. 1999)." - **There is no evidence to conclude that this statement applies to slick spots, and if it does apply, then what are the specific affects (good or bad) to *L. papilliferum*?**
3. "Slick spots often contain some surface water in the winter, spring, and after thundershowers (Fisher et al. 1996; James Klott, BLM, pers. comm., 2000)." - **While this statement is true, Fisher et al. (1996) makes several qualifying statements. They found that once slick spot soils thaw, high soil moisture content does not persist and that slick spots and adjacent areas have been found to dry at similar rates. It should be further noted that slick spot soils are DRY when temperatures are most suitable for plant growth. Fisher et al. (1996) further noted that spring and early summer precipitation events minimally impact slick spots due to low water infiltration rate of clay soils.**
4. "Water that is present for more than a day often will attract livestock to slick spots (J. Klott, pers. comm., 2000)." - **This statement is anecdotal and not supported by data. Mr. Klott in his March 3, 2002 letter to FWS only states that water in slick spots attract cattle. There is no evidence presented that cattle actively seek out slick spots with water.**
5. "Livestock trampling of slick spots is one of the main disturbances to slick spot micro sites (Mancuso 2001), especially in the spring (approximately April through June) when the soils are moist." - **Although Mancuso (2001) reports livestock "disturbance" to**

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slick spots, he provides no data showing an adverse affect to stands of *L. papilliferum*. Additionally, Fisher et al. (1996) found that once slick spot soils thaw, high soil moisture content did not persist into the active growing season. Soils thaw occurs in late March. By April the mean Max. /Min. temperatures (°F) for Bruneau ID (1962 - 2001) and Boise WSFO Airport (1940 - 2001) were 66.2/36.5 and 61.7/37.2 respectively (National Weather Service reports that show at: <http://www.wrcc.dri.edu/summary/climsmid.html>). Therefore, this statement is not supported by data.

6. "Trampling by livestock can physically damage the vegetation that exists there and compact the soil, which greatly accelerates desertification processes (becoming more like a desert) through increased soil loss and water runoff (Moseley 1994; D. Quinney and Jay Weaver, Idaho Army National Guard (IDARNG), pers. comm., 1998; J. Klott, pers. comm., 2000; Popovich (2001))." – The above statement was supposedly compiled from the referenced materials, unfortunately, a closer look at the referenced materials do not draw the same conclusions. For example, Moseley (1994) does not discuss the desertification process and does not support the position of D. Quinney and Jay Weaver pers. comm. that is based on an in-house report by Meyer (1993) and Meyer and Quinney (1993). Moseley (1994) states, "Their conclusions apply primarily to the Snake River Plains population and may not be entirely applicable to the foothills populations, especially their conclusions about run-off run-on relationships". Likewise, J. Klott, pers. comm., dated 3 March 2002 provides no scientific evidence to substantiate his claims. D. Quinney and Jay Weaver, Idaho Army National Guard (IDARNG), pers. comm., 12 April 1998, also do not discuss the desertification processes and provides no data to support this statement. Popovich (2001) also does not discuss accelerated desertification processes. The exact opposite can be argued. Livestock trampling may in fact benefit *Lepidium*-sites. For example, Fisher et al. (1996) observed that many seedlings germinated on *Lepidium*-sites during their study, but few survived and concluded that seedling survival on slick spots might be predicated by successful taproot extension into the argillic horizon. Fisher et al. (1996) also notes that it seems likely that physical resistance of the soil crust or resistance at the surface crust - argillic horizon interface stopped taproots of a majority of *L. papilliferum* seedlings from growing to necessary depths. Thus, livestock disturbance to slick spots could benefit *L. papilliferum*.

7. "This can also lead to the loss of Slickspot integrity, particularly from winter through spring when standing water remains for a longer period of time after a rainfall (Belnap et al. 1999; BLM et al. in litt 1999; Air Force 2000)." – None of the preceding references directly support this statement, indeed upon reviewing the cited literature a different conclusion can be obtained. Air Force (2000) for example, states, "Formal studies have not been done on direct impacts to slick spot peppergrass habitats or populations from grazing." Likewise, Belnap et al. (1999) does not mention loss of slick spot integrity, particularly from winter through spring when standing water remains for a longer period of time after a rainfall. His discussion of desertification

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pertains mainly to sandy soils, not hard packed clay soils (slick spots). Also, the cited reference, BLM et al. in litt., 1999, was not in the reference materials provided by FWS.

In Summary: The statements are taken out of context, misleading and not scientifically accurate. There is no empirical or field tested data to support these statements.

16. Notice Statement (page 46444, column 3, Para. 1, line 7): A total of 597 slick spots or complexes of varying sizes were located in a 1998 Air Force survey on the Juniper Butte ETR, and totaling approximately 0.9 ha (2.2 ac) of potential *L. papilliferum* habitat. This figure did not include the 121 ha (300 ac) of primary ordnance (bomb) impact zone. Slickspot habitat on the Juniper Butte ETR is currently considered low ranking (C-rank) (Mancuso 2002).

