







A small ecology container

An exciting take on keeping sustaining small ecology systems, to provide space and support for different eco environment, form aquatic wetland to arid landforms.

With a robotic gantry on top of the ecology space, to adopt camera and sensor tools for both scientific and cinematic expeditions into the micro ecological worlds !



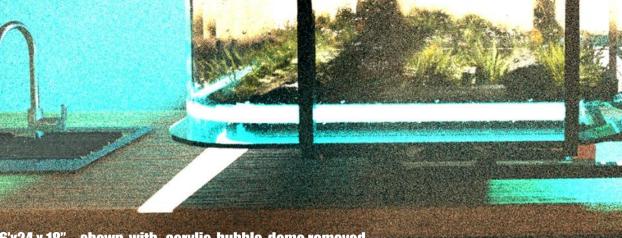
Layout and Key Elements

- 1. bubble dome
- 2. motorized gantry
- 3. camera arm
- 4. diffuser screen wall
- 5. planting area
- 6. power supply
- 7. micro controller

	Aquarium	Paludarium	Riparium	Terrarium
Same Container	Yes	Yes	Yes	Sometimes
Environment	Water	Generally tropical	Water	Generally arid
Humidity	-	High	Normal	Low
CO2 injections	Sometimes	Sometimes	Sometimes	No
Water	Yes	Yes	Yes/Most	No/Little
Land	No	Yes/Most	Yes/Little	Yes
Plants	Sometimes	Yes	Yes	Sometimes
Aquatic animals	Sometimes	Sometimes	Sometimes	No
Semi-aquatic animals	No	Sometimes	No	No
Terrestrial animals	No	Sometimes	No	Sometimes







36'x24 x 18" shown with acrylic bubble dome removed







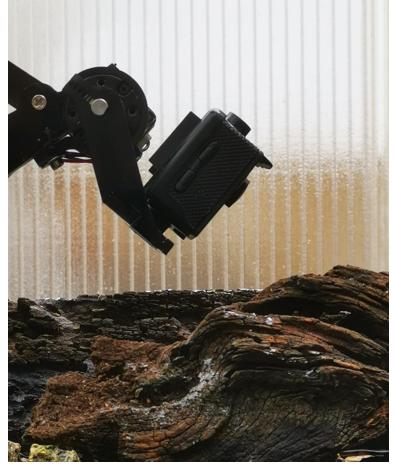








Motion control + cameras



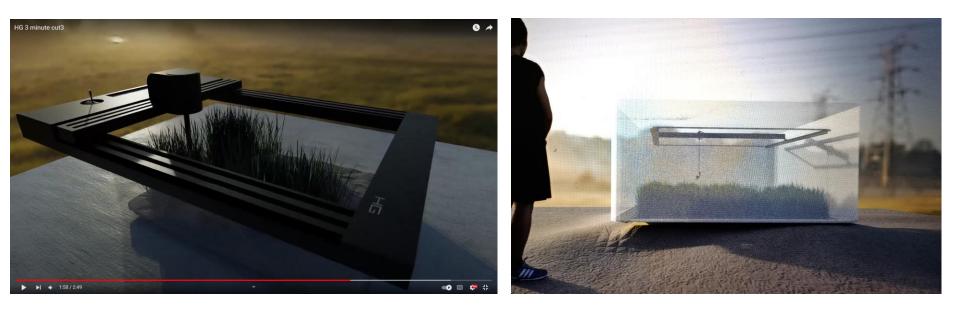




References:

earlier prototypes and design variations

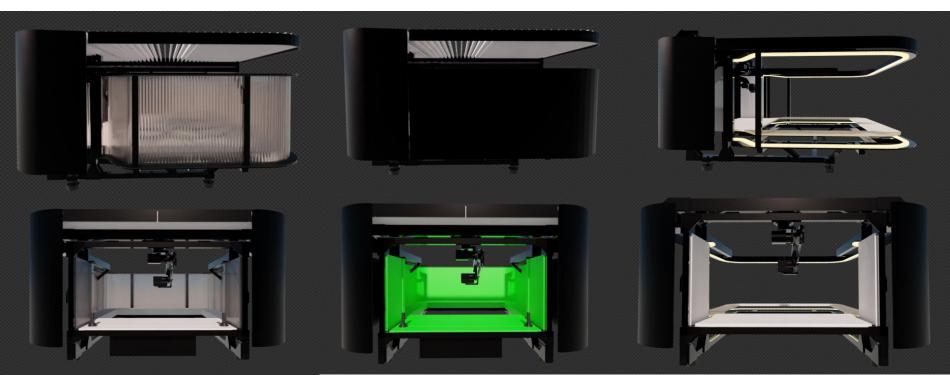
Concept design



Concept Variation : small studio setup for virtual and miniature production

Enclosed version of the basic stage ,designed to replicate a range of environmental conditions. Fm an openair green house to a fully closed looped terrarium

