Survey & Manage
Category B Lichens & Bryophytes with Completed Strategic Surveys

March 8, 2006

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Background of Strategic Surveys & Strategic Survey Implementation Guide (SSIG)

One requirement of the Survey and Manage Record of Decision (ROD) and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures (USDA and USDI 2001) was to develop a Strategic Survey Implementation Guide (SSIG), generally to be updated annually.

The SSIG identifies species information needs that can be answered through strategic surveys, outlines strategic survey methods and their benefits, and prioritizes surveys for Survey and Manage species at a species range or regional scale. It also identifies when strategic surveys are likely complete for a species.

The ROD specifies that for non-fungi Category B species, strategic surveys must be complete by the beginning of fiscal year 2006 or equivalent-effort surveys are to be conducted in the old-growth habitat where projects are planned. Under the 2001 ROD equivalent-effort pre-disturbance surveys have already been required for the Category B mollusks in any habitat conditions for these species.

The SSIG is subject to Regional Interagency Executive Committee (RIEC) review as stated on pages 28-29 of the Standards and Guidelines of the S&M ROD. The RIEC delegated the review of the SSIG to the Intermediate Managers' Group (IMG). The IMG reviewed the implementation guide and determined the document meets the requirements of the ROD. The 2003-2004 SSIG was approved in a September 12, 2003 memo (IB-OR-2003-244).

ROD 2001 S&G, page 29, paragraph 5

Strategic surveys are considered to be complete when one of four conditions applies. Strategic Surveys are complete for the 4 bryophytes and 4 lichens addressed in this document based upon Condition #2.

> 2. The objectives of strategic surveys (such as species information needs) have been accomplished and further surveys are not likely to contribute additional significant information about distribution, relative rarity, range, habitat associations, how to conduct pre-disturbance surveys, or other strategic survey objectives.

<u>Bryophytes</u>: *Diplophyllum plicatum, Iwatsukiella leucotricha, Rhizomnium nudum, Tritomaria quinquedentata*

Diplophyllum plicatum

The 2003-2004 SSIG stated the "Long term survey strategy to meet ROD timelines for Cat. B species" is to:

"Complete the random grid survey and analyze data. Conduct purposive surveys within the range of the species, using personnel with experience in identifying this species, with emphasis in potential habitat between the Olympic Peninsula and southern Oregon Coast Range. Develop a potential habitat map for this species by using known site survey data."

Strategic Surveys for this species are complete due to the following:

- **Random Grid surveys** have been completed on 750 plots from 2000-2003 (there was 1 detection of this species during that effort). Data interpretation is being finalized and will be shared with appropriate agencies and individuals. The Random Grid results support that the species is rare; it did not change our understanding of the distribution, range, or habitat associations.
- **Purposive surveys** were completed on over 9,000 acres by the Bryophyte Taxa Expert, Judy Harpel, local field unit botanists, and a Merlin Biological contract (14 detections). The potential habitat map referenced in the SSIG, to focus strategic survey efforts, was not developed since purposive surveys conducted without the potential habitat map were highly successful in locating additional sites.
- **Historic site revisits** were completed including relocating the Cape Perpetua site.
- **Known Site Surveys** to collect habitat data were conducted on 5 plots.
- **Additional Surveys** in Olympic National Park found 18 localities (Hutten, Martin, Woodward, Andrea, and Hutten, Karen, 2005, Inventory of the Mosses, Liverworts, Hornworts, and Lichens of Olympic National Park, Washington: Species List. U.S. Geological Survey, Scientific Investigations Report 2005-5240, 78 p.)
- **Habitat associations** for this species are known: It is found on both organic and inorganic substrates. These include decayed wood, down logs, trunks of *Thuja plicata* (Western red cedar), *Pseudotsuga menziesii* (Douglas-fir), *Taxus brevifolia* (Pacific Yew) and *Picea sitchensis* (Sitka spruce), mineral soil, and rock. It occurs on moist north-facing slopes, especially in shaded fairly steep crevices along river and streams, and on soil of upturned roots. Results from purposive survey efforts confirmed our understanding of and refined our definition of the habitat for this species.
- There are 66 sites in ISMS (2004), 1 Random Grid detection, and 18 other sites = 85 known sites
- Information collected through the purposive surveys and historic site visits was utilized and shared through the development of a Conservation Assessment (January 2005) for this species. Updated habitat information and distribution was included. Habitat is known (see updated Conservation Assessment July 2005).
- On 3/31/2004 in consultation between Bryophyte Taxa Expert, Judy Harpel and the Strategic Survey Coordinator, it was recommended that Strategic Surveys for this species are complete.

