

Great Land Trust Compensatory Mitigation Plan for addition of site to Instrument

1. Objectives. Preservation of a 160 acre parcel.
 - i) The property provides important physical, chemical, and biological functions for the watershed.
 - ii) The resources to be preserved contribute significantly to the sustainability of the watershed.
 - iii) Preservation is appropriate and practicable for the property.
 - iv) The resources are under threat of destruction and/or adverse modification from transportation and industrial development.
 - v) The site will be protected through title transfer to a state resource agency.

2. Site selection. *Great Land Trust assessed the following site selection factors:*
 - a. The property contains high-value habitat as documented in Cook Inlet Wetlands Mat-Su Borough wetlands mapping (<http://cookinletwetlands.info/>) and the GLT credit calculation;
 - b. The property provides scenic views from the Little Su River and the Little Su Recreational River lands;
 - c. Conservation of the property is consistent with Susitna Basin Recreation Rivers Management Plan;
 - d. Preservation of the property helps meet the Mat-Su Salmon Partnership Objectives and Strategic Actions, USFWS- Great Land Trust Mat-Su Borough Parcel Prioritization and Mat-Su Borough Parks Plan;
 - e. The property is located adjacent to protected open space;
 - f. The property is a critical piece of wetlands and open space within a large wetland complex near Big Lake;
 - g. The property is located in the Mat-Su Borough. The Mat-Su is an area considered to be the fastest growing in the region;
 - h. The parcel meets the criteria required for mitigation under Section 404 of the Clean Water Act; the parcel has threat of development for industrial, transportation and subdivision purposes.

3. Site protection instrument. Great Land Trust proposes to permanently conserve the 160 acre parcel with a deed restriction and no surface occupancy agreement.

4. Baseline information. The property comprises three wetland types: Relict Glacial Lakebed (including patterned flarks and strangs), Discharge Slope, and Depression wetlands as classified by the Mat-Su Borough's Cook Inlet Wetlands Classification (<http://www.cookinletwetlands.info/Index.html>) as follows:

“Relict Glacial Lakebed wetlands are extensive peatland complexes occurring on expansive flat-to-gently sloping surfaces that formerly supported proglacial lakes. Peatlands develop on these surfaces through a process known as primary peat formation. In contrast to lake in-filling, the most familiar model of peatland formation, primary peat formation proceeds where peat builds up over large, flat marshy areas. The marshy areas occur where drainage networks are poorly developed, such as over relict glacial lakebeds, interfluvial areas on glacio-estuarine flats and at watershed divides where topographic relief is low. The

original marshes may have been fed by ground water discharge that is recharged at distant features such as moraines or upland hills, or simply by ample precipitation, which drains slowly from the flat landform. Primary peat formation is the process responsible for most of the peat found worldwide.

In the Cook Inlet Lowlands, Lakebed peatlands are often interspersed fens and bogs. Patterning is often present, where low-lying pools, which can dry up seasonally to form mud-bottoms (flarks), are separated by intervening linear strangs (low shrubby ridges). The linear strangs are oriented perpendicular to porewater flow through the peat. Tree islands are common. Tree islands may indicate areas where bog peat is forming over fen peat. Bog formation is common in the Susitna Valley west and north of Houston, where bogs may form over a layer of fen peat, or directly over the underlying mineral sediments.

Discharge Slope wetlands occur over hydric mineral soils where shallow groundwater discharges at or near the surface. Discharge Slopes typically occur at the transition between wetland and upland where the boundary can be indistinct. These wetlands often support high water tables only seasonally, and therefore can be difficult to identify. Shallow groundwater wells in the Mat-Su Valley indicate that sites with late-season water tables deeper than 150 cm can support hydric conditions sufficient to meet wetland criteria (Clark, 1995).

Depression wetlands are surrounded by uplands. These wetlands are commonly peatlands in ice-block depressions on large moraine complexes. They are also found on smaller moraines scattered throughout the lowlands, and on glacial outwash deposits around Palmer. Geomorphologically, Depression, Kettle, and Spring Fen Ecosystem wetlands are all "ice block depressions". Ice-block depressions formed when large blocks of glacial ice melted. The blocks were entrained within the glacial till that was deposited at the last glacial maximum, around 8-15,000 years ago depending on the location. Some ice blocks were more isolated than others, and some were entrained in moraines, while others were entrained within glacial outwash sediments. The different names: Depression, Kettle and Spring Fen, help distinguish differences in wetland jurisdiction and ecosystem services occurring in this geomorphic setting.

