



# Exhibit Planning & Design

Task 4 Submittal  
RFP 11-001

Production Documents, Book 3 of 3  
Content Package  
Product Technical Data Sheets

Image, Artifact, Display Object, and  
Specialty Element Lists

Submitted to:  
NJ Pinelands Commission  
New Lisbon, NJ

Submitted by:  
Content • Design Collaborative LLC  
Scituate, Massachusetts



▶ **Panel 1.1 and 1.2**

Image 1.2 Apple Pie View  
Artist Tom Till

Source  
Tom Till  
tom@tomtill.com  
www.tomtill.com



▶ **Panel 1.2**

Image 1.2A Pine Barrens Gentian  
Artist Donna McBride

Source  
NJ Pinelands Commission



▶ **Panel 1.2**

Image 1.2C Weymouth Ruins  
Artist Jennifer W. Hanson

Source  
Jennifer W. Hanson  
ammodramus88@gmail.com



▶ **Panel 1.2**

Image 1.2D Summer Tanager  
Artist Michael Hogan Photography

Source  
Michael Hogan  
hoganphoto@verizon.net  
http://www.hoganphoto.com/  
609-476-2086



▶ **Panel 1.2**

Image 1.2F Jersey Devil  
Artist Evening Bulletin, 1909

Source  
Leeds Devil  
The Jersey Devil,  
Philadelphia Evening Bulletin, January  
1909



▶ **Panel 1.2**

Image 1.2H Pitcher Plant  
Artist Paul Leakan

Source  
NJ Pinelands Commission



▶ **Panel 1.2**

Image 1.2J Carranza  
Artist The Boston Public Library

Source  
Jones, Leslie, 1886-1967  
The Boston Public Library,  
Leslie Jones Collection



▶ **Panel 1.2**

Image 1.2K Pirates  
Artist A. Burnham Shute

Source  
"Stories of the American Revolution, Volume 2  
"Halt!" Frontpiece; published in 1898  
Lee and Shepard



## NJ Pinelands • Image Schedule

▶ **Panel 1.2**

Image 1.2L F16 In Flight  
 Artist NJ Dept. of Military and Veterans Affairs

Source

Armando Vasquez  
 Office: 609-530-7088  
 Armando.Vasquez@njdmava.state.nj.us  
 NJ Dept. of Military and Veterans Affairs



▶ **Panel 1.2**

Image 1.2M Batona Trail  
 Artist Mary Holer

Source

Mary Holer  
 A memorable trip to the Pinelands that time. A huge thunder storm came through late at night and scared the bejeezus out of us.

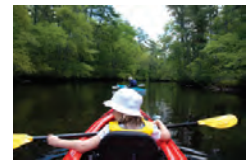


▶ **Panel 1.2**

Image 1.2O Mullica Kayak  
 Artist Bill Bessette

Source

Bill Bessette  
 Mullica River Kayaking,  
 Pleasant Mills to Crowley's Landing



▶ **Panel 1.2**

Image 1.2Q Pine Barons Albert Hall  
 Artist Albert Music Hall

Source

Elaine Ever  
 eever21072@aol.com  
 Jim Murphy and The Pine Barons  
 at Albert Music Hall



▶ **Panel 1.2**

Image 1.2T Timber Rattlesnake  
 Artist A. Ruppert

Source

Alex Ruppert  
 alx-r@gmx.net



▶ **Panel 1.2**

Image 1.2V Glass of Water  
 Artist Greg Riegler Photography

Source

Greg Riegler Photography



▶ **Panel 1.2**

Image 1.2W Shipbuilding  
 Artist Michael Hogan

Source

<http://www.ajmeerwald.org>  
 Michael Hogan Photography



▶ **Panel 1.2**

Image 1.2X Hidenburg  
 Artist United States Navy

Source

Historical #14-Hindenburg By Dock  
 Tom Worsdale, Public Affairs Officer  
 NAVAIR JB McGuire-Dix-Lakehurst  
 732-323-2811



## NJ Pinelands • Image Schedule

### ▶ Panel 1.2

Image 1.2Z James Still  
Artist Rutgers University Libraries

### Source

Joseph M. Laufer, Burlington County Historian  
Info@BurlcoHistorian.com  
Phone: 609-859-4042



### ▶ Panel 3

Image 3.0 White Sand Road  
Artist Lena Struwe

### Source

Dr. Lena Struwe, Rutgers  
(732) 932-9711 x235  
struwe@aesop.rutgers.edu  
Warren Grove Range



### ▶ Panel 3

Image 3.0X Pinus rigida  
Artist Will Cook

### Source

Will Cook  
Background image for panel



### ▶ Panel 3

Image 3.2A After Fire  
Artist Uli Lorimer

### Source

Uli Lorimer  
Curator of Native Flora,  
Brooklyn Botanic Garden  
Wharton State Forest, NJ



### ▶ Panel 3

Image 3.2B Controlled Burn  
Artist JJS Photo

### Source

John J. Shelmet, MD, Lawrenceville, NJ  
jsdiabetes@aol.com  
Greenwood-Pasadena Wildlife  
Management Area along Route 539



### ▶ Panel 3

Image 3.2C Apple Pie Hill Tower  
Artist Paul Leakan

### Source

NJ Pinelands Commission



### ▶ Panel 3

Image 3.2D Fire Breaks  
Artist The Star Ledger

### Source

Photograph from the Star Ledger.  
Warren Grove Fire, 2007



### ▶ Panel 3

Image 3.3A Flying Squirrel  
Artist Joe McDonald









### Source

Joe McDonald  
717- 543-6423  
McDonald Wildlife Photography  
info@Hoothollow.com





## NJ Pinelands • Image Schedule

<p>▶ <b>Panel 3</b></p> <p>Image 3.3B Eastern Spadefoot</p> <p>Artist Jonathan Mays</p>	<p>Source</p> <p>Jonathan Mays Scaphiopus holbrookii - Eastern Spadefoot</p>	
<p>▶ <b>Panel 3</b></p> <p>Image 3.3C Box Turtle</p> <p>Artist Paul Leakan</p>	<p>Source</p> <p>NJ Pinelands Commission</p>	
<p>▶ <b>Panel 3</b></p> <p>Image 3.3D Pixie Moss or Pyxie</p> <p>Artist Peter P. Grima</p>	<p>Source</p> <p>Peter P. Grima Pyxidantha barbulata (Diapensiaceae) in fruit on exposed sand and gravel in the East Plain pygmy forest</p>	
<p>▶ <b>Panel 3</b></p> <p>Image 3.3E Pink Lady Slipper</p> <p>Artist Michael Hogan Photography</p>	<p>Source</p> <p>Silhouette original image by Michael Hogan</p>	
<p>▶ <b>Panel 3</b></p> <p>Image 3.4A Pygmy Pine</p> <p>Artist Birdsall Nature Photography</p>	<p>Source</p> <p>Bob Birdsall 908-510-2650 bob@birdsphoto.com photo credit must be right next to photo</p>	
<p>▶ <b>Panel 3</b></p> <p>Image 3.4B Broom Crowberry</p> <p>Artist Peter P. Grima</p>	<p>Source</p> <p>Peter P. Grima Corema conradii (Empetraceae) growing abundantly in the East Plain pygmy forest</p>	
<p>▶ <b>Panel 3</b></p> <p>Image 3.51A Elizabeth White</p> <p>Artist Darlington Family</p>	<p>Source</p> <p>Elizabeth White Blueberry Pioneer Courtesy of the Darlington Family Photo Collection</p>	
<p>▶ <b>Panel 3</b></p> <p>Image 3.51B BlueBerry Packaging</p> <p>Artist Blueberry Council</p>	<p>Source</p> <p>Blueberry Council</p>	

## NJ Pinelands • Image Schedule

▶ **Panel 3**  
 Image 3.51C BlueBerry Season  
 Artist Jay Cassario

Source  
 Jay Cassairo  
 609-820-2091  
 jaycassario@gmail.com



▶ **Panel 3**  
 Image 3.5A Mechanized Picker  
 Artist Library of Congress

Source  
[www.loc.gov/pictures](http://www.loc.gov/pictures)  
 Mechanized blueberry picker.



▶ **Panel 3**  
 Image 3.5B Joe Ware  
 Artist Rutgers University Library

Source  
 William Augustine Collection,  
 Rutgers University Library  
 Joe Ware at Wading River saw mill



▶ **Panel 3**  
 Image 3.5C Charcoal  
 Artist Rutgers University Library

Source  
 William Augustine Collection,  
 Rutgers University  
 George Crummel at his charcoal pile.



▶ **Panel 3**  
 Image 3.73 Downtown  
 Artist Paul Leakan

Source  
 NJ Pinelands Commission



▶ **Panel 4**  
 Image 4.0A Chatsworth  
 Artist istock

Source  
 istock  
 4402397-cranberry-harvest-in-nj



▶ **Panel 4**  
 Image 4.0A Cranberry  
 Artist istock

Source  
 iStock  
 18068822  
 cranberry harvest



▶ **Panel 4**  
 Image 4.0A Double Trouble Cranberry  
 Artist Chase Schiefer

Source  
 Chase Shiefer Photography  
 A piece of Jersey  
 Double Trouble Cranberry Harvest





▶ **Panel 4**  
 Image 4.0B Cedar Swamp  
 Artist Krista Fiabane

Source  
 Krista Fiabane  
 Atlantic White Cedar Swamp



▶ **Panel 4**  
 Image 4.0C Bog Asphodel  
 Artist Michael Hogan Photography

Source  
 Michael Hogan  
 Bog Asphodel Field



▶ **Panel 4**  
 Image 4.1 Wet Savannah 676  
 Artist Joel Mott

Source  
 NJ Pinelands Commission



▶ **Panel 4**  
 Image 4.1A Moss Press  
 Artist Rutgers University Library

Source  
 William Augustine Collection  
 Rutgers University Library.  
 Sammy Ford at his moss press



▶ **Panel 4**  
 Image 4.1B Moss Harvest  
 Artist Library of Congress

Source  
[www.loc.gov/pictures](http://www.loc.gov/pictures)  
 Sphagnum moss harvest.



▶ **Panel 4**  
 Image 4.1C White's Bog  
 Artist Lewis Hine, Library of Congress

Source  
 Lewis W. Hine  
[www.loc.gov/pictures](http://www.loc.gov/pictures)  
 Arnao family, Whites Bog, Browns Mills, N.J.,  
 1910



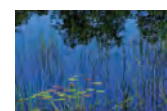
▶ **Panel 4**  
 Image 4.2B Sneak Box Beesley Pt  
 Artist Library of Congress

Source  
[www.loc.gov/pictures](http://www.loc.gov/pictures)  
 Sneak box at Beesley's Point.



▶ **Panel 4**  
 Image 4.3 Pakim Pond  
 Artist George Montgomery Jr.

Source  
 George Montgomery Jr.