Comment: Newer survey has been conducted since the 1998 AF survey referenced in the notice statement. In 2002, the AF (Air Force, 2002b) completed a 100% survey for *L. papilliferum* and slick spots on Juniper Butte Range (survey excluded the 300-acre impact area. The 2002 survey found 11,282 *L. papilliferum* plants, 61,382 slick spots, 2600 slick spots having *L. papilliferum*, and 109.14 acres of slick spot soils. Within the 300-acre impact area there are 634 slick spots comprising 1.4 acres of slick spot soil (A. Martin 2002, USAF Resource Biologist, pers. comm.). Fisher et al. (1996) correctly notes, "A question to be answered is whether slick spots, not bearing *Lepidium*, provides the same or similar edaphic environments as the *Lepidium*-slick spots." Fisher et al (1996) also raise the perplexing question of "why *Lepidium* is not growing on a greater proportion of slick spot sites, even within habitat where the plant is present."

Slickspot habitat on the Juniper Butte ETR is currently considered low ranking (C-rank) is based on the Hill index by (Mancuso 2002). This is not a valid conclusion (see Notice Statement #13 comments).

In Summary: The quantity of plants and slick spot acreage on Juniper Butte Range is grossly understated in the Notice Statement. Statements concerning habitat quality are subjective and habitat parameters have not been scientifically documented.

17. Notice Statement (page 46444, column 3, Para. 3, line 1): Under the INRMP, the Air Force proposes to utilize grazing throughout the entire Juniper Butte ETR to reduce the amount of standing grass biomass for wildfire control (Air Force 2000).

The Air Force is currently preparing a Vegetation Management Environmental Assessment (EA) that would address how the area is grazed by livestock and the necessary conservation measures needed for *L. papilliferum*. It is anticipated that the INRMP will be updated with information from the final EA.

Comment: Vegetation Management Environmental Assessment (EA) is final (U.S. Air Force 2002) and INRMP will be updated accordingly.

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In Summary: Wildfire control is critical to the Air Force Mission the mission of Mt Home AFB of defending the United States by training aircrews to fight and win any war if deterrence fails.

18. Notice Statement (page 46444, column 3, Para. 3, line 10): In the early spring, Air Force staff begins to check a number of slick spots, and if there is standing water in them, grazing may be delayed until after April 1 with the potential of having grazing delayed until May 1. However, at that time, whether the slick spots are wet or not, the cattle must be turned out to graze the 60 days until the end of June.

Comment: The Air Force's Natural Resource Program is designed to support National Defense. TITLE XXIX, Sikes Act Improvement Act of 1997, SEC. 2904 (C)(1)(I), in cooperation with the Secretary of the Interior, must ensure no net loss in capability of military installation lands to support the military mission of the installation. The Air Force has determined that the period 1 April – 30 June is the appropriate time to conduct range clean-up efforts to ensure no net loss in military mission support capability. The Air Force, using an ecosystem approach based on the best available scientific data, elected to use grazing as one of several vegetation management tools (U.S. Air Force 2002 b). Grazing is the least ecosystem invasive means of reducing wildfires (U.S. Air Force 2002 b). Wild fires must be controlled because they adversely impact the mission by destroying training ranges and/or reducing combat readiness flight training time.

There is no authoritative scientific evidence to show that grazing adversely impacts the Juniper Butte Training Range's *L. papilliferum* population. More importantly, there is no scientific evidence to show that cattle grazing on wet slick spots have any impact on *L. papilliferum* populations. Indeed, data from Fisher et al. (1996) debunks the conclusions of Myers and Quinney 1993 that showed flooded-soil conditions allowed *L. papilliferum* to grow on slick spot sites. Fisher et al. (1996) found that once soils thaw, high soil moisture content did not persist; and that through the late winter season, surface soils on both slick spots and adjacent areas dry at a similar rates. They also state that slick spot soils are dry most of the time that temperatures are suitable for plant growth.

In Summary: FWS needs to use an ecosystem approach to evaluate this listing based on sound science, not anecdotal evidence and literature extrapolations taken out of context. Ecologically, grazing reduction/elimination may actually have an adverse impact on *L. papilliferum* by increasing vegetation biomass, and subsequently increasing the spread and intensity of wildfires.

19. Notice Statement (page 46444, column 3, Para. 3, line 33): Livestock will be allowed to graze during this time. Soil and vegetation disturbance due to this activity would be greatest at this time of year, and would likely damage *L. papilliferum* and its habitat throughout the Juniper Butte ETR, especially at the INRMP proposed grazing intensity level, which is to graze 2,470 AUMs for 60 days (Air Force 2000).

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Comment: Of course vegetation will be disturbed, as it is being grazed upon, but there is no scientific evidence to show that cattle grazing activity significantly impacts *L. papilliferum*. Any reference to Air Force using AUMs (Animal Unit Month) is not valid because grazing at Juniper Butte is not AUM dependent (U.S. Air Force 2002 b). The Air Force elected to use percent of biomass removed due the requirement for a more stringent metric to manage vegetation. There is no scientific evidence to show that soil disturbance is any different now than in the historic past and that the current level of disturbance adversely affects *L. papilliferum*. There is no scientific data to show that a grazing level of 2,470 AUMs (although AUMs are no longer used to manage grazing at Juniper Butte Range) would negatively impact Juniper Butte *L. papilliferum* population.