Depression peatlands typically support lower pH and specific conductance values than Kettles or Spring Fens, indicating more bog-like, rather than fen conditions, especially west of Houston in the Matanuska-Susitna Valley. Bog conditions indicate that precipitation is a more important source of water to the wetland than groundwater. The low specific conductance values show that evaporative concentration is not a dominant process, so losses from the wetland must be to groundwater. Depressions are therefore probably controlled by a layer of low hydraulic conductivity and by the relatively low solar insolation reaching the bottom especially in smaller, steeper-sided Depressions. Together, these factors produce a micro-climate with lower outputs of incoming precipitation to evapotranspiration and deeper ground water. Very steep-sided depressions, such as those found in the Crevasse Moraine area, south of Palmer, can even support permafrost. At least 30 cm of hard ice was encountered 27 cm below the surface under a black spruce canopy in one Depression in the Crevasse Moraine area late in the season, on 21 August 2007. In less extreme cases, a deeper frost layer likely persists for an extended time into the growing season."

5. Determination of credits. GLT proposes the following credit methodology:

Functional assessments of wetlands units were calculated using an adapted HMG rapid assessment. These assessments followed the Slope/Flat Wetland Complexes HMG Functional Assessment worksheet using both field collected and geospatially determined data based on the 2011 Mat-Su Borough LiDAR and aerial imagery. Wetland unit classifications and delineations were taken from the 2013 Cook Inlet Alaska Wetland Classification and Mapping dataset (CIW) (Gracz, 2013).

Relict Lake Bed Wetland Units

Site Number	Wetland Acres	Calculated Ave. % departure from Reference Stand	Credits ((100% - %Departure)/100)*WetAcres
1 (field assessment)	51.09	11.04166667	45.4488125
2 (field assessment)	18.24	16.92708333	15.1525
3 (field assessment)	12.15	8.559027778	11.11007813
4 (aerial assessment site)	11.08	13.99305556	9.529569444
7 (aerial assessment site)	9.18	11.04166667	9.856583333
8 (aerial assessment site)	2.31	11.04166667	2.0549375
9 (aerial assessment site)	0.3	11.04166667	0.2668749
		Sum	93.4193558

Discharge Slope Wetland Units

Site Number	Wetland Acres	Calculated Ave. % departure from Reference Stand	Credits ((100% - %Departure)/100)*WetAcres
5 (aerial assessment site)	3.58	20.06944444	2.861513889
		Sum	2.861513889

Depression Wetland Units

Site Number	Wetland Acres	Calculated Ave. % departure from Reference Stand	Credits ((100% - %Departure)/100)*WetAcres
6 (aerial assessment site)	0.63	19.77430556	0.50542
		Sum	0.50542

Total Credits 96.786

6. Mitigation work plan. No construction is proposed for the addition of this site to the instrument. The property will be acquired fee simple and transferred to DNR with a deed restriction and a no surface occupancy agreement restricting disturbance of the surface estate by the owner of the subsurface estate.
7. Maintenance plan. This is a preservation only mitigation project. There is no construction involved. The property will be in public ownership and managed by the State of Alaska DNR. The project sponsor will monitor according to the monitoring requirements for compliance with the deed restriction and management plan. After the monitoring period the state of Alaska will assume this responsibility. Signage will be installed if the monitoring visits show increased levels of use.

Land acquired by the State of Alaska is entered into the Department of Natural Resources' Land Administration System (LAS), the department's primary business database for storing information. The land information entered into the system is detailed in nature and "coded" based on how the property was acquired, any restrictions associated with the property, assignment of public interest, allowable uses and classification of the land, to name a few. As part of the State's adjudication process, the legal description or other identifying information for a specified land area is entered in LAS and a detailed list of all associated information is returned. This ensures that current and historical data associated with the specified property is evaluated prior to any adjudication action.

8. Performance standards. The project will achieve its objectives when the site protection mechanism is implemented.
9. Monitoring requirements. The property will be monitored by Great Land Trust for a period of 5 years. After this period, the State of Alaska will assume responsibility for compliance with the regulations of the Little Su Recreation River within the Susitna Basin Recreation Rivers Management Plan.
10. Long-term management plan. The property will be managed and maintained by the State of Alaska consistent with the Susitna Basin Recreation Rivers Management Plan. The State of Alaska has legal authority to enforce the provisions in the management plan to the fullest extent of the law. The property will be managed consistent with the Lower Little Susitna River subunit. This subunit has a "Class I" management intent for primitive recreation. The goals for the area include to manage the property for Fish and Wildlife habitat, for mitigation, to monitor for change in conditions, and for education.
11. Adaptive management plan. The Susitna Basin Recreation Rivers Management Plan will be updated as deemed necessary by the State of Alaska. The property will be subject to the deed restrictions in perpetuity.
12. Financial assurances. The property will be managed as part of the Little Su Recreation River. Funding and enforcement of restrictions for the Little Su Recreation River is through the State of Alaska Department of Natural Resources. Great Land Trust will

provide funding and personnel to monitor the property during the 5 year monitoring period.