▶ **Panel 4**

Image 4.6D North American  
Artist Simon Phipps, iStock

Source  
iStock  
00000181550  
North American Beaver



▶ **Panel 4**

Image 4.8 Tree Frog  
Artist Matthew A. Jennette

Source  
Matthew A. Jennette, WPIT, AWB  
Wetland Biologist  
majennette@gmail.com



▶ **Panel 4**

Image 4.9 Bee Wetlands  
Artist Henrik Larsson, Fotolia

Source  
Fotolia  
32982817 Bee  
Henrik Larsson



▶ **Panel 5**

Image 5.0A White Water Lily  
Artist Paul Leakan

Source  
NJ Pinelands Commission



▶ **Panel 5**

Image 5.0B Cedar Water  
Artist Peter Massas

Source  
Peter Massas 732-778-9480  
Whitesbog N.J. Cedar Water



▶ **Panel 5**

Image 5.0C Feature Mullica River  
Artist Michael Hogan Photography

Source  
Michael Hogan  
<http://www.hoganphoto.com/>  
Mullica River Lower Bank



▶ **Panel 5**

Image 5.0D Batsto Sawmill  
Artist Michael Hogan Photography

Source  
Michael Hogan  
<http://www.pinebarrensbyway.org/>  
Batsto River and Saw Mill











▶ **Panel 5**

Image 5.0E Blackbanded Sunfish  
Artist N. Burkhead and R. Jenkins








Source  
N. Burkhead and R. Jenkins  
Virginia Game and Inland Fisheries  
Noel M Burkhead 352-264-3499  
nburkhead@usgs.gov





<p>▶ <b>Panel 5</b>                  Image 5.2A Kayak                  Artist Birdsall Nature Photography</p>	<p>Source                  Birdsall Nature Photography                  908-510-2650                  bob@pinebarrensphoto.com                  credit next to photo</p>	
<p>▶ <b>Panel 5</b>                  Image 5.6B Skeleton Pond                  Artist Kim Laidig</p>	<p>Source                  NJ Pinelands Commission                  Intermtent Ponds</p>	
<p>▶ <b>Panel 7.2</b>                  Image 7.0 Map Cartographer                  Artist Harpers Ferry Center</p>	<p>Source                  Tom Patterson, Cartographer                  Harpers Ferry Center Publications                  (304) 535-6020                  t_patterson@nps.gov</p>	
<p>▶ <b>Panel 7.2</b>                  Image 7.1.1 Pinelands                  Artist Paul Leakan</p>	<p>Source                  NJ Pinelands Commission                  Pitch pine branch and cone</p>	
<p>▶ <b>Panel 7.2</b>                  Image 7.1.2 National Salt Marsh                  Artist Chris M Morris</p>	<p>Source                  Chris M Morris                  Edwin B. Forsythe                  National Wildlife Refuge</p>	
<p>▶ <b>Panel 7.2</b>                  Image 7.1.3 - Mullica River                  Artist Bill Bessette</p>	<p>Source                  Bill Bessette                  The two individuals in the photo are my wife and daughter, and they give their consent for use.</p>	
<p>▶ <b>Panel 7.2</b>                  Image 7.1.4 State Park i Camping                  Artist istock</p>	<p>Source                  iStock                  State Parks</p>	
<p>▶ <b>Panel 7.2</b>                  Image 7.1.5 Bobwhite                  Artist Les Howard</p>	<p>Source                  Les Howard</p>	

## NJ Pinelands • Image Schedule

<p>▶ <b>Panel 7.2</b></p> <p>Image 7.1.6 Jakes Branch</p> <p>Artist Cathy Antener</p>	<p>Source</p> <p>Cathy Antener 609-698-2501  Cathy@pineypower.com  cantener@comcast.net  www.PineyPower.com</p>	
<p>▶ <b>Panel 7.2</b></p> <p>Image 7.2.1 - Albert Music Hall</p> <p>Artist Albert Music Hall</p>	<p>Source</p> <p>Albert Music Hall</p>	
<p>▶ <b>Panel 7.2</b></p> <p>Image 7.2.2 - Batsto House</p> <p>Artist Paul Leakan</p>	<p>Source</p> <p>NJ Pinelands Commission</p>	
<p>▶ <b>Panel 7.2</b></p> <p>Image 7.2.3 - Tuckerton Seaport</p> <p>Artist Timothy Hart</p>	<p>Source</p> <p>Timothy Hart  timh@tuckertonseaport.org  Jaclyn Stewart  jaclyns@tuckertonseaport.org</p>	
<p>▶ Panel 7.2</p> <p>Image 7.3.1 Batona Trail</p> <p>Artist Carol Cawafel</p>	<p>Source</p> <p>Carol Cawafel</p>	
<p>▶ <b>Panel 7.2</b></p> <p>Image 7.3.2 FREC seedling</p> <p>Artist USFS</p>	<p>Source</p> <p>www.fs.fed.us</p>	
<p>▶ <b>Panel 7.2</b></p> <p>Image 7.3.3 New Gretna Byway</p> <p>Artist Dustin Farnum</p>	<p>Source</p> <p>Dustin Farnum  Munion Field Road, New Gretna, NJ  Photographed on a bicycle ride</p>	
<p>▶ x</p> <p>Image Copyright</p> <p>Artist</p>	<p>Source</p> <p>The images contained on these disks are for use by the NJ Pinelands Commission Richard J. Sullivan Center Exhibit exclusively. Any other additional usage requires permission from the image copyright owner.</p>	



## NJ Pinelands Object & Artifact Schedule

▶ **Panel 3, 3.2 Case**

Item  
3.22  
Pitch Pine  
Bark Specimen



Specimen  
Pitch Pine bark to be mounted in case

Exhibit Drawings, Sheet 3.2

Photo for reference only

▶ **Panel 3, 3.2 Case**

Item  
3.23  
Pine Branch  
Specimen



Specimen  
Pitch Pine branch to be mounted in case

Exhibit Drawings, Sheet 3.2

Photo for reference only

▶ **Panel 3, 3.2 Case**

Item  
3.23  
Pine Cone  
Specimens



Pine cone specimen closed (before fire)  
Pine cone specimen open (after fire)

To be mounted in case

Exhibit Drawings, Sheet 3.2  
Photo for reference only

▶ **Panel 3, 3.2 Case**

Item  
3.25  
Serotiny Video



Video: The Pine Barrens: Up Close & Natural :  
Director and Producer: Mitchell Smith  
Produced In: 2002  
Natural Art Films

<http://www.pinelandsalliance.org/exploration/channel/>

Full video is 28 minutes, DVD format  
Editing to be determined

▶ **Panel 3, 3.2 Case**

Item  
3.4  
Indian Ann Basket



Reproduction - Display inside case,  
Basket: 12" wide x 12" deep x 16" tall  
Exhibit Drawings, Sheet 3.2  
Photo reference only  
Natural Resource Education Foundation,  
Waretown, NJ Pola Galie 609-698-8003  
pgalie@nrefnj.org  
traditional Lenape baskets  
Pinelands Folk Music & Basketry Center,  
Mt. Holly, Mary Carty 609-518-7600

▶ **Panel 3**

Item  
3.4  
Pine Snake  
Model



Touchable fiberglass replica  
to be mounted on panel

Exhibit Drawings, Sheet 3.1  
Photo for reference only

Kitchen Sink Productions, Bucks County, PA  
Stephen Binasiewicz 215-426-0858  
Steve@InTheSink.com  
<http://inthesink.com/>

▶ **Panel 4, 4.6 Case**

Item  
4.6  
Barnegat  
Sneakbox



Replica Sneakbox of 1/2 hull  
model mounted in case, 17" long  
Exhibit Drawings, Sheet 4.1

Photo reference only  
Hillman Art, Cape May, NJ,  
Anthony Hillman 609-536-2738  
Kitchen Sink Productions,  
Bucks County, PA  
Stephen Binasiewicz, replica builder  
215-426-0858

▶ **Resources**

Item  
6.0.01  
Bog Ore



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

Obtain bog iron specimen.  
Batsto shown here.

▶ **Resources**

Item  
6.0.02  
Cast Iron



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

Vintage cast iron kettle pot bucket  
with metal handle to carry.

▶ **Resources**

Item  
6.0.03  
Iron Ingot  
or Sprue



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Resources**

Item  
6.0.04  
Tombstone



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

Batsto sample shown.

▶ **Resources**

Item  
6.0.05  
Cannon Ball



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Resources**

Item  
6.0.06  
Section of Pipe



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Resources**

Item  
6.0.07  
Fire Back



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Resources**

Item  
6.0.08  
Sand Pile

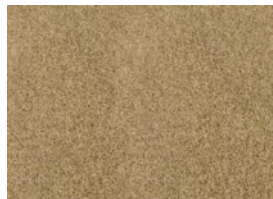


Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Resources**

Item  
6.0.09  
Mason Jar



Sturbridge Yankee Workshop, Portland  
1-800-343-1144

Glass and metal lid. 3.75" W and 7.25" H.  
Mason Fruit Jar - Quart

Photo for reference only

▶ **Resources**

Item  
6.0.10 Glass  
Paper Weight



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4  
Photo for reference only

By the start of the 20th century,  
an upright flower, the "Millville Rose,"  
produced in Millville, N.J.;  
Wheaton Arts and Cultural Center

▶ **Resources**

Item  
6.0.11 Slag



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

Slag from Esterville Glass  
ruins shown here.

▶ **Resources**

Item  
6.0.12  
Jersey Glass



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Resources**

Item  
6.0.13  
Charcoal Pile



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

Batsto shown here



▶ **Resources**

Item  
6.0.14  
Lump Charcoal



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

Use actual "lump charcoal" available for purchase.

Create a glowing ember effect within pile.

▶ **Resources**

Item  
6.0.15  
Cedar Tree



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

Typical scenic representation of cedar tree

▶ **Resources**

Item  
6.0.16  
Cedar Planks



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

Cedar specimen, see sheet for more details

▶ **Resources**

Item  
6.0.17  
Wooden Shingles



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

Shingle specimen, see sheet for more details

▶ **Resources**

Item  
6.0.18  
Duck Decoys - 3



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Progressive - 3 Steps  
Step 1 - Rough  
Step 2 - Partially Carved  
Step 3- Finished

Photo for reference only

▶ **Resources**

Item  
6.0.19  
Sphagnum Moss



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Resources**

Item  
6.0.20  
Crates



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

See sheet for more details

Photo for reference only

▶ **Resources**

Item  
6.0.21  
Cranberries



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Resources**

Item  
6.0.22  
Cranberry Scoop



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Resources**

Item  
6.0.23  
Jersey Devil



Exhibit builder see Exhibit Drawings  
Exhibit Drawings, Sheets 6.0 - 6.4

Photo for reference only

▶ **Uplands**

Image 3.3.01 Black Jack Oaks

Artist Paul Lamble

Source

Paul Lamble  
plamble@everestkc.net



▶ **Uplands**

Image 3.3.02 Bracken Fern

Artist David Shand

Source

David Shand  
davidshand60@btinternet.com



▶ **Uplands**

Image 3.3.03 Pitch Pine Seedling

Artist Peter P. Grima

Source

Peter P. Grima



▶ **Uplands**

Image 3.3.04 Bearberry

Artist Teresa Marrone

Source

Teresa Marrone



▶ **Uplands**

Image 3.3.05 Lowbush Blueberry

Artist Jean Knowles

Source

Jean Knowles



▶ **Uplands**

Image 3.3.06 Mountain Laurel

Artist Uli Lorimer

Source

Uli Lorimer  
Curator of Native Flora  
Brooklyn Botanic Garden



▶ **Uplands**

Image 3.3.07 Black Huckleberry

Artist Marielle Anzelone

Source

Marielle Anzelone  
*Gaylussacia baccata*  
Wells Pond Park.



