



Pre-settlement

Mendel Wetland

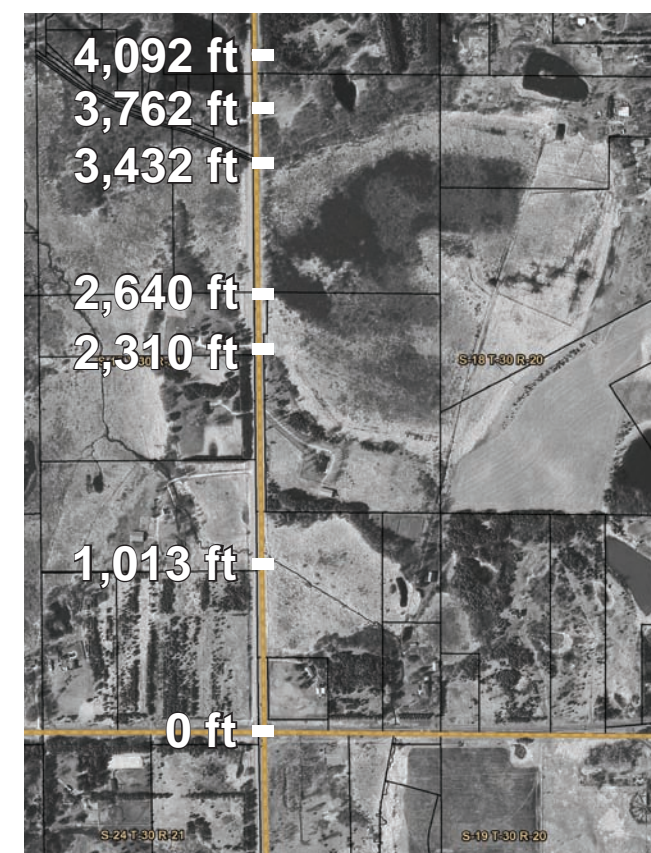
- Mendel Wetland appears to have originally existed as a black spruce – tamarack bog, with native wet meadow vegetation surrounding its fringes (i.e. sedge meadow dominated community)

