

REPORT ON THE CONSERVATION STATUS OF
CAREX ABORIGINUM, IN IDAHO

by

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REPORT ON THE CONSERVATION STATUS OF
CAREX ABORIGINUM IN IDAHO

Taxon Name: Carex aboriginum M.E. Jones
Common Name: Indian Valley sedge
Family: Cyperaceae
States Where Taxon Occurs: U.S.A.; Idaho
Current Federal Status: Category 2* Candidate
Recommended Federal Status: Category 3a Candidate
Author of Report: Robert K. Moseley
Original Date of Report: April 2, 1990
Date of Most recent Revision: N/A
Individual to Whom Further
Information and Comments
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ABSTRACT

Carex aboriginum (Indian Valley sedge) has not been relocated since Jones collected the type specimen in Indian Valley, Adams County, Idaho, on July 12, 1899. Taxonomists have remained unanimous over the years that it is a distinct species. The natural landscape of the Indian Valley area has been altered considerably by agricultural conversion and rangeland grazing practices. Virtually no unaltered habitats were observed in the Indian Valley area in 1989.

Indian Valley sedge is listed presently as a Category 2* candidate species with the U.S. Fish and Wildlife Service. This category includes candidate taxa that are possibly extinct, but verification is needed. Based on information presented in this status report, I recommend that the candidate status of Indian Valley sedge be changed to Category 3a. This subcategory includes taxa for which the Fish and Wildlife Service has persuasive evidence of extinction. If rediscovered, such taxa might acquire high priority for listing. At this time, however, the best available information indicates that the taxa in this subcategory, or the habitats from which they were known, have been lost.

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I. Species Information.

1. Classification and nomenclature.

A. Species.

1. Scientific name.

a. Binomial: Carex aboriginum M.E. Jones

b. Full bibliographic citation: M.E. Jones. 1910. Montana botany notes. Bulletin University of Montana 15:69-70.

c. Type specimen: Jones s.n., "Indian Valley, Southern Idaho, near Salubria, July 12, 1899. The type is located at POM (Claremont College, Pomona, CA). Annotated by F.J. Hermann in 1964 (Lenz 1986).

2. Pertinent synonym(s): None.

Mackenzie's "C. aboriginum" (Mackenzie 1935) is completely different from Jones' type collection and is really a variant of C. parryana (Cronquist 1969; Hermann 1970).

3. Common name: Indian Valley sedge

4. Taxon codes: PMCYP03010 (Idaho Natural Heritage Program).

5. Size of genus: More than 1000 species, occurring in all parts of the world, most abundantly in moist regions of the North Temperate Zone and in the Arctic; tropical species mostly montane (Cronquist 1969). Mackenzie (1935) recognized 533 species in North America, while Hermann (1970) treated 165 species and many varieties in the Rocky Mountains and Colorado Basin.

B. Family classification.

1. Family name: Cyperaceae

2. Pertinent family synonyms: None

3. Common name for family: Sedge

C. Major plant group: Monocotyledonea

D. History of knowledge of taxon: The type specimen was collected by Marcus E. Jones, a geological consultant and botanist, on July 12, 1899, in Indian Valley, in what is now Adams County, Idaho. Apparently Indian Valley sedge has never been collected or seen since Jones' 1899 collection.

E. Comments on current alternative taxonomic treatment(s):

As mentioned above, Mackenzie's "C. aboriginum" (Mackenzie 1935) is completely different from Jones' type collection and is really a variant of C. parryana (Cronquist 1969; Hermann 1970).

2. Present legal or other formal status

A. International: None.

B. National.

1. Present designation of proposed legal protection or regulation: Indian Valley sedge is a Category 2* candidate (U.S. Fish and Wildlife Service 1990).

2. Other current formal status recommendation: Indian Valley sedge is currently believed to be extinct throughout its range (global rank = GX) by the Nature Conservancy.

3. Review of past status: In 1976, Indian Valley sedge was recommended for listing as endangered (Federal Register, 41(117):24540, June 16, 1976). In 1980, it was listed as a Category 1 candidate (Federal Register, 45(242):82495, December 15, 1980). In 1985, it was listed as a Category 2* candidate (Federal Register, 50(188):10, November 20, 1985).