▶ **Uplands**

Image 3.3.08 Sharp-shinned Hawk

Artist Steve Byland

Source

Steve Byland  
Sharp-shinned Hawk  
Cape May NJ



▶ **Uplands**

Image 3.3.09 Barred Owl  
 Artist Michael Hogan Photography

Source  
 Michael Hogan  
 hoganphoto@verizon.net  
 www.hoganphoto.com/  
 609-476-2086



▶ **Uplands**

Image 3.3.10 Red Headed Woodpecker  
 Artist USFWS

Source  
<http://search.usa.gov>  
<http://digitalmedia.fws.gov>



▶ **Uplands**

Image 3.3.11 Turkey Beard  
 Artist Joel Mott

Source  
 NJ Pinelands Commission



▶ **Uplands**

Image 3.3.12 Eastern Fence Lizard  
 Artist Glen K. Peterson

Source  
 Glen K. Peterson  
 Eastern fence lizard  
 (Sceloporus undulatus)



▶ **Uplands**

Image 3.3.13 Broom Crowberry  
 Artist Bob Cunningham

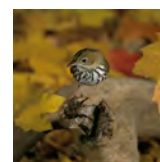
Source  
 Bob Cunningham



▶ **Uplands**

Image 3.3.14 Ovenbird  
 Artist USFWS

Source  
 Maslowski, S.  
<http://digitalmedia.fws.gov/>  
 Ovenbird (Seiurus aurocapilla)  
 U.S. Fish and Wildlife Service



▶ **Uplands**

Image 3.3.15 Northern Pine Snake  
 Artist Kevin Messenger

Source  
 Marshall Herpetology  
 Marshall University  
 Herpetology Lab



▶ **Uplands**

Image 3.3.16 Red Fox  
 Artist USFWS

Source  
<http://search.usa.gov>  
<http://digitalmedia.fws.gov>





▶ **Uplands**

Image 3.3.17 Little Brown Bat

Artist Justin Boyles

Source

Justin Boyles  
Little Brown Bat  
(Myotis lucifugus)



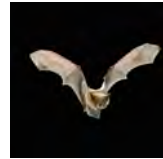
▶ **Uplands**

Image 3.3.18 Big Brown Bat

Artist Angell Williams

Source

Angell Williams  
Little Brown Bat  
(Myotis lucifugus)



▶ **Uplands**

Image 3.5.19 Corn Snake

Artist Mike Wesemann

Source

Mike Wesemann  
corn snake  
Pantherophis  
guttatus guttatus



▶ **Wetlands**

Image 4.5.01 Grass Pink Orchid

Artist Michael Hogan Photography

Source

Michael Hogan  
hoganphoto@verizon.net  
www.hoganphoto.com/  
609-476-2086



▶ **Wetlands**

Image 4.5.02 Orange Crested Orchid

Artist Donna McBride

Source

NJ Pinelands Commission



▶ **Wetlands**

Image 4.5.03 White Fringed Orchid

Artist Donna McBride

Source

NJ Pinelands Commission



▶ **Wetlands**

Image 4.5.04 Spatulate-leaved Sundew

Artist Peter P. Grima

Source

Peter P. Grima



▶ **Wetlands**

Image 4.5.05 Bladderwort

Artist John F. Bunnell

Source

John F. Bunnell  
Chief Scientist Pinelands Commission



▶ **Wetlands**

Image 4.5.06 Pitcher Plant

Artist USFWS

Source

<http://search.usa.gov>

<http://digitalmedia.fws.gov>



▶ **Wetlands**

Image 4.5.07 Bog Asphodel Detail

Artist Uli Lorimer

Source

Uli Lorimer  
Curator of Native Flora  
Brooklyn Botanic Garden  
Nartheicum americanum  
Wharton State Forest



▶ **Wetlands**

Image 4.5.08 Swamp Pink Lily

Artist Uli Lorimer

Source

Uli Lorimer  
Curator of Native Flora,  
Brooklyn Botanic  
Helonias bullata, forested wetlands



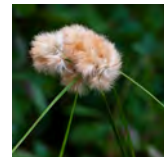
▶ **Wetlands**

Image 4.5.09 Tawny Cotton Grass

Artist Kurt Hasselman

Source

Kurt Hasselman



▶ **Wetlands**

Image 4.5.10 Sphagnum Moss

Artist USFWS

Source

<http://search.usa.gov>

<http://digitalmedia.fws.gov>



▶ **Wetlands**

Image 4.5.11 Southern Leopard Frog

Artist John F. Bunnell

Source

John F. Bunnell  
Chief Scientist Pinelands Commission



▶ **Wetlands**

Image 4.5.12 Northern Spring Peeper

Artist Corinne Lamontagne

Source

Corinne Lamontagne  
A tiny treefrog, less than  
1 inch or 20mm in length.



▶ **Wetlands**

Image 4.5.13 Green Frog

Artist Jim Glibert

Source

Jim Gilbert  
Bernardsville, NJ  
Leonard J. Buck Garden, Far Hills, NJ



▶ **Wetlands**

Image 4.5.14 Carpenter Frog

Artist John F. Bunnell

Source

John F. Bunnell  
Chief Scientist Pinelands Commission



▶ **Wetlands**

Image 4.5.15 Frosted Elfin Butterfly

Artist Geoff Gallice

Source

Geoff Gallice



▶ **Wetlands**

Image 4.5.16 Arogos Skipper

Artist Christian Nunes

Source

Christian Nunes



▶ **Wetlands**

Image 4.5.17 Mink

Artist Jim Glibert

Source

Jim Gilbert  
Bernardsville, NJ  
Barnegat Light State Park, NJ



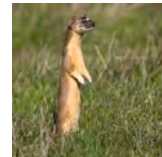
▶ **Wetlands**

Image 4.5.18 Weasel

Artist Matt Knoth

Source

Matt Knoth



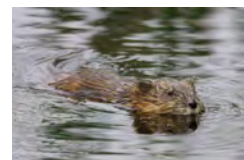
▶ **Wetlands**

Image 4.6 Muskrat 3012

Artist Brett Klapproth

Source

Brett Klapproth  
Bmknj17 <bmknj17@aol.com>  
Waterworks Pond, Sayreville, NJ.



▶ **Surface Water**

Image 5.4.01 Golden Club 2 PDL

Artist Paul Leakan

Source

NJ Pinelands Commission



▶ **Surface Water**

Image 5.4.02 Fragrant Lily White

Artist Paul Leakan

Source

NJ Pinelands Commission



▶ **Surface Water**

Image 5.4.03 Spotted Turtle

Artist Paula Pannes

Source

Paula Pannes  
It was crossing the road so I helped it along.



▶ **Surface Water**

Image 5.4.04 Red-bellied Turtle

Artist John F. Bunnell

Source

John F. Bunnell  
Chief Scientist Pinelands Commission  
Red belly turtle adult Turn Mill Pond



▶ **Surface Water**

Image 5.4.05 Blue Heron

Artist Steve Troletti

Source

stock 123RF 5612938  
Great Blue Heron with fish in beak



▶ **Surface Water**

Image 5.4.06 River Otter

Artist One World Images

Source

River Otter  
stock 123RF 4072245



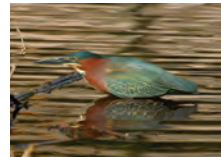
▶ **Surface Water**

Image 5.4.07 Green Heron

Artist Ari Kaufman GSWA

Source

Steve Reynolds  
Great Swamp Watershed  
Associationsreynolds@greatswamp.org  
973-538-3500 x 21



▶ **Surface Water**

Image 5.4.08 Mud Sunfish

Artist NYSDEC

Source

Cathleen Kittle, Director 518 402-8006  
cskittle@gw.dec.state.ny.us  
5-6 inches long



▶ **Surface Water**

Image 5.4.09 Bluespotted Sunfish

Artist NYSDEC

Source

Cathleen Kittle, Director 518 402-8006  
cskittle@gw.dec.state.ny.us  
3-4 inches long



▶ **Surface Water**

Image 5.4.10 Pirate Perch

Artist NYSDEC

Source

Cathleen Kittle, Director 518 402-8006  
cskittle@gw.dec.state.ny.us  
4-5 inches long





▶ **Surface Water**

Image 5.4.11 Swamp Darter

Artist Joseph Tomelleri

Source

Joseph Tomelleri  
1-2 inches long  
*Etheostoma fusiforme*



▶ **Surface Water**

Image 5.4.12 American Eel

Artist USFWS

Source

<http://search.usa.gov>  
<http://digitalmedia.fws.gov>



▶ **Surface Water**

Image 5.4.13 Chain Pickerel

Artist Chris Brosky

Source

Chris Brosky  
[seebrosky@gmail.com](mailto:seebrosky@gmail.com)



▶ **Surface Water**

Image 5.4.14 Aquatic Grasses

Artist Uli Lorimer

Source

Uli Lorimer  
Curator of Native Flora,  
Brooklyn Botanic Garden



▶ **Surface Water**

Image 5.4.15 Bald Eagle

Artist USFWS

Source

<http://search.usa.gov>  
<http://digitalmedia.fws.gov>



▶ **Surface Water**

Image 5.4.16 Osprey

Artist USFWS

Source

<http://search.usa.gov>  
<http://digitalmedia.fws.gov>



▶ **Surface Water**

Image 5.4.17 Ringneck

Artist Alan Vernon

Source

Alan Vernon  
Ring-necked duck (*Aythya collaris*)



▶ **Surface Water**

Image 5.4.18 Wood Duck

Artist USFWS

Source

<http://search.usa.gov>  
<http://digitalmedia.fws.gov>



The Eastern Timber Rattlesnake is one of at least 43 animals listed as endangered or threatened in New Jersey.

Image: A. Ruppert

1.2T Endangered Animals 5 x 7 Output at 100% Timbersnake



1.2T

There is a substantial military presence in the Pinelands.

Image: NJ Department of Military and Veterans Affairs

1.2L Roaring F16s 5 x 7 Output at 100% Plane



1.2L

The Pine Barrens Gentian is one of more than 90 rare, threatened, or endangered plant species.

Image: Donna McBride

1.2A Endangered Plants 5 x 7 Output at 100% Gentian



1.2A

Watch for wildlife, paddle a quiet river, or just relax.

Image: Mullica River, Bill Bessette

1.20 Wilderness to Enjoy 5 x 7 Output at 100% Girl Paddles Kayak



1.20



You may discover a sense of the Pinelands in the local language, music, and art.

Image: Jim Murphy and The Pine Barons at Albert Music Hall

1.2Q Our Own Cultural Flare 5 x 7 Output at 100% Pine Barrons at Albert Hall

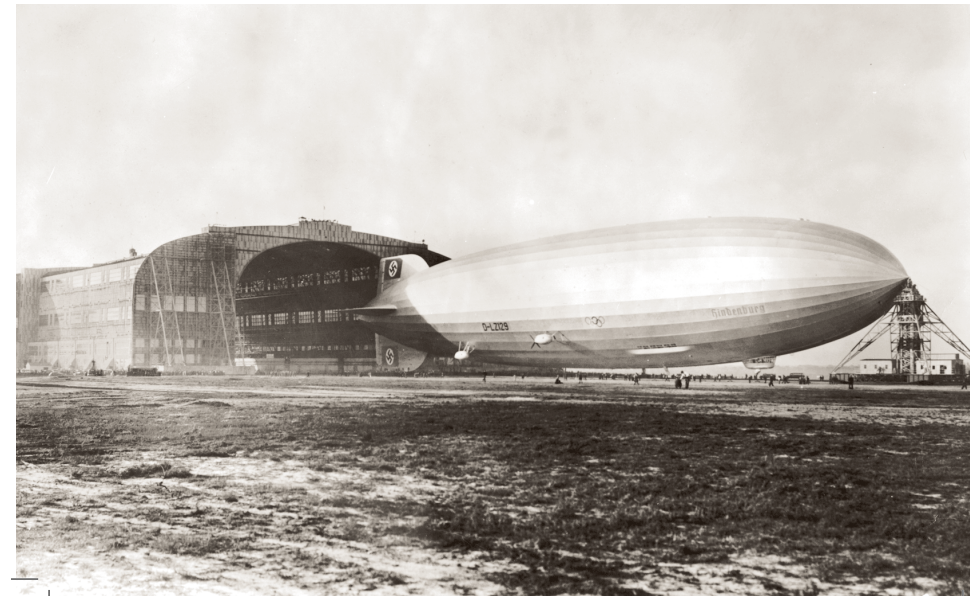


1.2Q

The German zeppelin Hindenburg was destroyed by fire while attempting to moor at the Lakehurst Naval Air Station in 1937.

Image: United States Navy

1.2X A National Tragedy 5 x 7 Output at 100% Zeppelin



1.2X



The A. J. Meerwald, a Delaware Bay oyster schooner, launched in 1928, was one of hundreds built in that era using the area's largest oak trees.

Image: Michael Hogan Photography

1.2W Shipbuilding 5 x 7 Output at 100%



1.2W

The water beneath the Pinelands—some seventeen trillion gallons of it—quenches the thirst of more than a million people.

Image: Greg Riegler Photography

1.2V Flap Vertical 5 x 7 Output at 100% Water



1.2V

Joe Mulliner led a band of “Pine Robbers” during the Revolutionary War. He was known as the “Robin Hood of the Pine Barrens” for his unusual class. John Bacon, another notorious Tory outlaw, was known for brutal attacks. Both men were put to death in the end.