Brown's Creek

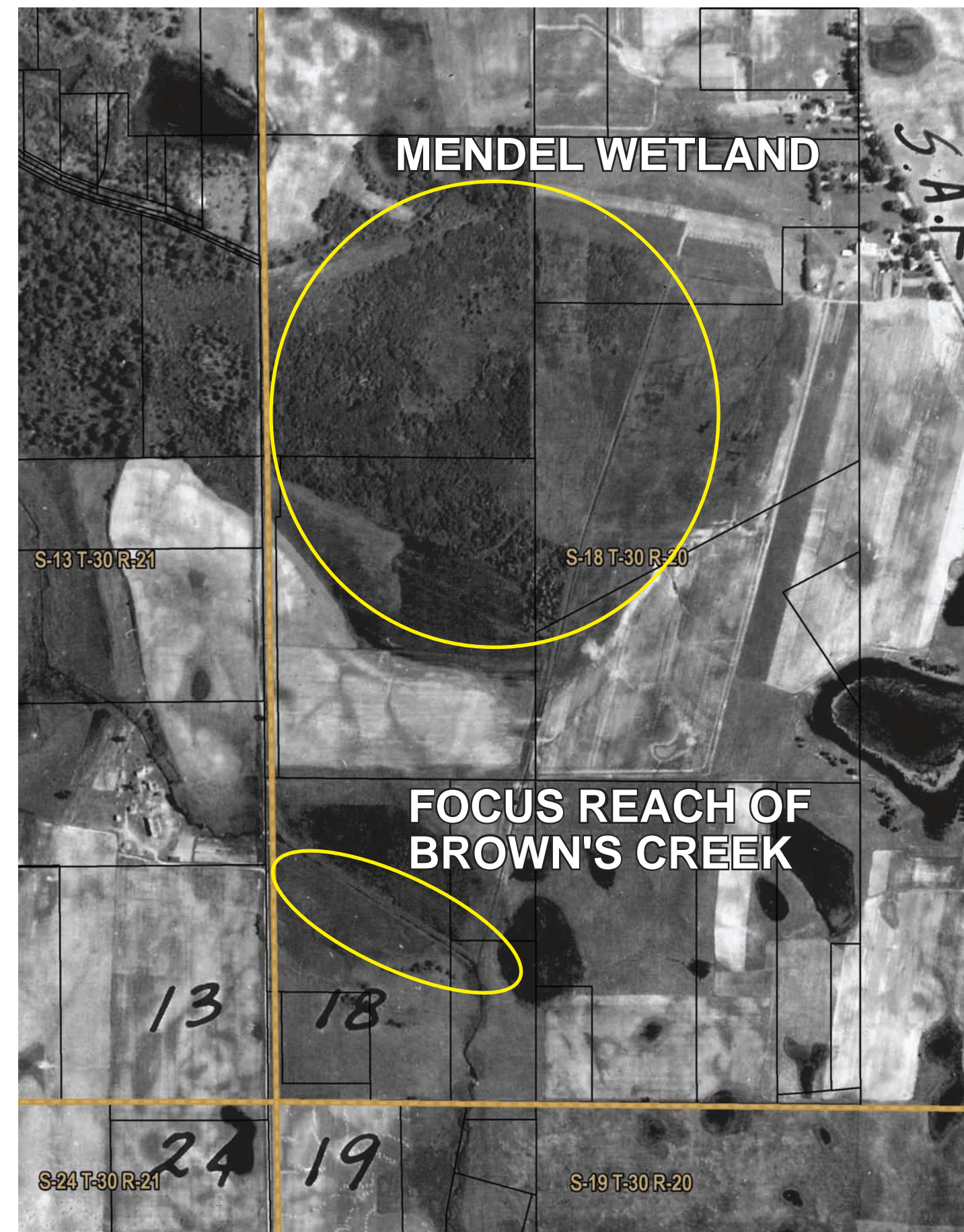
- Brown's Creek immediately downstream of present day Manning Avenue was a meandering stream (sinuosity (k) of 1.5+/-) through a sedge meadow

MN Land Survey Records - 1847

00.00 ft	North on line between Sections 13 & 18
1,013 ft	To a stream 15 links (9.9 feet) wide flowing east
2,310 ft	Enter tamarack swamp by SE
3,640 ft	Set a post at 1/2 section corner
	Spruce (Black) 8 inches in diameter bearing NE 20 links (13.2 feet)
	Spruce (Black) 8 inches in diameter bearing West 18 links (11.88 feet)
3,432 ft	Leave swamp
3,762 ft	To round pond
4,092 ft	Over pond
5,200 ft	Set a post at corner of section 7, 12, 13 & 18 made a mound



