# SUNRIVER GREAT MEADOW MANAGEMENT PLAN Sunriver Owners Association Revised December 2010

#### Introduction

The purpose of the Sunriver Great Meadow Management Plan (GMMP) is to ensure that the Great Meadow is preserved for the pleasure and enjoyment of Sunriver owners and visitors both in the present and the future. The Great Meadow is approximately 500 acres and located in the western one third of Sunriver.

#### 1. Property Description

1.1. **Overview:** The Great Meadow includes a number of ecological zones: rivers and riparian, wetlands, grasslands, transition zones, and groves of lodgepole/ponderosa pines. The open space (undeveloped area) we know as the Great Meadow is habitat for a large variety of flora and fauna, and provides vistas of the Cascade Mountain Range to the west. The Great Meadow also contributes to a variety of human activities and uses: commercial, residential and recreational.

#### Commercial enterprises include:

- Meadows Golf Course
- Sunriver Airport
- Sunriver Marina
- Sunriver Nature Center & Observatory
- Sunriver Resort Lodge
- Sunriver Resort Lodge Village
- Sunriver Stables
- Sunriver Utilities Company
- Trout House Restaurant

#### Residential areas include:

- Aspen Meadows
- Duck Pond Lane
- Meadow House North Condominiums
- Meadow House West Condominiums
- Quelah Condominiums
- Quelah Lane
- Sisters Lane
- Skyline Condominiums
- Sky Park
- Vista Lane

Recreational activities include:

- Deschutes River
- Flora and fauna viewing
- Mary McCallum Park
- Pathways and trails

On the Deschutes River, along the western edge of the Great Meadow, property owners include: the U.S. Forest Service, the Sunriver Owners Association (SROA), and Sunriver Limited Partnership (SRLP). The Great Meadow is accessed through a system of roadways, pathways, and trails as well as via the Deschutes River.

1.2. **Historical Perspective:** The area described as Sunriver's Great Meadow has changed over the centuries from being primarily a forest to a marsh and today primarily a meadow. Over 6,000 years ago, a pine forest covered the area. That forest died when Lava Butte erupted and a lava flow blocked the Deschutes River.

Over the last 6,000-10,000 years, people have lived in or near the area described herein as the Great Meadow. Early inhabitants included the Paiute and Tenino Indians who camped here on a seasonal basis. Ranchers who grazed their cattle and horses in the Great Meadow replaced these Indians. During the 1940's the U. S. Army built Camp Abbot, a combat engineering training facility. Following World War II and the deactivation of Camp Abbot, the meadow was used as a cattle ranch. Military and ranching activities during 1940's and 50's significantly altered the physical character of the Great Meadow due to training exercises and munitions use. In the late 1960's Sunriver was created and developed into a residential and resort community. Since then, protocols have been instituted to retain as natural a meadow setting as possible. But the Great Meadow, if unmanaged and left to nature, will naturally change dramatically over time. Forest and meadow boundaries fluctuate depending on weather conditions and landscape changes.

1.3. **Boundary:** The Great Meadow is located in the western one third of Sunriver and shares a common boundary with the Sunriver Forest to the east and the Deschutes River to the west. See attached map #1.

From the south Sunriver property line at the east end of Harper Bridge, the boundary goes north to Meadow Road. It continues north along Meadow Road past the rear property lines of lots 1 and 2 Meadowlark Lane. It then follows the fifth fairway of the Meadows Golf Course and joins the pathway behind lot 4 Fairway Road. The boundary follows the pathway to the front of the Sunriver Resort Lodge, crosses the lodge parking lot and continues along the main access road through Sunriver Resort Lodge Village. The line then proceeds between the green at the 10th hole and the tee box of number 11 to the rear property lines of 5 and 8 Colonial Drive. The boundary then joins the west branch of Island Road. It follows Island Road northwest and joins the pathway running west to a point at the rear of lot 1 Spyglass. The boundary follows the pathway to a point behind the 16th green and

then runs north until it intersects Abbot Drive. It then follows Abbot Drive to the boundary of the SROA Public Works Yard where it runs between the south fence line of the SROA Public Works Yard and the rear property lines of lots 12-21 Quelah Lane. The boundary continues along the rear lot lines of 5-10 Bachelor Lane and then follows Bachelor Lane until it intersects West Cascade Road. Proceeding along West Cascade to the rear property lines of 1-11 Hummingbird Lane and 10-23 Golden Eagle Lane, it crosses SROA commons to the rear of lot 6 Loon Lane. It continues along the rear lot lines of 6-14 Loon Lane to Cardinal Landing Bridge where it meets the Great Meadow's western boundary. The western Great Meadow boundary is the west boundary of Sunriver (mid-stream of the Deschutes River). From Cardinal Bridge the boundary follows the river south to Harper Bridge where it meets the Great Meadow's eastern boundary.