Ecosystems development is a continuous process of coevolving flora, fauna, biotic soils, and abiotic components. The current JBR landscape, including native vegetation, is partly a bi-product of the Pleistocene. Although there is some controversy, the preponderance of authoritative scientific literature reports that the Pleistocene (1.8 million to 11,000 years ago) was a period dominated by mega fauna, such as bovids, equids, camelids, and other large herbivores. Bison (*Bison spp*), for example, survived the Pleistocene and large herds roamed the American prairies (Roe 1970). Hall and Kelson (1959:1024 and map 496); Hall (1981:1109 and map 542) report bison were documented at Agency Creek in Lemhi County and 20 miles W. of the Raft River in Cassia County Idaho; Barren Valley, E. of Steens Mts. and Lee Oregon. Reynolds et al (1982:972) show bison's prehistoric and historic ranges to encompass Owyhee County, including JBR. Meagher (1986) notes that by the late Illinoian /early Sangamon large steep bison occurred in much of unglaciated North America but seemed most common from Alberta to Texas along the east front of the Rocky Mountains and intermontane basins. Numerous eyewitness accounts attest to the abundance of bison in southwestern Wyoming and on the Snake River Plain and adjacent valleys of southeastern Idaho (Ogden 1910, Work 1913, Davis 1935, and Haines 1955). Schroed (1973), Agenbroad (1978), and Van Vuren and Bray (1985) report a broad distribution of bison in eastern Washington, eastern Oregon and southwestern Idaho. Agenbroad (1978) notes a bison kill site in Owyhee County, Idaho, that was in use an estimated 7000 years suggesting that bison in the area were an established population rather than an occasional group that strayed west. Antelope (*Antilocapra Americana*) still persist on JBR.

Overall, this statement is misleading, what this Notice statement actually says is: Livestock will be allowed to graze during this time. Soil and vegetation disturbances are unknown. Although the Service hypothesis that disturbances would be greatest at this time of year, there is no scientific evidence to show that grazing 2,470 AUMs for 60 days (Air Force 2000) would damage *L. papilliferum* and its habitat throughout the Juniper Butte ETR.

In Summary: This is no empirical or field-tested data to support that soil and vegetation disturbance due to this activity would be greatest at this time of year, and would likely damage *L. papilliferum*.

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20. Notice Statement (page 46445, column 1, Para. 3, line 22): In their study examining the effects of drill seeding on *L. papilliferum*, Scholten and Bunting (2001) found that the density of *L. papilliferum* individuals was lower on drilled slick spots than on non-drilled sites.

Comment: In a manuscript written 1 year earlier, Scholten (2000) reports: "although there is a measurable amount of mechanical impact from drill seeding [to slick spots], it did not affect *L. papilliferum* densities, flowering, and non-flowering, nor class size. Also, drill seeding did not impact seed production." This is in contrast to significant differences they found among some size classes of *L. papilliferum* between drilled and control sites (Scholten and Bunting 2001), however, they conclude that a subsequent year of data would be advisable to validate and confirm the conclusions of the 2001 study.

In Summary: This is a misstatement of facts. Data from the 2001 study is not validated or confirmed.

21. Notice Statement (page 46445, column 2, Para. 2, line 1): Seeding burned areas with *Agropyron cristatum*, a non-native forage species, or other non-native perennial grasses, has resulted in the destruction of at least one *Lepidium papilliferum* site (Moseley 1994).

Comment: Although this site was reported destroyed by Moseley (1994) there is no indication that Mancuso and Moseley (1998), Mancuso (1999), Mancuso (2000), Mancuso (2001) and Mancuso (2002) ever revisited site #044 to document if recovery has or has not occurred. It is important to note that Scholten (2000) reports in her study the density of *L. papilliferum* was unaffected by burning and her results did not support her hypotheses that burning decreases *L. papilliferum* cover or density.

In Summary: Empirical field-tested data does not support this Notice Statement.

22. Notice Statement (page 46445, column 3, Para. 6, line 1): Military training activities and the development of the 4,856 ha (12,000 ac) Juniper Butte ETR in southwestern Idaho by the Air Force is also a threat to the species, and it is expected that direct impacts due to construction and training activities will result in the loss of *Lepidium papilliferum* within the 121 ha (300 ac) primary ordnance impact zone (Air Force 1998, 2000).

Comment: There is no credible scientific evidence that military training activities by the Air Force are a threat to the *L. papilliferum* species or the population on Juniper Butte Range. The Air Force has exclosed approximately 25 acres of *L. papilliferum* containing 4000 plants within the range. This is consistent with Moseley (1994) who suggested "maintaining metapopulation structure and dynamics as an important aspect of any conservation strategy developed for *L. papilliferum*, where many of the populations have become isolated from one another as suitable habitat has become highly fragmented.

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Maintaining multiple populations over a wide range of geography and habitats will serve as a source for colonists as a hedge against a shifting mosaic of habitats and environmental stochasticity, and will buffer the effects of land management and future natural habitat changes."