Conclusion: The "Long term survey strategy to meet ROD timelines for Cat. B species" identified in the SSIG for this species including the Information Needs, have been addressed with updated information fully utilized in the Conservation Assessment for the field to use in their management of the species. Further strategic surveys would not contribute additional significant information about distribution, relative rarity, range, or habitat associations. Strategic Surveys are complete.

Iwatsukiella leucotricha

The 2003-2004 SSIG stated the "Long term survey strategy to meet ROD timelines for Cat. B species" is to:

"Complete random grid surveys and summarize data. Revisiting historic locations may not be as necessary since new locations have been discovered. Conduct purposive surveys in vicinity of known sites and high likely habitat. Collect habitat data from known site surveys that may be used to develop a potential habitat map."

Strategic Surveys for this species are complete due to the following:

- **Random Grid surveys** have been completed on 750 plots from 2000-2003 (there were 0 detections of this species during that effort). Data interpretation is being finalized and will be shared with appropriate agencies and individuals. The Random Grid results support that the species is rare; it did not change our understanding of the distribution, range, or habitat associations.
- **Purposive surveys** were completed on over 250 acres by contractor Martin Hutton (8 sites in 2003, 2 sites in 2005) and by Bryophyte Taxa Expert Judy Harpel in the Willapa Hills Nature Preserve survey (1+ detection). The potential habitat map referenced in the SSIG to focus strategic survey efforts was not developed since purposive surveys conducted without the potential habitat map were highly successful in locating additional sites.
- **Historic site revisit** to Saddle Mountain site (NE Oregon Coast Range) by Judy Harpel in 2002 with other bryophyte experts including Martin Hutten and John Christy
- **Additional surveys** in Olympic National Park found 18 localities (Hutten, Martin, Woodward, Andrea, and Hutten, Karen, 2005, Inventory of the Mosses, Liverworts, Hornworts, and Lichens of Olympic National Park, Washington: Species List. U.S. Geological Survey, Scientific Investigations Report 2005-5240, 78 p.)
- **Habitat associations** for this species are known: It is in forests along maritime fog drenched coastal ridges that usually have older, true fir present. It grows on the bark of twigs, branches, and tree trunks with the main host trees being silver fir, noble fir, Douglas-fir, western hemlock and to a lesser extent on red alder, and Sitka alder. Results from purposive survey efforts confirmed our understanding of and refined our definition of the habitat for this species.
- Information collected through the purposive surveys, historic site visits, and from the Olympic National Park was utilized and shared through the development of a Conservation Assessment (July 2005) for this species. Updated habitat information and distribution was included. Habitat is known (see updated Conservation Assessment July 2005).
- There are 17 sites in ISMS (2004), plus the 2 sites from 2005, and 18 sites on National Park lands; the species is also known from further north in B.C. and Alaska.

Conclusion: The "Long term survey strategy to meet ROD timelines for Cat. B species" identified in the SSIG for this species including the Information Needs, have been addressed with updated information fully utilized in the Conservation Assessment for the field to use in their management of the species. Further strategic surveys would not contribute additional significant information about distribution, relative rarity, range, or habitat associations. Strategic Surveys are complete.

Rhizomnium nudum (in OR)

The 2003-2004 SSIG stated the "Long term survey strategy to meet ROD timelines for Cat. B species" as:

"Following completion of the data analysis of the random grid survey on CVS/FIA plots an assessment will be made of what additional strategic surveys may be needed. Since this species has numerous detections on the random grid survey, this may be enough information to meet conditions for completing strategic surveys, or identify areas within the species range where strategic surveys are no longer needed. If this species does not meet those conditions, then additional surveys would be needed, possibly in selected portions of the species range to fill needed information gaps."