#### 2. Purpose and Objectives

The purpose of the Great Meadow Management Plan is as stated above in the "Introduction" section consistent with the SROA Mission Statement of:

"Maintaining Sunriver as a premier residential and resort community, protecting and enhancing its quality of life, natural environment and property values."

The following GMMP objectives are set-forth to attain the desired goal:

- Preserve grasslands
- Preserve wetlands and riparian areas
- Preserve the vitality of the Sun River and Lake Aspen
- Preserve wildlife habitat
- Preserve the transition zones
- Manage selected pine groves, sentinel and buffer trees
- Manage human activities to minimize adverse impacts on the land and environment
- Maintain productive pastures

#### 3. Ecological Zones

The Great Meadow is a complex and diverse ecosystem. Six ecological zones are identified, each with unique characteristics and needs:

- Deschutes River and Associated Riparian Areas
- Wetlands and Lake Aspen
- Sun River and Associated Riparian Areas
- Transition Zones
- Pine Groves, Sentinels and Buffer Trees
- Grasslands and Pastures

The following paragraphs define the various ecological zones, specify their intended use and outline the management actions necessary to achieve the goal and objectives set forth in the Great Meadow Management Plan. Where higher-level government rules or regulations control land use, SROA will be in accord with and/or obtain approval when and where required from appropriate governmental agencies before implementing plans or taking action in these areas.

- 3.1. **Deschutes River and Associated Riparian Areas:** The Deschutes River is a dominant feature of Sunriver and is a major attraction for its scenic beauty and recreational opportunities. The river forms the western boundary of Sunriver and the Great Meadow.
  - 3.1.1 The Upper Deschutes River is designated a Wild and Scenic River under the Federally mandated Wild and Scenic Rivers Act of 1968 and a State Scenic Waterway as amended by the Omnibus Oregon Wild and Scenic Rivers Act of 1988. Over twenty governmental and quasi-governmental agencies interact to provide oversight and control of all development, management and restoration activities within the river corridor. The U.S. Forest Service is designated the lead agency in administering the comprehensive management plan for the Upper Deschutes River.
  - 3.1.2 The Upper Deschutes Wild and Scenic River and State Scenic Waterway Comprehensive Management Plan, July 1996, is the document governing development, management or restoration activities on property within Sunriver's segment of the river corridor.
  - 3.1.3 The Sunriver segment of the river corridor begins at Harper Bridge and flows to the north boundary. See attached map #2. All development, management and restoration activities within the Great Meadow will abide by the goals, standards and guidelines outlined in this plan.
- 3.2 **Wetlands and Lake Aspen:** Within the Great Meadow there are over 150 acres of federally designated wetlands, including Lake Aspen. Less than half of the wetlands are permanent, with standing water present all year. Most of the remaining wetlands are intermittent, with standing water present only during periods of heavy rain, snow, exceptionally high river levels or high groundwater tables. The attached map #3 shows the location and shapes of the various wetland parcels scattered throughout the Great Meadow. Federal, state and county regulations govern land use of nationally designated wetland areas.
  - 3.2.1 **Description:** Sunriver's Great Meadow wetlands are characterized by the presence of standing water, either permanently or intermittently, depending on the water table and the amount of recent rain/snow fall. In the permanent wetlands, moist and water saturated soil supports a variety of vegetation especially adapted to this environment. Present are various types of sedges,

rushes, cattails, pond lilies, and wildflowers. The dominant tree found along the marshy area is willow, some growing to heights of 15-20 feet. Quaking aspen can also be found in wooded areas and along waterways. The wetlands appear as open areas with rushes and cattails growing to heights of six to seven feet. In the intermittent wetlands, the soil is drier and supports a mixture of sedges, grasses and wildflowers.