C. State.

1. Idaho.

a. Present designation or proposed legal protection or regulation: None.

b. Other current formal status recommendation: Indian Valley sedge is currently believed to be extirpated in Idaho (state rank = SX) by the Idaho Natural Heritage Program (Moseley and Groves 1990).

- c. Review of past status: Steele (1977; 1981) recommended a federal status of endangered, although he noted that it may be extinct. Packard (n.d.) also recommended endangered status for Indian Valley sedge if it was still extant.

3. Description.

- A. General nontechnical description: The flowering culms much exceed to leaves; leaves occur on the basal 1/3 of the plant but not at the very base; spikes 3-4, erect or ascending; stigmas 3 (Packard n.d.).
- B. Technical Description: Technical descriptions of Indian Valley sedge have been published by Cronquist (1969), Hermann (1970), Davis (1952) and Jones (1910). The following is from Cronquist (1969): Stems loosely clustered from short rhizomes, 7-10 dm tall, slightly aphyllopodic; leaves elongate, flat, 2-4 mm wide, scattered on the lower part of the stem; spikes 3 or 4, short-peduncled or sessile, loosely approximate, all erect or closely ascending, the terminal one staminate or gynaeandrous, about 1.5 cm long, the lateral ones pistillate to androgynous or gynaeandrous, 1.5 cm long, stout, short-cylindric; bract subtending the lowest spike sheathless, about equalling or distinctly surpassing the inflorescence; pistillate scales reddish brown, narrower and shorter than the perigynia; perigynia somewhat coppery-tinted on a pale background, ovate or elliptic, rather firm-walled, somewhat inflated below the more flattened tip, about 5 mm long, scabrous about the prominent, short (to 1.0 mm) bidentate beak, otherwise glabrous, slightly papillate-roughened, obscurely several-nerved, loosely ascending to spreading or the lower ones reflexed; stigmas 3; style deciduous; achene trigonous, about 2.5 mm long.
- C. Local field characters: Stems arising from short, horizontal rootstocks, stiff, slender and erect, about 3 feet tall, much exceeding the leaves. Spikes 2-3, oval, at the ends of the culms. (see Appendix 2 for line drawings).

Of Idaho sedges, Indian Valley sedge is most closely related to *C. raynoldsii*, which differs by having smaller perigynia (3.3-4.4 mm long), which are inflated distally and abruptly contract to the short, scarcely bidentate beak (Cronquist 1969).

- D. Identifying characteristics of material which is in interstate or international commerce or trade: No interstate or international trade is known. See above section for differences with closely related species.
 - E. Photographs and/or line drawings: Line drawings of Indian Valley sedge appear in Jones (1910), Hermann (1970) and Cronquist (1969). See Appendix 2 for a reproduction of the line drawings from Cronquist (1969).
4. Significance.
- A. Natural: None known.
 - B. Human: None known.
5. Geographical distribution.
- A. Geographical range: Indian Valley sedge is known only from the type locality in Indian Valley, 12 miles east of Cambridge, Adams County, Idaho (Appendix 4). Jones collected Indian Valley sedge while using the old townsite of Salubria as headquarters between July and September 1899 (Lenz 1986). The site of Salubria is across the Weiser River from the present-day Cambridge, in Washington County.
 - B. Precise occurrences in Idaho.
 - 1. Populations currently or recently known extant: None.
 - 2. Populations known or assumed extirpated: The only known population of Indian Valley sedge is the one that Jones collected the type specimen from. This population is assumed extinct.
 - 3. Historically known populations where current status not known: None.
 - 4. Locations not yet investigated believed likely to support additional natural populations: Suitable habitat for Indian Valley sedge apparently occurs in the middle portion of the Weiser River drainage around Cambridge and Indian Valley, Idaho. Botanists have explored this area for many years, especially to look for Indian Valley sedge in the last 20 years, but have located no extant populations. Since most of the habitat in this region is private and access is relatively difficult, there is still a chance that extant populations exist.

5. Reports having ambiguous or incomplete locality information: Cronquist (1969), Packard (n.d), and Hermann (1970) all erroneously report that Indian Valley is in Washington County, Idaho, instead of Adams County. There are no known populations in Washington County.