Summary: Low swampy 3rd rate land. Spruce timber. October 20th 1847



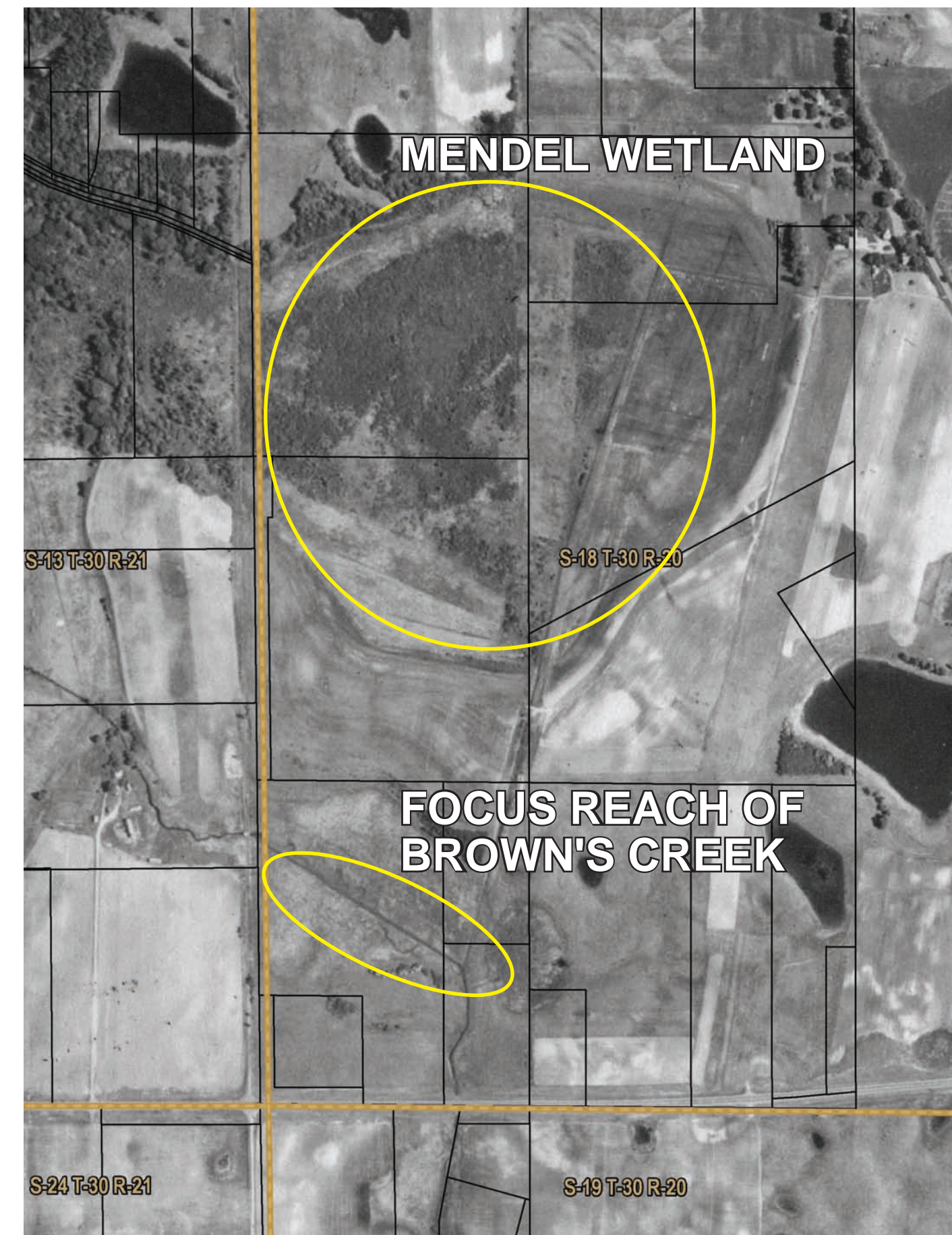
1938 (earliest aerial photography of area)

Mendel Wetland

- Evidence of man-made drainage ditches and other anthropogenic changes (clearing, farming, grazing, etc.) are apparent throughout the Mendel Wetland, more intensely on eastern and southern quarters. Main drainage ditch was cut to the south, providing a direct connection to Brown's Creek
- As a consequence, the plant communities of the Mendel wetland had started to shift away from being dominated by black spruce and tamarack to a wetland system more dominated by shrubby plant species such as alder and glossy buckthorn

Brown's Creek

- Brown's Creek has already been channelized by this date. Adjacent wetlands are grazed and/or utilized for hay cropping