Strategic Surveys for this species are complete due to the following:

- **Random Grid surveys** have been completed on 750 plots from 2000-2003 (there were 3 detections in Oregon and 21 detections in Washington of this species during that effort). *Rhizomnium nudum* was detected in the Umpqua Basin area approximately 250 kilometers south of the known range and represented a significant range extension. Subsequent detections of *R. nudum* in the Random Grid were made on the Willamette National Forest north of the Umpqua Basin, suggesting that locations in the Umpqua Basin may not be disjunct. Data interpretation is being finalized and will be shared with appropriate agencies and individuals. The Random Grid results did change our understanding of the distribution and range.
- **Purposive surveys** were completed on over 3,000 acres in Oregon by the Bryophyte Taxa Expert, Judy Harpel, local field unit botanists, and a Merlin Biological contract (7 detections in Oregon).
- **Known Site Surveys** to collect habitat data were conducted on 46 plots and a **habitat model** of this species was developed in northwest Washington (Henderson and Lesher), which resulted in locating additional sites and in this species being removed from S&M in that part of its range.
- **Habitat associations** for this species are known: It grows in moist forest, humus soils and mineral soils and has been found in seepages, on soil over rock in the splash zone of a stream and in vernally wet areas. Forest associations from north to south are known as well. Results from purposive survey efforts confirmed our understanding of and refined our definition of the habitat for this species.
- There are 220 sites in ISMS with 32 of those in Oregon and the remainder from Washington (2004), 3 Random Grid detections in Oregon = 35 known sites in Oregon
- On 3/31/2004 in consultation between Bryophyte Taxa Expert, Judy Harpel and the Strategic Survey Coordinator, Judy Harpel recommended that Strategic Surveys for this species are essentially complete. The only information need further identified was to survey more in the southern Willamette and in the Umpqua National Forests, which is the southern part of its range. However, purposive surveys for multiple species of bryophytes and lichens were conducted under the Merlin Biological contract and by botanists on the Umpqua and Willamette National Forests. It is the southern extent of the species range, and it is likely that further surveys will not contribute additional significant information about distribution, relative rarity, range, or habitat associations.

Conclusion: The "Long term survey strategy to meet ROD timelines for Cat. B species" identified in the SSIG for this species including the Information Needs, have been addressed with updated information fully utilized in the Conservation Assessment for the field to use in their management of the species. Further strategic surveys would not contribute additional significant information about distribution, relative rarity, range, or habitat associations. Strategic Surveys are complete.

Tritomaria quinquedentata

The 2003-2004 SSIG stated the "Long term survey strategy to meet ROD timelines for Cat. B species" as:

"Following completion of the data analysis of the random grid survey on CVS/FIA plots an assessment will be made of what additional strategic surveys will be needed. This assessment will need to address if any of the four conditions for completing strategic surveys have been met or what additional surveys are needed and where."

Strategic Surveys for this species are complete due to the following:

- **Random Grid surveys** have been completed on 750 plots from 2000-2003 (there were 0 detections of this species during that effort). Data interpretation is being finalized and will be shared with appropriate agencies and individuals. The Random Grid results support that the species is rare; it did not change our understanding of the distribution, range, or habitat associations.
- **Purposive surveys** were completed on over 1,500 acres of the north Cascades, Pasayten Wilderness, and southern Cascades of Washington by the Bryophyte Taxa Expert, Judy Harpel, by Forest Service liverwort expert Rick Dewey, and local field unit botanists (11 detections).
- **Habitat associations** for this species are known: It grows in arctic boreal-like environments in cool, moist sites generally associated with cold water streams. Known sites occur on sandy, mineral soil or humus along low gradient, low volume, perennial streams and seeps and on rock talus slopes. It is reported to also occur on wet humus over boulders, shaded cliffs, on soil over exposed rock surfaces, on decaying branches at the fringes of spray zones, and among heather on slopes. Results from purposive survey efforts confirmed our understanding of and refined our definition of the habitat for this species.
- Information collected through the purposive surveys and historic site visits was utilized and shared through the development of a Conservation Assessment (January 2005) for this species. Updated habitat information and distribution was included. Habitat is known (see updated Conservation Assessment July 2005).
- There are 13 sites in ISMS (2004).
- On 3/31/2004 in consultation between Bryophyte Taxa Expert, Judy Harpel and the Strategic Survey Coordinator, Judy Harpel recommended that Strategic Surveys for this species are complete. More detections of this species may be found in high elevation rocky areas with cold seeps, springs, or streams on the Okanogan and Mt. Baker-Snoqualmie National Forests and perhaps to the south, but additional finds are not likely to contribute additional significant information about distribution, relative rarity, range, or habitat associations.