This will be a ecological container for educational purpose, customizable in scale and environmental control Enclosed version of the basic stage ,designed to provide frantastic camera motion for film production . a miniature setup of for expermental works. Applications that Integrate with Unity game engine currently under development , it will be open source and available to built our miniature studio community This is the basic stage set for desktop production, , a 5 dof motion control camera. on a open framework make easy for adoptation in light, visual effects , back drop and enclosure, a studio to play out all your cinematic scenarios in one go.



eco pond + filming gantry





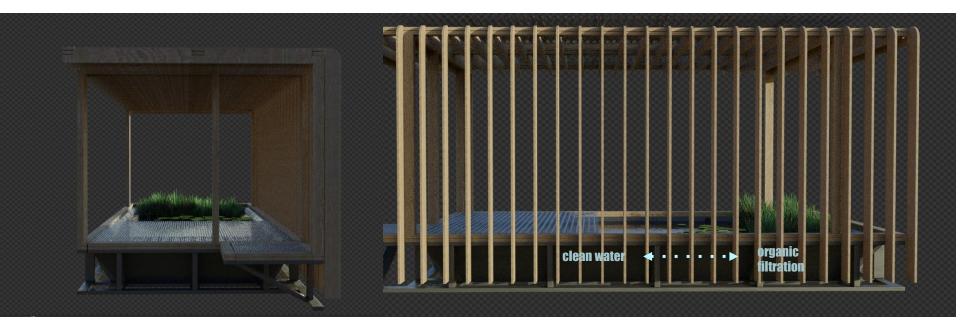
A simple natural pool that promote biodiversity so you and your family can reconnect to nature.

First introduced over **25** years ago in Austria and Germany, Natural swimming pools are 100-percent chemical-free pools that are filtered through aquatic plants and helpful bacteria. They provide a natural water garden and are a wonderful eco-friendly alternative for those seeking a chemical-free way to treat their pools.



clean swimmable water natural / energy efficient filtration system

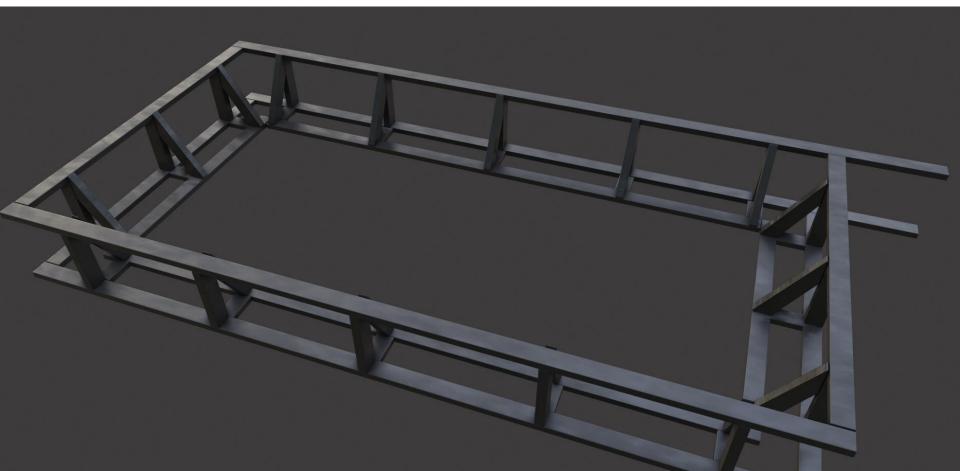
composed of two parts: a swimming area and a regeneration zone. The regeneration zone looks like a small pond or water garden and provides a habitat for aquatic plants that filter the water. The plants take nutrients out of the water, which helps outcompete algae for available resources. A natural swimming pool is a living system, and because the water is not sterilized or disinfected in any way, there will always be a small amount of algae and sediment in both the regeneration zone and the swimming area.



