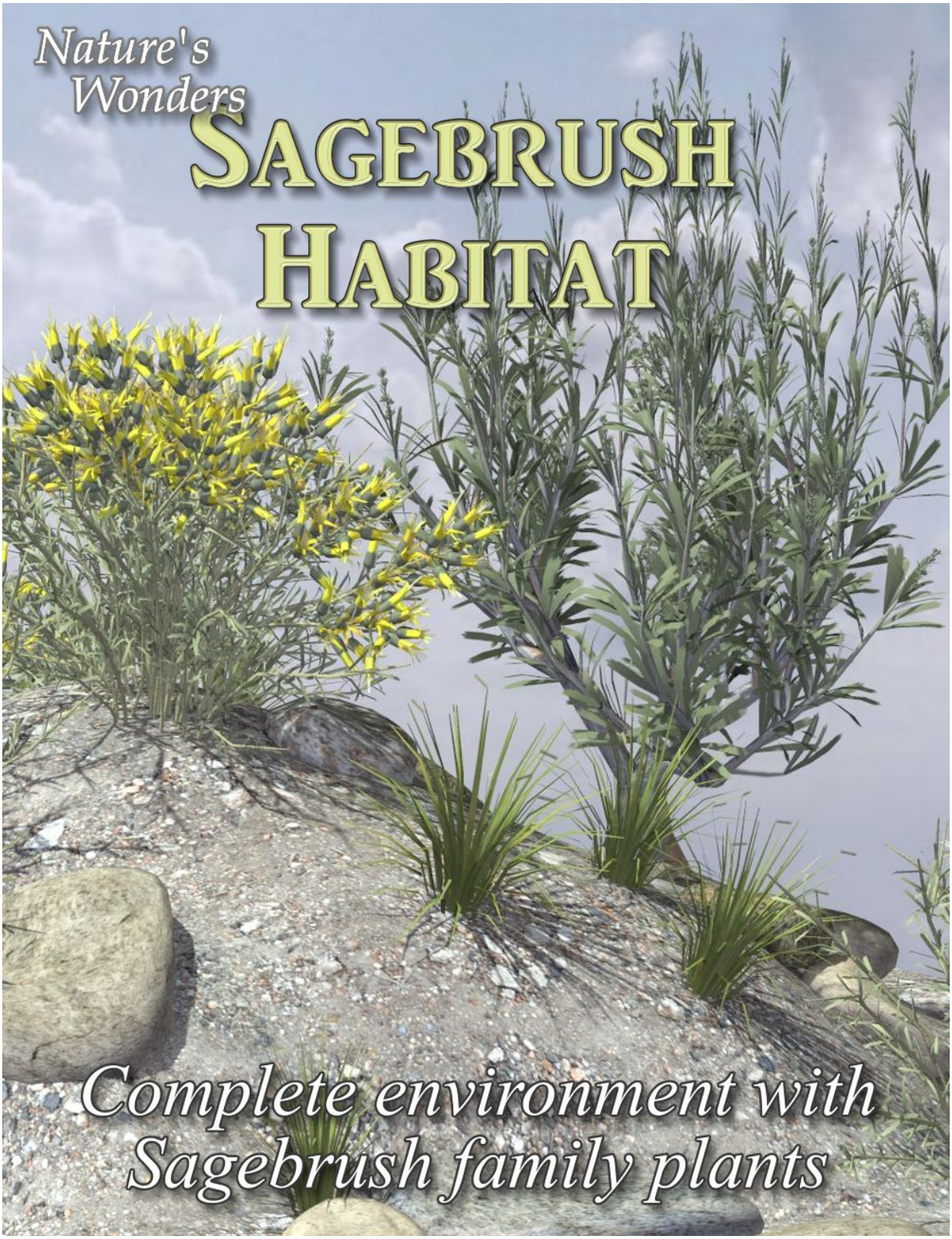

3D Botanical Models by Ken Gilliland

Sagebrush Habitat

Contents

Introduction

The Sagebrush Habitat is a mini-sage-steppe environment perfect for the Songbird ReMix birds and Nature's Wonders creatures. The American sage-steppe ecosystem to the casual eye, is an arid and monotonous expanse of sagebrush that early European settlers could not wait to traverse on westward journeys. Yet, this "flyover country", which may appear devoid of life and thus immune to human impact, is in fact the most widespread ecosystem type in the United States, one that teems with wildlife.

The habitat prop comes in SSS and non-SSS versions for Poser 9+ and 3D Delight and Iray versions for DAZ Studio 4.8+. Also included are standalone props for Great Basin Sagebrush, Gray Rabbitbrush, Blue Gamma Grass, Rocks and Ground.