The label from Jones' type collection gives the elevation of Indian Valley as 2300 feet, which is incorrect; Indian Valley lies at about 3000 feet.

6. Locations known or suspected to be erroneous reports: As has been reported previously (Packard n.d.; Steele 1981), two collections that had originally been misidentified as Indian Valley sedge have now been correctly identified. These collections are:

Holmgren 8251 (BYU, UTC, UT, RENO) from Cache County, UT.

Thompson 13989 (RENO) from Custer County, ID.

Rosentreter (1981) reports a collection from Silver Bow County, Montana (Lackschewitz 9728), that was initially identified as Indian Valley sedge. This collection was not mentioned in Rosentreter (1986), however, so it is assumed that it had been misidentified.

- C. Biogeographical and phylogenetic history: Jones (1910) speculated that Indian Valley sedge is most closely related to C. raynoldsii. Cronquist (1969), in treating the sedges of the Pacific Northwest, concurred with Jones. Hermann (1970), in his treatment of sedges of the Rocky Mountains and Colorado Basin, states that Indian Valley sedge is closely related to C. serratodens in the section Atratae. Carex serratodens is distributed from southern Oregon, south to California, and interestingly, has a disjunct population in northeastern Arizona, 400 miles east of its main range.

Although not a major center of endemism, this area of Idaho has one other narrow endemic, Allium tolmiei var. persimile. As was mentioned by Cronquist (1969), the dry gumbo soil habitat on which Jones found Indian Valley sedge carries species of very restricted distribution in other families.

6. General environment and habitat description.

- A. Concise statement of general environment: Indian Valley occurs in the sagebrush-steppe zone, near its boundary with coniferous forest. The only description of specific habitat occupied by Indian Valley sedge is from Jones' original description, where he states that it occurred on "dry gumbo soil which is wet in the spring".

B. Physical characteristics.

1. Climate.

- a. Koppen climate classification: Habitat for Indian Valley sedge is classified as Koppen's unit BSk: semiarid climate or steppe, with an average annual temperature under 64.4° F (Trewartha 1954).
- b. Regional macroclimate: The average monthly maximum temperature for this region reaches its highest point during the month of July, a month which also marks the beginning of a pronounced dry season; about 15% of the total annual precipitation falls during the period from July through October. Two periods of peak precipitation occur, one in January and the other in May. The winter precipitation peak is greatest with more than 38% of the mean annual precipitation falling between December and February (Soil Conservation Service 1976).

Precipitation data are not available for Indian Valley, but data from Payette County, 25 miles south and about 1,000 feet lower in elevation indicate that mean annual precipitation ranges from 8 to 13 inches and the mean annual temperature ranges from 50° to 52° F. The frost-free period ranges from 140 to 160 days (Soil Conservation Service 1976). The precipitation at Indian Valley is probably somewhat higher and temperatures lower than those indicated for Payette County.

- c. Local microclimate: Unknown.
2. Air and water quality requirements: Unknown
 3. Physiographic provinces: Indian Valley lies within the Seven Devils Section of the Columbia-Intermountain Province (Ross and Savage 1967).
 4. Physiographic and topographic characteristics: Indian Valley is a large, flat bottomland along the Little Weiser River between low-lying basalt hills.

5. Edaphic factors: Jones (1910) states that he collected the type specimen from "dry gumbo soils which are wet in the spring". It is unclear exactly where this habitat is but it probably refers to the clay-textured soil (gumbo) of swales on the basalt upland surrounding Indian Valley. The rich bottomland soils of the area are not gumbo and do not dry until late in the season. The clayey, gumbo soils of the uplands are relatively shallow over basalt bedrock, and have a perched water table early in the season. These sites dry rapidly, however, and most herbaceous plants become senescent by late-June or early July.

6. Dependence of this taxon on natural disturbance:
Unknown.

7. Other unusual physical features: None known.

C. Biological characteristics.

1. Vegetation physiognomy and community structure: Jones did not record the community in which he found Indian Valley sedge, and it is difficult to reconstruct specific communities of the gumbo soils in the area since they have been almost entirely altered by agriculture, livestock grazing, and unnatural frequencies of the wildfires caused by a century of overgrazing.