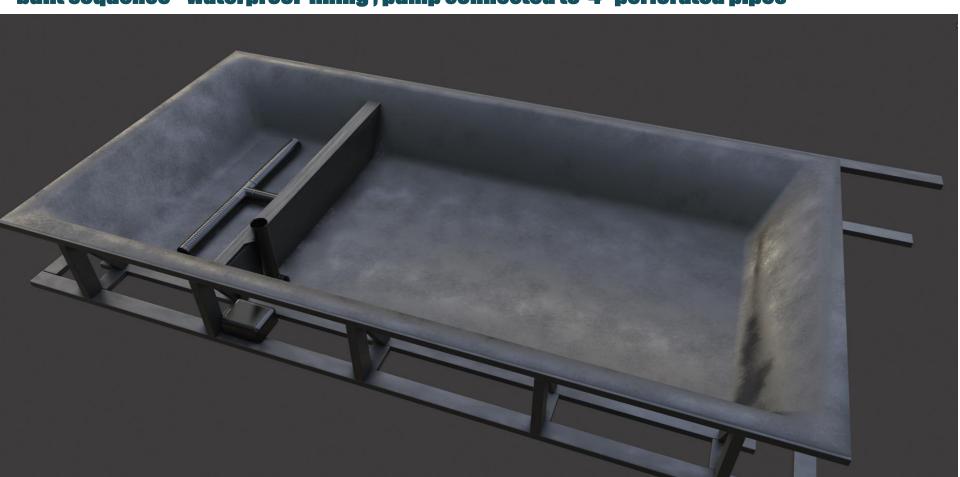




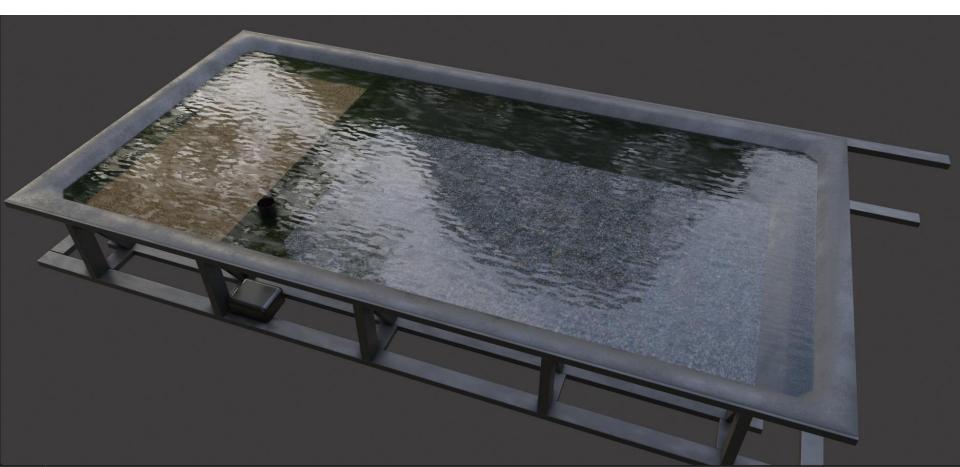
pilot pavilion built built sequence – 2by4 base frame



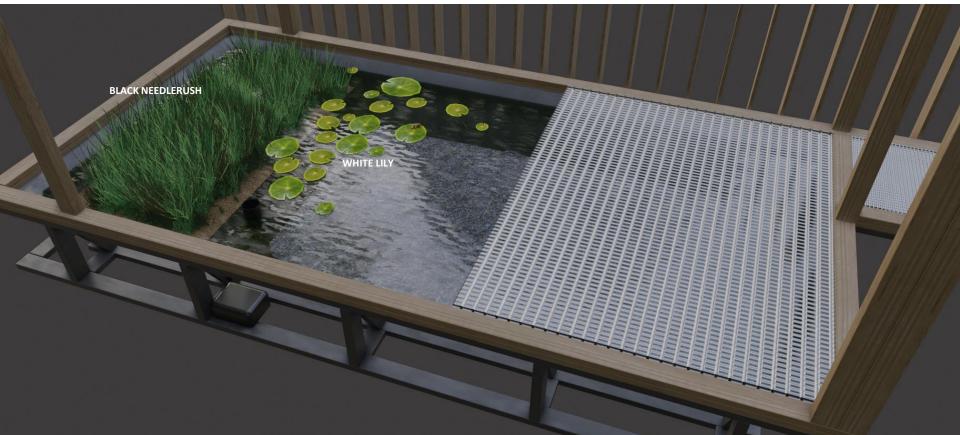
pilot pavilion built built sequence - waterproof lining , pump connected to 4" perforated pipes