How to Care for Your Habitat

Horticultural techniques in Poser

1. Get the planting area ready by installing the product in Poser.
2. Load Poser and go to the Props section. Locate the "Nature's Wonders/Flora/Sagebrush Habitat" folder.
3. Select the entire burrow mound or plant you want to plant by clicking the icon.
4. The plants often look their best when given lots of sunlight (100% or more on the main light is recommended.)

Horticultural techniques in DAZ Studio

1. Get the planting area ready by installing the product in DAZ Studio.
2. Load Studio and go to the "Environments" folder in the DAZ Studio section. Locate the "Nature's Wonders/Flora/Sagebrush Habitat" folder.
3. Select the entire burrow mound or plant you want to plant by clicking the icon.
4. The plants often look their best when given lots of sunlight (100% on the main light is recommended.)

Physical Based Renderers & Subdivision

Physical based rendering systems such as Iray, Superfly and Octane do not show displacement in the same way that 3D Delight and Firefly do. Physical based renderers require a very high mesh density (heavy subdivision) in order to show displacement while older renderers don't. Unfortunately, achieving good displacement in a physical renderer does require a powerful computer with a lot of memory as well as the patience in waiting on render times. The Iray version included automatically subdivides the "Base" and "Ground Plane" models enough to achieve good displacement, though may be demanding on your computer. The Superfly version will require you to subdivide the mesh to at least 4 or higher levels and is exceptionally demanding on your system and may often crash Poser 11. I've found subdivision level 4 is the safest and will give you a little displacement.

All maps in this set are 4K (4000 x 4000). The reason for these large maps is to allow close camera positions without pixelating the materials in renders. If memory is an issue, copy the original maps to a back-up location and then resave them at a lower resolution using the same names in the "Runtime : Textures : Notung : SagebrushHabitat" folder.

This model set or it's parts can by subdivided using DAZ Studio 4.8+ or Poser 11+. Some branches and/or leaves will become disconnected with subdivision use. The geometry relies on specific locations for branch and leaf connections and if the branch angles are smoothed by subdivision, it may change it's physical location. Earlier versions of Poser will subdivide some parts correctly and **some incorrectly** due to the way subdivision is calculated in those versions. Specifically the *Ericameria nauseosa* (Rabbitbrush) model has issues in Poser 10/Poser 2014 and previous versions. You can get around this by bringing the model into a modeling program and subdividing it there and then saving it.

Expansion and Individual Part Use

This model set includes individual parts that will allow you to expand the existing main model or they can be used with a scene of your choosing. All three plant types and the five rock shapes, as well as a ground plane, are included as separate parts. In addition, it is possible to change the materials on the five different rock shapes. These models use a common material called "rock", unlike the rocks in the main model, so that any of the five materials (found in the material library) can be applied to them.

About the Biodiversity and Sagebrush

from the US Department of Fish and Wildlife

The sage-steppe ecosystem of the western United States is, to the casual eye, an arid and monotonous expanse of sagebrush (A*rtemisia tridentata*) that early European settlers could not wait to traverse on westward journeys. Yet, this "flyover country", which may appear devoid of life and thus immune to human impact, is in fact the most widespread ecosystem type in the United States, one that teems with wildlife and also contains other important natural resources that fuel our nation's economy. Across the sage-steppe, a diverse array of partners is working to balance development of these resources with sustainable populations of native wildlife and arrest the decline of this vital place.

Dependent Wildlife

Small mammals such as pygmy rabbits (*Brachylagus idahoensis*) and sagebrush voles (*Lemmiscus curtatus*), reptiles including the sagebrush lizard (*Sceloporus graciosus*), birds of prey such as golden eagles (*Aquila chrysaetos canadensis*), and game species such as pronghorn (*Antilocapra Americana*), mule deer (*Odocoileus hemionus*), and elk (*Cervus canadensis*) all rely on sage-steppe habitat. While the diversity of wildlife in sage-steppe ecosystems may be less than other ecotypes such as forests, many species found in sagebrush, such as the Greater sage-grouse (*Centrocercus urophasianus*) live nowhere else in the world.

Functionally, sage-steppe serves as a nursery area for a multitude of wildlife species.

Human Values

Beginning with the Native American peoples who used the sage-steppe for hunting and other subsistence activities, this vast inter-mountain landscape has long held economic value for humans. As Europeans colonized the West and established large-scale agricultural economies, sagebrush communities became – and remain – central to livestock grazing throughout much of the West, especially during winter months, when higher elevation pastures are unavailable due to snow. More recently, energy development, first from conventional sources such as coal, oil and gas and increasingly, from renewable sources such as wind, has emerged as a critical component of the United States' energy supply. In addition, this system supports a variety of recreational activities, notably hunting for big game species and upland birds, which contribute to local economies from Colorado's Western Slope to the eastern slope of the Cascades. Lastly, and while perhaps harder to quantify, the uniquely American aesthetic of the "sagebrush sea" occupies a special spot in our natural heritage and reminds us all of the wide-open spaces that continue to define a large portion of our national geography and the shared history and culture of the West.