2. Regional vegetation type: Kuchler (1964) places this portion of Idaho in the potential vegetation type of Sagebrush Steppe (Artemisia - Agropyron).

3. Frequently associated species: None were recorded by Jones, but species inhabiting gumbo soils of the Indian Valley area include Allium tolmiei var. persimile, Eriogonum sphaerocephalum, Artemisia rigida, and numerous exotic weeds such as Poa bulbosa, Lactuca serriola, and Bromus tectorum.

It should be noted that the Indian Valley area is unusually depauperate in sedge species. Only two species were seen in early July, growing in wet ditches in the bottomland; one occurred in very minor amounts. Both had immature fruits and could not be properly identified.

The depauperate sedge flora I observed at Indian Valley is contrary to the "notably rich representation of Cyperaceae" in Indian Valley reported by Steele (1981) and Rosentreter (1981; 1986) and DeBolt and Rosentreter (1988).

4. Dominance and frequency: Unknown.

5. Successional phenomena: Difficult to predict since the specific habitat of Indian Valley sedge is unknown.

6. Dependence on dynamic biotic features: Difficult to predict since the specific habitat of Indian Valley sedge is unknown.

7. Other endangered species: The narrow endemic Allium tolmiei var. persimile, a Category 3c candidate, occurs in similar habitats of the area.

7. Population biology.

A. General summary: The population biology of Indian Valley sedge is unknown since Jones did not record its abundance or population structure.

B. Demography.

1. Known populations: No populations are known to be extant.

2. Demographic details: (see also Appendix 5)

1. Indian Valley (001)

a. Location: The Indian Valley area lies largely in T14N,R1W, Boise Meridian.

b. Area: Unknown.

c. Number and size of plants: Population considered extinct.

d. Density: Unknown.

e. Presence of dispersed seeds: Unknown

f. Evidence of reproduction: No evidence

g. Evidence of expansion/contraction: Population considered extinct.

C. Phenology.

1. Patterns: Details unknown, but mature achenes were present when Jones collected the type specimen on July 12, 1899.

2. Relation to climate and microclimate: Most species occurring in similar habitats in the Indian Valley area have a very early phenology, beginning growth in late March and April and flowering by late April or early May.

D. Reproductive ecology.

1. Type of reproduction: Apparently both by sexual reproduction and vegetative propagation. Mature, well-developed achenes are present on the type material. Vegetative propagation has been variously described as "shortly stoloniferous" (Jones 1910), short rhizomatous (Cronquist 1969), and "culms arising from short, horizontal rootstocks" (Hermann 1970).
2. Pollination.
 - a. Mechanisms: The genus Carex is wind pollinated.
 - b. Specific known pollinators: Probably wind.
 - c. Other suspected pollinators: None.
 - d. Vulnerability of pollinators: None.
3. Seed dispersal.
 - a. General mechanisms: Specific details unknown, but wind and gravity dispersal is suspected.
 - b. Specific agents: Unknown, but probably wind and/or gravity.
 - c. Vulnerability of dispersal agents and mechanisms: Probably none.
 - d. Dispersal patterns: Specific details unknown, but probably not far from parent plant.
4. Seed biology.
 - a. Amount and variation of seed production: Unknown.
 - b. Seed viability and longevity: Unknown.
 - c. Dormancy requirements: Unknown.
 - d. Germination requirements: Unknown.
 - e. Percent germination: Unknown.
5. Seedling ecology: Unknown.
6. Survival and mortality: Unknown.