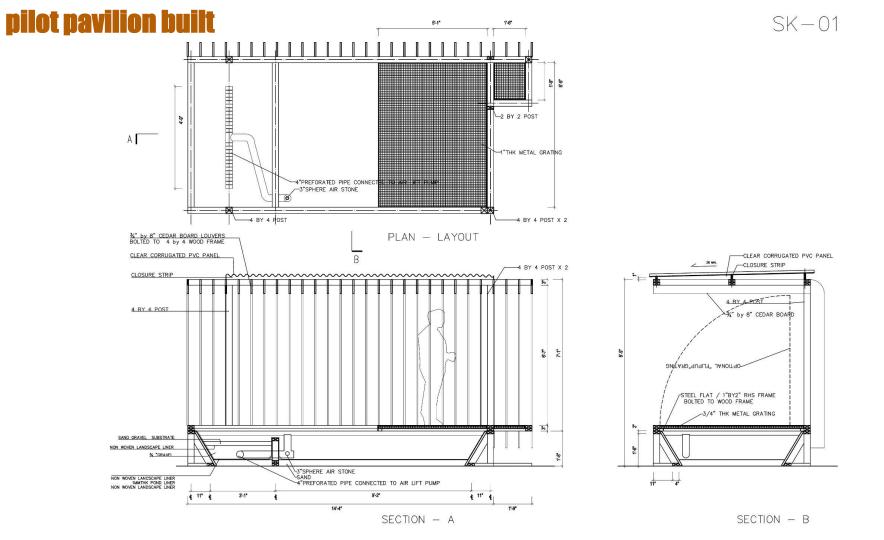


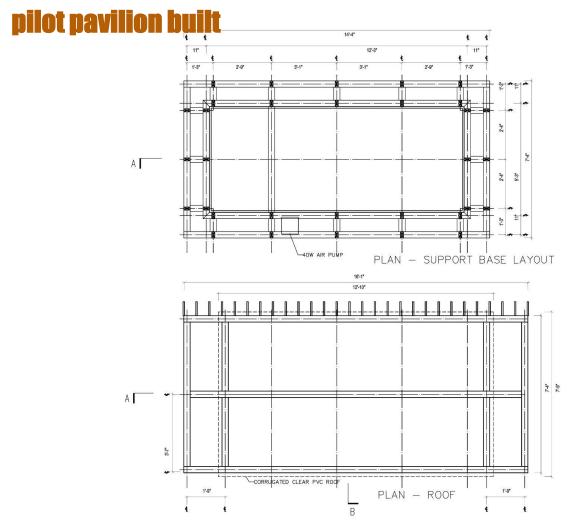
pilot pavilion built built sequence - gravel /sand / planting substrate



pilot pavilion built built sequence - upper framing ,grating, softscape







FRAMING -BASE	2BY4 WEATHER SHIELD	170'X1.2 = 200FT
	34 INCH PRESSURE TREATED PLY SHEET	42'X1.5' =60SQFT
	NON WOVEN LANDSCAPE LINER	16'X9'+50 =200SQFT
POND	1MMTHK POND LINER	16'X9' =150SQFT
	GRAVEL	30X60X6 =10800CUIN
	SAND	150X60X4 = 36000CUIN
	4 INCH PERFORATED PIPE	15FT
	40W AIR PUMP	1
	UNDERWATER LIGHTING	2
	FILTRATION SYSTEM W UV (OPTIONAL)	1
	SOFTSCAPE - EMGERGENT	20
	SOFTSCAPE - FLOATING	20
	2BY4 WEATHER SHIELD	140FT
FRAMING -COLUMN+ROOF	48Y4 WEATHER SHIELD	30FT
	X INCH BY 4 INCH LOUVER BOARD CEDAR	15' X 28 = 420'
	CLEAR PVC CORRUGATED ROOFING	12' X 8' = 96SQFT
GRATING	34 INCH GMS GRATING	5X7 + 1.5X2= 40 SQF
	FLIP UP MECHANISM (OPTIONAL)	1

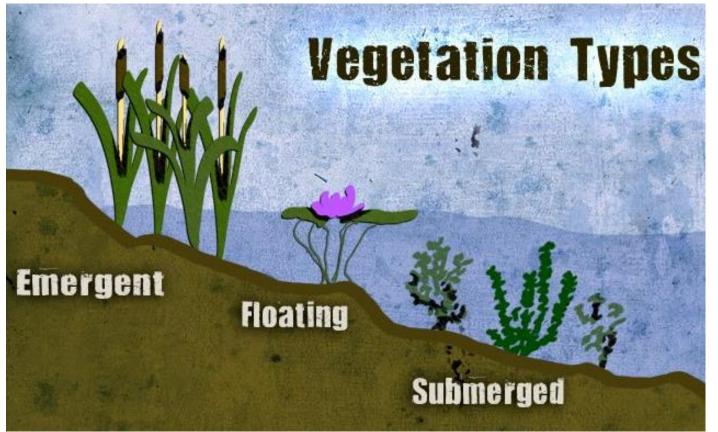
ABOUR	SITE PREP.	2 MANDAY
	FRAMING (BASE)	2 MANDAY
	LINING	2 MANDAY
	FILTRATION	2 MANDAY
	FRAMING (UPPER)	2 MANDAY
	LOUVERS	2 MANDAY
	GRATING	1 MANDAY
	PVC ROOF	1 MANDAY