Conservation Value

Despite the significant values it provides to wildlife and humans, the sage-steppe ecosystem is one of the most imperiled ecosystems in America. Recently, the prospect of a Greater sage-

grouse Endangered Species Act listing has brought additional attention to the condition of the sage-steppe system. This iconic bird's habitat has been fragmented by development of sagebrush environments and there has been a considerable loss of suitable sagebrush habitat to support the bird's life history, including its needs for food, cover and nesting space. The fragmentation has been exacerbated by invasive weeds, especially cheatgrass, which fuels more intense wildfires; and, land-management practices that preclude restoration of large, contiguous blocs of sagebrush. Indeed, very little of this unique ecosystem has been undisturbed or unaltered in the past two centuries. Fragmentation of sagebrush habitats can have a particularly acute impact on wildlife because in the arid west, food, cover and water resources are distributed unequally across the landscape. This characteristic of sagebrush means many obligate species have evolved to require very large areas of intact habitat to meet their seasonal and annual resource needs. Therefore, a relatively small number of fragmented sagebrush acres can have a disproportionate impact on the species that need that particular habitat to survive.

The sagebrush that dominates the sage-steppe landscape plays a critical role in the hydrologic cycle of the arid West. Sagebrush itself often serves as a "nurse" plant for other plants, many of which are important to sustaining grazing wildlife and domestic livestock. In addition to the hundreds of birds, mammals, reptiles and amphibians that depend on sagebrush, many unique insects, spiders, plants and lichens are associated with the sagebrush community. Imperiled wildlife, especially sagebrush obligate species; grazing livestock, especially cattle; and, some people whose livelihoods depend on healthy sage-steppe have been impacted by the loss of sage-steppe ecosystem. Over time, usage of sagebrush by people, especially fragmentation of the sagebrush lands, has altered the sage-steppe landscape, resulting in a loss of the unique biodiversity associated with this habitat type. Consequences for wildlife include declines in the populations of both game and non-game species. Consequences for people include more restrictive regulatory scenarios to protect wildlife that, in turn, place more stringent controls on economic activities, especially extractive activities such as energy and minerals development.

Threats

Fire is one of the primary factors linked to loss of sagebrush-steppe habitat. Loss of sagebrush habitat to wildfire has been increasing in the western extent of the ecosystem due to an increase in fire frequency. The increase in mean fire frequency in sagebrush ecosystems has been facilitated by the incursion of nonnative annual grasses, primarily cheatgrass (*Bromus tectorum*) and medusahead (*Taeniatherum asperum*). The positive feedback loop between exotic annual grasses and fires can preclude the opportunity for sagebrush to become re-established. Exotic annual grasses and other invasive plants also alter habitat suitability for many species of wildlife, including sage-grouse by reducing or eliminating native vegetation essential for food and cover. Annual grasses and noxious perennials continue to expand their range, facilitated by ground disturbances, including wildfire, improper grazing, agriculture, and infrastructure associated with energy development. Climate change may alter the range of invasive plants, potentially expanding the importance of this threat across the entire ecosystem.

Habitat loss is also occurring from the expansion of native conifers (e.g., pinyon-pine (*Pinus edulis*) and juniper (*Juniperus spp.*) in part due to changes in fire return intervals and the overstocking of domestic livestock, particularly during the latter 1800s and early 1900s. Conifer encroachment may be facilitated by increases in global carbon dioxide (CO2) concentrations, and climate change.

The persistent and increasing demand for energy resources means continuous development of the sage-steppe ecosystem, which results in habitat fragmentation. Fragmentation of habitat is causing significant reductions of wildlife populations, such as Greater sage-grouse and pronghorn and other sagebrush-dependent species. Although data are limited, impacts resulting from renewable energy development are expected to have negative effects on sagebrush habitats due to their similarity in supporting infrastructure and that there will likely be permanent infrastructure developments within the sage-steppe, which will have long-lasting impacts. Both non-renewable and renewable energy developments are increasing within the sagebrush ecosystem. Other factors associated with habitat loss and fragmentation in the sage-steppe ecosystem include conversion of sagebrush habitats for agriculture, the expanding human populations in the western United States and the resulting urban development in sagebrush habitats, vegetation treatments resulting in the alteration or removal of sagebrush to enhance grazing for livestock, and impacts from wild ungulates and free-roaming equids (horses and burros).