Image: A. Burnham Shute

1.2K Flap Vertical 5 x 7 Output at 100% Pirates

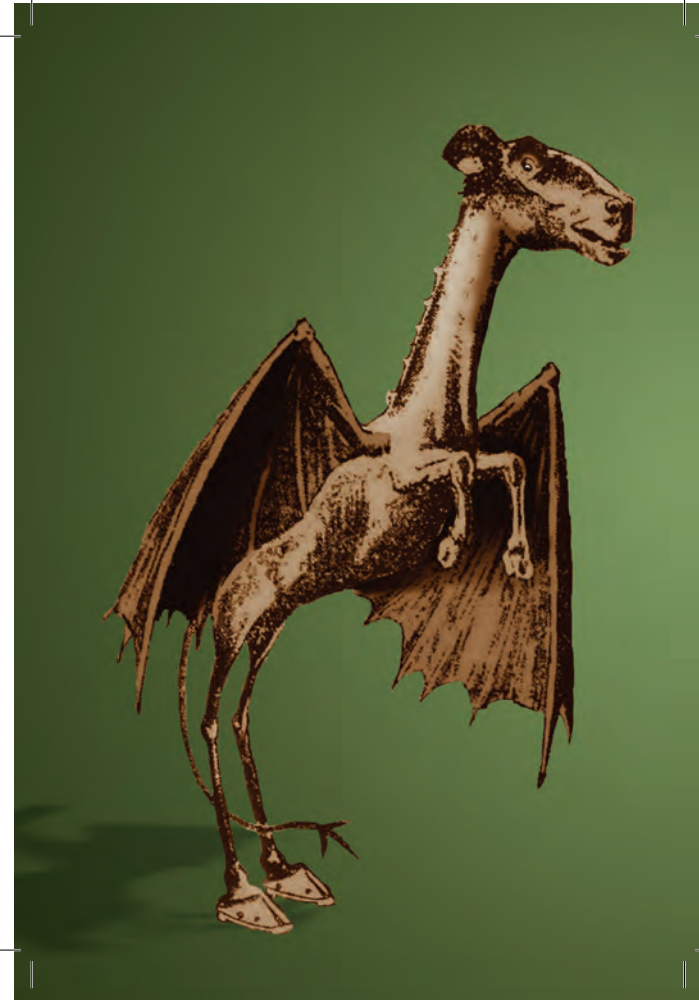


1.2K



Some people claim to have seen a “Jersey Devil” that prowls the woods.  
Let us know if you see one!

Image: Philadelphia Evening Bulletin, January 1909

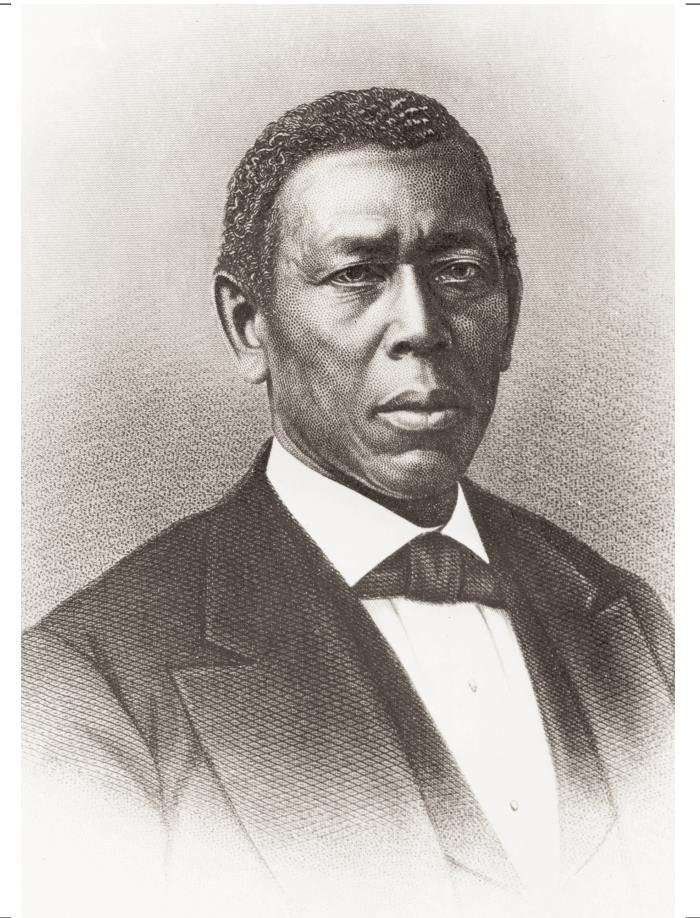


1.2F Flap Vertical 5 x 7 Output at 100% Devil

1.2F

Dr. James Still, the “Black Doctor of the Pines,” overcame prejudice in the medical profession by successfully treating Pinelands patients with herbal remedies.

Image: Rutgers University Library



1.2Z Flap Vertical 5 x 7 Output at 100% Still

1.2Z



Highly specialized plants and animals, like insect-eating Pitcher Plants, thrive in Pinelands habitats.

Image: Paul Leakan



1.2H Flap Vertical 5 x 7 Output at 100% Pitcher Plant

1.2H

The Batona Trail (short for BACK TO NATURE) treks 50 miles through the Pinelands wilderness.

Image: Mary Holer



1.2M Flap Vertical 5 x 7 Output at 100% Batona Trail

1.2M



Migratory birds, like the Summer Tanager, find food, water, and shelter here as they travel the Eastern Seaboard.

Image: Michael Hogan Photography



1.2D

The remains of mills, furnaces, and forges recall a day when iron, glass, and lumbering industries flourished.

Image: Jennifer W. Hanson



1.2E

1.2E Old Industries 5 x 7 Output at 100% Weymouth Ruins

1.2D Rest Stops 5 x 7 Output at 100% Tangier Bird



Legendary Mexican aviator Emilio Carranza perished after crashing his plane here in 1928. Today, a monument marks the site.

Image: The Boston Public Library, Leslie Jones Collection



1.2J Lost Pilot 5 x 7 Output at 100% Carranzq

1.2J



Pitch pines have bark, roots, and seeds that are all adapted to fire. You will find Black Jack Oak, which is fire tolerant for a hardwood. Bracken Ferns and Bearberry bounce back burn after burn. Their underground stems re-sprout shortly after a fire.



Black Jack Oak

Paul Lamble



Bracken Fern

David Shand



Pitch Pine Seedling

Peter Grimm



Bearberry

Teresa Marrone

Many of the Heath family of plants (including Mountain Laurel) dominate the upland understory. They, like the Lowbush Blueberry and Huckleberry with whom they share space, keep a portion of their stems buried and insulated from fire.



Lowbush Blueberry

Jean Knowles



Mountain Laurel

Uli Lorimer



Black Huckleberry

Marielle Anzelone



Owls and woodpeckers nest in the hollows of trees killed by fire. With shorter-than-average wings (for a hawk), the Sharp-shinned Hawk is specially adapted for fast forest flying. You might hear the call of the Ovenbird, Whip-poor-will, Pine Warbler, Eastern Towhee, or the Common Yellowthroat during breeding season.



Sharp-shinned Hawk

Steve Byland



Barred Owl

Michael Hogan



Red-headed Woodpecker

USFWS

Very frequent fires have helped to keep trees small, opening ground for Broom Crowberry, a northern plant that exists in the Pine Plains at the southernmost extent of its range. Turkey Beard, a southern plant, takes advantage of similar openings in the tree canopy and on the forest floor.



Turkey Beard

Joel Mott



Eastern Fence Lizard

Glen Peterson



Broom Crowberry

Bob Cunningham



When the forest is ablaze, some animals burrow out of harm's way like chipmunks and Pine Snakes while others respond by running or flying away like coyotes, foxes, and Turkey Vultures.



Ovenbird

USFWS



Northern Pine Snake

Kevin Messenger



Red Fox

USFWS

Twenty snake species can be found in the Pinelands, and they feed on small birds, rodents, fish, frogs, and toads. One of the least common but most colorful is the Corn Snake, and you may find a Rough Green Snake hanging in a tree. Bats take to the air in the night skies above the wetlands, scooping up mosquitoes, moths, and aquatic insects that hatch at night, like mayflies.



Little Brown Bat

Justin Boyles



Big Brown Bat

Angell Williams



Corn Snake

Mike Wesemann



Many orchids thrive in the Pinelands' damp soils, with wetlands providing habitat for many species found here. One or another are blossoming from spring to fall, providing a continuous display of color.



Grass Pink Orchid Michael Hogan



Orange Crested Orchid Donna McBride

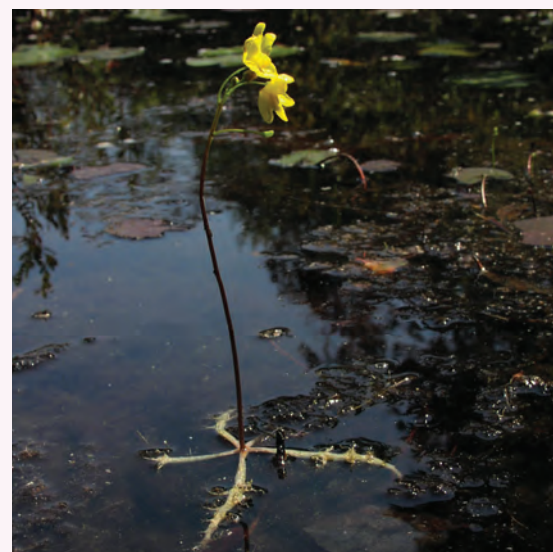


White Fringed Orchid Donna McBride

A surprising diversity of carnivorous plants are found in the Pinelands. By capturing and "eating" insects, these plants are able to grow where nutrients are scarce. Unusual among these is the Bladderwort. The bladders that keep it afloat trap insects, not its rare flower.



Spatula Leaf Sundew Peter Grima



Bladderwort John F. Bunnell



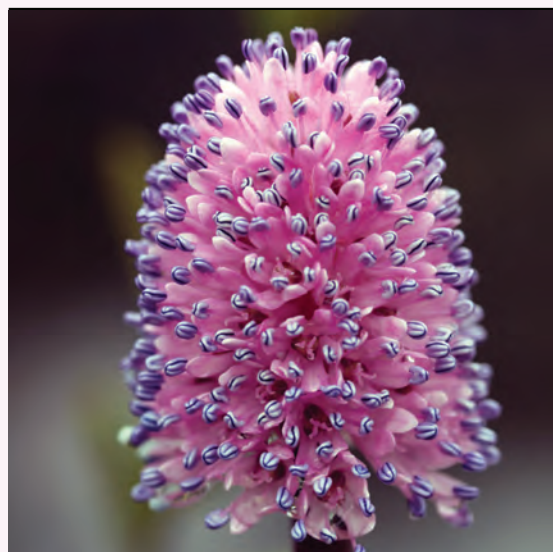
Pitcher Plant USFWS



Over 800 flowering plants have been identified in the Pinelands. The Bog Asphodel, Swamp Pink Lily, and Tawny Cotton Grass are especially rare residents of wetland areas. Atlantic White Cedar swamps are characterized by vast carpets of Sphagnum Moss.



Bog Asphodel Uli Lorimer



Swamp Pink Lily Uli Lorimer



Tawny Cotton Grass Kurt Hasselman

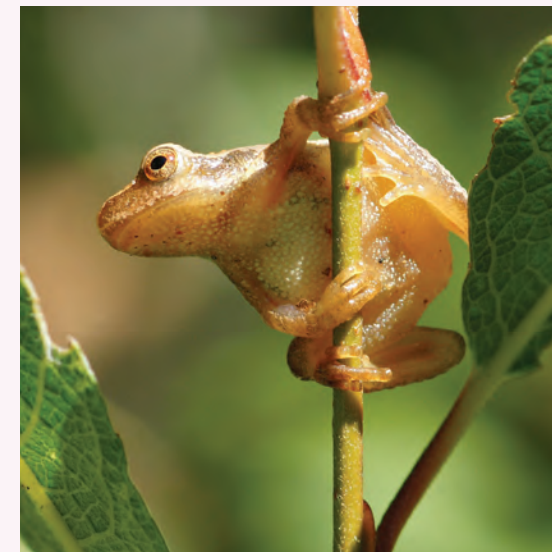


Sphagnum Moss USFWS

A mix of sunny and shady, moist wetland habitats give rise to a wide range of snakes, frogs, toads, and other reptiles and amphibians. Southern Leopard Frogs are fast and can leap great distances, Green Frogs spend most of their time in their aquatic habitat, and Spring Peepers are the smallest.