Conclusion: The "Long term survey strategy to meet ROD timelines for Cat. B species" identified in the SSIG for this species including the Information Needs, have been addressed with updated information fully utilized in the Conservation Assessment for the field to use in their management of the species. Further strategic surveys would not contribute additional significant information about distribution, relative rarity, range, or habitat associations. Strategic Surveys are complete.

<u>Caliciod "Pin" Lichens:</u> *Calicium abietinum, Chaenotheca chrysocephala, Chaenotheca ferruginea, Microcalicium arenarium*

The Calicioids are considered "impractical" to survey for because of their tiny size and difficulty to identify. They look like tiny pins sticking up from their substrate (mainly old bark and wood) with a stalk and a distinct head on top. They range in size from a couple of millimeters to tenths of millimeters. Dense colonies may look a little like stubble.

The 2003-2004 SSIG stated the "Long term survey strategy to meet ROD timelines for Cat. B species" as:
"For all Caliciod lichens: Strategic surveys for these species will be considered completed with the completion of the CVS/FIA random grid survey. These surveys will have completed the objectives of strategic surveys for this species and further surveys are not likely to contribute additional significant information about distribution, relative rarity, range, habitat associations, how to conduct pre-disturbance surveys, or other strategic survey objectives (Condition 2, ROD page S&G - 30)."

Calicium abietinum:
Strategic Surveys for this species are complete due to the following:

- **Random Grid surveys** have been completed on 750 plots from 2000-2003 (there was one possible detection that is being re-checked by an expert identifier). Data interpretation is being finalized and will be shared with appropriate agencies and individuals. The Random Grid results support that the species is rare; it did not change our understanding of the distribution, range, or habitat associations.
- **Purposive surveys** were conducted on over 9,000 acres for multiple lichen species including this species by contractors (0 detections).
- **Additional surveys** were conducted by Elroy Burnett in WA (4 detections as of June 2003) and Mildred Arnott in WA (1 detection as of June 2003).
- **Habitat associations** for this species are known from previous understanding of this species (2000 draft species fact sheet): Habitat is common and includes open, gappy, well-lit sites including conifer stands, oak balds with occasional remnant conifer snags, conifer snags around rocky outcrops, and the edges of beaver ponds and bogs. In the southern part of its range, old untreated cedar fence posts infrequently function as substitute snags. Precipitation regime seems important with frequency decreasing in wetter areas. The species is known to occur on large, old decorticate conifer snags with a hard, gray, weathered-looking woody surface (2000 draft species fact sheet) and branch stubs (E.B. Peterson pers. comm.).
- There are 10 sites in ISMS (2004) and 5 other sites = 15 known sites

Conclusion: The "Long term survey strategy to meet ROD timelines for Cat. B species" identified in the SSIG for this species including the Information Needs, have been addressed. Further strategic surveys would not contribute additional significant information about distribution, relative rarity, range, or habitat associations. Strategic Surveys are complete.

Chaenotheca chrysocephala
Strategic Surveys for this species are complete due to the following:

- **Random Grid surveys** have been completed on 750 plots from 2000-2003 (there were 14 detections of this species during that effort). Found to be positively associated with LSOG (>80 year old stands), but not Reserve land use allocations. The species was found to be rare throughout the NWFP area, but uncommon in the Umpqua Basin. The Grid results confirmed our

understanding of this species' rarity, distribution, range, and habitat associations. Data interpretation is being finalized and will be shared with appropriate agencies and individuals.

- **Purposive surveys** were conducted on over 9,000 acres for multiple lichen species including this species by contractors (0 detections).
- **Additional surveys** were conducted by Elroy Burnett in WA (12 detections as of June 2003), Mildred Arnott in WA (2 detections as of June 2003), and Eric B. Peterson in the Oregon Cascades (many detections – pers. comm. 2/8/2006).
- **Habitat association modeling** based on a priori knowledge and CVS/FIA habitat data from Random Grid plots where the species was detected is being completed by Dr. Jeff Dunk, PSW Arcata (expected completion date: end of summer 2006).
- **Habitat associations** for this species are known. Results from purposive surveys and the Random Grid efforts confirmed our understanding of and refined our definition of the habitat for this species. Habitat is humid conifer stands in areas of moderate precipitation regime at mid- to low-elevation sites. The species prefers conifers 80 or more years of age though it becomes less frequent on trees after about 200 years of age. It occurs on the side of the tree bole that lacks mosses and macrolichens (i.e., the side that usually does not intercept rain). (2000 draft species fact sheet).
- On 3/15/2004 in consultation between Lichen Taxa Lead, Marty Stein and the Strategic Survey Coordinator, Marty Stein recommended that Strategic Surveys for this species are complete.
- There are 12 sites in ISMS (2004), 14 Random Grid, and 14 other sites = 40 known sites