PROJECT MANAGE	DESIGN AND DRAWING DELIVERABLES	нк
	CONSTRUCTION SUPERVISION	HK + LOCAL
	CLIENT COORDINATION	LOCAL

SK-02

Ecology softscape and material references / California

softscape



emergent

- **BLACK NEEDLERUSH most wild cool** looking
- Soft Stem Bulrush alternative wild ooking emergent choice
- villow nice white flower , more ielicate looking lickerelweed-

floating

1. 2. white lily yellow cow lily



Southwest	Aquatic	Services	Plant	List
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Common Name	Scientific Name	
Water Willow	Justicia Americana	
Squarestem Spikerush	Eleocharis Quadrangulata	
Soft-stem Bulrush	Scirpus Tabernaemontani	
California Bulrush	Scirpus Californicus	
Grassy Arrowhead	Sagittaria Graminea	
Arrowhead	Sagittaria Latifolia	
Buttonbush	Cephalanthus Occidentalis	
Baldcypress	Taxodium Distichum	
White Water Lily	Nymphaea Odorata	
Yellow Cow Lily	Nuphar Luteum	
Pickerelweed	Pontederia Cordata	
Black Needlerush	Juncus Roemerianus	
Alligator Flag	Thalia Dealbata	







Alligator Flag

Pickerel weed (Pontederia cordata)

Soft-stem bulrush (Scirpus tabernaemontani)



Wetlands-Map.jpg
Vegetation-types.jpg

P Type here to search

Black Needlerush



Juncus roemerianus, a.k.a. Black Needlerush

Juncus roemerianus is the specialist of the Rushes. Though it can grow perfectly well in freshwater, in the wild it grows between mean high tide and spring tide in brackish areas with up to 25 ppt salinity. Under such conditions it becomes the dominant species.

Juncus (a.k.a. Rush)

are grasslike plants that are extremely useful in stormwater management and erosion control projects.

They are evergreen and survive winter planting quite nicely - a rare feature for a non-woody wetland plant. Geese don't consider them edible, although they will tear up new installations for fun. And rushes develop massive, erosion controlling root systems.

pricing

Total Plants per Shipment	Price per Plant	
200-2999	\$1.23	
3000-6499	\$1.18	
6500-9999	\$1.14	
10,000 or more	\$1.10	
Retail		
100-199	\$4.00	
less than 100	\$5.00	

Prices above are for every species except *Netumbo*, *Nymphaea*, and *Nuphar* which are the following prices regardless of quantity:

Nelumbo lutea	\$4.00
Nymphaea odorata	\$3.25
Nuphar lutea	\$3.25

Shipping and Delivery

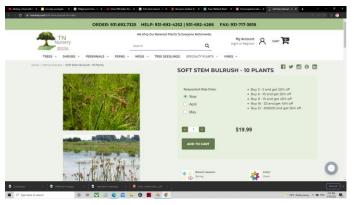
FREE throughout NC, SC and VA \$0.06 per plant for shipments to GA, TN, MD \$0.12 per plant for shipments to AL, MS, LA, AR, DE, NJ, PA, NY \$0.18 per plant for shipments to FL, TX, KY, IN





https://www.tnnursery.net/soft-stem-bulrush-for-sale/





Soft Stem Bulrush Schoenoplectus Is Useful For Controlling Erosion And Attracting Wildlife

Soft Stem Bulrush – Schoenoplectus tabernaemontani, also called great bulrush, is native to the United States and grows where water often accumulates. It prefers to build in up to 12 inches of rain.

This plant produces small flowers protruding from the stem at the top of the plant. It grows well, whether it is planted in pots or the ground, and can reach up to eight feet tall. This plant is an ideal candidate for those who have a pond or water feature in their landscaping.

Every plant can have a spread of more than four feet. It produces a left blade that is less than 0.04 inches in diameter, and it can curve slightly on its outside edges. It also provides a small brownish fruit that is surrounded by reddish-brown scales.

Soft Stem Bulrush Schoenoplectus Is An Ideal Candidate For Ponds And Water Feature Landscaping

The inflorescence of this plant usually droops or arch downward, making it look particularly beautiful when the wind blows through it. The dark brown fruit often appears in late May and is present until September.

Unlike hard-stem bulrush, the stems on this plant have a spongy feeling that can be easily compressed. This is a sun-loving plant, although it will tolerate partial shade. Left alone, this plant will spread, creating new plants without the homeowner having to do any work. To take advantage of this characteristic, it is recommended that they not be planted closer than one foot apart.