Southern Leopard Frog John F. Bunnell



Northern Spring Peeper Corinne Lamontagne



Green Frog Jim Gilbert



The caterpillar of the Arogos Skipper Butterfly feeds on Pine Barrens Reed Grass. Only a few Pinelands savannahs hosting this plant and butterfly remain. The Pinelands shelters one of the world's largest colonies of Frosted Elfin Butterflies.



Carpenter Frog John F. Bunnell



Frosted Elfin Butterfly Geoff Gallice



Arogos Skipper Butterfly Christian Nunes

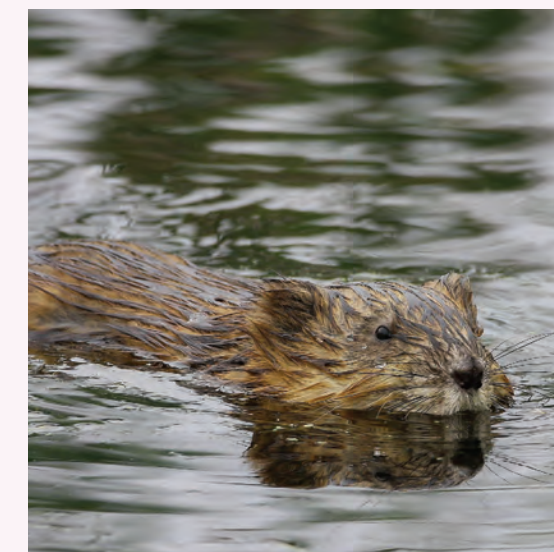
Muskrats, Long-tailed Weasels, and mink have the necessary "equipment" to make a living in the tangled wetlands. The mink is shown on the rocks along Barnegat Bay, and the Long-tailed Weasel is picking up the scent of its prey, such as rats, squirrels, and voles.



Mink Jim Gilbert



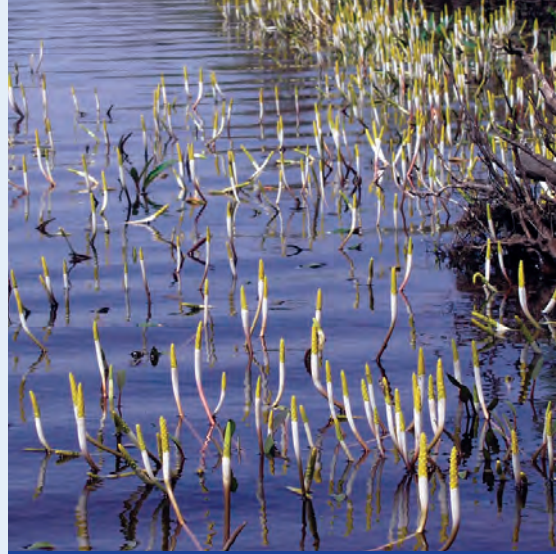
Long-tailed Weasel Matt Knoth



Muskrat Brett Klaproth

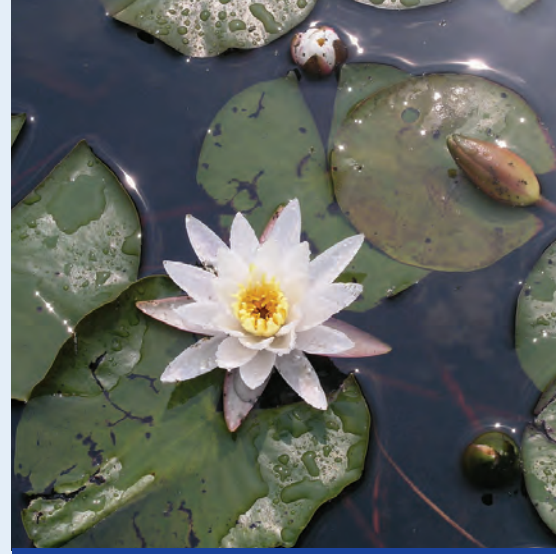


At the water's edge, you may find turtles basking in the sun and pickerel hiding along the stream banks. As you look out over the shallow lakes and ponds, you will notice many plants rising up from the bottom. Two of the most common and showy are Golden Club and White Fragrant Lily



Golden Club

Paul Leakan



Fragrant Lily

Paul Leakan



Spotted Turtle

Sandy Pannes



Red-bellied Turtle

John F. Bunnell

Wading birds, like the Great Blue Heron and the smaller Green Heron, patrol the shorelines in search of frogs and fish. Green Heron may drop food, insects, or other small objects on the water's surface to attract fish, making them one of the few known tool-using species. River Otters and beavers move from land to water with ease, feeding on fish and plant shoots.



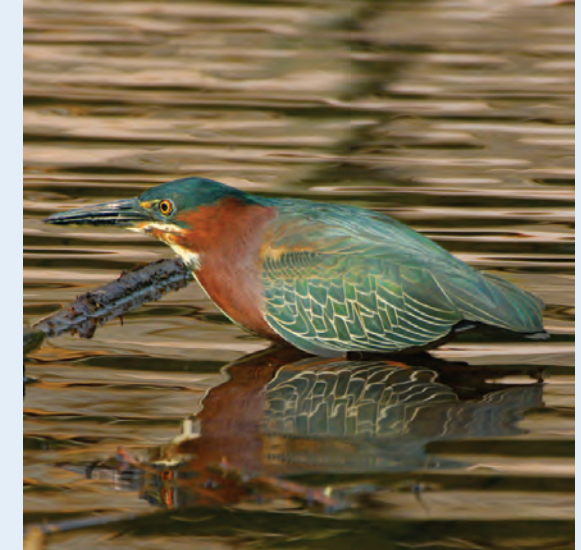
Great Blue Heron

Steve Troletti



River Otter

One World Images



Green Heron

Ari Kaufman, GSWA



The Pinelands' many streams are filled with surprisingly colorful fish. They eat algae, aquatic insects, and each other.

Note: fish on this page are shown at actual size



Mud Sunfish 5-6 inches long NYSDEC



Blue Spotted Sunfish 3-4 inches long NYSDEC



Pirate Perch 4-5 inches long NYSDEC



Swamp Darter 1-2 inches long Joseph Tomelleri

Hungry American Eels control aquatic insects, crayfish and other fish, and they serve as prey to other predators. Eels are found in the strong flowing waters at the center of a stream. Chain Pickerel are the largest fish and are a popular sport fish.



American Eel 24-40 inches long USFWS



Chain Pickerel 36" inches long Chris Brosky



This stream has White Water Lily, Bayonet Rush, and Swaying Bulrush. These plants, along with Alga Pondweed, form the foundation of the food web in moving streams and still waters.



Water Bulrush (shoreline) and Swaying Bulrush (submerged)

Uli Lorimer 5.43

Bald Eagles and Osprey build their nests overlooking open water. From lofty perches, they can see the large fish and waterfowl upon which they feed. Migratory waterfowl and resident ducks and geese rely on open water for food and safety.



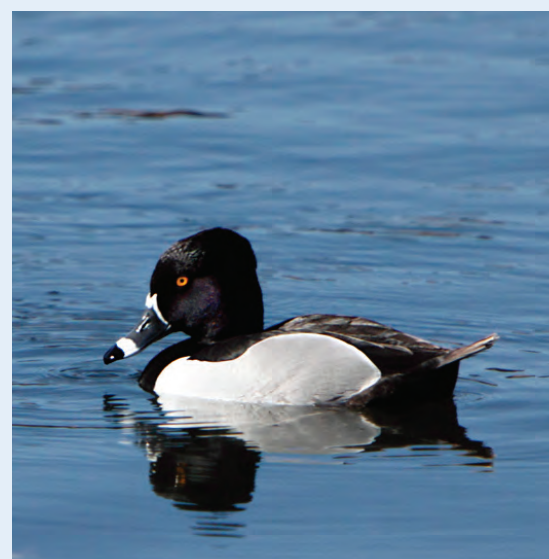
Bald Eagle

USFWS



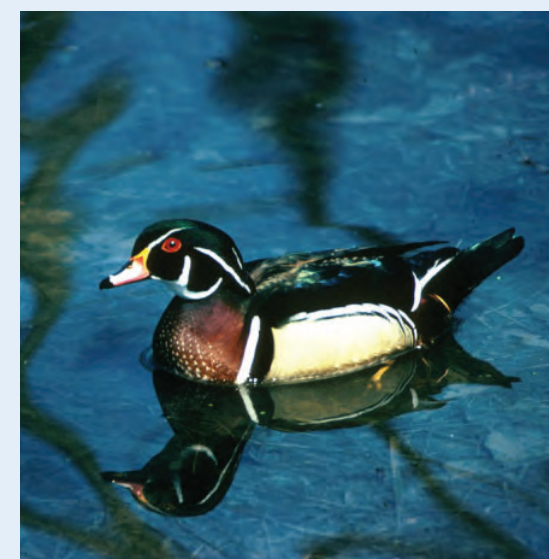
Osprey

USFWS



Ring-necked Duck

Alan Vernon



Wood Duck

USFWS



# The New Jersey Pinelands

## *A place like no other*

You may be in the middle of the nation's most densely populated state, but you're also on the edge of a surprisingly vast wilderness—the 1.1 million-acre Pinelands National Reserve. Although established to protect the area's valuable water resources, it also preserves a unique and fragile ecosystem. Within you'll find forests adapted to fire, wetlands full of rare species, slow-moving rivers, farms, abandoned towns, and modern communities housing more than 700,000 people.

The Pinelands is a place worth understanding and exploring. You can find out about it here and then wander the sand roads to discover some of its many wonders.

### **Pinelands National Reserve**

The Pinelands National Reserve covers 22% of the state of New Jersey, or about 1.1 million acres, and includes some of the largest unbroken tracts of forest on the East Coast. Established in 1978 as the first National Reserve, it was also later designated an International Biosphere Reserve.

### **State Pinelands Area**

The State Pinelands Area, created by the New Jersey Pinelands Protection Act of 1979, encompasses over 938,000 acres with slightly different borders than the Reserve. The area includes parts of seven counties and 53 municipalities.

Background Image: Tom Till

### **Historic Sites**

There are more than three dozen Pinelands locations on the National Register of Historic Sites, including restored historic villages and settlements, town historic districts, and historic structures and ruins.

### **Wild & Scenic Rivers**

Two of the five major Pinelands river systems are designated National Wild and Scenic Rivers: The Great Egg Harbor River and the Maurice River.

### **Pine Plains**

The 15,000-acre Pine Plains is the largest pygmy forest in the country and the best example of this type of ecosystem.

# More than just pines

## *Discover the secrets of the Pinelands*

It may look like just pine trees and sand, but investigate a little further and you'll encounter a fascinating natural and cultural landscape. The Pinelands is a vast mosaic of forests, streams, and wetlands, plus farms, villages, and homes—some long abandoned and some modern and vibrant.

We invite you to discover what's beneath the surface.

### **View from Apple Pie Hill Fire Tower**

Background Image: Tom Till

**Rich Folklore**

**Rest Stops**

**Endangered Animals**

**A Pioneering Healer**

**Endangered Plants**

**Old Industries**

**A National Tragedy**

**Legendary Robbers**

**A Boatbuilding Tradition**

**Nature Trails**

**A Wilderness to Enjoy**

**A Lost Pilot**

**Roaring F16s**

**Unusual Plants**

**Our Own Cultural Flare**

**An Enormous Aquifer**

# A Sandy Foundation

## *The unique character of the Pinelands begins underground*

The sand you see throughout much of the Pinelands provides a peek into what makes this area so important. The soil is almost pure quartz sand. It holds little moisture near the surface and few minerals or nutrients. European settlers discovered that their crops wouldn't grow here and called the area "barren." But many unusual plants flourish here.

