

Lee Metcalf National Wildlife Refuge

Seasons of Wildlife & Highlighted Species

Source: fws.gov/refuge/lee-metcalf/species

Seasons of a Wetland

"Nowhere is the intricate relationship between water, wetlands and human survival better illustrated than in the case of the Nile River and ancient Egypt. The cyclical ebb and flow of the river waters determined the fortunes and fate of the powerful civilization that grew in the area and left its weighty marks." Convention on Wetlands (Ramsar, 1971) Culture Working Group

Wetland Processes

Seasonal wetlands are the result of many variables and processes: groundwater tables, climate, geology, topography, soil type, glaciation, groundwater movement, irrigation, land use, etc. The climate/hydrology in place at Lee Metcalf National Wildlife Refuge was documented by Heitmeyer, Artmann and Frederickson (2010) in the publication: An Evaluation of Ecosystem Restoration and Management Options for Lee Metcalf National Wildlife Refuge. Snowpack (melt) from the Bitterroot River drainage (2,500 sq. mile) is a major contributing variable to Refuge hydrology; here are two figures from the Refuge Comprehensive Conservation Plan highlighting the flood of 1974 and Bitterroot River streamflow measured at Darby. Many of the wetlands on the Refuge are not seasonal in nature; they are sloughs and oxbows, remnants of the former Bitterroot River channel.

Wetland Ecology

Wetland impoundments (man-made wetlands) on the refuge were constructed and developed to provide open-water habitat for migratory waterfowl and shorebirds. As a consequence, the Refuge has become an important refuge for migratory birds during the spring and fall. Waterfowl breeding and brood rearing occurs on Lee Metcalf National Wildlife Refuge with a great variety of waterfowl using the refuge for these life history requirements; however, the refuge is not a major production refuge. The most important habitat management efforts will focus on providing optimal habitat for foraging and resting during migration. Lowering the water levels will serve to increase food availability by concentrating foods in smaller areas and at water depths within the foraging range of target wildlife. The rate and timing of drawdowns have important influences on the production and composition of semi-permanent wetland plants and invertebrates that provide protein-rich food resources for each of the target bird species.

Wetland Impoundment Target Species Selection Process

Early in the Comprehensive Conservation Plan process, the planning team selected three groups of target species (representatives of guilds of species) that support the objectives and strategies described under the habitat goals for the Bitterroot River floodplain, wetland impoundments, and grassland and shrubland habitat. Part of this process was to review three separate documents focused on sustaining or recovering species in Montana: the "Montana Intermountain West Joint Venture Plan," "Montana State Conservation Plan," and the "Bitterroot River Subbasin Plan." An

initial list was developed based on whether a species either occurred on the refuge or could occur on the refuge if its preferred habitat was expanded or restored, as indicated under each goal. Almost all of the species selected are recognized in these three documents. The life history needs of over 100 species were examined for similarities and relevance to the proposed goals. The final lists of 16 species were selected based on their ability to represent guilds or because they were good indicators of the quality of a specific habitat type. The habitats that support the migration, foraging, and nesting needs of these selected species should benefit a much broader group of secondary bird species as well as a variety of other wildlife, both migratory and resident. These target species will be monitored for trends in abundance and distribution to evaluate the effectiveness of these actions.

Seasons of Wildlife

The climate of the Bitterroot Valley is characterized by cool summers, generally light precipitation, little wind, and relatively mild winters. Annual precipitation averages about 13 inches but is variable related to position in the valley. The growing season in the Valley averages about 103 days; on average, the last freeze occurs May 30, and the first frost occurs September 10.

Spring

Spring is the wettest season of the year; about 25 percent of the annual precipitation occurs during May and June. Runoff via the Bitterroot River drainage is highest in spring; 55 percent of the river's discharge also occurs in May and June following snowmelt and local rainfall. Most years there is regular backwater flooding; in periodic years there is overbank flooding that inundates large areas of the floodplain for brief periods of time. These drainage forces, the Bitterroot River most obvious, created the heterogeneous mix of communities: riverfront and gallery forest next to the Bitterroot River and floodplain drainages, persistent emergent wetland communities along floodplain drainages and fluvial-created depressions, wet meadow habitats, and grassland and sagebrush communities on higher elevation terraces and alluvial fans.

