

# Upper Mississippi River

*National Wildlife & Fish Refuge*

*La Crosse District*

*Visitor Center/Offices and Maintenance Facility*



## Leadership in Energy and Environmental Design (LEED) Features

### Onalaska, Wisconsin

#### What is LEED?

The Leadership in Energy and Environmental Design (LEED) certification program was developed by the U.S. Green Building Council to encourage builders to think critically about the long-term environmental sustainability of their structures. New or renovated buildings are voluntarily evaluated and awarded points in five categories: site selection, water efficiency, energy-wise strategies, sustainable building materials, indoor air quality, and awareness and education. These points provide a baseline standard for what it means to build “green.” The Upper Mississippi River National Wildlife & Fish Refuge’s new Visitor Center/Offices, located near Brice Prairie, Wisconsin, will receive silver-level certification. The Maintenance Facility also meets silver-level certification. More information about the U.S. Green Building Council and LEED certification program can be found at: [www.usgbc.org](http://www.usgbc.org). Information specific to how LEED points are awarded can be found here: <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=220>

#### Capturing Sunlight

##### Photovoltaic Panels

On the south side of the visitor center, 156 photovoltaic modules turn sunlight into electricity. Working in two groups of modules, these groups are each called a “panel.” When sunlight hits the modules, electrons in the building materials of the module are energized by the sun’s rays, creating direct current, or DC, electricity. An adapter inside the building transforms DC electricity into alternating current, or AC, electricity, which can be used to power the buildings. The panels are expected to provide up to 30% of the electricity needed to run the building each day, or about 48,400 kilowatts per hour per year. When power is not needed it flows back into the grid. In effect, anyone on the grid could, at times, be using solar power from these panels.

##### Solar Thermal Panels

While the photovoltaic panels turn sunlight into electricity, three solar thermal modules on the southwest corner of the visitor center capture heat from the sun to warm water. Glycol, an anti-freeze-like liquid, flows through a closed loop system in each of these modules. The glycol heats up as the sunlight hits the tubes. The heated glycol flows back into the building and through coils in a hot water tank, warming the water within without ever touching it directly. On cloudy days, the solar thermal modules are assisted by an electric water heater. A thermal regulator inside prevents the water temperature from rising above 110°F.



Three solar thermal modules can be seen on the back of the new visitor center . The solar thermal panels utilize sunlight to heat water for the restrooms and sinks. To the right of these solar thermal modules, 156 photovoltaic modules form two panels that transform sunlight into electricity.

## Utilizing Rainwater

### *Rainwater Collection*

On the southeast side of the visitor center, black plastic circles beneath the rain gutters mark the areas where rainwater is collected. Inside each black circle are various sized rocks on top of a mesh filter. The rocks and mesh help filter the rainwater before it moves downward through the black cylinders and into a 3,000 gallon rainwater collection tank. Water in the rainwater collection tank is used to flush the toilets and urinals. When rainwater is scarce, water from the well will be used instead.

### *Stormwater Management*

Roofs, parking lots, and sidewalks can create large amounts of runoff water after a rain storm. As paved areas don't allow rain water to re-enter the ecosystem, this water can flow into roadways, contribute to erosion around paved surfaces, and often carries debris. To help keep runoff water on the Refuge, five shallow infiltration basins have been constructed near the parking lots and sidewalks. The soil types in these basins have a low clay content to let any water that collects there drain within a day of the last rain. Additionally, planting native species of grasses and wildflowers in and around these basins helps soak up excess water.

## Producing Heat/Cooling

### *Geothermal Heating and Cooling*

About ten feet below the grasses and wildflowers, the ground temperature is unaffected by the hot sun or cool frosts. The temperature here stays between 50°F - 55°F throughout the year. This means that in the winter, when the ground is warmer than the air outside, a heat pump can draw warmth from water flowing through pipes in the ground — heating the buildings from a starting temperature of 55°F rather than 10°F. In the summer the reverse is true – heat from the buildings is put into the water, which is cooled again in the earth. Fifty percent of the visitor center floors use a radiant floor heating system.

## Using Sustainable Materials

### *Marmoleum® floor*

Inside the multipurpose room, a swirl of beige and blue brings the prairie and river ecosystems of the Upper Mississippi River National Wildlife & Fish Refuge together. This smooth floor is made of natural and renewable materials including linseed oil, limestone, cork flour, wood flour, and natural pigments. Marmoleum® flooring is expected to last at least 25 years and is fully biodegradable.

## Native Landscaping

Native grasses and wildflowers have been planted to restore the land to a sand prairie ecosystem. Adaptations like deep roots and narrow leaves (to reduce moisture loss) allow the plants to survive moderate periods of drought and help anchor the soil against wind and rain. The plants provide food, habitat, and nesting sites for native wildlife.



Rainwater is filtered by mesh and rocks before entering a collection tank.



The floor of the multipurpose room is made of all natural materials.



A bee benefits from the pollen and nectar of the perennial wildflower, spotted bee balm.

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*The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.*