If you could look below the surface, you'd discover a vast reserve of water held in deep layers of sand. This underground resource—more than 17 trillion gallons of fresh water—feeds rivers, wetlands, and wells throughout the Pinelands.

### **Pine-Oak Uplands**

Forests of pine and oak grow in dry areas above the groundwater table, where water drains quickly away from the surface of the land. Today, homes are built in some of these upland areas.

### *Homes/People*

Wells bring drinkable water from the aquifer to most residents of Southern New Jersey.

### **Surface Water**

The many rivers and streams flow slowly across the Pinelands to the coastal bays and eventually the Atlantic Ocean. The lakes present today were formed by damming these waterways to provide power and water for crops like blueberries and cranberries.

### **Wetlands**

In these wet places, the land surface can be near, at, or below the groundwater table, resulting in swamps, savannas and ponds. These habitats provide a great diversity of plants, and filter runoff, which protects surface waters.

## Gravel

This layer has mostly eroded away, but you can see it on the hilltops. It is the most recent formation and may have been deposited by the ancient Hudson River, which was once much more extensive than it is today.

## Coarse Sand –The Cohansey Formation

This is the layer at the surface in most of the Pinelands. It is composed mostly of coarse-grained quartz sand and reaches an average depth of 100 feet. The loosely packed, similar-size sand grains in this layer excel at taking in rainwater, which travels easily through it.

## Fine Sand –The Kirkwood Formation

This formation varies from 100 to 700 feet thick. It contains fine-to-medium-grained sand with clay in places.

## Clay

Layers of fine particles of clay prevent water from penetrating. The clay acts like the bottom of an immense bowl, keeping water in the sand layers above.

*Water comes to the Pinelands as rain and snow and is stored underground and at the surface as wetlands, ponds, lakes, and streams.*

## The shore of an ancient sea

The thick layers of sand that lie beneath the surface in the Pinelands were deposited by oceans millions of years ago. Rising and falling seas sifted and sorted the sand particles. This left deep, extensive layers (geologic “formations”) of similar-size particles on the flat coastal plain of New Jersey, as if it were a vast beach.

## A world-class natural reservoir

The sandy soils beneath the Pinelands in the Kirkwood and Cohansey formations make up one of the nation’s major natural groundwater reserves, called the Kirkwood-Cohansey aquifer. It extends 3,000 square miles and stores enough water to fill a 10-foot-deep lake the size of New Jersey.

The sand in these formations can absorb as much as six inches of rain per hour. Water travels easily into and through the aquifer, replenishing the groundwater supply and feeding streams year-round. Pollution can also enter and spread through the aquifer, so this valuable resource must be carefully maintained and protected.

Push the button to watch as:

- Rain falls on the land.
- Sandy soils hold water between the grains.
- A deep layer of clay stops the water from soaking out.
- In times of abundance (when the underground supply of water is full), the top of the water supply is near the surface—sometimes it’s even exposed as surface water.

## Aquifer in action

**Aquifer Water Cycle**



# Upland Forests

## *Adapted to fire*

Take a sandy trail into the upland forests of the Pinelands, and you enter a unique wilderness. Only certain kinds of plants can survive in the dry, acidic, nutrient-poor sand of the uplands. These plants can also withstand regular wildfires.

For centuries, wildfires have routinely burned through the Pinelands, resulting in the dominance of pitch pine over the other pines and oaks that accompany it. Pitch pine stands out among plants as especially adapted to fire. It is the most abundant tree in the Pinelands and a fitting symbol of this distinct place.

*“At all seasons there is a peculiar restfulness in these quiet stretches, over which the pines stand as silent sentinels.”*

*— Witmer Stone*

## Pine-oak or oak-pine: the influence of fire

When fire burns mixed pine/oak forests, pines have the advantage. Oak trees—with their thinner bark—burn more readily, and the acorns burn, too. They can’t compete with fire-resistant pitch pines.

If many years pass without a fire, oaks do better than pines. Acorns sprout easily in the leaf litter on the forest floor, but young pines cannot take root. Without a fire at least every few decades, a mostly pine forest becomes a mostly oak forest. Fires must be allowed to burn—or purposely set and controlled—in order for the Pinelands to maintain its character.

## *Extensive forests host diverse species*

Unbroken tracts of forest as large as those of the Pinelands are rare on the Eastern Seaboard. Many animals that depend on these forests have become threatened or endangered. The extensive forests of the Pinelands provide much-needed habitat for vulnerable creatures like the Barred Owl, Timber Rattlesnake, and Pine Snake, plus many other woodland species.

## *The forest fueled Pinelands industries*

The earliest European settlers in the Pinelands made extensive use of the woodlands, first for lumber and then for fuel. After lumbering cleared the forest of the best trees, a charcoal industry developed in the Pinelands as a way to use the remaining trees and branches—mostly pitch pine.

Charcoal fueled the blast furnaces used to make iron and glass. Fueling each furnace required clearing thousands of acres of woodlands, leaving vast areas of the Pinelands deforested.

## Northern Pine Snake

Background Image: Will Cook

Birdsall Nature Photography

Blueberry Council

Darlington Family Photo Collection

## ELIZABETH WHITE

### *Blueberry Pioneer*

The plump blueberries you see in the grocery store might not exist without the work of one of the Pinelands’ most famous residents. In 1911, Elizabeth White began collaborating with a botanist from the US Department of Agriculture to create a commercial version of the blueberries that grew wild under the New Jersey pines. She paid residents throughout the Pinelands for plants with the largest berries. The breeding program succeeded. Like cranberry farming, blueberry cultivation became a major Pinelands industry and remains so today.

# Pitch Pine: The anatomy of fire resistance

- 1 Thick, layered bark resists burning and protects dormant buds. Dormant buds under the bark quickly sprout needles and branches after a fire. (If fire consumes all the needles, the tree will look normal in just a few years.)
- 2 Even if the trunk burns down, shoots grow quickly from the dormant buds in the roots. Roots don't burn in the sandy soil, which holds almost no flammable organic matter.
- 3 Some pitch pine cones (called serotinous cones) stay tightly closed for many years. They won't open and drop their seeds until the tree is burned or cut down. Almost all the cones on the dwarf pines in the Pine Plains are serotinous.
- 4 Delicate seeds only germinate on bare ground cleared by fire. They won't sprout if they fall on a thick mat of dead needles and leaves.

## Pine Plains: the dwarf forests of the Pinelands

The Pinelands is one of very few places in the world where you can see dwarf forests of short, gnarly pines and oaks. Typical Pine Plains trees grow no taller than a person and have a look all their own—stunted and twisted with multiple trunks growing low over the sand.

Dwarf pitch pines have large, woody root systems much older than the tree trunks. The roots usually survive fires, even when the trunks burn to the ground. Fires rage more frequently in the Pine Plains than in normal-height Pinelands forests, and scientists believe this is what has kept the pygmy forests distinct.

William Augustine Collection, Rutgers University

Here Joe Ware cuts slats for berry crates at his Wading River saw mill.

Paul Leakan

Historic Medford Village has a scenic downtown that includes many quaint shops.

Library of Congress

Designed by Tom Darlington, this mechanized blueberry picker is one of the many local blueberry industry innovations.

George Kummel building a charcoal pile near Jenkins Neck. The grandson of a Lenape Indian from the Brotherton Reservation near Indian Mills, Kummel was the last collier, or charcoal maker, in the area. He made dozens of charcoal piles on 50 acres of land until 1954, when the State of New Jersey bought the land and created the Wharton State Forest.

William Augustine Collection, Rutgers University

Lena Struwe

**White Sand Road, Warren Grove**

The Star Ledger

**Warren Grove Fire, 2007**

Uli Lorimer

**Regrowth after fire**

JJS Photo

**Controlled Burn**

Peter P. Grima

**Broom Crowberry**

Jonathan Mays

**Eastern Spadefoot**

Michael Hogan Photography

**Pink Lady's Slipper**

Joe McDonald

**Flying Squirrel**

Paul Leakan

**Box Turtle**

Peter P. Grima

**Pyxie**



# Wetlands

## *Habitats brimming with diversity*

Visit the wetlands to see some of the Pinelands' most spectacular and unusual sights. These habitats make up more than 380,000 acres, or 35 percent, of the Reserve and provide habitat for most of its rare species. There are insect-eating plants, globally rare Atlantic White Cedars, orchids, and flowers found nowhere else in the world.

Wetlands of different types occur where the groundwater meets the surface, either seasonally or year-round. These swamps, savannas, and vernal ponds prevent flooding and filter runoff before it enters streams, rivers, and the underground water supply.

### *The Pinelands' wetlands are home to many diverse and rare species*

Most of the region's natural diversity can be found in its wetlands. At least 24 plant species were first discovered here, and at least two live nowhere else. Many plants and animals are listed as threatened or endangered because so much of these habitats has been lost.

Lewis Hine, Library of Congress

Here an entire family works the cranberry harvest at Whitesbog in Browns Mills in 1910.

Library of Congress

### **A sneaky boat design**

The Barnegat Bay sneakbox, based on an 1836 design by Hazelton Seaman, was the preferred boat of South Jersey duck hunters. Above, Harry Shourds of Seaville blends in with his sneakbox at Beesley's Point.

Chase Schiefer

Background Image: iStock

# Cedar swamps: rare and vulnerable

Walking into a cedar swamp is like entering a cool, eerie sanctuary. Atlantic White Cedar trees rise 50 or 60 feet with few branches at eye level. Overhead, their dense canopy completely shades the ground.

No other trees, not even young cedars, can survive in the shade, but where the sun shines through openings in the canopy, some unusual plants take root. Sphagnum Moss grows in big, spongy patches.

You might also find the carnivorous Pitcher Plant, the rare Curly-grass Fern, an orchid or two, and other plants adapted to the acidic water and soil.

Cedar swamps used to extend for thousands of acres in the Pinelands and across New Jersey. Today, these rare habitats are protected.

## *Taming the wild cranberry: an industry takes root*

Cranberries grow wild in acid soil along streams and on the edges of wetlands. In the 1800s, Pinelands residents began transplanting cranberry plants to cleared wetlands, sometimes where bog iron had been mined. Today, Pinelands farms produce 55 million pounds of cranberries, and New Jersey is one of the nation's biggest cranberry producers.

Background Image: Fran Rapa

Henrik Larsson, Fotolia

**Bee**

Krista Fiabane

Matthew A. Jennette

**Atlantic White Cedar Swamp**

**Pine Barrens Tree Frog**

Michael Hogan Photography

Simon Phipps, iStock

**Bog Asphodel**

**North American Beaver**

Joel Mott

**Savanna**

**Pakim Pond**

William Augustine Collection, Rutgers University Library.

Another Pinelands industry was the harvest and packaging of Sphagnum Moss for use by florists, gardeners, and plant nurseries. On the left, Sam Ford operates a moss baler. To the right, William Wasiowich harvests Sphagnum in a Pinelands swamp.



# Surface Waters

## *One of the Pinelands' greatest resources*

One of the best ways to see the Pinelands is by canoeing one of its many rivers and streams. These slow-moving waterways mostly start in the Pinelands and flow out, feeding the marshes and bays of Southern New Jersey.

Pinelands rivers attracted settlers to this area. They built dams and waterwheels to operate mills, forges, and furnaces, transported natural resources and products on Pinelands waterways, and established towns and villages near rivers and industrial sites.

### What makes the water so dark?

When plants like cedar trees and Sphagnum Moss soak in standing water, acidic dyes called tannins leach into the water. A similar process and compound gives tea its color. Combined with dissolved iron and organic matter, the tannins make the water very dark.

### *Rare species survive in acid waters*

Pinelands water is too acidic for a lot of common freshwater animals. Some fish can't reproduce in acidic water, and many mollusks and crustaceans need less acidic water to produce their shells. But you will find native frogs, toads, and fishes that thrive in swamps and other acidic waters, plus oodles of damselflies, dragonflies, and Whirligig Beetles.