In Summary: There is no empirical or field-tested data to support the statements in the Notice that military training activities by the Air Force are a threat to *L. papilliferum* population on Juniper Butte Range.

23. Notice Statement (page 46445, column 2, Para. 3, line 1): Other potential threats to this species resulting from fire prevention and rehabilitation measures include the use of Oust, a non-specific herbicide that is toxic to plants in the mustard family.

Comment: The above excerpt from the notice statement is contrary to Scholten (2000) who reported "All concentrations of sulformeturon significantly reduced *L. papilliferum* density the first year of the study. The year after herbicide application there was no detectable effect on *L. papilliferum*. This is in contrast to significant differences they found among some size classes of *L. papilliferum* between drilled and control sites (Scholten and Bunting 2001). Note that Scholten and Bunting (2001) conclude that a subsequent year of data would be advisable to validate and confirm the conclusions of the 2001 study.

In Summary: Empirical and field-tested data needs to be validated and confirmed.

24. Notice Statement (page 46445, column 2, Para. 4, line 1): The long-term viability of *Lepidium papilliferum* occurrences on private land is questionable due to the continuing expansion of residential developments in and around Boise (Moseley 1994).

Comment: Thirteen occurrences are within a 10-mile radius of Boise, ID with only 1 thought to be extirpated; hardly a significant threat (Attachment 5). One must question the notion of *L. papilliferum* being extirpated. Moseley (1994) reports 21 populations extirpated. However Mancuso (2000), Shelly Cooke, Idaho Conservation Data Center (ICDC), pers. comm., (2002), and ICDC (2002) report only 13 populations extirpated. Who is correct? There are several explanations for this recovery of 8 occurrences from extinction: 1) the populations were never extinct; 2) locations were not surveyed properly and assumed to be extinct; and 3) populations reestablish themselves from the existing seed bank if the area is not paved over.

In Summary: Data from ICDC does not support this Notice Statement.

25. Notice Statement (page 46445, column 3, Para. 1, line 1): Development of adjacent private land also threatens at least four *Lepidium papilliferum* occurrences on BLM land (Mancuso 2000). For example, the Soles Rest Creek *L. papilliferum* occurrence is on BLM land adjacent to private property that is under construction for a residential development (A. DeBoldt, pers. comm., 2002). An all-season road has

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replaced a two-track road and spur roads now lead off the improved road. Due to this increased access, and the resulting potential for an increase in off-road vehicle use that would trample plants, fire hazard, and introduction of nonnative species, this *L. papilliferum* occurrence declined from an A-rank to a B-rank.

Comment: The above statement was taken out of context. What Mancuso (2000) actually said was, "Impacts from threats such as urban development and gravel mining have the potential to be alleviated or minimized if proactive management actions can be taken." NOTE: the term potential does not mean that the event has actually occurred and it is not known if the event will ever occur, thus there is no data presented to evaluate the threat. In a FWS Contact Letter with A. DeBoldt, pers. comm., (2002) it states "I spoke with Ann DeBolts of the BLM on development adjacent to BLM land that **may affect** [bold added by commenter] LEPA. Due to this increased access, and the resulting potential for an increase in off-road vehicle use that would trample plants, fire hazard, and introduction of nonnative species, this *L. papilliferum* occurrence declined from an A-rank to a B-rank." Again, the term potential does not mean that the event has actually occurred and it is not known if the event will ever occur, thus there is no data presented to scientifically evaluate the threat.

In Summary: No empirical and field-tested data to support the statement. These Notice Statements are assumptions, hypotheses, and speculation.

26. Notice Statement (page 46445, column 3, Para. 2, line 1): In this same general area, a recent trespass occurred in which a private landowner bladed a 2.4 kilometer (km) (1.5 mile (mi)) road through BLM land to reach his private inholding. This individual bladed the road through slickspot habitat and a *Lepidium papilliferum* population.

Comment: There is no information presented to evaluate this statement. How much of the population was impacted? When did the impact occur, before or after the plants seeded? This statement is a premature conclusion based on incomplete data, as BLM is only now in the process of developing an environmental assessment to rehabilitate the land damaged during this incident. BLM is also routing a road away from slick spot habitat and *L. papilliferum* plants to accommodate this landowner as well as others (A. DeBoldt, pers. comm., 2002); thus negating any future "threats". There is no scientific data to show that this population was significantly impacted.

In Summary: There is no empirical and field-tested data to support this Notice Statement.

27. Notice Statement (page 46445, column 3, Para. 3, line 1): In another recent event, unauthorized blading of an existing roadway on BLM lands impacted at least six slick spots known to contain *Lepidium papilliferum*. The total number of slick spots impacted by the 84 km (52 mi) of blading is unknown as the blading may have removed all physical evidence of small slick spots (BLM 2001).

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Comment: **Comment:** There is no information presented to fairly evaluate this statement. Certainly, if slick spots were bladed, the habitat would be altered. Unfortunately, there is no way of knowing how much of the population was impacted. The statement "The total number of slick spots impacted by the 84 km (52 mi) of blading is unknown as the blading may have removed all physical evidence of small slick spots" is not necessarily true. The soil description for slick spots are well defined. As defined by NRCS (2001), slick spot soils are deep dense clay soils with the E horizon (0 to 1 inch) with a slightly hard silt loam; the Bt (1 to 3 inches) is hard firm silty clay loam, and the Btkn (12 to 32 inches) very hard firm silty clay loam. Unless blading depth was greater than 31 inches, slick spots should have been discernable. There is no scientific data to show that the population *L. papilliferum* was significantly impacted by the blading operation.