Conclusion: The "Long term survey strategy to meet ROD timelines for Cat. B species" identified in the SSIG for this species including the Information Needs, have been addressed. Further strategic surveys would not contribute additional significant information about distribution, relative rarity, range, or habitat associations. Strategic Surveys are complete.

Chaenotheca ferruginea

Strategic Surveys for this species are complete due to the following:

- **Random Grid surveys** have been completed on 750 plots from 2000-2003 (there was 1 detection of this species during that effort). Data interpretation is being finalized and will be shared with appropriate agencies and individuals. The Random Grid results support that the species is rare; it did not change our understanding of the distribution, range, or habitat associations.
- **Purposive surveys** were conducted on over 9,000 acres for multiple lichen species including this species by contractors (1 detection).
- **Additional surveys** were conducted by Elroy Burnett in WA (10 detections as of June 2003) and Mildred Arnott in WA (6 detections as of June 2003)
- **Habitat associations** for this species are known from previous understanding of this species (2000 draft species fact sheet): Habitat is open, gappy, well-lit sites including conifer stands, oak balds with occasional remnant conifer snags, conifer snags around rocky outcrops, and the edges of beaver ponds and bogs. It occasionally occurs on the boles of large, old oaks. It grows on large, old, conifers with highly textured bark on the side of the tree bole that lacks mosses and macrolichens (i.e., the side that usually does not intercept rain). (2000 draft species fact sheet).
- There are 44 sites in ISMS (2004), 1 Random Grid, and 17 other sites = 62 known sites

Conclusion: The "Long term survey strategy to meet ROD timelines for Cat. B species" identified in the SSIG for this species including the Information Needs, have been addressed. Further strategic surveys would not contribute additional significant information about distribution, relative rarity, range, or habitat associations. Strategic Surveys are complete.

Microcalicium arenarium

Strategic Surveys for this species are complete due to the following:

- **Random Grid surveys** have been completed on 750 plots from 2000-2003 (there were 0 detections of this species during that effort). Data interpretation is being finalized and will be shared with appropriate agencies and individuals. The Random Grid results support that the species is rare; it did not change our understanding of the distribution, range, or habitat associations.
- **Purposive surveys** were completed on over 9,000 acres by contractors (1 detection).
- **Additional surveys** have been conducted in the NWFP area by calicioid experts Eric B. Peterson (Nevada Natural Heritage and formerly Oregon State Univ.) and Jouko Rikkinen (University of Helsinki, Finland) and further sites have not been found (E.B. Peterson pers. comm. 2/8/2006).
- The **habitat** of this species is considered to be the other species that it parasitizes. This species is known in the NWFP from Columbia River Gorge on a basalt rock face on *Chrysothrix chlorine* and from Lane County in the Cascades where it was found on the pin lichen *Chaenotheca furfuracea* (S&M species removed in the 2003 ASR). It is also thought to parasitize "non-lichenized *Stichococcus* [algal] colonies" (Tibell 1999).
- *M. arenarium* on *C. furfuracea* produces very different appearing fruiting bodies intermingled with those of regular-looking *C. furfuracea* (2000 draft species fact sheet). Seventy *C. furfuracea* sites are known from the Columbia River Gorge, 27 sites from Random Grid plots, 21 sites from Elroy Burnett (2003), 4 sites from Mildred Arnott (2003), and 35 sites from ISMS (2004) as a result numerous specimens of the host species *C. furfuracea* have been examined.
- On 3/15/2004 in consultation with Lichen Taxa Lead, Marty Stein and the Strategic Survey Coordinator, Marty Stein recommended that Strategic Surveys for this species are complete.

Conclusion: The "Long term survey strategy to meet ROD timelines for Cat. B species" identified in the SSIG for this species including the Information needs, have been addressed. Further strategic surveys would not contribute additional significant information about distribution, relative rarity, range, or habitat associations. Strategic Surveys are complete.