For you wildlife watchers, each community does not have strict boundaries, but different species favor some over others...adjust your efforts accordingly. Eighty-nine percent of the birds on the Refuge checklist can be found during this season; riparian species of interest is Lewis's woodpecker. The blooming period for the 400+ plant species on the Refuge overlaps with the summer season; an early season beauty is sagebrush buttercup. Numerous butterfly species can also be found when flowers, muddy puddles are available with sunny skies and at temperatures above 60 degrees. Red squirrel and yellow-pine chipmunk are readily found in the Wildlife Viewing Area. Basking turtles (painted turtle) on woody debris of Pond 5 are favorites for many local visitors.

Summer

Little rain falls in the summer, though thunderstorms can occur. Typical feature of these storms are "dry lightning" strikes, the cause of wildfire activity on extensive National Forest lands off the Bitterroot Valley floor. Natural flows in the Bitterroot River decline from spring peaks throughout the summer and remain relatively stable through winter.

Blooming for many plant species is still ongoing no matter the community type. Bird activity for songbirds (song and foraging) will be good early in the morning and rapidly decline after 10 am.

Shorebirds are different and migrate through (both to and from their breeding grounds) during this season; they can be found on Refuge wetlands given extensive areas of shallow water depths. Butterfly activity continues; some species flight season will end, other species flight season will begin. Dragonfly abundance peaks, close to 30 species can be found depending on habitat type, time of day, and specific flight period.

Fall

Fall is a time of plenty for most wildlife, for good reason as fat is necessary for migration and/or surviving winter conditions. First frost typically falls near the date of September 10. Diurnal temperature variation averages above 30 °F (17 °C) from late June thru late September.

Fall colors of black cottonwood and western larch can be prolonged and spectacular given favorable climatic conditions. Fall migration of birds on the Refuge is not marked by large, definitive waves, more so by a steady presence of resident species with a low volume mix of migrants. A careful and deliberate (frequent stops listening for call notes) walk at the Wildlife Viewing Area is a good tactic for finding the feeding flock, ergo passerine migrants. No need to start at the crack of dawn, however you definitely do not want to be looking intensely during times of 90+ degrees. Migration can start as early as the first week in July for shorebirds and continue into September. Make sure you cover all the available habitats (Kenai Nature Trail for grassland/wetland) to maximize your chances of finding targeted species.

Winter

The Refuge participates annually in the Stevensville Christmas Bird Count and has listed over 55 species for the count over the last several years; the key group found are birds associated with water. Looking for and identifying mammal tracks in the snow can also be productive and fun. Don't forget to look for colorful plants that do not flower in a traditional sense or season of the year, i.e. lichens. Winter wildlife watching is of course more difficult, but offers different opportunities given climate realities.

Wikipedia has summary winter climate data for Missoula as follows: a) the monthly daily average temperature for December is 23.9 °F (-4.5 °C) b) there is an average of 45 days where the temperature does not rise above freezing, and 7.8 days with sub-0 °F (-18 °C) lows annually. December and January have the least amount of sunshine compared to the other months.

Natural flows in the Bitterroot River decline from spring peaks throughout the summer and remain relatively stable through winter. Climate data for Montana show a slight reduction in annual precipitation and increases in temperatures over the last 100 years (National Climatic Data Center 2011). Climate change impacts predicted in the Rocky Mountains are rising temperatures, less snow, less water in snowpacks, earlier spring snowmelts, and lower streamflows in the summer.

Featured Species

Amphibians and Reptiles

"Amphibians seem to be disappearing from the landscape for many known, unknown reasons. So, if you encounter an amphibian or reptile while wildlife watching on the Refuge, please email Refuge staff describing what, where, and when.

At least eight species of reptiles and amphibians commonly use the refuge including three snakes, one turtle, two frogs, one toad, and one salamander.

FAQ

Q: Where is the best place to find turtles, snakes and frogs?

A: We have a reptile and amphibian brochure illustrating the species found on the Refuge. A general rule of thumb, cold areas (worldwide) usually have a low diversity of reptile species. And that is the case for the Refuge; about eight species of reptile and amphibian have been documented on the Refuge. Only one reptile, the Painted Turtle (*Chrysemys picta*), can be commonly seen in numbers; look for them June through September on Pond 5 sunning themselves on the former tree limbs sticking out of the water. Some staff report seeing a snake only five times over a ten year period, one Bullsnake (*Pituophis melanoleucus*) and the rest Garter Snakes (*Thamnophis* sp.).