In Summary: No empirical and field-tested data are presented to support the notice statement.

28. Notice Statement: (page 46445, column 3, Para. 4, line 1): A recent assessment of the ecological status of *Lepidium papilliferum* indicates that the six remaining high-quality (A-ranked) *L. papilliferum* occurrences are threatened by fire, off-road vehicle use, habitat degradation and trampling resulting from livestock, powerline/pipeline maintenance activities, and illegal dumping (Mancuso, in litt., 1998; Mancuso 2000). These six occurrences are located on mixed land ownerships consisting of BLM, State, and private land.

Comment: As argued in other comments, the ecological status of *L. papilliferum* is unknown. There are no approximations of population size and a comprehensive systematic population census has not been conducted. Those surveys that have been conducted are highly suspicious road-side counts. Based on existing data (Attachment 6), 79.1% of the *L. papilliferum* occurrences have been found within 0.5 km of a road (Table 1). The *L. papilliferum*/road association is not because of some unique ecological condition, but rather, these areas are easiest to survey. It appears that when surveys are done in connection with some potentially disruptive action, e.g., establishing the Air Force Juniper Butte Range, numerous *L. papilliferum* plants are located. As population and habitat dynamics have yet to be determined, the role/function of *L. papilliferum* in the ecosystem has not been established.

Table 1. Distance (kilometers) to nearest road for 86 *L. papilliferum* occurrences. Data provided by ICDC.

0.0-.49 km	0.5-0.9 km	1.0-1.49 km	1.50-1.9 km	2+ km
68 (79.1%)	12 (13.9%)	4 (4.7%)	0 (0%)	2 (2.3)

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In Summary: Population surveys conducted to date are not representative as they are biased to habitat/counts located along the edge of roads. There are no empirical and field-tested data to support this Notice Statement.

29. Notice Statements (page 46445, column 3, Para. 5, line 1): Military training activities and the development of the 4,856 ha (12,000 ac) Juniper Butte ETR in southwestern Idaho by the Air Force is also a threat to the species, and it is expected that direct impacts due to construction and training activities will result in the loss of *Lepidium papilliferum* within the 121 ha (300 ac) primary ordnance impact zone (Air Force 1998, 2000).

The Air Force constructed facilities within the 121 ha (300 ac) primary ordnance impact zone during 2000 and 2001, and to avoid impacts to some slick spots, the Air Force shifted the locations of several industrial complex buildings just prior to construction.

Comment: The preceding statements are conflicting and misleading. Air Force (1998) refers to the ETI EIS that only suggested that there could be an impact to *L. papilliferum* during the construction phase. However as FWS noted, the Air Force was accommodating by shifting the locations of several industrial complex buildings prior to construction to avoid significant impacts to slick spots. Air Force (2000) does not report any scientifically based threat to *L. papilliferum*. Air Force (2002b), the Vegetation Management EA, found no significant impact to *L. papilliferum*. Although FWS had expressed concerns about *L. papilliferum*, the Service could not provide a single bit of scientific evidence to demonstrate that Air Force training activities would result in the loss of the *L. papilliferum* population within the 121 ha (300 ac) primary ordnance impact zone.

In Summary: This is not a threat, only a hypothesized threat based on no scientific data. We are also unable to comment on the term just prior to construction, since the term has no meaning.

30. Notice Statements (page 46446, column 1, Para. 1, line 12): Although fire protection has been made a priority, it is inevitable that fire will occur due to proposed training activities throughout the Juniper Butte ETR.

Comment: This statement reads that there is a 100% certainty that a fire will occur throughout Juniper Butte ETR due to proposed training activities. There is no predictive model on which this statement is based.

In Summary: This statement is merely an assumption.

31. Notice Statements: (page 46446, column 1, Para. 1, line 16): The overall habitat quality in the Juniper Butte ETR ranges from moderate to low since portions of the area burned several years ago (A. DeBolt, pers. comm., 1999) and have been reseeded to nonnative perennial grasses.

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Comment: A. DeBolt, (pers. comm., 1999) presents no scientific data to support this statement.

In Summary: No empirical and field-tested data to support this Notice Statement.

32. Notice Statements (page 46446, column 1, Para. 2, line 1: Because the slick spots are relatively small, it would be difficult to avoid them on the bombing range. However, this threat is considered minimal as the Air Force intends to use only 121 ha (300 ac) or 2.5 percent of the entire Juniper Butte ETR as the actual bombing impact area (Air Force 2001), and because this area contains only 3 percent of the total occupied *L. papilliferum* habitat.

The total amount of habitat containing interspersed slick spots that have extant occurrences of *L. papilliferum* is about 5,000 hectares (ha) (12,356 acres (ac)).