### The aquifer's "back door"

Pinelands surface waters link directly to the Kirkwood-Cohansey aquifer, Southern New Jersey's vast underground water supply. Pollutants like chemicals and fertilizers that drain into surface waters can easily enter the aquifer and contaminate groundwater throughout the region. Likewise, pollution that enters the groundwater from upland sources can travel into wetlands and streams.

### Blackbanded Sunfish

N. Burkhead and R. Jenkins, courtesy Virginia Game and Inland Fisheries

### White Water Lily

Background Image: Paul Leakan

### Cedar water: dark but sweet

Pinelands tea-colored "cedar water" was naturally good tasting. Sea captains used to fill their casks with it, because it stayed fresh longer than any other water they could find and actually tasted sweet. Today, no surface water is guaranteed drinkable, because it may contain harmful microorganisms.

### Pinelands lakes offer a peek into the past

All lakes in the Pinelands were created by people. Some were formed when settlers dammed streams to harness water power; others are former cranberry bogs or mine sites.

Michael Hogan Photography

### Rich opportunities for recreation

You can swim, fish, or watch wildlife in a Pinelands lake or kayak one of its rivers through the wild interior of this vast reserve.

Birdsall Nature Photography

### Skeleton Pond

This is an example of an intermittent pond—sometimes it is there, sometimes it is not.

Kim Laidig

## **Bog Iron: Pinelands first major industry**

“Bog iron,” or iron-bearing limonite, formed in and around the sluggish, acidic streams and swamps of the Pinelands. Layers of this “ironstone” ran to about two feet thick in places.

Pinelands forges and furnaces used bog iron to make cannonballs, kettles, stoves, and nails from the 1760s to the 1860s. Bog iron was so resistant to rust that you can still find iron tombstones in local cemeteries and iron flagstones around old houses.

## **From sand to glass**

The abundant sand of the Pinelands inspired a thriving glass industry in the 1800s. The sand is made up of almost pure quartz, or silica, the main ingredient in glass. Manufacturers first fused the sand into windowpanes, then made bottles and other decorative objects.



## Making charcoal

To make charcoal, wood was burned very slowly in nearly airless charcoal mounds until almost pure carbon was all that remained. The mounds were made of logs stacked 10 or 20 feet high, then sealed beneath sod and sand. Colliers maintained a fire inside the mound around the clock for up to two weeks. If you see scattered charcoal in an area with little vegetation, you've probably found the site of a charcoal mound.

## **Cedar swamps provided a valuable harvest**

Because cedar wood is virtually waterproof, or decay resistant, people have been harvesting it since the first settlers arrived. Used for siding, roofing, fence posts, boats, and decoys, the trees were nearly wiped out as early as the mid-1800s.

## Of sugar and spungs

The Pinelands has a language of its own; some residents of Southern New Jersey call it “Piney talk.”

Noonin: taking time off for lunch

Spung: small swamp or pond that is wet only part of the year

Sugar sand: soft white Pinelands sand

Hen’s claw: where one road splits into three

Fingerboard or point: where several roads come together

Swamp Chicken: a Snapping Turtle

Stump jumper: woodsmen work in the cedar swamps

Bogmen: work the cranberry bogs

Bush knocker: blueberry picker

Baymen: work the bay

Pinehawker: one who gathers Pinelands resources

Crick: [‘krik] creek



# *Welcome* to the Pinelands

The New Jersey Pinelands Commission—  
Preserving, protecting, and enhancing the  
resources of the Pinelands National Reserve.

# Nature

## Pinelands National Reserve

Explore 1.1 million acres of private and public land where rivers, trails, and roads lead to wetlands, dwarf forests, mysterious ruins, and ghost towns.

Photo: Paul Leakan

## National Wildlife Refuge Areas

Observe native and migratory wildlife in a variety of grassland, salt marsh, bog, and coastal habitats.

Photo: Chris M Morris

## Scenic & Recreational Rivers

Accessible by kayak, canoe, or boat, these Pinelands rivers are among America's most pristine.

Photo: Bill Bessette

## State Parks & Forests

Walk through former villages and historic landmarks surrounded by pygmy pines and cedar swamps. Camping, mountain biking, horseback riding, and cross-country skiing offer year-round outdoor opportunities.

Photo: iStock

## State Wildlife Management Areas

Encounter diverse, wild lands where over 43 animals listed as endangered or threatened make this their home. You might see Bald Eagles, swans, ospreys, River Otters or foxes.

Photo: Les Howard

## County Parks

Enjoy open space for picnics, hiking, golfing, and scenic views. Programs include music festivals, crafts, and environmental education. Jakes Branch is called *The Gateway to the Pines*, and Wells Mills hosts the annual Pine Barrens Jamboree.

Photo: Cathy Antener

# Culture

## Albert Music Hall

An institution for over 30 years, and now home to a 350-seat concert hall, Albert Hall is the cradle of traditional Pinelands music. Check schedules for performances and weekly jam sessions.

## Historic Villages

Visit an active historic village at Batsto or a deserted village in Atsion. Explore the ruins of Harrisville, Weymouth Furnace, and Esterville.

Photo: Paul Leakan

## Tuckerton Seaport and Baymen's Museum

Relive the unique coastal heritage of the Jersey Shore. Observe local craftspeople, boatbuilders, and live aquatic displays.

# Venture

## Batona Trail

Winding over 50 miles, this easy trail passes through forests, crosses streams, and connects once-bustling historic towns. Don't miss the view from Apple Pie Hill and the history of Batsto Village.

Photo: Carol Cawafel

## Forest Resource Education Center

Explore the forests and learn about wildlife through indoor and outdoor exhibits, and environmental education programs.

Photo: USFS

## Pine Barrens Byway

Drive 130 miles through the undiscovered, pure scenic beauty and historic heritage of the Pinelands from Batsto and Tuckerton in the north to Dennisville and Port Elizabeth in the south.

Photo: Dustin Farnum

# The New Jersey Pinelands

*A place like no other*

# LumeLEX<sup>®</sup> Series

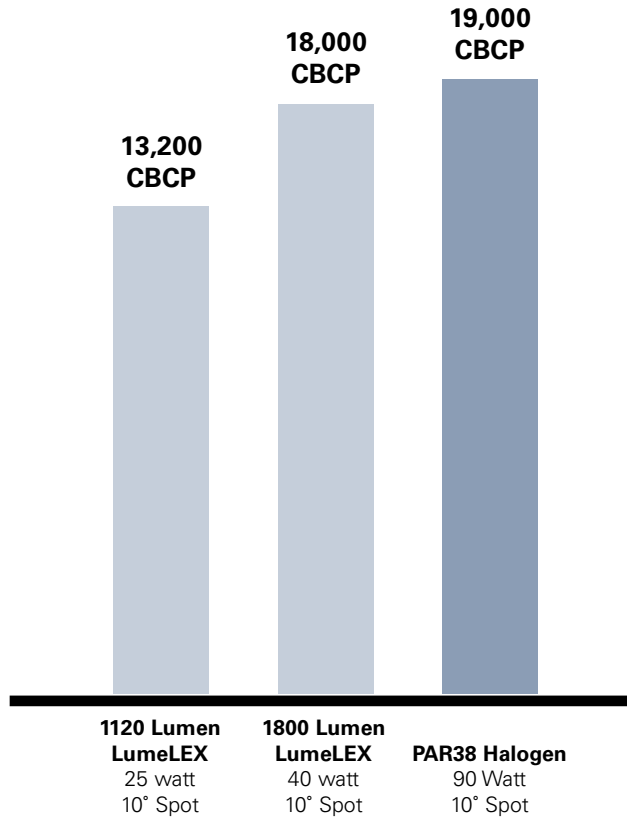
LED Lighting Fixtures

Lighting system  
See sheet 0.4 for quantities in the  
exhibit drawing package





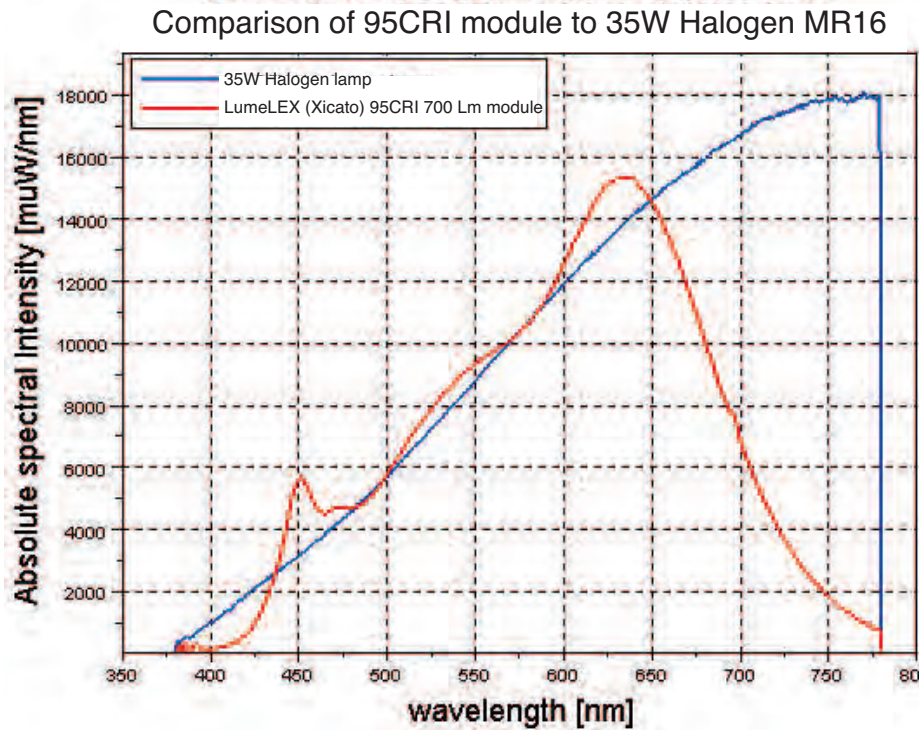
# Announcing the Introduction of an 1800 and 1120 Lumen Output Fixture, each with Xicato Remote Corrected Cold Phosphor Technology<sup>®</sup>



Comparable to a 90W Halogen PAR38 lamp, the new generation of LumeLEX fixtures offers a brilliant output of 1800 Lumens and 1120 Lumens.

## LumeLEX has the Highest CRI

With independent ratings of 97 CRI, the LumeLEX Series, based on the latest in Corrected Cold Phosphor Technology® by Xicato, has the highest Color Rendering Index of any LED on the market today, producing the most consistent, highest quality white light and maintaining extremely tight color control (within 2 MacAdam ellipses, vs. the NEMA standard of 7).



## LumeLEX has the Best Consistency

Lighting Services Inc has created a Consistency Datasheet, based on LM79 test verification that details how the product exceeds ANSI requirements C78.377. The purpose of this document is to detail the consistency of the white light from the LED based LumeLEX 2000 series family products. The LumeLEX Series is designed for the Xicato LED module. Fixture-to-fixture, the LumeLEX Series has exceptional optical control and maintains extremely tight color consistency (within 2 MacAdam Ellipses) and intensity throughout the long 50,000 hour life of the LED module.



Download the LumeLEX 2000 Series Consistency Datasheet here: [bit.ly/LumeLEX\\_consist](http://bit.ly/LumeLEX_consist)

# LumeLEX has Long Term Sustainability

Lighting Services Inc warrants the LumeLEX Series for five years, including the high quality components such as the driver and LED module. The LumeLEX Series is designed for real world, long-term sustainability, the LumeLEX line of products is both forward and backward compatible, with easily replaceable 50,000 hour LED modules to reduce waste and fixture replacement costs.