As for amphibians, only the Bullfrog (*Rana catesbiana*) is commonly encountered in public use areas. A good place again is between Ponds 5 & 6 parked on Wildfowl Lane; look at the water surface June-September and you usually see the frogs' eyes poking out of the water.

Habitat

One valuable habitat for these animals is riparian habitat. The Bitterroot River is characterized by constantly shifting stream channels through the riparian habitat. This habitat provides some of the most productive wildlife habitat in the State and is a home to a wide variety of birds, mammals, reptiles, and amphibians (Montana Fish and Wildlife Conservation Plan-MFWP 2005). Throughout the riparian woodlands are various wetland types including ephemeral pools, sloughs, and remnants of former gravel pits which provide breeding grounds for amphibians such as the long-toed salamander and the boreal toad, a State species of concern. In response to this Boreal Toad listing, the Refuge plans on enacting the following:

Gravel Pits Objective

Use the gravel pits—created when gravel is harvested east of the Bitterroot River—to provide nursery habitat for amphibians such as the boreal toad, a State species of concern, and the Columbia spotted frog.

Strategies

- Remove vegetation and soil from the artificial gravel pits to restore the desired habitat conditions for native amphibians, as appropriate. If necessary, harvest gravel October through March, avoiding disturbance and displacement of any amphibians during breeding season.
- Manage these old gravel pits as ephemeral pools to discourage the American bullfrog, an invasive predator of amphibians and other desirable native species.
- Survey amphibian populations and monitor the response of amphibians to determine the success of management techniques. Adapt management techniques to ensure the refuge is using the most effective methods, research, and proven technologies.

National Overview-Amphibian Deformity and Abnormality

The USFWS recently published a 10 year study of amphibian abnormality on Refuges. "Less than 2 percent of frogs and toads sampled on 152 refuges had physical abnormalities involving the skeleton and eyes - a lower rate than many experts feared based on earlier reports. This indicates that the severe malformations such as missing or extra limbs reported in the media during the mid-1990s were actually very rare on national wildlife refuges."

Birds

Migratory birds are especially abundant on the refuge during fall and spring migration. More than 260 species of birds are present in the Bitterroot River watershed, and 242 species have been documented on the refuge.

Migratory birds are especially abundant on the refuge during fall and spring migration. More than 260 species of birds are present in the Bitterroot River watershed, and 242 species have been documented on the refuge, including grebes, bitterns, herons, egrets, waterfowl, raptors, shorebirds, flycatchers, swallows, chickadees, warblers, wrens, sparrows, and blackbirds. Birder sightings can be accessed via our **E BIRD widget**.

The many ecological and community changes to the Lee Metcalf Refuge ecosystem have had corresponding effects on fish and wildlife populations using the area. Unfortunately, few quantitative data are available on animal use of the area during historical times.

Riverfront and riparian woodlands, wetlands provide important nesting, foraging, and stopover habitat for many birds. These include neotropical songbirds such as least flycatcher, yellow warbler, Vaux's swift, and Lewis's woodpecker, and waterbirds such as common merganser and wood duck. Riverfront forest is also important for nesting and perching sites for large raptors such as bald eagles and osprey.

Non-forested wetlands away from the Bitterroot River are a key habitat for migrant waterfowl species such as mallard; gadwall; northern pintail and shoveler; cinnamon, green-winged, and blue-winged teal; and wood, redhead, and ruddy duck. Other waterbirds documented on these impoundments includes six species of grebe, American white pelican, white-faced ibis, and occasionally a great egret. Both trumpeter and tundra swans stopover at the refuge, and bitterns are sometimes seen hiding amongst the cattail. When extensive mud-flats are present, migrant shorebirds such as least sandpiper, semipalmated plover, American avocet, black-necked stilt, dowitcher, and yellowleg are seen feeding in these areas. Double-crested cormorants can usually be found in the north ponds and have historically nested over water in dead trees. Abundant yellow-headed and red-winged blackbirds can be found nesting in the summer among the cattails along with marsh wren, sora, and Virginia rail.

Abundance of small mammals in upland habitat provides feeding opportunities for great blue herons and raptors including red-tailed hawk, rough-legged hawk, American kestrel, and prairie falcon. Sandhill cranes have also been seen foraging in the upland fields. As uplands are dominated by invasive and other nonnative species, most upland areas do not provide the necessary heterogeneous structure (lack of vertical and horizontal patchiness) for nesting resources of grassland-dependent migratory birds.