It can also be useful for controlling erosion as it has deep roots helping to hold the soil in place. Native Americans often ate the tender shoots in the spring while they collected taller soft-stem bulrush to weave into bags or to create thin pads for sitting upon.

Wildlife love to hide their homes in between these tall plants that they use for food. Additionally, waterfowl often love to hide amongst this plant's stems.

Soft Stem Bulrush

The Soft Stem Bulrush, also known by the scientific name of Schoenoplectus tabernaemontani, can be found natively all across North America and Eurasia. Other names for this plant include the Tall Bulrush or Great Bulrush.

It is a water-loving, hardy wildflower that can grow anywhere between 2 and 9 feet in height, though taller is more common. This perennial plant is happy in hardiness zones 4-9 and thrives in ponds, wetlands, swamps, wet prairies, and other damp or moist environments.

It consists of a thick green culm, or hollow shaft, with a delicate cluster of flowers at the top. It also is a popular addition to any wetland restoration or pond landscaping project. The flowers are an attractive orangish-brown color and eventually mature into a hard brown seed fruit.

A process that occurs between July and September, though blossoms can be found as early as May in some cases. It does not have noticeable leaf blades, though there are leaves that hug the shaft, especially near the bottom of the plant. The plants like to grow in clusters, with a 4-5 foot spread, and prefer silty or peaty soils, though it is reasonably tolerant of many soil types.



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TREES - SHRUBS - PERENNIALS - FERNS - MOSS - TREE SEEDLINGS SPECIALTY PLANTS -

Horns / Shoubs / Water Willow- Shipe April- Aug.



Dépent: Feet (Buy 1 Get 1 Free) Feet (Buy 1 Get 1 Free) and Ship Date: / I ember 2022 (Fail)	Buy 3 - 5 and get 19% of Buy 6 - 10 and get 20%. Buy 1 - 10 and get 20%. Buy 16 - 20 and get 30% Buy 21 - 1000 and get 4
	\$29.99











Water Willow Plant Description

The American water-willow, scientifically known as Justicia Americana, is an aquatic, herbaceous flowering plant belonging to the Acanthaceae family. There are around 2,500 species in this family, ranging from small trees to herbs and shrubs. Water willows are native to North America and occur mainly in Iowa, Kansas, Texas, Oklahoma, Vermont, and Michigan. You can also find this plant in Quebec and Ontario.

Flowering occurs in June and might last until September, dependent on the location. Typically, just a few flowers bloom at a time. Following that, seed capsules replace the flowers. Each capsule holds two cells, with each cell holding two seeds. The seeds are warty and roughly 1/8 inches long. The root system is hizomatous, generating plant colonies.

Physical Appearance

This perennial herbaceous wildflower is normally an emergent aquatic plant with a moderate density that grows between one to three feet above the water's surface. However, it can also be a terrestrial plant of comparable height. Typically, the stems are unbranched and can grow to anything between one and a half and three feet high.

The leaves are deciduous, thin at the base, and sword-shaped. These can grow up to an inch in width and six inches in length. Their edges are typically smooth, while the outer edges may be somewhat undulate. The leaves' top and lower surfaces are both glabrous and medium green. The seeds have a bright polish with a width of 0.07 inches and are 0.11 inches long.

The flowers are either white or violet, with an average length of 0.4 inches. The lobes are primarily white, except for the deep purple-hued mottling at the lower lobe's base. Otherwise, the flowers are gently speckled with small purple dots or stained pale purple. They grow in tiny bunches on stalks from the leaf axis.

The sepals are about 0.27 inches in length, whereas the spikes grow up to 1.18 inches in length. The fruit is dry and extends beyond the flower, growing to a height of about 0.47 inches.

Habitat

The water willow grows in shallow, stagnant water of up to three feet deep, where there's partial or full sun or damp weather, with soil that's gravelly, sandy, or mucky. Throughout the summer, shallow riffles in rivers and major streams are typical habitats. Other suitable habitats include wet portions of swamps, river sandbars, muddy river or pond banks, rocky highland streams, and sandy marshes

What's the Water Willows Purpose in The Ecosystem?

The water willow is advantageous to the ecosystem as it provides food for several creatures. As an aquatic plant, fungi and bacteria decompose it once it dies, providing food for several marine invertebrates. It is a host plant for Darapsa Versicolor caterpillars, which feed on the leaves.