Comment: These Notice statements are confusing. If, as noted on page 46441 of Notice to List, "the total amount of habitat containing interspersed slick spots that have extant occurrences of *L. papilliferum* is about 5,000 hectares (ha) (12,356 acres (ac)), and *L. papilliferum* is found throughout much of Juniper Butte ETR which is 12,000 acres; then is the 3 percent of the total occupied *L. papilliferum* habitat referring to Juniper Butte or total habitat acreage. If this refers to Juniper Butte ETR, then the total acreage is double what is stated on page 46441.

In Summary: The FWS needs to determine what they mean by *L. papilliferum* habitat. There appears to be some confusion. The FWS appears to designate slick spots (both with and without stands of *L. papilliferum*) as "habitat". We are not sure that is an appropriate designation. In any case, the acreages used in the above argument do not make sense.

33. Notice Statements (page 46446, column 1, Para. 2, line 1: An additional potential threat to *Lepidium papilliferum* on the Juniper Butte ETR within the primary ordnance impact area is the impact of dropping bombs on slickspots.

Comment: This statement appears to be based on the Air Force's (1999) rare plant survey since that year 1000 plants were identified. Within the 300-acre impact area only 8 plants were identified (0.8% of the Juniper Butte Population); and there was no *L. papilliferum* in the area where the most impact is expected to occur. The probability of all eight plants lost to bomb strikes is very small. If the period April - July is considered the time when *L. papilliferum* sprouts, grows, and seeds, then only about 1270 BDU-33's (Air Force 1998) could potentially hit a plant (635 BDU-33's per Month * 2 Month + 2 months range shut down). The probability hitting a plant, assuming 1 square foot of impact damage, is 1: 10,290 (43560 sq ft x 300 acres divided by 1270 BDU's) or less than 1 plant. In 2002 the Air Force identified 185 plants within the impact area and 11282 outside of the impact area (1.6% of the Juniper Butt population). This is hardly a threat.

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There is no scientific evidence to show that impacting a slick spot when *L. papilliferum* is dormant will have a significant impact.

In Summary: There is no empirical and field-tested data to support the statement

34. Notice Statements (page 46446, column 1, Para. 4, line 1): Gravel or cinder mining threatens at least two occurrences of *Lepidium papilliferum* on State and Federal lands (M. Mancuso, in litt., 1998; A. DeBolt, pers. comm., 1999).

The Tenmile Creek site has been affected by recent, apparently illegal mining activity (A. DeBolt, pers. comm., 1999); this site is on BLM and private land

Comment: In DeBolt pers.comm., (1999) there is no evidence that the two occurrences have been impacted, only threats are hypothesized. As for the state land, DeBolt's pers.comm states that the state was supposed to enter into a conservation agreement. What is the current status? This data is 2+ years old. M. Mancuso, in litt., 1998, also does not provide any evidence of impact.

In Summary: There is no empirical and field-tested data to support the statement

35. Notice Statements (page 46446, column 2, Para. 3, line 1): The effects of overgrazing by livestock (generally defined as greater than 45 percent use of the available forage) in shrub-steppe habitats has been well documented (Yensen 1980; Whisenant 1990; Noss et al. 1995; Holechek et al. 1998; Belnap et al. 1999; Holcchek et al. 1999).

Comment: We are not sure what the point is of this statement since there is no scientific proof that overgrazing directly impacts *L. papilliferum*.

In Summary: Pointless statement

36. Notice Statements (page 46446, column 2, Para. 3, line 19): Recent studies from 1994 to 1999 reported that as much as 50 percent or more of the *L. papilliferum* plants at various monitoring sites on the Snake River Plain were damaged or destroyed by cattle and sheep grazing and trampling (Moseley 1994; J. Weaver, in litt., 1998; Mancuso 2000).

Comment: Neither Moseley (1994) or J. Weaver, in litt., (1998) reported that as much as 50 percent or more of the *L. papilliferum* plants at various monitoring sites on the Snake River Plain were damaged or destroyed by cattle and sheep grazing and trampling.

It is unclear why the FWS has chosen to report percentages only. Percentages by themselves provide no data for making judgments. Fifty percent is the same for 1 out of 2 or 44 out of 88.

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Mancuso 2000 uses the figure 50% but provides no data that measures impact to *L. papilliferum* from trampling.

In Summary: This conclusion not supported by empirical and field-tested data

37. Notice Statements (page 46446, column 2, Para. 4, line 1: Herbivory by beetles has been observed on *Lepidium papilliferum* plants (M. Mancuso, in litt., 1998). Although some plants were nearly defoliated and may have been killed by beetle herbivory, it is not considered to be a major threat at this time. However, the effects of threats such as insect herbivory on *L. papilliferum* may become more detrimental as population sizes are reduced.

Comment: Herbivory by beetles cannot be considered any threat since the *L. papilliferum* population is not decreasing. From Moseley (1994) to Mancuso (2000); Shelly Cooke, Idaho Conservation Data Center (ICDC), pers. comm., (2002), and ICDC (2002) there has been a 84% increase in occurrences in spite of the alleged impacts (see Notice Statement #1 comments).

In Summary: There is no empirical and field-tested data to support the statement that herbivory by beetles is a threat to the *L. papilliferum* species.