A total of 42 wildlife State species of concern and 21 Federal birds of conservation concern have been found in the Bitterroot Valley. These wildlife species are identified on the State and/or Federal lists as species that require special attention to prevent them from becoming threatened or endangered. All but eight of these species have been documented using the refuge.

Target Species Selection Process

Early in the planning process, the Service selected three groups of target species that will be supported by the objectives and strategies described under the habitat goals for the Bitterroot River floodplain, wetland impoundment habitat, and grassland and shrubland habitat. The initial suite of birds, amphibians, or mammals was selected after Service staff reviewed three documents focused on sustaining or recovering species in Montana:

- Montana Intermountain West Joint Venture Plan
- Montana State Conservation Plan
- Bitterroot River Subbasin Plan

The criteria for this species list were based on whether a species either occurred on Lee Metcalf Refuge or could occur on the refuge if its preferred habitat was expanded or restored, as indicated under each goal. The life history needs of over 100 species were examined for similarities and relevance to the proposed goals. Ultimately, 16 species were selected based on their ability to represent guilds or because they were good indicators of the quality of a specific habitat type. The habitats that support the migration, foraging, nesting, and migration needs of these selected species should benefit a much broader group of secondary bird species as well as a variety of other wildlife, both migratory and resident. These target species will be monitored for trends in abundance and distribution to evaluate the effectiveness of the objectives and strategies.

Butterflies

"The ancient Greek word for "butterfly" is ψυχή (psūchē), which primarily means "soul" or "mind" (Source: wikipedia.com).

From 1991 until 2003, a variety of Volunteers (Will Kerling, Chris Tonkinson, Graig Odegard and Byron Weber) surveyed the Refuge for butterflies. Thanks to their efforts the Refuge has a pretty good idea of what species are here or could be here. Will Kerling said it best in a 2003 note to then Refuge Manager Dave Gillund: "Fifty butterfly species are presently documented for the refuge and we still project a final list of approximately sixty species." Byron Weber appeared on the Montana PBS program Backroads of Montana (Episode Twenty-Four "Fromberg to Ulm" [2005]) talking about Montana butterflies; skip to the 23:23 timeline mark of the archived video to watch. Montana Field Guides, official State website dedicated to plant and animal life of Montana, also contains much good information on ecology, distribution and identification of butterfly species.

Pollinator Garden

The Refuge, with expertise of Volunteers Rob Mediak, Paul and Mary Hayes and Dianne Adams, designed and built a Pollinator Garden in 2007 for the benefit of butterflies and other

pollinators...and wildlife watchers. It is located at the entrance to the Visitor Center. A true case of "build it and they will come"; many butterfly species come to the flowers for nectar and inadvertently pollinate the plant. Attracting Pollinators to Your Garden is a USFWS publication offering advice on creating your own pollinator garden. The Service also has an excellent series of webpages dedicated to Pollinators. Pollination results when the pollen from the male part of the flower (stamen) is moved to the female part of the same or another flower (stigma) and fertilizes it, resulting in the production of fruits and seeds. Some flowers rely on the wind to move pollen, while other rely on animals to move pollen.

Animals visit flowers in search of food and sometimes even mates, shelter and nest-building materials. Some animals, such as many bees, intentionally collect pollen, while others, such as many butterflies and birds, move pollen incidentally because the pollen sticks on their body while they are collecting nectar from the flowers. All of these animals are considered pollinators.

The Missoula County Extension Service published many years ago Butterfly Flowers in Missoula Valley Grasslands as guide for wildflowers and the butterflies that use them...though dated, it is short and concise and has excellent information. A companion document from the Extension Service contains information documenting bloom dates (phenology) of Wildflowers and Weeds of Missoula Valley Grasslands to give you a general idea of when to look for certain species.

Dragonflies

"I tell people dragonfly watching is better than bird watching," said Cynthia Berger, "because for birding, you have to get up pretty early when it's miserable out. But dragonflies are solar powered -- they're cold blooded -- so when it gets nice and warm, just walk around a body of water to find dragonflies" (online story by John Hayes-Pittsburgh Post Gazette, 4/19/2009).

What Are?