Additionally, numerous macro and micro invertebrates live in the submerged parts of all aquatic plant species. Fish and other creatures such as ducks, reptiles, and amphibians consume these invertebrates. Other wildlife species that eat the water willow rhizomes are the nutria, white beaver, and muskrat. Deer also graze on the water willow's leaves.

https://www.gardenia.net/plant/schoenoplectus-tabernaemontani





Pickerelweed is a native herbaceous emergent that grows along shallow shorelines up to 4 feet tall and is found in all areas of NC. The thick rhizomes spread to form large colonies. Its preference is for freshwater depth up to 12 inches in full sun in rich loamy soils. It can tolerate part sun, poor soils and occasional flooding up to 20 inches. The tall spikes of lavender-blue flowers occur summer through fall and attract many pollinators. They are held well above the water for a showy long season display.

Use this plant along bogs, ponds or streams. It can also be grown in a large container or water gardens. It is very important to maintain water depths greater than saturation, but shallower than the leaves year-round.

Where Does it Grow?

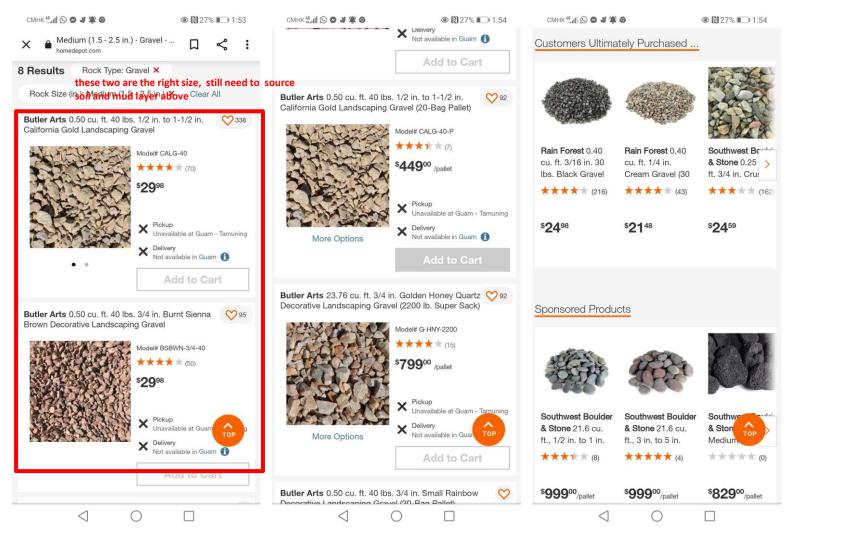
Pickerelweed can be found in marshes, sluggish streams, and ditches in shallow water.

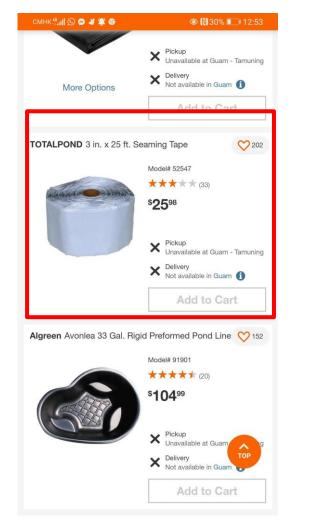
Pros and Cons of Pickerel-weed

Ducks will consume the seeds of pickerelweed; while muskrats and nutria will consume the rhizomes and base. Submerged portions of all aquatic plants provide habitats for many micro and macro invertebrates. These invertebrates in turn are used as food by fish and other wildlife species (e.g. amphibians, reptiles, ducks, etc). After aquatic plants die, their decomposition by bacteria and fungi provides food (called "detritus") for many aquatic invertebrates.



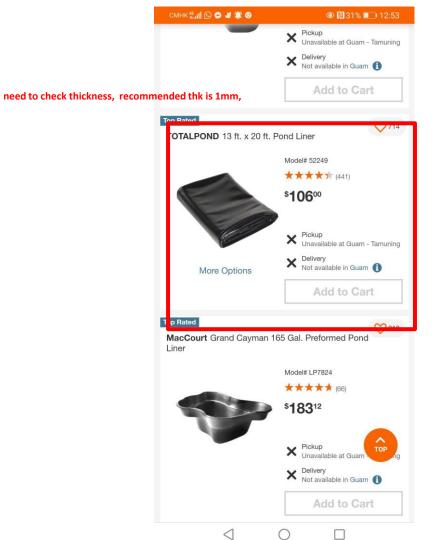






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gfabric

ft. x 100 ft. Non Woven Heavy Non-Voven Weed Barrier Landscape Fabric for Gardening Mat and Raised Bed

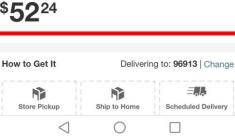
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WEED CON USE Mulch/Straw