38. Notice Statements (page 46446, column 3, Para. 1, line 4): Monitoring helps to identify threats and management actions that may be necessary to control habitat degradation, but the effects of activities such as livestock use of the habitat have not been evaluated for most *L. papilliferum* occurrences managed by the BLM. Numerous occurrences on Federal lands are threatened by nonnative weeds, herbicide spraying, mining, off-road vehicle use, and habitat degradation through increased fire frequency (see Factors A and E for additional information).

Comment: Monitoring will only tell what is happening to population numbers not the cause and effect relationship. Without scientifically knowing causes and effect relationships, threats can only be hypothesized. Giles (1978) defines Wildlife Management as: the Art and Science of making decisions and taking actions to manipulate the structure, dynamics, and relations of populations, habitats, and people to achieve specific human objectives by means of the natural resources. This definition not only applies to wildlife, but all natural resources management. Without empirical and field-tested scientific data, management cannot occur.

If effects of activities such as livestock use of the habitat have not been evaluated for most *L. papilliferum* occurrences managed by the BLM, then FWS cannot conclude that there are significant effects.

In Summary: There appears to be a lack of distinction by FWS among the terms monitoring, science, and management.

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39. Notice Statements (page 46446, column 3, Para. 2, line 1): Land exchanges involving the transfer of BLM land supporting *Lepidium papilliferum* into private ownership are a potential threat to this species.

Comment: This statement provides no data to determine if the species is threatened. What data is there to suggest that BLM will not protect *L. papilliferum*, especially since it is a BLM species of concern? Additionally, potential threats are not actual threats unless there is some stated probability of actually occurring based on data.

In Summary: There is no empirical and field-tested data to support the statement

40. Notice Statements (page 46446, column 3, Para. 4, line 1): *Lepidium papilliferum* is considered to be rare and imperiled at the global and State scale (G2/S2 rating) by the Idaho Natural Heritage Program (Idaho Native Plant Society 1999; Air Force 2000). However, Idaho has no endangered species legislation that protects threatened or endangered species.

Comment: According to the Idaho Native Plant Society's (1999) guidelines for Globally Rare Species, a Global Rank of G2 designates a species imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences). A Global Rank of G3 designates a species that is rare or uncommon, but not imperiled (typically 21 to 100 occurrences). Elzinga et al. (1998) also reports that the Nature Conservancy/Natural Heritage Program gives a G3 rating to populations with fewer than 10,000 individuals. On Juniper Butte Range alone there were over 11,000 individuals. If one extrapolates from the Juniper Butte data (Air Force 2002b) to whole of Owyhee County, ID, a *L. papilliferum* population estimate for the county is 5.3 million individuals (110.5 individuals per acre of slick spot soil x 51142 acres of slick spot soil in the county). The population estimates do not include other counties with *L. papilliferum* populations. (X)

There are no factors of *L. papilliferum* biology that have been empirical or field tested to demonstrate that it is especially vulnerable to extinction, especially since the number of occurrences have increased 84% since 1994. The number of occurrences is currently (ICDC 2002) at 70. Therefore, a Global Rank of G4 with low priority is the appropriate designation for *L. papilliferum*.

Idaho Native Plant Society (1999) guidelines State Priority 1 designates species in danger of becoming extinct in the foreseeable future if identified factors continue to operate; these are taxa whose population are present only at critically low levels or whose habitats have been degraded or depleted to a significant degree. Priority 2 is taxon likely to be classified as Priority 1 within the foreseeable future in Idaho, if factors contributing to its population decline or habitat degradation or loss continue. Sensitive species are taxon with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose population and habitats may be jeopardized without active management or removal of threats. Monitor

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designates taxa that are common within a limited range as well as those taxa that are uncommon, but have no identifiable threats. Because there are no empirical or field-tested significant threats and the numbers of occurrences are increasing, the State Priority designation needs to be adjusted lower.

In Summary: Down grade *L. papilliferum* to G4, 8. State Priority could justifiably be Sensitive based on the nebulous phrase may be jeopardized.

41. Notice Statements (page 46447, column 1, Para. 1, line 1. Section E. Other Natural or Manmade Factors Affecting Its Continued Existence

Comment: There is no scientific creditable data to support this section. Additionally, ecological and ESA terms are misused. For example the statement, "Because the majority of populations of *Lepidium papilliferum* are extremely small (fewer than 5 plants per slickspot)" – the term population is used incorrectly. In the Endangered Species Act – a "population," or "distinct population segment," are terms with specific meaning when used for listing, delisting, and reclassification purposes to describe a discrete vertebrate stock that may be added or deleted from the list of endangered and threatened species. The term "population" will be confined to those distinct population segments officially listed, or eligible for listing, consistent with section 4(a) of the Act and the Services' population policy [61 FR 4722-4725 (February 7, 1996)]. Ecological - a population is an interbreeding group of organisms occupying a particular space.