7. Overall assessment of reproductive success: There is not enough data available to make an assessment of reproductive success.
8. Population ecology.
 - A. General summary: One historical population of unknown size has been recorded. This population is considered extinct due to unknown causes. The Indian Valley area is highly altered from its presettlement state by a century of agricultural conversion and overgrazing with resultant exotic weed invasions and unnatural, increased fire frequencies.
 - B. Positive and neutral interactions: Unknown.
 - C. Negative interactions.
 1. Herbivores, predators, pests, parasites and diseases: Unknown, but herbivory by domestic livestock may have contributed to the presumed extinction of Indian Valley sedge.
 2. Competition.
 - a. Intraspecific: Unknown.
 - b. Interspecific: Unknown, but numerous introduced weeds now inhabit many habitats in the Indian Valley area. Competition from the generally dense stands of these introduced populations may have contributed to the presumed extinction of Indian Valley sedge.
 3. Toxic and allelopathic interactions with other organisms: Unknown.
 - D. Hybridization.
 1. Naturally occurring: Cronquist (1969) speculated that, because Indian Valley sedge was never recollected, it may be a hybrid or a freak. But Jones' collection had well-formed achenes, and Cronquist could not visualize a set of parents which could be expected to produce Indian Valley sedge. It should be noted that the Indian Valley area is unusually depauperate in sedge species. Only two species were seen in early July growing in wet ditches, one occurred in very minor amounts. Both had immature fruits and could not be properly identified, but neither appeared to be closely related species of the section Atratae.
 2. Artificially induced: None.
 3. Potential in cultivation: None.
 - E. Other factors of population ecology: Unknown.
9. Current land ownership and management responsibility:

- A. General nature of ownership: Most of the Indian Valley area is private. Some BLM land occurs in the foothills of the West Mountains, to the east of Indian Valley.
 - B. Specific landowners: Not applicable.
 - C. Management responsibility: Not applicable.
 - D. Easements, conservation restrictions, etc.: None.
10. Management practices and experience.
- A. Habitat management.
 - 1. Review of past management and land-use experiences.
 - a. This taxon: Unknown.
 - b. Related taxa: Hermann (1970) reports that a related species, C. raynoldsii, has fair to relatively high palatability for cattle, sheep and horses and does not withstand grazing well. Because of this characteristic, Hermann states that C. raynoldsii may no longer be as plentiful in some areas as it once was.
 - c. Other ecologically similar taxa: Unknown
 - 2. Performance under changed conditions: Details unknown, but the fact that Indian Valley sedge is presumed extinct and the high degree to which the landscape has been altered in the Indian Valley area since settlement, indicates that it did not do well under changed conditions.
 - 3. Current management policies and actions: Much of the Indian Valley area is currently being used for agriculture and rangelands.
 - 4. Future land use: Unknown.
 - B. Cultivation.
 - 1. Controlled propagation techniques: None.
 - 2. Ease of transplanting: Unknown.
 - 3. Pertinent horticultural knowledge: None.
 - 4. Status and location of presently cultivated material: None.
11. Evidence of threats to survival.
- A. Present or threatened destruction, modification, or curtailment of habitat or range.
 - 1. Past threats: Considerable human-caused habitat destruction

and disturbances have taken place in a wide variety of habitats in Indian Valley since its settlement. The effect of these perturbations on Indian Valley sedge is unknown.

The flat, bottomland habitats in the floodplain of the Little Weiser River have been plowed and planted with agricultural crops. During a survey in early July 1989, I saw no native habitat remaining in the valley bottom.

The upland habitats, which are used primarily as rangeland for domestic livestock, consist of low hills and ridges with shallow soils underlain by basalt. These habitats are very susceptible to disturbance, especially in an area as arid as Indian Valley. Overgrazing by domestic livestock for over a century has altered the landscape to a considerable degree. The effects of grazing on natural habitats in Indian Valley have been both direct, through herbivory, and indirect, through increased rates of soil erosion, invasion of pernicious exotic annuals into degraded rangelands, and increased fire frequency and size due to the unnatural predominance of exotic annuals.

2. Existing threats: Since the species is considered extinct, this section does not apply. The past threats outlined above are, for the most part, continuing today.

3. Potential threats: See above.

B. Overutilization for commercial, sporting, scientific, or educational use.

1. Past threats: Unknown.

2. Existing threats: Unknown.

3. Potential threats: Unknown.

C. Disease, predation, or grazing.

1. Past threats: Some direct and many indirect effects of domestic livestock grazing have negatively affected natural habitats in the Indian Valley area. The effect of these on the presumed extinction of Indian Valley sedge is unknown.

2. Existing threats: Since the species is considered extinct, this section does not apply. The past threats outlined above are, for the most part, continuing today.