- 3.2.2 **Intended Use**: The Great Meadow wetlands, including Lake Aspen, add to the open space ambience of Sunriver. The intent of certain federal and state laws is to protect the existing features of the wetlands to the maximum extent possible. SROA is committed to preserving the Great Meadow wetlands.
  - 3.2.2.1 Human activity should be non-intrusive and limited to viewing vistas and wildlife from the wetland periphery.
    - 3.2.2.1.1 Wetland soil and vegetation are fragile and break down easily when disturbed resulting in permanent or semi-permanent damage often requiring at best many years to recover.
    - 3.2.2.1.2 Wildlife is sensitive to disturbances. Interrupting feeding, nesting, incubation, resting and hibernation cycles adds stress and can adversely impact wildlife populations.
    - 3.2.2.1.3 Problems resulting from human presence include soil compaction and erosion (especially from horse and bicycle traffic), each creating a fertile environment for the growth of noxious weeds and other undesirable invasive plant species.
  - 3.2.2.2 The large island in Lake Aspen, Rehabilitation Island, is set aside by SROA for the rehabilitation of raptors under direction, per a yearly agreement with SROA, of the Sunriver Nature Center & Observatory.

#### 3.2.3 Management Actions:

- 3.2.3.1 The SROA Board of Directors may designate wetland areas as Limited or Restricted in accordance with the Oregon Department of Fish & Wildlife (ODF&W) and the U.S. Fish & Wildlife Service (USFWS) regulations to protect these fragile environments. If necessary, signs will be posted by SROA to inform the public.
  - 3.2.3.1.1 Limited access authorizes SROA approved paved pathways, unpaved nature trails and horse trails to cross over some wetland areas.
  - 3.2.3.1.2 Restricted access prohibits public entry except for approved restoration projects or soil/vegetation maintenance.

- 3.2.3.2 The SROA staff will maintain all board-approved pathways and trails.
- 3.2.3.3 SROA and SRLP will monitor the condition of their respective pastures overlying wetlands and assure that the pasturing of livestock is restricted whenever standing water is present.
- 3.2.3.4 Wetlands and Lake Aspen are Restricted except for SROA staff, Sunriver Nature Center & Observatory employees and approved volunteers and contractors.
- 3.2.3.5 To the extent feasible appropriate measures will be taken to control if not prevent the intrusion of undesirable plant and animal species, including but not limited to coniferous seedlings, into wetland areas and to control aquatic vegetation in Lake Aspen
- 3.2.4 **Government Regulations:** Federal, state and county regulations governing wetland use were developed to protect our nation's wetlands. The intents of these regulations are three-fold:
  - 1. where possible, avoid disturbing wetland areas
  - 2. if impossible, minimize adverse impacts, and
  - 3. as a last resort, mitigate any damage.

The Deschutes County Community Development Department is the locally responsible agency authorized to grant conditional use permits under Deschutes County Zoning Ordinance, Title 18, wetland areas. To approve wetland projects, the planning department requires justification, maintenance criteria showing minimum removal of vegetation, and no practical alternative for the project. Any proposal for work in the Great Meadow will also require coordination with appropriate public agencies (county, state, federal) tasked with the protection of waterways and wetlands to assure wildlife habitat is preserved.

- 3.3 **Sun River and Associated Riparian Areas:** The Sun River is a man-made waterway flowing between spring-fed ponds near the meadow's eastern boundary. The stream originates in a large pond at the south end of Sunriver near Vista Lane. The stream flows north and splits just south of River Road. The western arm flows westerly and empties into a large wetland area north of River Road. The eastern arm of the stream flows into Lake Aspen and then north where it joins the Deschutes River near Cormorant Landing Road.
  - 3.3.1 **Description:** The Sun River is a small, shallow stream connecting a series of spring fed ponds that feed into wetland areas in the meadow. The stream drop from its point of origin to where it flows into the Deschutes River is approximately 12 inches. For this reason, the flow rates are very slow (less than

one mph) and the water temperatures are three to five degrees warmer than the Deschutes River. The Sun River begins as a spring on the south golf course (Meadows Golf Course), travels a channel generally northward to Lake Aspen and associated ponds and wetlands, ultimately draining into the Deschutes River. Water flow is managed through a series of weirs, including two that connect to the Deschutes River. The riparian area is made up of various reeds, cattails, marsh grasses and willows thickets interspersed along its banks. Due to slow flow rates, warmer water temperatures and available nutrients, aquatic plants and algae are found in abundance. The stream is occupied by a wide variety of amphibians, birds and mammals including but not limited to river otter, beaver, mink, weasels, frogs, toads, song birds, black birds, ducks and geese. Mid-stream islands are covered mostly with grasses and are ideal nesting grounds for waterfowl.

