Water Quality Standards

**Designated Beneficial Uses**

- Drinking Water
- Recreation
- Aquatic Life
- Agriculture
- Great Salt Lake

**Criteria**

*Numeric:*
- Toxic substances
- Salinity
- pH
- Oxygen

**Narrative**
Designated Uses

5E Transitional Lands
- waterfowl, shorebirds, food web, recreation

Impounded wetlands within [...] wildlife management areas
- waterfowl, shorebirds and food web
- Non-game fish and other aquatic life
- recreation

All waters of the state (marshes)
- Recreation
- Aquatic life

- **Willard Spur**
- **Great Salt Lake wetlands**
Examples of Existing Wetland Designated Uses

Wildlife habitat
Aquatic life
Recreation
Wetland
Agriculture & irrigation
Water supply protection
Water quality enhancement
Aesthetics
Flood attenuation
Industrial use
Narrative Standards

- General Statements of water quality goals
  - There SHALL be:
    - *No floating material*
    - *Biological and community structure maintained*

- Describe things not well captured by numeric standards
  - *Wetlands*

- Starting point for numeric standards and biological assessment methods
Examples of Wetland Narrative Standard Criteria

Biological community
Toxicity
Turbidity
Temperature
Radioactivity
Pathogenic organisms
Biostimulatory substances
Hydrology
Algae
Junk and refuse
Bioaccumulation or pesticides
pH
Willard Spur
Wetland Water Quality Standards

Wetland Designated Use

Waterfowl

Wetland Narrative Criteria

Narrative ‘shall be …’

• 
• 
• 
• 
• 
• 

Division of Water Quality
Great Salt Lake Wetlands

- Submergent
- Tall emergent
- Meadow
- Short emergent
- Playa
- Mudflat

Legend:
- Aquatic Bed
- Emergent Meadow
- Playa
- Emergent Marsh
- Mudflat
- Deep Water
- Shallow Water
- GSL Meander Line
- Management Area
- Evaporation Ponds
Great Salt Lake Wetlands

- Impounded Wetlands
- Fringe Wetlands
- Playas & Mudflats
Targets

Playas and Mudflats

Fringe Marsh

Impounded Wetland
Impounded wetlands

- Dikes, canals, & headgates create stable, extended flooding
- Depth gradient: Submergent → emergent → meadows
- Supports nesting, loafing and foraging habitat for all bird guilds
  - Cinnamon Teal
  - Redheads
  - Tundra Swans
  - American Avocets
  - Black-necked Stilts
  - Wilson’s Phalaropes
  - American White Pelicans
  - Franklin’s Gulls
  - Forster’s Terns
Fringe wetlands

- Unmanaged wetlands, high and low
- Shifting mix of submergent and emergent wetland types
- Supports nesting, loafing and foraging habitat for all bird guilds
  - Cinnamon Teal
  - Redheads
  - White-faced Ibis
  - Black-necked Stilts
  - Western Grebes
  - Forster’s Tern
  - Wilson’s Phalaropes
Playa wetlands

- Flat shoreline habitat, fluctuate with GSL
- Playas have halophyte plants, mudflats are unvegetated
- Supports nesting, loafing and foraging habitat for all bird guilds
  - Snowy Plover
  - Black-necked Stilts
  - American Avocets
  - Long-billed Dowitchers
  - Marbled Godwits
  - Western Sandpipers
  - Long-billed Curlews
Targets > Nested Targets

- Impounded Wetland
- Fringe Marsh
- Playas and Mudflats
- Shorebirds
- Waterfowl
- Waterbirds
Division of Water Quality

Targets > Nested Targets > Ecological Attributes

Hydrologic Regime  Size  Plants

Chemical Regime  Macroinvertebrates  Nutrient Regime
## Nested Targets Habitat Requirements

<table>
<thead>
<tr>
<th>Waterfowl</th>
<th>Shorebirds</th>
<th>Waterbirds</th>
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<tbody>
<tr>
<td>Diving Waterfowl</td>
<td>Large Shorebirds</td>
<td>Piscivorous Birds</td>
</tr>
<tr>
<td>Dabbling Waterfowl</td>
<td>Small Shorebirds</td>
<td>Colonial Birds</td>
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</tbody>
</table>

### Feeding
- **Macroinvertebrates, Tubers**
- **Macroinvertebrates, Leaves, Seeds**
- **Macroinvertebrates**
- **Macroinvertebrates**
- **Fish**
- **Macroinvertebrates**

### Nesting
- **Emergent Vegetation**
- **Meadow Vegetation**
- **Playa/Mudflat**
- **Playa/Mudflat**
- **Islands**
- **Meadow Vegetation**
### Ecological Attributes > Indicators

**Hydrologic Regime**

<table>
<thead>
<tr>
<th>Playas and Mudflats</th>
<th>Fringe Marsh</th>
<th>Impounded Wetland</th>
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</thead>
<tbody>
<tr>
<td>Diversity of salinity conditions, topography, and hydrology</td>
<td>Presence of submergent, emergent, meadow, and playa wetlands</td>
<td>Flooding depth, flushing flows</td>
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</tbody>
</table>
# Proposed GSL Wetlands KEAs

<table>
<thead>
<tr>
<th>Key Ecological Attribute and Indicator</th>
<th>Impounded Wetlands</th>
<th>Fringe Wetlands</th>
<th>Playas &amp; Mudflats</th>
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</thead>
<tbody>
<tr>
<td>Hydrology – Timing &amp; quantity</td>
<td>☑</td>
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<tr>
<td>Chemical Regime - Toxic substances</td>
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<tr>
<td>Nutrient regime – Availability &amp; cycling</td>
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<tr>
<td>Macr invertebrates - composition &amp; biomass</td>
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<tr>
<td>Plants – Composition &amp; diversity</td>
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<tr>
<td>Plants – SAV cover &amp; condition</td>
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<tr>
<td>Size</td>
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