

Level 4 Potential Conservation Area (PCA) Report

Name Redwell Basin Iron Fen

Site Code S.USCOHP*23632

IDENTIFIERS

Site ID 1020 Site Class PCA
Site Alias None

Network of Conservation Areas (NCA)

<u>NCA Site ID</u>	<u>NCA Site Code</u>	<u>NCA Site Name</u>
-		No Data

LOCATORS

Nation United States Latitude 385336N
State Colorado Longitude 1070318W

Quad Code Quad Name
38107-H1 Oh-be-joyful

County
Gunnison (CO)

Watershed Code Watershed Name
14020001 East-Taylor

SITE DESCRIPTION

Minimum Elevation	10,200.00	Feet	3,109.00	Meters
Maximum Elevation	12,090.00	Feet	3,685.00	Meters

Site Description

The Redwell is a spring which discharges near the head of the basin through Cretaceous-age rocks and is depositing hydrous iron oxides (Neubert 2000). The iron oxides have built up around the discharging spring, causing it to be 5-6 ft. deep. However, iron fen vegetation is not found at this location. The water in the Redwell was found to have a pH of 3.51, conductivity of 304 μ S, very high levels of lead, zinc, cadmium, iron, aluminum, manganese, and copper (Neubert 2000). Drainage from the Redwell and other upstream springs flow through the center of the basin. Between the Redwell and where the road crosses the creek is an acidic seep on the east side of the creek. Typical iron fen vegetation is found here and at another seep, also on the east side of the creek, downstream of the road. Development of iron fen vegetation is minimal in both locations, but enough exists to identify it as an area receiving different groundwater than other nearby portions of the wetland. Upland slopes are covered in spruce-fir and the area is near treeline. Old mine addits are nearby as well as associated roads. Iron fens are unusual peatlands in that surface/groundwater pH and the associated plant species are typical of ombrotrophic bogs and acidic, nutrient poor fens, while the concentration of ions is more typical of rich and extreme rich fens (Cooper 1999). Peatlands are often classified along a chemical gradient (pH and concentration of cations such as Ca²⁺, Na⁺, K⁺, and Mg²⁺) (Cooper and Andrus 1994). The gradient is typically as follows: ombrotrophic bogs and poor fens are characterized by low pH and low cation concentration, whereas rich and extreme rich fens (e.g., High Creek Fen near Fairplay, CO) are characterized by high pH and high cation concentration. Iron fens do not fit into this gradient because of the unusual biogeochemistry (low pH but high concentration of cations (especially Ca²⁺ and SO₄²⁻). This occurs due to groundwater and surface water draining through rock rich in pyrite. As the pyrite becomes oxidized, it produces a sulfuric acid, which leaches ions from surrounding rock while also creating an acidic solution, leading to a nutrient rich yet acidic water supply (Cooper 1999). Iron fens are characterized by limonite ledges, which form when iron precipitates out of solution and then solidifies into hard rock. Organic substrates (e.g., peat and coarse woody debris) often are mixed with the iron precipitate thus limonite often contains large amounts of organic materials. The plant species typically found in iron fens include: Engelmann spruce (*Picea engelmannii*), lodgepole pine (*Pinus contorta*), bog birch (*Betula glandulosa*), dwarf blueberry (*Vaccinium cespitosum*), creeping wintergreen (*Gaultheria humifusa*), water sedge (*Carex aquatilis*), bluejoint reedgrass (*Calamagrostis canadensis*), with a continuous carpet of mosses mainly dominated by sphagnum (*Sphagnum* spp). Iron fens at this site are dominated by water sedge and sphagnum peat moss. Tufted hairgrass (*Deschampsia cespitosa*) and dwarf blueberry are also found in the iron fen areas. Very few shrubs or trees occur in the iron fens. Small, stunted individuals of bog birch and Engelmann spruce are in a few locations. Dark, blackish moss is found on seeping limonite outcrops. Most non-iron fen meadows have water sedge, tufted hairgrass, bluejoint reedgrass, King's crown (*Rhodiola integrifolia*), elephantella (*Pedicularis groenlandica*), rushes (*Juncus* sp.), and planeleaf willow (*Salix planifolia*).

Level 4 Potential Conservation Area (PCA) Report

Name Redwell Basin Iron Fen

Site Code S.USCOHP*23632

Key Environmental Factors

No Data

Climate Description

No Data

Land Use History

No Data

Cultural Features

No Data

SITE DESIGN

Site Map Y - Yes

Mapped Date 12/19/2002

Designer Rocchio, F.J.