The title of this page is somewhat misleading. Yes, the generic, familiar term "dragonfly" can connote both dragonfly and damselfly, but they are classified (in a taxonomic sense) separately. Damselflies belong to the same taxonomic Order as dragonflies, Odonata (or odonates informally), but are in a different Suborder Zygoptera (meaning "yoked wings", 2 sets of wings of same shape). Similar to, but different from damselfly are dragonfly which belong to the Suborder Anisoptera (meaning "unlike wings", the rear set of wings is differently shaped than the front). The groups also differ in how they hold their wings at rest and whether the two compound eyes physically touch (small number of exceptions). The differences apply to the adult stage of both groups and not the nymph stage which is aquatic. The nymph stages can last from several months to several years before metamorphosis to adult form. Both adult and nymph forms are predacious insects. There are 453 species of odonates in North America and roughly 5680 worldwide. These animals are fast fliers; they average 10 mph cruising with bursts of speed to 34 miles/hour. Rarely do they eat insects as large as butterflies; some species specialize in eating other odonates! Of course, odonates are eaten by a host of other animals: birds, frogs, fish, aquatic invertebrates, etc.

Where Are?

The life cycle of odonates are centered on wetlands, both still and riverine waters. For the most part they are resident as adults, i.e. they don't migrate. Foraging can take place far from wetland areas.

This is especially true for odonates that have recently morphed from nymph to immature adult. Within the broad definition of wetland, look for odonates flying over waters and/or perched on nearby vegetation (grasses, sedges, flowers, shrubs, trees). Each species has different behaviors or habits, once learned by you, will make discovery of these creatures in specific habitat niches easier.

When to Look

Finding different species requires knowledge of their ecology and life cycle. Many species "emerge" (metamorphosis from larval to adult form) at specific times of the year (spring through fall). The adults may live only several days to at most a couple of months. So it is critical to know these "flight periods" in order to find them. Even within flight periods finding adults can be difficult because time of day and weather determine odonate activity; sunny and 60 F are minimums for dragonfly to be visibly active.

Refuge Hotspots

Water areas in the public use areas are all good for odonate viewing. Specifically, the area around the Refuge Headquarters (edge of Pond 6, Aquatic Education Pond, Pollinator Garden) is good for a variety of species. Wildfowl Lane between Ponds 5 & 6 is also good for dragonfly watching. The trails in the Wildlife Viewing Area are very good for finding "meadowhawks" and other odonates. Beyond the Refuge, this State of Montana publication by Nate Kohler is an excellent guide for your efforts.

Mammals

"Most important in becoming a nature detective is for you to learn to think like an animal, more specifically, like a wild mammal!" (A Field Guide to Mammal Tracking in North America, James Halfpenny, 1986).

More than 40 mammal species are present on the refuge. Some of the more common species include white-tailed deer, yellow-bellied marmot, yellow-pine chipmunk, northern pocket gopher, meadow vole, porcupine, striped skunk, muskrat, American beaver, mink, and raccoon. Though not readily observable, there are eleven bat species found on the refuge, all of which depend on the gallery forest for various stages of their life cycles. Of these 11 species, 3 of them are State species of concern including Townsend's big-eared bat, hoary bat, and fringed myotis.

Finding and observing mammals on or off the Refuge is difficult because there is a lot less dynamic/timely information, compared to birding, to go on. Montana Field Guides-Mammals will provide you with good information on which to build. One should become thoroughly familiar with identification, behaviors and ecological requirements of local species before going on a finding mission or field trip. Be prepared for brief looks using either binoculars or camera. Many times the best you may come up with are tracks/sign. A good strategy would employ a temporary "blind" (as simple as sitting still in one spot) and much patience in favored habitats...let them come to you instead of stalking. Of course, the ends don't always justify the means...be mindful of trampling or disturbing any vegetation, stay on trails.

A small mammal inventory was done during June through August 1987 by Denver Holt (temporary Biological Aid) in five different habitat types. Forty-four mammals of five species were captured and identified over 900 trap-nights. Most common species was meadow vole (*Microtus pennsylvanicus*). Other species collected included: masked shrew (*Sorex cinereus*), vagrant shrew (*Sorex vagrans*), montane shrew (*Sorex monticolus*), and deer mouse (*Peromyscus maniculatus*). Darin Newton, University of Montana undergraduate, also did a small mammal survey (unpublished-on file) of the Refuge in 2008. Six species were captured in an 11 week period in four habitat types (forest, marsh, irrigation ditch and grassland) using Sherman traps and transects. Meadow voles were again most common, 56% of the 851 captured individuals. Additional species caught beyond the Holt survey list included yellow-pine chipmunk (*Tamias amoenus*) and short-tailed weasel (*Mustela erminea*).