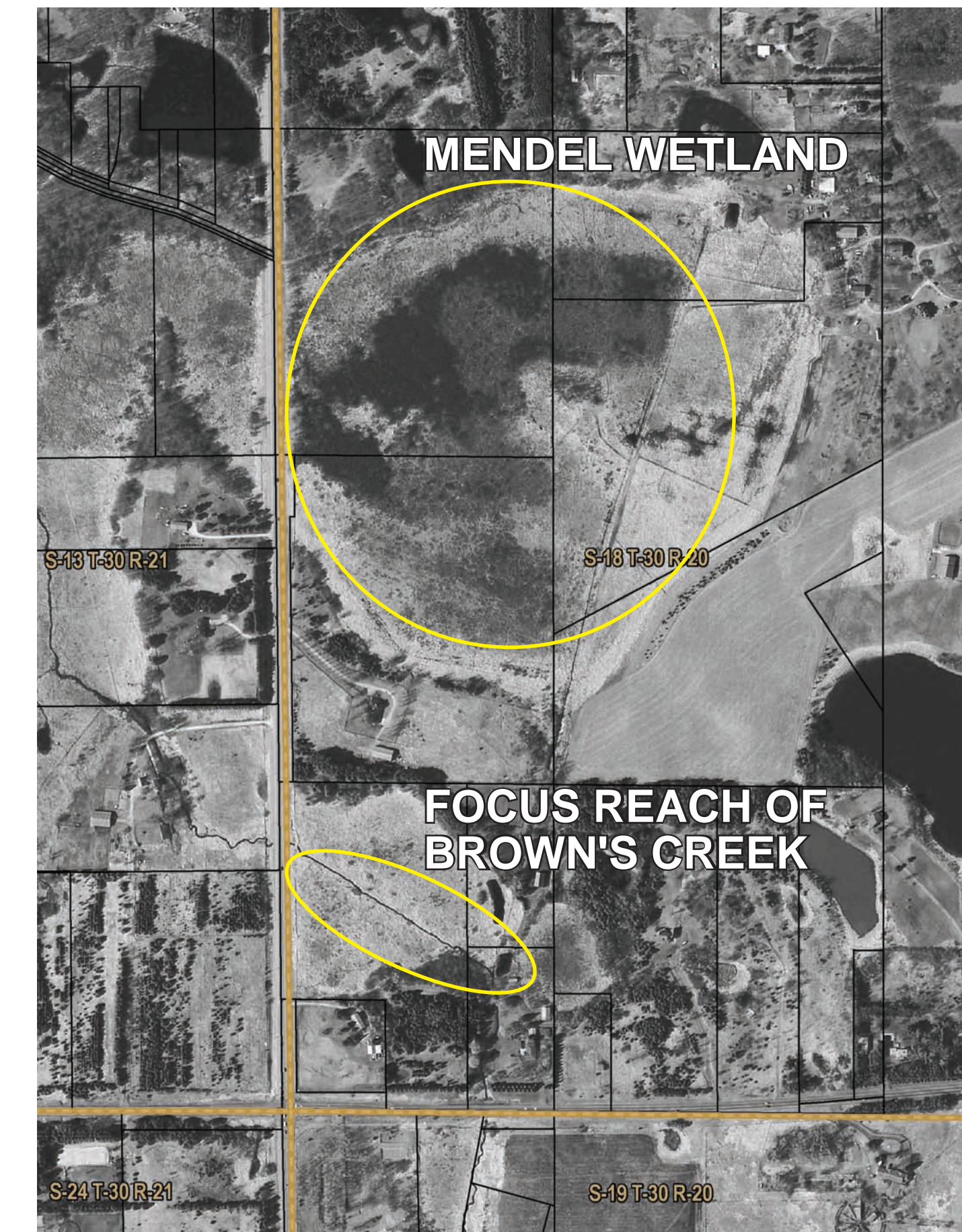
1957

Mendel Wetland

- Fewer conifer trees in Mendel wetland, continual dominance by shrubs in the interior
- Landuse (farming) and light intensity reading from aerial photography indicate that the wet meadow fringes were becoming more dominated by reed canary grass - an invasive non-native specie

Brown's Creek

- Note the signatures of the former meandering water course of Brown's Creek, which are apparent in the 1957 aerial photography