3.3.2 **Intended Use:** The Sun River forms a natural boundary between the residential areas of Sunriver and the Great Meadow. Its open waters, reeds, cattails, and grasses are habitat for an abundance of wildlife. The streams and ponds add scenic variety and enhance the overall ambience of the Great Meadow. The Sun River and its riparian areas are to provide a buffer to the Meadow and habitat for wildlife.

#### 3.3.3 Management Actions:

- 3.3.3.1 Ponds, streams and riparian areas, including Lake Aspen, located on or crossing SROA owned property will be managed by SROA in accordance with the Oregon Department of Fish and Wildlife (ODF&W), Deschutes County Community Development Department (DCCDD), and the Great Meadow Management Plan.
- 3.3.3.2 SRLP in accordance with ODF&W, DCCDD, and the Great Meadow Management Plan will manage ponds, streams and riparian areas located on or flowing across SRLP property.
- 3.3.3.3 Public use of the Sun River waterway and riparian area is Restricted to protect the stream and pond banks, and wildlife habitat.
- 3.3.3.4 SROA employees, SRLP employees, and approved volunteers and contractors are authorized onto or into the waterway for the purpose of maintaining the streams and ponds to complete projects approved by SROA, SRLP, ODF&W and DCCDD.
- 3.3.3.5 Maintenance of the Sun River will be primarily for the purpose of controlling what is deemed excessive vegetation by SROA in the waterway and along the stream banks, as well as controlling other plants and animals, all to the extent necessary and feasible. All projects

- recommended for the waterway will be in accord with county, state, and federal agencies.
- 3.3.3.6 Per contract with SROA, the Sunriver Nature Center & Observatory, whose property is located on the west bank of Lake Aspen, will manage the activities on Rehabilitation Island and the west bank riparian area in accordance with this Plan, as well as manage the two weirs that connect the Sunriver to the Deschutes River in order to maintain water levels to protect wetlands.
- 3.3.3.7 Fertilizer use in Sunriver shall be done at state government approved application rates to avoid excessive leaching and runoff. Special care should be exercised within 200 feet of any Sunriver waterway. Further information can be obtained from the Oregon Department of Agriculture and the Oregon Department of Environmental Quality.
- 3.4 **Transition Zones:** The Transition Zones, or forest-meadow ecotone, is that portion of the Great Meadow bordering the Sunriver forest. An ecotone is defined as the boundary between two adjacent ecological areas. Ecotones vary in width depending on how quickly the two ecological areas blend together across the landscape. Forest-meadow ecotones are characterized by a shift from dense stands of trees in the forest, through areas of decreasing numbers of trees and increasing shrubs and grasses, to areas consisting predominately of grasses in the meadow. The Sunriver forest-meadow ecotone fluctuates in width along its length, contributing to varied amounts of influences from the two ecological zones (edge effects). Transition zones are important ecologically as they are used by many wildlife species due to the availability of resources from both types of habitats. The Great Meadow's transition zones run south to north along the commonly held forest boundary and extend into the meadow to the Sun River riparian areas. See attached map #3.
  - 3.4.1 **Description:** Trees, bitterbrush and a variety of other shrubs and grasses are present in the Transition Zones. Moving from the forest to the meadow within this ecotone, the trees tend to begin to thin out and open grassy areas become more prevalent. This ecotone provides habitat, including perching and roosting areas as well as protection and cover, for a number of edge-oriented species such as songbirds, birds of prey, and mammals.
  - 3.4.2 **Intended Use:** The purpose of the Transition Zones are to protect the edge habitat between forest and meadow, to preserve the meadow's benchmark open spaces, and provide screening of buildings when looking back in to the Transition Zones from the west.