Extensive census data of the white-tailed deer (*Odocoileus virginianus*) population has been recorded in the Refuge Annual Narratives. Like all mammal species there is an ebb/flow to population numbers. Refuge management wrote in 1987: "Mild winters during the past four years, an excellent food source, high reproduction and low harvest have perpetuated conditions for herd expansion. Conditions are ideal for a catastrophic die off due to harsh winter conditions or disease. Total habitat available to deer on the refuge is 2100 acres. Peak number of deer censused in 1987 was 329; yielding 1 deer/6.4 acres. Woody vegetation has suffered substantially from the surplus animals as evidenced by a browse line throughout most of the refuge." More detailed information on white-tailed deer is on our hunting brochure.

Plants

"The clearest way into the Universe is through a forest wilderness" (John of the Mountains: The Unpublished Journals of John Muir, edited by Linnie Marsh Wolfe, 1938, page 313).

Wallace Albert, Pat Bartholomew, Judy Hoy, Sheila Morrison, and Peter Stickney did much volunteer botanical work for the Refuge in the late 90's, early 2000's. The Refuge plant list (~425 species) and an out-of-print wildflower brochure are based almost entirely on their work, i.e. the tedious task of compilation, collection and identification of plants. Starting in 2011, volunteers Gary and Joan Dickerson have collected some 140 species from the WVA for environmental education use and as voucher specimens in the Refuge herbarium; Refuge staff are thankful and very appreciative of these efforts.

Nearly 25 soil types/groups currently identified by the U.S. Department of Agriculture SSURGO data bases are present on or adjacent to Lee Metcalf National Wildlife Refuge ultimately determine plant diversity. The most extensive soils are Riverrun-Curlew-Gash complex, Ambrosecreek sandy loams, and Riverside-Tiechute-Curlew complexes. Most soils on the national wildlife refuge are shallow, with thin veneers of silts and clays overlying deeper sands and gravels. In many places sandy outcrops occur, especially near the Bitterroot River.

Historic vegetation in the Bitterroot River floodplain near Lee Metcalf National Wildlife Refuge included seven distinct habitat/community types: 1) Riparian/Riverfront-type Forest, 2) floodplain "Gallery-type" forest, 3) Persistent Emergent wetland, 4) Wet Meadow Herbaceous, 5) floodplain and terrace Grassland, 6) Saline Grassland, and 7) Grassland-Sagebrush. The relatively low precipitation in the Bitterroot Valley prohibits the establishment of expansive areas of densely

wooded or herbaceous wetland vegetation communities that require larger amounts of water each year. Consequently, the distribution of woody or wetland-type species is restricted to areas of greater soil moisture – primarily sites adjacent to the Bitterroot River and in floodplain drainages/depressions. Though not Refuge or Bitterroot Valley centric, the National Park Service has a visual website dedicated to the plant collection by the Lewis & Clark expedition 1804-06.

Riverfront Forest includes early succession tree species such as cottonwood and willow that are present on newly deposited and scoured gravelly-sand, sand, and fine sandy-loams near the active channel of the Bitterroot River and in sand-outcrop sites adjacent to floodplain drainages.

Gallery Forest at Lee Metcalf National Wildlife Refuge is dominated by cottonwood and ponderosa pine and is present on higher floodplain elevations with veneers of Chamokane loams over underlying sands along natural levees and point bar terraces adjacent to minor floodplain tributaries. Gallery Forest areas often have woody shrubs such as alder, hawthorn, dogwood and wood's rose in the understory and mixed grass species such as bluebunch wheatgrass and Idaho fescue under and between trees and shrubs.

Low elevation oxbows, depressions, and tributary off-channel areas contained more permanent water regimes and supported water tolerant wetland vegetation species dominated by Persistent Emergent species such as cattail. Sites immediately adjacent to Persistent Emergent communities grade into diverse Wet Meadow communities dominated by annual and perennial sedges, rushes, herbaceous species, and water tolerant grasses.

The majority of higher elevations within the Lee Metcalf National Wildlife Refuge floodplain region were covered with grasses and some scattered shrubs. Sites that had occasional surface flooding contained more wet Grassland communities with interspersed herbaceous plants such as smartweed and sedges while higher floodplain terraces, slopes and alluvial fans included mixed wet- and upland-type grasses and shrubs such as rabbit brush, sage, needle and thread, and junegrass. A useful publication by the Missoula County Extension Service, *Wildflowers and Weeds of Missoula Valley Grasslands*, outlines bloom dates for native plants.