Boundary Justification

Boundaries are drawn to include the potential groundwater recharge zones, which must be maintained to preserve the hydrological integrity of the iron fen. These boundaries, however, are preliminary and additional research on the recharge zones is needed, as local hydrology is complex.

Primary Area 404.64 Acres 163.75 Hectares

SITE SIGNIFICANCE

Biodiversity Significance Rank B2: Very High Biodiversity Significance

Biodiversity Significance Comments

The site supports a good (B-ranked) example of the globally imperiled (G2/S2) iron fen plant community (*Picea engelmannii* / *Betula glandulosa* / *Carex aquatilis* - *Sphagnum* sp.). Iron fens are unusual peatlands where the surface/groundwater pH and plant species are typical of ombrotrophic bogs and acidic, nutrient poor fens (pH <4.4), while the concentration of ions is more typical of rich and extreme rich fens (pH > 6.0) (Cooper 1999). The combination of species (more typical of true bogs) that occur in iron fens is rare in Colorado (approximately 9 occurrences of iron fens are known in the state). In Colorado, iron fens are found in the mineral belt. Mineralized zones in Idaho, Montana, Wyoming, and South Dakota may contain similar wetlands (George Jones, personal communication, 1999). For example, there is an Iron Bog Research Natural Area within the Challis National Forest in Idaho where cation concentrations and pH are very similar to the iron fens documented here in Colorado (Fred Rabe, personal communication, 1999). More research is needed within the Rocky Mountain region to determine the extent of this wetland type.

Other Values Rank No Data

Other Values Comments

No Data

LAND MANAGEMENT ISSUES

Land Use Comments

No Data

Natural Hazard Comments

No Data

Exotics Comments

No Data

Offsite

No Data

Information Needs

No Data

ASSOCIATED ELEMENTS OF BIODIVERSITY

Element			Global	State	Driving
State ID	State Scientific Name	State Common Name	Rank	Rank	Site Rank
24847	<i>(Picea engelmannii) / Betula nana / Carex aquatilis - Sphagnum angustifolium</i> Woodland	Iron Fen	G2	S2	Yes

REFERENCES

Level 4 Potential Conservation Area (PCA) Report

Name Redwell Basin Iron Fen

Site Code S.USCOHP*23632

Reference ID

Full Citation

173839

Rocchio J., G Doyle, and R. Rondeau. 2003. Final Report: Survey of Critical Wetlands and Riparian Areas in Gunnison County, Colorado. Colorado Natural Heritage Program, Fort Collins, CO.

173182

Rocchio, J. 2002. Colorado Natural Heritage Program Field Survey of Critical Wetlands in Gunnison County.

ADDITIONAL TOPICS

Additional Topics

No Data

VERSION

Version Date 12/19/2002

Version Author Rocchio, F.J.

Disclaimer

These data are a product and property of Colorado State University, Colorado Natural Heritage Program (CNHP). These data are strictly "on loan" and should be considered "works in progress". Data maintained in the Colorado Natural Heritage Program database are an integral part of ongoing research at CSU and reflect the observations of many scientists, institutions and our current state of knowledge. These data are acquired from various sources, with varying levels of accuracy, and are continually being updated and revised. Many areas have never been surveyed and the absence of data in any particular geographic area does not necessarily mean that species or ecological communities of concern are not present. These data should not be regarded as a substitute for on-site surveys required for environmental assessments. Absence of evidence is NOT evidence of absence. Absence of any data does not mean that other resources of special concern do not occur, but rather CNHP files do not currently contain information to document this presence. CNHP is not responsible for whether other, non-CNHP data providers have secured landowner permission for data collected.

These data are provided for non-commercial purposes only. Under no circumstances are data to be distributed in any fashion to outside parties. To ensure accurate application of data, tabular and narrative components must be evaluated in conjunction with spatial components. Failure to do so constitutes a misuse of the data. The Colorado Natural Heritage Program shall have no liability or responsibility to the data users, or any other person or entity with respect to liability, loss, or damage caused or alleged to be caused directly or indirectly by the data, including but not limited to any interruption of service, loss of business, anticipatory profits or indirect, special, or consequential damages resulting from the use of operation of the data. Data users hereby agree to hold CNHP, Colorado State University, and the State of Colorado harmless from any claim, demand, cause of action, loss, damage or expense from or related to data users use of or reliance on the data, regardless of the cause or nature thereof, and even in the event that such cause is attributable to the negligence or misconduct of CNHP.

These data are provided on an as-is basis, as-available basis without warranties of any kind, expressed or implied, INCLUDING (BUT NOT LIMITED TO) WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT. Although CNHP maintains high standards of data quality control, CNHP, Colorado State University, and the State of Colorado further expressly disclaim any warranty that the data are error-free or current as of the date supplied