#### 3.4.3 **Management Actions:**

3.4.3.1 The primary management action will be to preserve healthy ponderosa

and jeffrey pine trees. The secondary management action will be to maintain lodgepole pine trees so that lodgepole pines tend to thin out (less dense) moving from the forest edge to the west, towards the grasslands/golf course, while still providing sufficient screening of buildings.

- 3.4.3.2 Permits are required for all thinning and ladder fuels reduction projects (including limbing) and will include a mandatory pre-site and post-site inspection by the SROA Environmental Services Department. Procedures for cutting, limbing and disposal are described in the SROA Ladder Fuels Reduction Plan.
- 3.4.3.3 Thinning on SROA controlled properties will be accomplished in direct coordination with the SROA Environmental Services Department. Tree removal procedures are found in the SROA Ladder Fuels Reduction Plan.
- 3.4.3.4 Hazard trees and wildlife trees will be managed in accordance with the SROA Ladder Fuels Reduction Plan.
- 3.5 **Pine Groves, Sentinels, and Buffer Trees:** Across the Great Meadow are stands of pines, lone sentinels and lines of buffer trees. Each provides habitat for wildlife and at times defines roadways, pathways, fairways, runway and property lines, and adds aesthetic variety to the open spaces.
  - 3.5.1 **Description:** Three distinct types of pine tree growth patterns are found within the meadow.
    - 3.5.1.1 Pine groves are areas where pines have established themselves in relatively large numbers and appear as a small forest. These trees are mostly lodgepole pines with grassy understories, and are generally shorter with broader canopies than those found in the forest.
    - 3.5.1.2 Sentinels are solitary trees standing alone in an open area. These trees are hardy, sturdy and resist wind and other severe weather conditions.
    - 3.5.1.3 Buffer trees are found growing along roadways, pathways, fence lines, golf course fairways and between residences. These trees tend to be shorter with broader canopies than those found in the forest.

#### 3.5.2 **Intended Use**

- 3.5.2.1 The principal function of the pine groves and sentinels is to provide wildlife habitat and to add variety to the Great Meadow mosaic.
- 3.5.2.2 Buffer trees outline roadways, pathways and trails. They provide

windbreaks and visual cues for snowplow drivers during periods of impaired visibility. They also act as buffers between residences and vehicle or pedestrian traffic, and provide screening of buildings. The buffer trees along the east side of the airport runway provide critical visual cues to pilots during aircraft takeoffs and landings. Lines of buffer trees are also used to define the Meadows Golf Course fairways.

#### 3.5.3 **Management Actions:**

- 3.5.3.1 SROA will designate and maintain eight (8) pine groves within the Great Meadow. Pine groves are numbered and named as follows: 1) South-West Point Grove, 2) North-West Point Grove, 3) River Bend Grove, 4) Trail Grove, 5) Marina Grove, 6) Eagle Point Grove, 7) Nature Center Grove, and 8) North Meadow Grove. See attached map #3.
- 3.5.3.2 All designated pine groves within the meadow are to be managed and maintained in accordance with this plan and the Upper Deschutes Wild and Scenic River Management Plan.
- 3.5.3.3 The meadow pine groves will be scheduled for ladder fuel reduction in conjunction with their respective ladder fuels maintenance areas or more often if necessary.
- 3.5.3.4 The SROA Environmental Services Department selects sentinel trees for their health, vigor, location and appearance. Trees so designated are charted, mapped and monitored for their continued health and growth. Sentinels can be trees of any species, although ponderosa pines are preferred.
- 3.5.3.5 Buffer trees may be retained between residences, between residences and roads or pathways, and along golf course fairways. Buffer trees may also be retained to provide visual cues for snowplow drivers and aircraft pilots. Trees are to be maintained by their respective property owners. SROA Staff will maintain trees on SROA properties. Trees will be maintained in accordance with SROA's Forest Management and Ladder Fuels Reduction Plans.
- 3.6 **Grasslands and Pastures:** Great Meadow areas not set aside as wetlands, waterways, transition zones, and pine groves are identified as grasslands or pastures. These areas are interspersed across the Great Meadow, interconnecting the various ecological zones, completing the Great Meadow mosaic.
  - 3.6.1 **Description:** The areas of grasslands and pastures are higher than the surrounding wetlands. The alluvial soil is porous, dry, and with a relatively low ability to hold moisture. The zone is capable of sustaining a variety of native