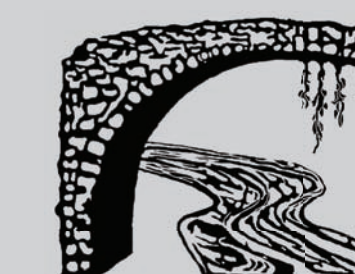
Present Day

Mendel Wetland

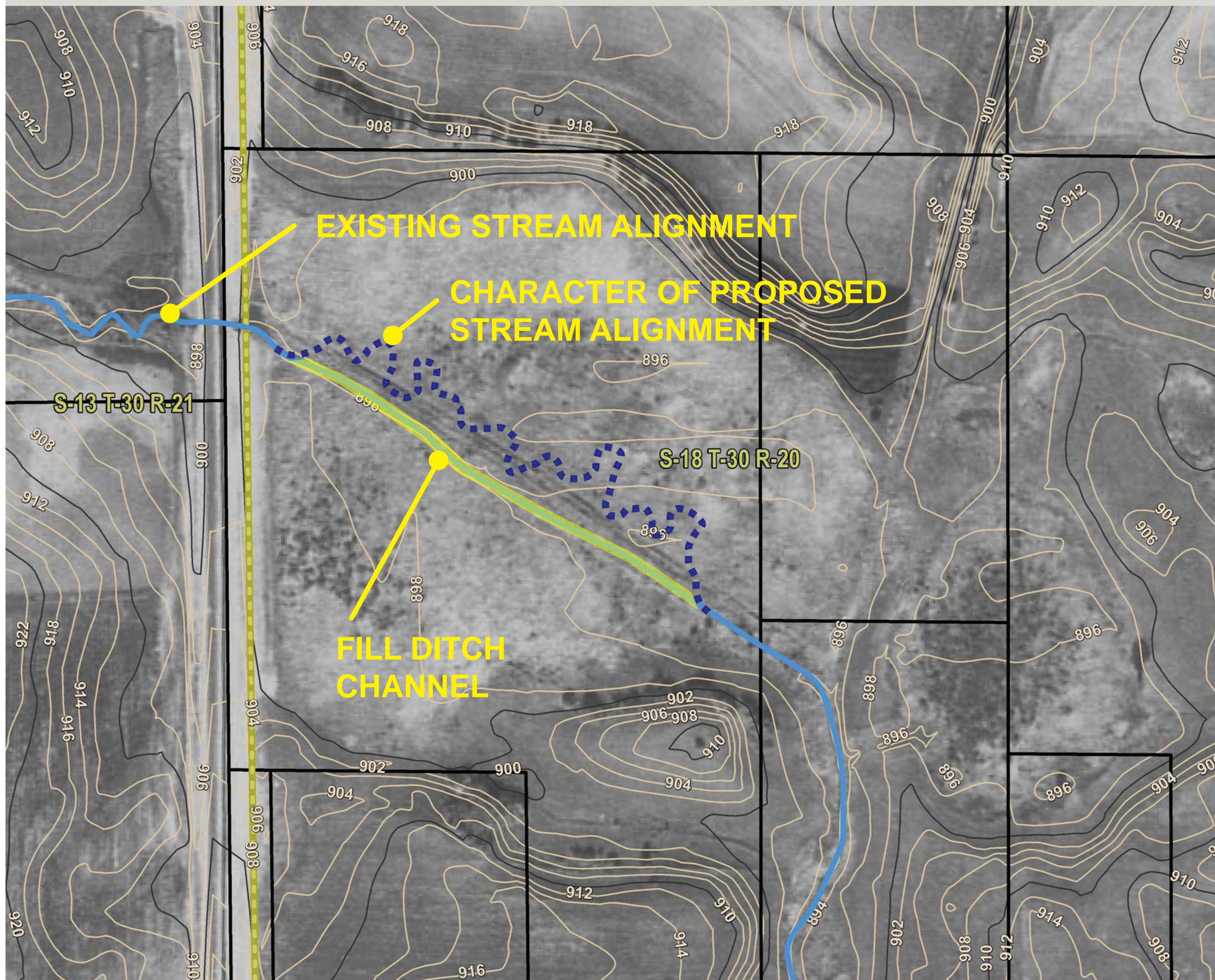
- Additional lateral drainage ditches have been added to the Mendel wetland system since 1957
- Aerial photographs and recent vegetation surveys on the ground indicate that Mendel wetland's interior has become dominated by glossy buckthorn (an invasive non-native species), and the surrounding wet meadow fringes have become dominated by reed canary grass

Brown's Creek

- Woody shrub (mostly Willow species), establishing in wetland adjacent Brown's Creek due to fallow condition and drainage of wetland (slight stream entrenchment).
- Prior assessments of Brown's Creek have illustrated that this reach currently provides very poor habitat; adjacent wetland is dominated by reed canary grass - an invasive non-native



