Sustainability Bulletin # 2 – Sustainability Projects

A brief highlight of ongoing sustainability activities at U.S. Fish and Wildlife Service refuges and hatcheries

Energy Efficiency Focus

The U.S. Fish and Wildlife Service (Service) has many projects underway that are designed to increase energy efficiency and reduce energy consumption. This bulletin provides a sample of projects implemented at Environmental Management System (EMS) facilities nationwide that improve efficiencies in lighting, structural components, transportation and fueling, and water conservation.

Lighting

Fluorescent Fixtures – Spring Creek NFH, Region 1

To reduce energy consumption and increase cost savings, Spring Creek National Fish Hatchery (NFH) replaced all incandescent lighting in an egg incubation building with green, low-wattage fluorescent fixtures. The former incandescent fixtures (144 fixtures @ 300 watts each) produced 43,200 watts, while the new fluorescent fixtures (89 fixtures @ 64 watts each) produce 5,696 watts for full lighting, thus resulting in a power reduction of 87%.

Occupancy Sensors - Dexter NFHTC, Region 2

Dexter National Fish Hatchery and Technology Center (NFHTC) installed 28 occupancy sensors to control lighting in five buildings throughout the Hatchery. Sensors are of the passive infrared and ultrasonic detection types. The sensors control a total of 280-32 watt T8 fluorescent bulbs. The sensors are programmable for a variety of parameters; the most important being the length of time that light remains on after movement is no longer detected. Each of the sensors have a "walk through" mode which shortens the time the lights remain on even further; if motion is not detected after the first 30 seconds that the area is occupied. The standard passive infrared sensors are used in the majority of locations. The ultrasonic sensors work well in bathrooms as they can detect occupancy behind stalls and do not turn out the lights if no movement is present in the detection zone, as the passive infrared sensors will. The lighting control sensors have worked especially well in bathrooms and storerooms where individuals often neglect to extinguish the lights when they leave. For areas not accessed on a regular basis, it can be days before it is discovered that lights were left on. The estimated energy savings is between 30-40% less electricity usage.

What is an EMS?

An EMS is a set of processes that the Service uses to: establish goals for reducing impacts to the environment from our operational activities (including energy and transportation); implement plans to meet the goals; evaluate progress; and make continual improvement. The Service has deployed, maintains, and audits EMSs at 66 designated field locations.

Transportation and Fueling

Honda Hybrid Electric – Charles M. Russell NWR Complex

Fuel Efficient Sedans - Charles M. Russell NWR Complex, Region 6

The Charles M. Russell (CMR) National Wildlife Refuge (NWR) was one of the first Service facilities to purchase two hybrid electric vehicles. The hybrid pictured above has an average fuel efficiency of 47 mpg and 145,000 total miles. Also included in the fuel efficient fleet are flex fuel sedans and mission-essential biodiesel trucks. The CMR NWR Complex vehicle fleet travels upwards of one million miles per year, a greenhouse gas savings of 70%.

Electric Utility Cart – J.N. Ding Darling NWR

J.N. Ding Darling NWR, Region 4

With four Neighborhood Electric Vehicles and one hybrid car, Ding Darling NWR has established a sustainable vehicle fleet for daily travel across the Sanibel Island location.

Transit Study - Parker River NWR, Region 5

In order to promote transportation efficiencies throughout the Refuge, Parker River NWR completed a Transit Study with recommendations to acquire a 28-passenger bio-diesel bus for refuge and partner programs.

Sustainable Fueling Stations – Arctic NWR, Region 7

Artic NWR installed two 2500-gallon sustainable fueling systems at Galbraith Lake and Arctic Village. The benefits of fueling stations are two-fold; they sustain the refuge's mission by providing accessibility to fuel in a remote location, and use renewable energy to operate the system. The systems are mostly powered by batteries that are charged by a combination of solar panels and a wind generator. However, when the system is down or during the winter months, an alternate diesel generator is used.

Turbine, Tank and Cabin, Arctic NWR - Galbraith

Powershed Array, Arctic NWR - Galbraith

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Water Conservation

Domestic Waterline Replacement - Coleman NFH Complex, Region 8

Coleman NFH replaced domestic water lines throughout the Hatchery. Approximately 200 feet of the 2" water main was replaced by directional drilling. This line supplied the station quarters. A new supply line to each of the quarters was also installed. The line was replaced as it was deteriorated due to electrolysis and was badly pitted and beginning to leak.

Rainwater Collection System - Necedah NWR, Region 3

Necedah NWR's new visitor center incorporates a rainwater collection system. This system provides water supply to building toilets and urinals. Rainwater is collected from roof downspouts, then filtered, and piped to a 10,000 gallon underground storage tank. The level of water in the tank is monitored through a remote wireless level alert located in the west mechanical room. This monitor reduces the number of times personnel must actually enter the tank. In the event of low tank water level, the solenoid valve in the mechanical room is powered open allowing building toilets and urinals supply piping to be pressurized by the well water system.

Rainwater Harvesting - Panther Swamp and Yazoo NWRs, Region 4

Each building in Panther Swamp and Yazoo NWRs contains its own Rainwater Harvesting System which collects and stores rainwater in an above ground cistern. An above ground cistern was chosen as a visual element for visitors to learn and see how the rainwater is collected. Each cistern has a 2,500 gallon capacity, which is enough to carry the refuge through the longest recorded drought in the last 50 years. The rainwater is collected and stored to use for flushing all toilets, the janitor mop sink and all exterior garden hose outlets. Collecting rainwater at these locations will save approximately 110,000 gallons of water each year.

Aboveground Cistern – Yazoo NWR

Structural Components

PV Vehicle Shade Structure – Bosque del Apache

Solar Water Heater – Bosque del Apache

PV Array Vehicle Maintenance Shop – Bosque del Apache

High Efficiency Roofing - Bosque del Apache NWR, Region 2

Bosque del Apache NWR has maximized roof efficiency by installing three solar water heaters in residences and lounge, AC Foam Roof insulation and coating (R44) at the bunkhouse, 6 kW and 12kW Photovoltaic (PV) arrays at the fire management building and maintenance shop, and a vehicle shade structure with PV arrays. These high efficiency projects reduced approximately 40% of the metered electricity usage.

Photovoltaic System – Panther Swamp NWR

Solar Photovoltaic System - Panther Swamp and Yazoo NWRs, Region 4

Another sustainable element at Panther Swamp and Yazoo NWRs is the Solar Photovoltaic (PV) System installed on the standing seam metal roof in the form of adhesive strips. Each PV strip fits tightly within the width of the metal panels and generates a percentage of power from the south facing roof slopes. As the Solar PV system generates power it feeds into an inverter that converts the sun's energy into electricity. The power that is generated is fed back though the electrical grid essentially reversing the meter to reduce the refuge's power bills. The PV systems installed on each building generate approximately 35-45% of the building's power use.

Want more information?

For additional detail on the Service's Sustainability initiatives, please visit: https://inside.fws.gov/go/post/ECB-Sustainability

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