grasses, wildflowers and shrubs. Non-native crested wheatgrass was introduced into the grasslands in an effort to stabilize the soil following several excavation projects: i.e. wetland fill to expand pastures, excavation of Lake Aspen and the Sunriver Airport. The Great Meadow grasslands are habitat for a wide variety of wildlife, including but not limited to: birds, squirrels, voles and occasionally badgers. Because of the abundance of wildlife, the meadow is also productive feeding and hunting grounds for coyotes and a variety of raptors: northern harriers (marsh hawk), American kestrel (falcon), red tailed hawks and bald eagles.

- 3.6.2 **Intended Use:** Because of its relatively dry, stable soil, the meadow grasslands and pastures can accommodate a variety of uses.
  - 3.6.2.1 Recreation is and will continue to be a major activity within the meadow. Cycling, walking and jogging on pathways, horseback riding on established horse trails, hiking along nature trails, cross country hiking and skiing, and fishing along the Deschutes River are all acceptable recreational activities.
  - 3.6.2.2 Pastures overlaying grasslands will continue to be used for grazing.
  - 3.6.2.3 Commercial and residential properties within this area also subject to all applicable Sunriver Covenants, Rules and Regulations and Board directives.
  - 3.6.2.4 The grasslands and pastures will be maintained clear of encroaching trees, seedlings and saplings.

#### 3.6.3 **Management Actions:**

- 3.6.3.1 SROA will maintain approved roadways, pathways and trails on SROA properties for access to meadow facilities and amenities.
- 3.6.3.2 Areas where soil has been disturbed will be revitalized (treated, fertilized and seeded as necessary) to restore and maintain the land in a productive state.
- 3.6.3.3 The SROA Environmental Department will take appropriate measures to prevent the intrusion of undesirable plant and animal species into the Great Meadow grasslands.
- 3.6.3.4 Sensitive grassland areas may be set aside to preserve vegetation and soil when deemed appropriate and necessary by the SROA Environmental Director.