Concept Plan



Benefits/Goals

Environmental

Improvement of fisheries habitat

Economic

Increase property value

Social

Education – awareness of resource and restoration

Objective

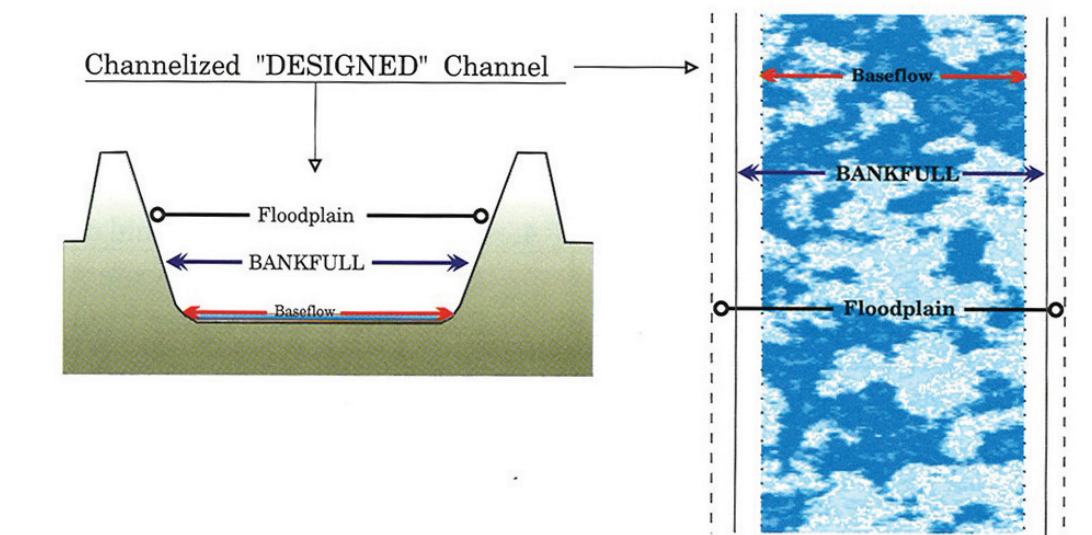
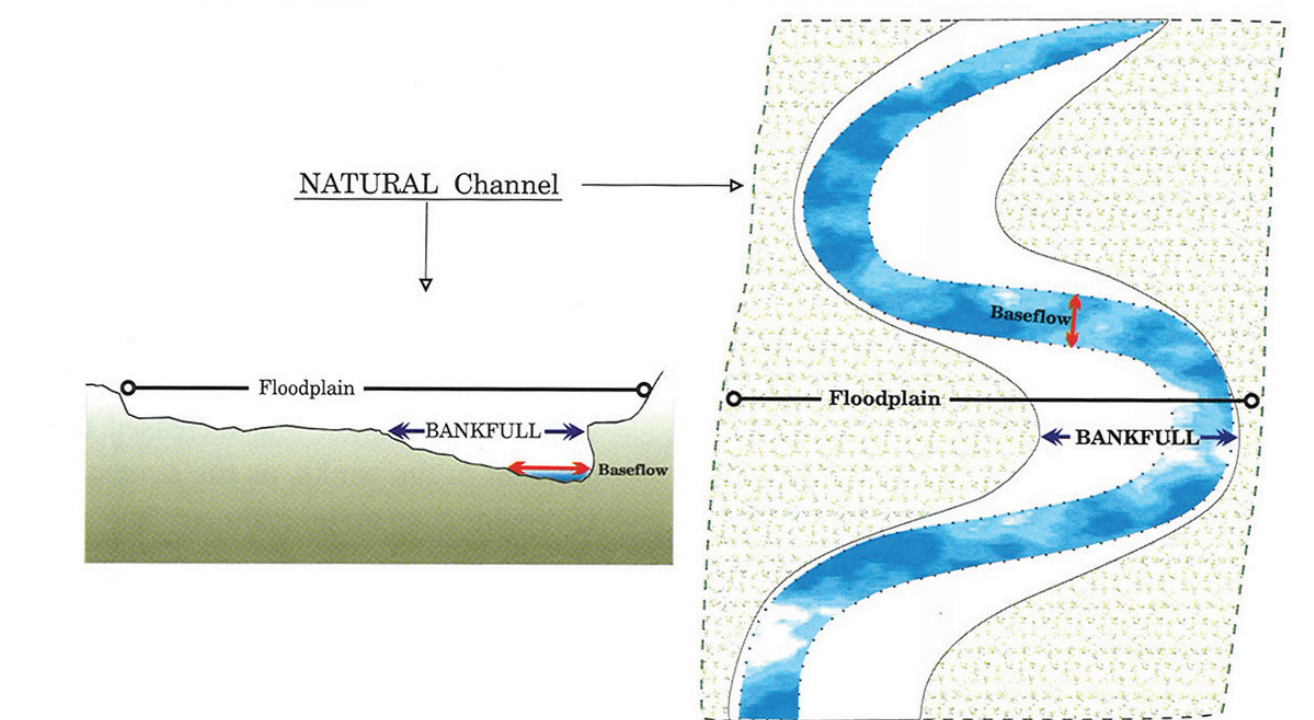
Due to past ditching of Brown's Creek and other anthropogenic alterations down stream of Manning Avenue this reach is degraded and affords poor habitat. A viable opportunity exist to reverse the effects of channelization and restore this designated trout fishery.