The Future of the Sage-steppe Ecosystem

While the impacts to the health of the sage-steppe ecosystem are widespread and persistent, partners ranging from federal land management agencies to private landowners are increasingly coming together to identify and pursue strategies to arrest the decline of sagebrush and dependent species across the range. While much of the attention of the conservation community to this effort is currently focused on the Greater sage-grouse, the larger issues underlying the status of the sage-grouse, namely the invasive species-wildfire nexus and the need to responsibly develop energy and other natural resources, affect a broad suite of wildlife and must be successfully managed if the sage-steppe ecosystem is to remain a vibrant and functional landscape. A growing awareness and appreciation for this remarkable place and its values is an important first step in fostering lasting stewardship of this uniquely American landscape.

Species Name: *Artemisia tridentata*
Common Name: *Great Basin Sagebrush*

Big Sagebrush is a coarse, many-branched, pale-grey shrub with yellow flowers and silvery-grey foliage, which is generally 0.5–3 m tall. A deep taproot 1–4 m in length, coupled with laterally spreading roots near the surface, allows sagebrush to gather water from both surface precipitation and the water table several meters beneath. Big sagebrush that is over a meter tall is an indicator of arable land, because it prefers deep, basic soils. Sagebrush is generally long-lived once it makes it past the seedling stage, and can reach ages of over 100 years.

Plant Family: Asteraceae

Plant Type: Shrub

Height by Width: 4-6' H x 4' W

Growth Habit: Upright, dense

Deciduous/Evergreen: Evergreen

Growth Rate: Moderate

Sun Exposure: Full sun

Soil Preference: Well-draining

Water Requirements: Drought-tolerant to occasional

Cold Hardy to: 15 degrees F

Flower Season: Spring/Summer

Flower Color: Same as foliage

Endangered?: Not listed

Distribution: High Cascade, Inner South Coast, and Transverse Ranges, Sierra Nevada Foothills, Southern San Joaquin Valley, South Coast, Great Basin, Mojave Desert

Natural Habitat: Dry soils, valleys, slopes below 9,000'

Species Name: *Ericameria nauseosa*
Common Name: *Gray Rabbitbrush*

It produces pungent-smelling, golden-yellow flowers. Leaves, depending on the subspecies, are long and narrow to spatula-shaped. Both the flexible (rubbery) stems and the leaves are greenish-gray with a soft felt-like covering. It grows in the arid regions of western Canada, western United States (from the western Great Plains to the Pacific) and northern Mexico.

Plant Family: Asteraceae

Plant Type: Perennial

Height by Width: 2-4' H x 3' W

Growth Habit: Upright open shrub

Deciduous/Evergreen: Winter deciduous

Growth Rate: Moderate

Sun Exposure: Full sun

Soil Preference: Well draining

Water Requirements: Drought-tolerant

Cold Hardy to: 15 degrees F

Flower Season: September-October

Flower Color: Yellow

Endangered?: Not listed

Distribution: Outer South Coast Range, Transverse Range, Mojave Desert

Natural Habitat: Dry scrub, deserts 1200' - 7000'

Species Name: *Bouteloua gracilis*
Common Name: *Blue Grama Grass*

It is most commonly found from Alberta, Canada, east to Manitoba and south across the Rocky Mountains, Great Plains, and U.S. Midwest states, onto the northern Mexican Plateau in Mexico. Blue grama accounts for most of the net primary productivity in the short-grass prairie of the central and southern Great Plains. It is a green or grayish, low-growing, drought-tolerant grass with limited maintenance. Seed heads resemble small flags with an eyelash
shape.

Plant Family: Poaceae

Plant Type: Grass (warm season)

Height by Width: 6 in -1' H x 6 in -1' W

Growth Habit: Low, clumping and spreading

Deciduous/Evergreen: Winter dormant

Growth Rate: Fast

Sun Exposure: Full to part sun

Soil Preference: Adaptable

Water Requirements: Occasional to regular

Cold Hardy to: 15 degrees F

Flower Season: Summer

Flower Color: Produces an “eyelash” shaped seed head

Endangered?: Not listed

Distribution: San Bernardino Mountains, Eastern Desert Mountains (Ivanpah, New York, and Clark Mtns

Natural Habitat: Sandy to rocky slopes, flats, drainages, scrub, woodland, pine forests below 7000'

Special Thanks to…

….FlintHawk (my beta tester) and Szark (for his invaluable help with Iray materials settings)

Sources

Wikipedia (http://www.wikipedia.com)
US Department of Fish and Wildlife (https://www.fws.gov/)
Theodore Payne Foundation for Native California Plants and Wildflowers (http://theodorepayne.org/)


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