#### 3.6.4 Pasture Use

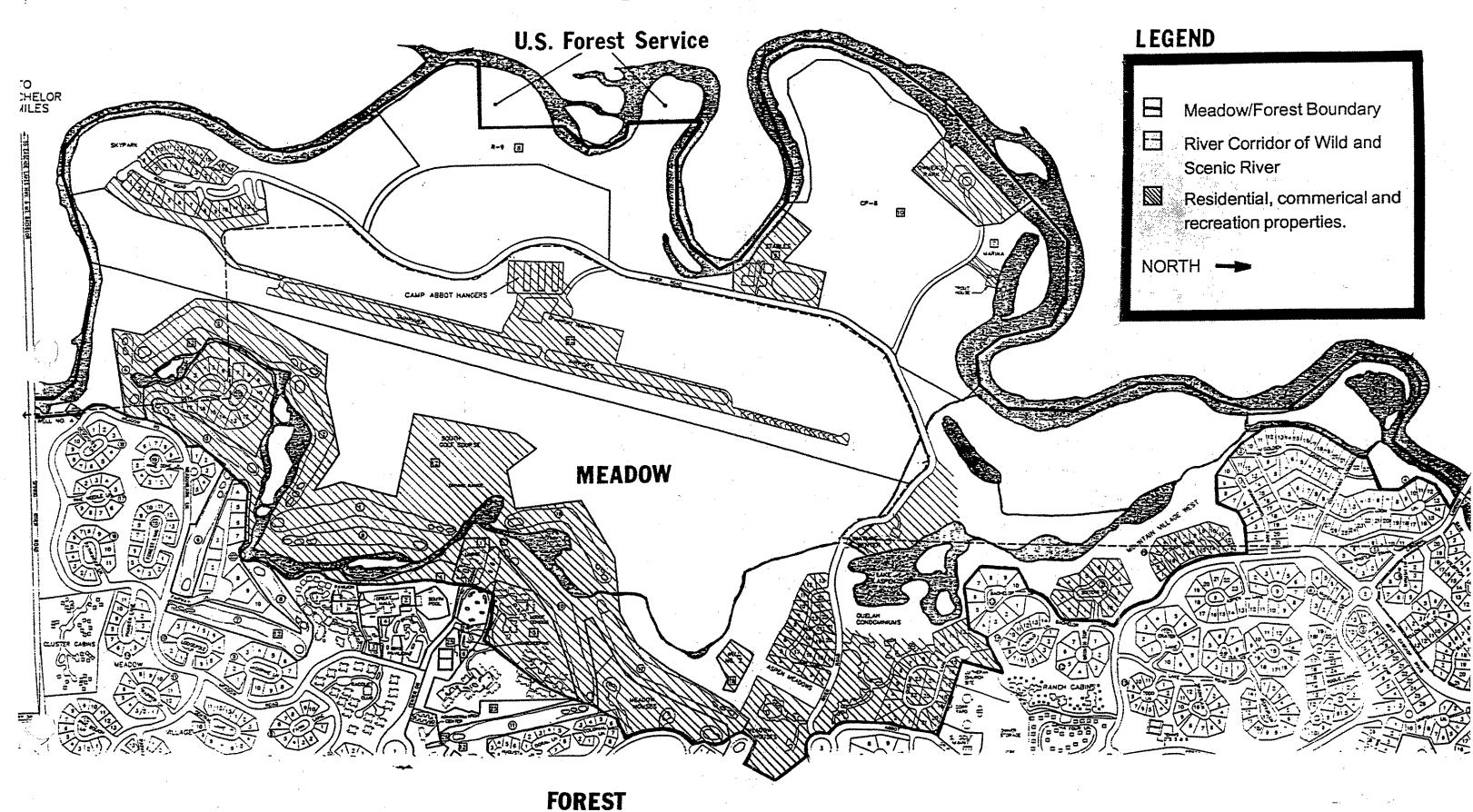
- 3.6.4.1 **Description:** Overlaying the Great Meadow ecological zones are approximately 313 acres of pastures set aside for the grazing of livestock. Eleven Pastures have been fenced and gated. See attached map #4. Sunriver Resort Limited Partners (SRLP) owns approximately 138 acres; SROA owns the remaining 175 acres. The grazing of livestock within the meadow has been a long-standing tradition dating back to the late 1800's. The pastures are currently being used to graze horses belonging to SROA members and the stable managers. The stables operate under contracts with SRLP to provide the resort with recreational amenities.
- 3.6.4.2 **Overview:** The pastures are confined mainly to the grassland area. Areas of intermittent wetlands and pine groves do however lie within the pastures. The individual pastures are of varying acreage and physical conditions. The pastures are generally in use from May through October.
- 3.6.4.3 **Pasture Management:** SROA and SRLP are responsible for managing their respective pastures. Notwithstanding these individual responsibilities, SROA and SRLP will cooperate in overall pasture management. Responsibilities include, but are not limited to: assessing pasture conditions, determining number and species to be grazed, recommending improvements, developing rotation schedules, and monitoring stable operations.

#### 3.6.4.4 **Governing Documents:**

- 3.6.4.4.1 SROA Standard Procedure Instructions (SPI) 600.05.
- 3.6.4.4.2 Pasture Assessment: 1995 Oregon State University Extension Service base line assessment.
- 3.6.4.4.3 Pasture Rotation Schedule: As needed, a pasture rotation schedule will be prepared by the SROA Environmental Services Department, predicated on pasture condition and the number of animals by species to be grazed. The stable operator is responsible for implementing this schedule. The pastures are to be professionally assessed as needed. Pastures with standing water on intermittent wetland areas will be closed until conditions improve as determined by the joint pasture coordination committee.
- 3.6.4.4.4 Fence, Corral, and Gate Requirements: Applicable County, State, and Federal standards including minimum standards for conditions of approval of any new fencing in wildlife combining zones.
- 3.6.4.4.5 SROA and SRLP Agreements: Pasture Lease Agreement and Horse Trail License Agreement, on file at SROA.

### Map #2

## **Property Boundary**



### Map #3 **Ecological Zones LEGEND U.S. Forest Service** Meadow/Forest Boundary River Corridor of Wild and TO CHELOR AILES Scenic River Pine Groves, Buffer Trees and Sentinels Intermittent Wetlands Permanent Wetlands $\sqrt{V}$ Transition Zone NORTH **MEADOW FOREST**