Character of Construction

1. Dig 875' +/- of new channel over winter #1
 - a. Excavated material will be stockpiled; portion may be hauled off site
 - b. Newly dug channel will be seeded and planted with native vegetation and stabilized at this time
2. New channel remains "off-line" for following spring, summer and fall
 - a. old channel still carrying flow; while vegetation is establishing in new channel
3. New channel is brought online during winter #2
 - a. old channel is filled with stockpiled soil
 - b. remaining disturbed areas are seeded and stabilized

Questions to be Addressed

1. Environmental Impact Statement:
 - Determine change in flooding frequency, duration and elevation, if any
 - Determine wetland impacts, if any
 - Determine plant and animal impacts, if any
 - Geologic hazards and soil conditions
 - Identification, if any and impact to archaeological resources if any
2. Need for easement(s) or agreement
3. Identification of drain tile and impact to system, if any

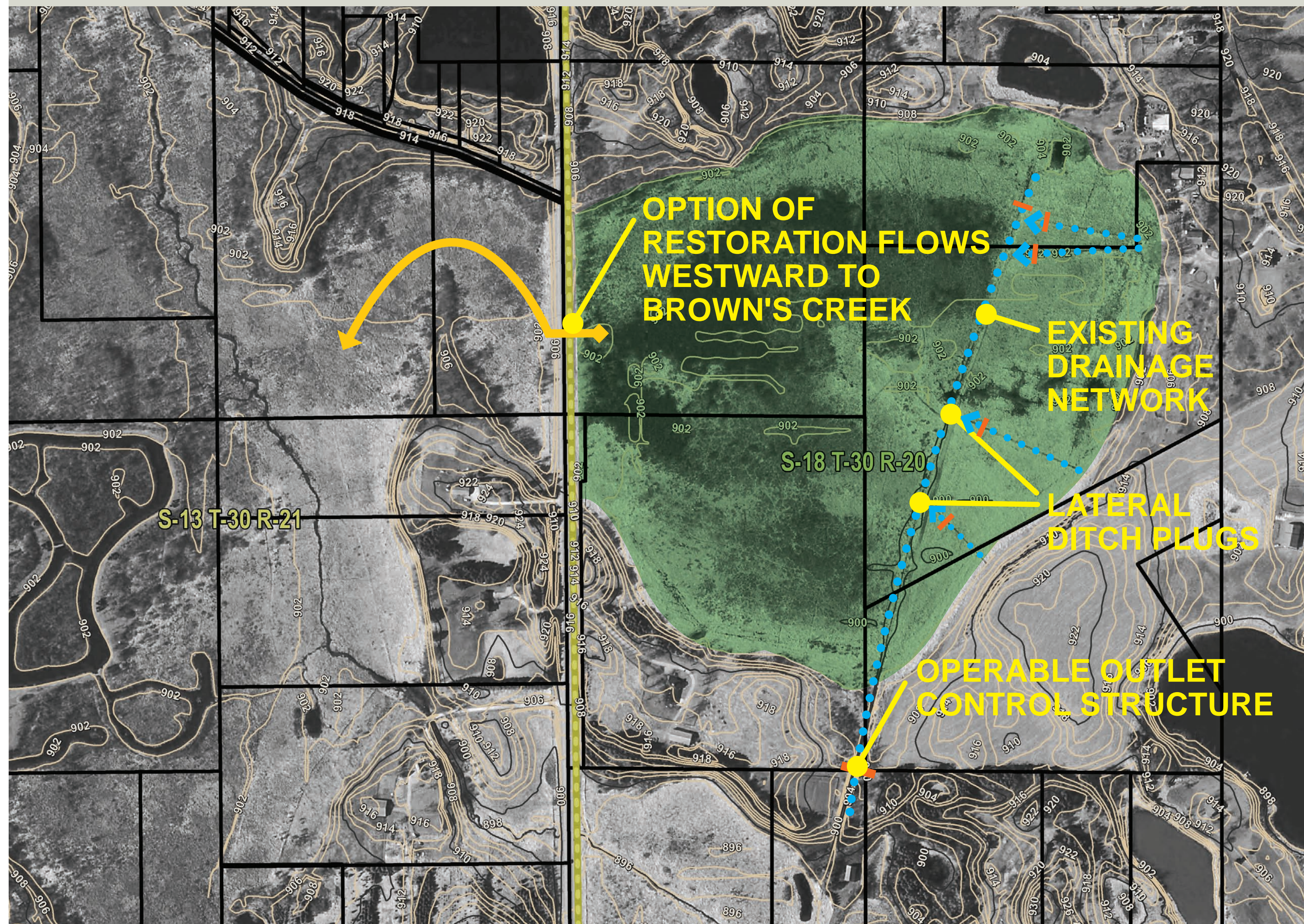


PROPOSED PROJECTS
Creek Restoration—D.S. of Manning Ave



PROSPECTIVE IMPROVEMENT PROJECTS
BROWN'S CREEK WATERSHED DISTRICT - FEB 2010

Concept Plan



Benefits/Goals

Environmental

Restoration of rare plant community – Tamarack Swamp
 Water quality – reduce downstream nutrient input
 Water quantity – reduce peak flow and restore base flow
 Groundwater recharge

Economic