Although the population of *Lepidium papilliferum* is unknown, ICDC data report an 84% increase of occurrences. Scientifically surveyed have not been completed. There is no empirical or field-tested data to show existing habitat is fragmented by agricultural conversion, fire, grazing, roads, and urbanization, and local extirpation is a threat to this species. There is no empirical or field-tested data to show habitat fragmentation has in reduced gene flow between populations or inhibiting dispersal and recolonization suitable habitat areas. Habitat Ranking is not an empirically accepted or field-tested procedure.

The Notice to List is not based on the best scientific and commercial information available, but primarily on misstatements, confusing statements, assumptions, hypotheses, misuse of ecological concepts, and lack of consideration for existing data.

Existing regulatory mechanisms are adequate or effective in protecting this taxon since the numbers of occurrences have increased.

In Summary: Based on our evaluation, *L. papilliferum* does not meet the definition of endangered under the Act, which is a species in danger of becoming extinct throughout all or a significant portion of its range.

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42. Notice Statements (page 46448, column 2, Para. 4, line 1: Activities that we believe could potentially result in a violation of section 9 includes, but are not limited to:

(1) Grazing levels within *L. papilliferum* habitat that promote the invasion of nonnative species - **THERE IS NO EMPIRICAL AND FIELD-TESTED DATA TO SUPPORT THE STATEMENT;**

(2) Placement of water, salt, and fences for livestock and its associated use within *L. papilliferum* habitat - **THERE IS NO EMPIRICAL AND FIELD-TESTED DATA TO SUPPORT THE STATEMENT;**

(3) Grazing during wet periods that results in the disturbance of slickspot hydrology - **THERE IS NO EMPIRICAL AND FIELD-TESTED DATA TO SUPPORT THE STATEMENT;**

(4) Fire rehabilitation that does not reseed to native shrub-steppe habitat and maintain slickspot integrity - **THERE IS NO EMPIRICAL AND FIELD-TESTED DATA TO SUPPORT THE STATEMENT;**

(5) Failure to control wildfires in shrub-steppe habitats - **THERE IS NO EMPIRICAL AND FIELD-TESTED DATA TO SUPPORT THE STATEMENT;**

(6) Residential or commercial development within shrub-steppe habitat with slickspots; - **Only if *L. papilliferum* exists there. If all slick spots are *L. papilliferum* habitat then there is 79 sq miles of suitable habitat just in Owyhee County**

(7) Uncontrolled off-road vehicle use and other recreational activities in *L. papilliferum* habitats; - **THERE IS NO EMPIRICAL AND FIELD-TESTED DATA TO SUPPORT THE STATEMENT;**

(8) Federal land exchanges that may result in the loss or degradation of *L. papilliferum* habitat; and - **THERE IS NO EMPIRICAL AND FIELD-TESTED DATA TO SUPPORT THE STATEMENT;**

(9) Application of pesticides/herbicides in violation of label restrictions. - **SCIENTIFIC EVIDENCE IS NOT CONCLUSIVE**

In Summary: No empirical and field-tested data to support these statements.

IV. In order to assist the U.S. Air Force in preparing scientific valid comments to the Notice to List *L. papilliferum* the Air Force solicited comments from scientific subject matter experts. The following is a list of those experts:

Terry L. Bashore, Ph.D, Chief Ecological Scientist, HQ ACC/DORI, Langley AFB, VA
He is considered by USFWS as an independent expert reviewer for the listing of *L. papilliferum* (Attachment 8). Dr Bashore 's comments are those above, numbers 1 through 42.

David R. Huff, Ph.D, Associate Professor of Plant Genetics, Department of Crop and Soil Sciences, Pennsylvania State University, University Park, PA 16802 (Attachment 7).

Charles R. Lee, Ph.D, CPSS, Research Soil Chemist, U.S. Army Corps of Engineers, Waterways Experimental Station, Vicksburg, MS (Attachment 3).

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Robert Lichvar, Ph.D, Botanist, U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Hanover NH 03755-1290 (Attachment 1).

Steven D. Warren, Ph.D, Center for Environmental Management of Military Lands Colorado State University, Fort Collins, CO 80523-1490 (Attachment 9)

Antonio J. Palazzo, M.S., Research Agronomist, U.S Army Corps of Engineers Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover NH 03755-1290 (Attachment 10).

Brief summary of Expert comments is presented below. It is important to note that a commenter's silence on listing statements does not imply agreement; rather the commenter elected not to address that issue. Full text of the Experts comments may be read in the attachments:

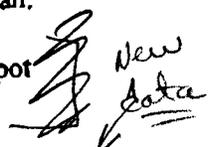
1. Lack scientific evidence to support or reject any of these claims (Bashore, Huff, Lee, Palazzo, and Warren)
2. IIII needs scientific peer review of this new approach before it can be used for listing endangered species (Lee, Warren, and Bashore).
3. Whether this taxa is best treat at the species level or submerged under *L. montanum* at this time is not possible to determine without further rigorous investigation. (Lichvar, Lee, Huff, and Warren)
4. Inaccurate, confusing, and misleading presentation of listing arguments (Huff, Warren, and Bashore)
5. Lack of sufficient population surveys to support or reject arguments of population decline (Bashore, Lee, Huff, and Warren).
6. Lack of scientific data to warrant listing of the species (Bashore, Huff, and Warren)

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