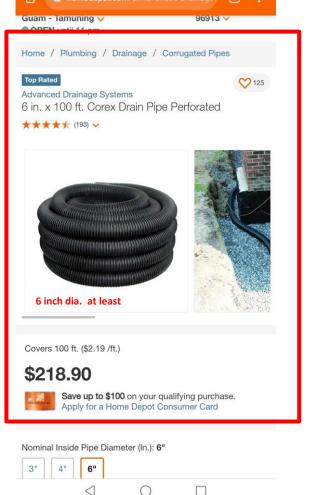
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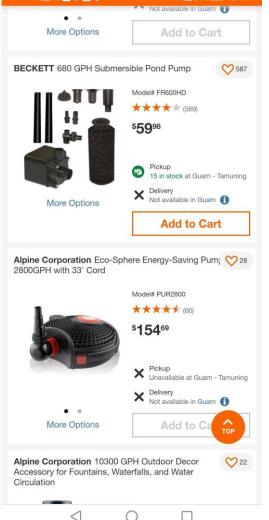
below water prove, and above gravel layers,





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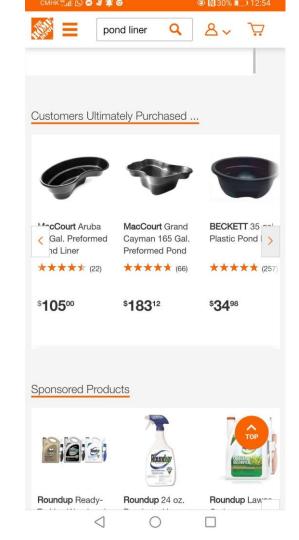


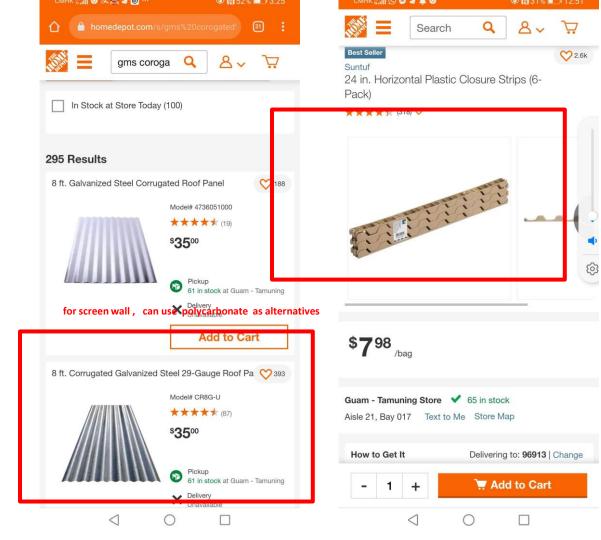
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Pump Valves	Pump Switches
	TOP HASEMENT WATCHDOC

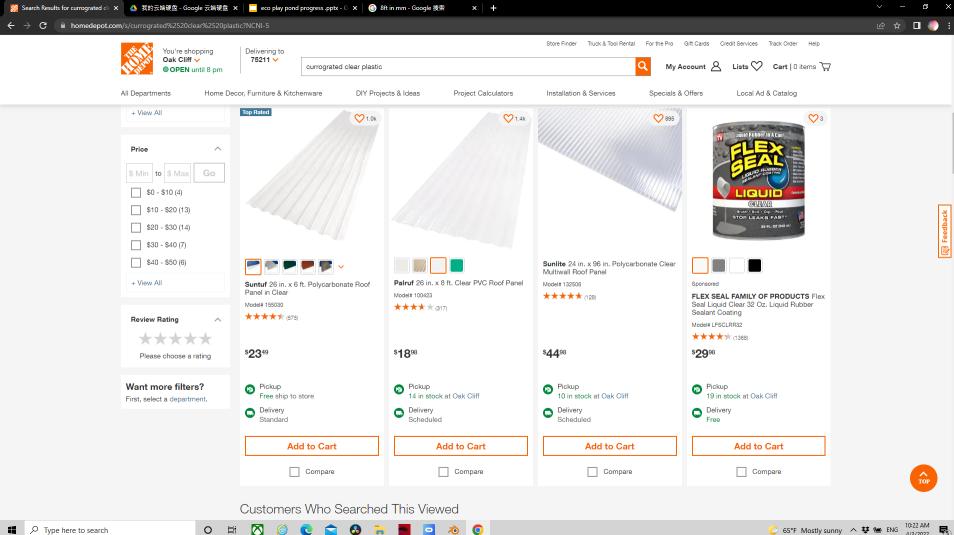
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