Increase property value

Social

Educational – awareness of resource and restoration
 Improved aesthetic

Objective

A viable opportunity exists here to restore a Tamarack/Spruce Bog, a rare plant community in Washington County. To realize this and many other benefits hydrology will need to be restored to this wetland complex.

Character of Construction

Preconstruction

Monitoring groundwater and surface water fluctuations

Construction

- Modification of any drain tile systems, if necessary
- Construct an operable outlet structure at outlet of wetland
- Modify Manning Avenue culvert crossing, if necessary

Vegetation Management

Activities to promote growth and regeneration of tamarack swamp plant species (seed collection, plantings, and invasive species control)

Post Construction

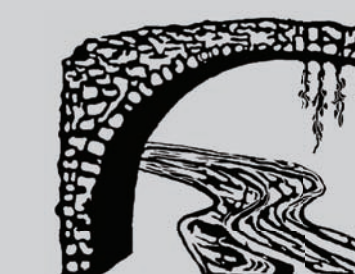
Monitoring of groundwater and surface water fluctuations – adjustments to outlet if necessary

Questions to be Addressed

1. Model change in flooding (frequency, duration and elevation) and groundwater elevation, if any:
2. Survey critical areas to accurately model
3. Identify any drain tile systems
4. Explore option of restoring historical flow to the West
5. Determine wetland impacts, if any
6. Determine plant and animal impacts, if any
7. Need for easement(s)



PROPOSED PROJECTS
Mendel Wetland Restoration



PROSPECTIVE IMPROVEMENT PROJECTS
 BROWN'S CREEK WATERSHED DISTRICT - FEB 2010