3. Potential threats: See above.

D. Inadequacy of existing regulatory mechanisms.

1. Past threats: Unknown.

2. Existing threats: Unknown.

3. Potential threats: Unknown.

E. Other natural or manmade factors.

1. Past threats: Unknown.

2. Existing threats: Unknown.

3. Potential threats: Unknown.

II. Assessment and Recommendations.

12. General assessment of vigor, trends, and status: Indian Valley sedge has not been relocated since Jones collected the type specimen in Indian Valley, Adams County, Idaho, on July 12, 1899; it is considered extinct. Taxonomists have remained unanimous over the years that it is a distinct species. The natural landscape of the Indian Valley area has been altered considerably by agricultural conversion and rangeland grazing practices. Virtually no unaltered habitats were observed in the Indian Valley area in 1989.

13. Recommendations for listing or status change.

A. Recommendations to the U.S. Fish and Wildlife Service: Indian Valley sedge is listed presently as a Category 2 candidate species with the U.S. Fish and Wildlife Service (1990). This category includes candidate taxa that are possibly extinct, but verification is needed.

Based on information presented in this status report, I recommend that the candidate status of Indian Valley sedge be changed to Category 3a. This subcategory includes taxa for which the Fish and Wildlife Service has persuasive evidence of extinction. If rediscovered, such taxa might acquire high priority for listing. At this time, however, the best available information indicates that the taxa in this subcategory, or the habitats from which they were known, have been lost.

B. Recommendations to other U.S. Federal Agencies.

1. Bureau of Land Management: Indian Valley sedge is not currently a BLM Sensitive Plant Species. The Cascade Resource Area of the Boise District manages land on the east side of Indian Valley. Although I surveyed this highly-altered area in July 1989 and did not find it, there is a remote possibility that it could occur there. Therefore, Indian Valley sedge should be added to the BLM Sensitive Plant Species list for Idaho, and district personnel should be made aware of its possible presence in their area.

C. Other status recommendations.

1. Counties and local areas: No recommendations.

2. State: Currently Indian Valley sedge is ranked SX by the Idaho Natural Heritage Program (Moseley and Groves 1990); based on data presented here, it should remain as SX
3. Other Nations: No recommendations.
4. International: No recommendations.
14. Recommended critical habitat: None recommended.
15. Conservation/recovery recommendations.
 - A. General conservation recommendations.
 1. Recommendations regarding present or anticipated activities: None recommended.
 2. Areas recommended for protection: None recommended.
 3. Habitat management recommendations: None recommended.
 4. Publicity sensitivity: None.
 5. Other recommendations: None.
 - B. Monitoring activities and further studies recommended: None recommended.
16. Interested parties:

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III. Information Sources.

17. Sources of information.

A. Publications.

1. References cited in report: See Appendix 1.

2. Other pertinent publications.

a. Technical: None.

b. Popular: None.

B. Herbaria consulted: Only one specimen of Indian Valley sedge is known:

Jones s.n. (POM, NY)

C. Fieldwork: Numerous botanists have visited Indian Valley in the last 20 years to try and relocate Indian Valley sedge, all to no avail. I conducted field searches during the first week of July 1990.

D. Knowledgeable individuals:

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E. Other information sources: None known.

18. Summary of material on file: Color slides of Indian Valley, computer records, maps, and all published and unpublished references pertaining to Indian Valley sedge are on file at the Idaho Natural Heritage Program office.

IV. Authorship.

19. Initial authorship:

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20. Maintenance of status report: The Idaho Natural Heritage Program will maintain current information and update the status report as needed.

V. New information.

21. Record of revisions: Not applicable.

APPENDIX 1

Literature Cited.

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Appendix 2

Line drawings of Carex aboriginum
(from Cronquist 1969)

Appendix 3

Slides of Indian Valley, Idaho,
former range of Carex aboriginum.

- Slide 1. Overview of Indian Valley; note bottomland habitat in middle ground (dark green) and shallow-soil swale habitat over basalt in foreground.
- Slide 2. Overview of Indian Valley; note bottomland habitat in middle ground (dark green) and big sagebrush and bitterbrush communities in foreground.

Appendix 4

Maps of Indian Valley.

- Map 1. Location of Indian Valley in Idaho.
- Map 2. Portion of 1954 Council 15' quadrangle showing Indian Valley and vicinity.

Appendix 5

Occurrence record for historical
Carex aboriginum population.