# LumeLEX has Flexibility

## Choice of Reflector to modify the beam spread distribution:

- **Field Changeable Reflectors:**  
Spot-10°, Narrow-20°, Medium-40° and Wide-60°
- **Tool-Mounted Reflector:**  
Spot-12°

## Choice of lumen output (system lumens)

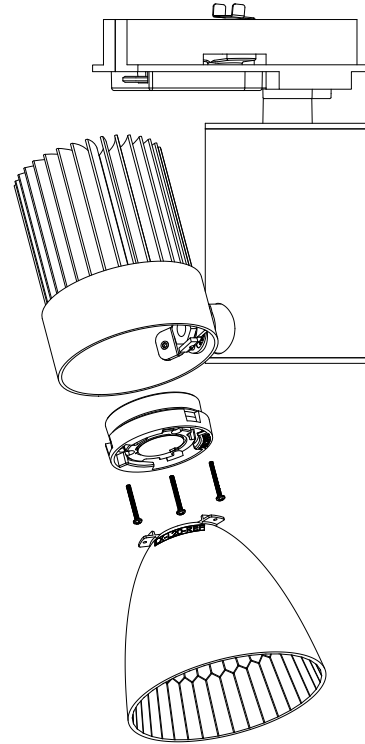
1800 lumens, 1120 lumens, 860 lumens, 600 lumens

## Choice of color temperatures (+/- 50K)

2700K (warm white) or 3000K (neutral white)

## Choice of Color Rendering Index (CRI)

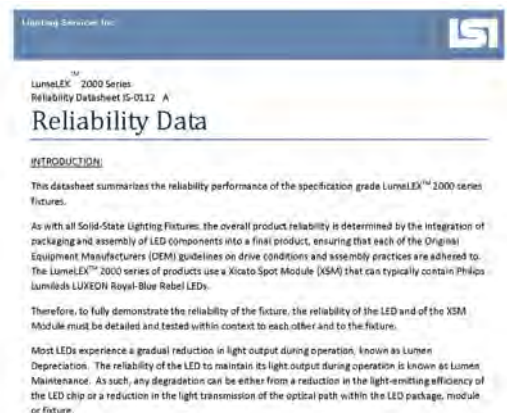
97 (high) or 80+ (standard)



# LumeLEX 2000 Series Reliability Datasheet

Lighting Services Inc has created a Reliability Datasheet document for the entire LumeLEX 2000 Series to show how we exceed  $L_{70} = 50,000$  hours. The Reliability Datasheet explains definitions of LED terminology, construction of the fixtures, drive current, case temperatures, reliability testing (IESNA LM-80-08), product lifetime, production testing, conclusion and fixture warranty.

Download the LumeLEX 2000 Series Reliability Datasheet here: [bit.ly/LumeLEX\\_reliability](http://bit.ly/LumeLEX_reliability)





## LumeLEX 2044 Series

The LumeLEX 2044 Series is a clean, elegant stem mounted fixture with a discreetly hidden driver, making it appear no different than a traditional halogen source. Utilizing the Xicato LED module, the LumeLEX 2044 produces the most consistent, highest quality white light and maintains extremely tight color control (within 2 MacAdam ellipses, vs. the NEMA standard of 7). The LumeLEX 2044 offers a variety of lumen packages from 600-1120, flexible beam control, and a full range of internal accessories for manipulating the distribution of light, much like you can do with any halogen source.

### Quick Notes:

- Xicato LED Module
- 50,000 Hour Life
- Elegant Stem Mounted Design with hidden LED driver
- Field changeable reflectors (10°, 20°, 40°, 60° beam spread)
- Integral Cartridge accepts up to two Size-AA accessories
- Dimmable- Trailing Edge ELV



### Available Lumen Packages:

LSI Code	Available Lumens	Delivered Lumens	CRI	Watts	Lumens Per Watt
C	700	600	97	15	40
D	1000	860	80	15	57
E	1000	860	97	25	34
F	1300	1120	80	25	45

## LumeLEX MAR Series

The LumeLEX MAR Series is an adjustable recessed spot-light system designed to be integrated directly into today's clean architectural environment. The LumeLEX MAR Series is available in one, two, three or four LED module configurations, with a choice of three lumen packages, all at 40° beam spread. Each LED module sits in a free floating cradle and is fully adjustable up to twenty-three degrees of vertical angle in any direction. All fixture types come with a removable holder for up to two Size-AA LSI accessories.

### Quick Notes:

- Xicato LED Module
- 50,000 Hour Life
- 40° beam spread
- 1, 2, 3, 4 LED module configurations
- Holds up to two size-AAA accessories
- Fully adjustable 360° horizontally and 23° vertically
- Dimmable- Trailing Edge ELV



### Available Lumen Packages:

LSI Code	Available Lumens	Delivered Lumens	CRI	Watts	Lumens Per Watt
C	700	600	97	15	40
D	1000	860	80	15	57
			80	25	45Á



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 Fax: +1 845.942.2177

[www.LightingServicesInc.com](http://www.LightingServicesInc.com)  
[www.LightingServicesInc.co.uk](http://www.LightingServicesInc.co.uk)

## Notable LumeLEX Installations



Subscribe to the **Lighting Services Inc YouTube Channel** for all the latest demonstration videos



[www.Lightingfacts.com](http://www.Lightingfacts.com)

220 Water Street Complex, Brooklyn, NY 6060 Sunset Gower Studios, Los Angeles, CA  
 Air Force Visitors Center, Washington, DC American Museum of Natural History, New York, NY  
 ArenaNet, Bellevue, WA Art Gallery of Ontario, Toronto, ON Atlantic Ocean Club, Delray Beach, FL  
 Bande A Part FM (Radio Canada), Boucherville, QC Brooklyn Navy Yard, Brooklyn, NY  
 Bruce Museum, Greenwich, CT Cambridge School of Weston, Weston, MA  
 Casa Concha, Ica, Peru CBS Control Room, New York, NY  
 CDA Casino, Worley, ID Children's Discovery Museum, San Jose, CA  
 Cooper Hewitt Design Museum, New York, NY Coppin Art Gallery, Baltimore, MD  
 Culver Crisp Visual Arts, Plymouth, IN Deutsche Bank, Boston, MA DeWitt Wallace Gallery, Williamsburg, VA  
 Dinosaur National Park, Jensen, UT Disney Hollywood Studios, Anaheim, CA  
 Duncaster Hospitality, Bloomfield, CT Ferragamo, Las Vegas, NV  
 Field Museum, Chicago, IL Gaiser Silver Gallery, Williamsburg, VA  
 Hard Rock Cafe, Tampa, FL Harley Davidson Museum, Milwaukee, WI Intel, Santa Clara, CA  
 Jarrett Gordon Ford, Detroit, MI Keweenaw Natural History Park, Calumet, MI  
 LEGO Showroom, Enfield, CT Lockheed Martin, Orlando, FL Loews, New York, NY  
 Marine View Ventures, Tacoma, WA Metropolitan Museum of Art, New York, NY  
 Midstate Medical Center, Meriden, CT Minnesota History Center, Saint Paul, MN  
 Mission San Jose Church, San Antonio, TX Musée d'art Contemporain, Baie-Satin Paul, QC  
 Museum of History and Industry, Seattle, WA Museum of Arts & Culture, Spokane, WA  
 Museum of the Moving Image, New York, NY Norton Simon Museum, Pasadena, CA  
 NYU Gallatin Hall, New York, NY Oberlin College and Art Gallery, Oberlin, OH  
 Phoenix Bank, Phoenix, AZ Phillips Museum of Art, Lancaster, PA  
 Reflection de la Terrasse Dufferin, Quebec City, QC Royal Ontario Museum, Toronto, ON  
 Saint Luke's Hospital, Kansas City, MO San Francisco Museum of Modern Art, San Francisco, CA  
 Science World, Vancouver, BC Smithsonian Institution Museum of Natural History, Washington, DC  
 Sotheby's, New York, NY Soundview YMCA, Branford, CT  
 Stark Museum of Art, Orange, TX Testarossa Winery, Los Gatos, CA  
 Tiffany & Co., New York, NY UBC Biodiversity Museum, Vancouver, BC  
 Vero Beach Museum of Art, Vero Beach, FL Warner Bros DC Entertainment, Huntington Beach, CA  
 Washington Monument, Washington DC

3.5 Serotiny video panel  
See sheet 3.2 for detail

# VFM1035-52

10" DIGITAL PHOTO FRAME  
WITH SwifTouch™ CONTROLS

## Storing Memory

Delight your loved ones with ViewSonic's larger format 10" VFM1035-52 digital photo frame. Insert the memory card from your digital camera and use the easy-to-use touch controls to scroll through your photos, create a slideshow or add MP3 audio to your viewing. The control buttons are hidden until you touch the frame to illuminate them, maintaining a fingerprint-free screen and smooth lines on the frame. The 1024x768 high resolution, large format screen displays your photos in beautiful color and vivid detail. 2GB of internal memory lets you store thousands of photos, videos and music. As a gift, the VFM1035-52 is the picture perfect way to show your loved ones how much you care. Preserve your memories and relive them anytime with the VFM1035-52 digital photo frame.



- > Hidden control buttons illuminate in blue when touched
- > USB 2.0 port allows for fast photo imports from your camera, computer, thumb drive
- > Ultra-high screen resolution of 1024x768 delivers life like picture quality
- > Slideshow feature lets you add transition effects and vary display speeds
- > Enjoy your favorite MP3 music along with your photos
- > Industry leading 2GB internal memory built-in
- > Video/audio capabilities for a personalized viewing experience
- > Alarm, clock and calendar features keep you on schedule

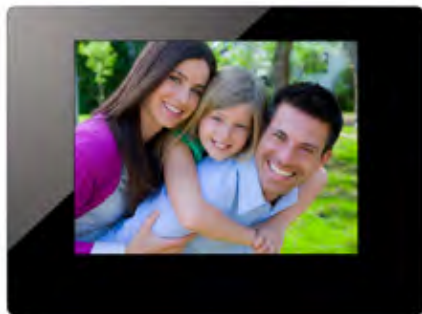


# VFM1035-52 10" DIGITAL PHOTO FRAME WITH SwifTouch™ CONTROLS

- > Hidden control buttons illuminate in blue when touched to indicate your selection and direct you to your photo, slideshow, music or video.



Touch controls activated.



Touch controls not activated.

- > Video and audio capabilities for a personalized viewing experience.



ViewSonic Corporation's OMS & EMS have been registered to ISO 9001 & ISO 14001, respectively, by TÜV NORD.

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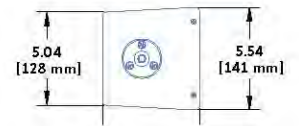
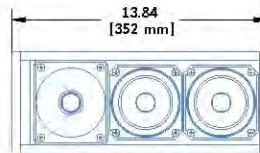
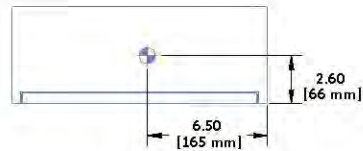
- > USB 2.0 port allows for fast photo imports from your camera, computer or thumb drive.
- > Supports most popular memory cards.

<b>LCD</b>	Type	10" (25.4 cm) color TFT active matrix LCD
	Effective Viewing Area	7.9" x 6" (202.8mm x 152mm)
	Resolution	1024x768
	Contrast Ratio	600:1 (typ)
	Viewing Angles	140° horizontal, 120° vertical
	Brightness	250 cd/m <sup>2</sup> (typ)
	Glass Surface	Anti-glare
<b>INTERNAL MEMORY</b>		2GB
<b>AUDIO</b>		1x1-watt
<b>COMPATIBILITY</b>	Card Reader	SD/SDHC, MMC, MS/MS Pro
	Photo Formats	JPEG
	Video Formats	M-JPEG, MPEG1/4
	Audio Formats	MP3
	USB	2.0
<b>DIMENSIONS (W x H x D)</b>	Physical	11.8" x 8.7" x 2.1" (300mm x 220mm x 52.5mm)
<b>WEIGHT</b>	Net	1.9 lb. (0.85 kg)
<b>REGULATIONS</b>		FCC, CE, ETL, C-TICK, BSMI, GOST, CCC, PSE, CB
<b>PACKAGE CONTENTS</b>		Digital Photo Frame, power adapter, frame stand, remote control, Quick Start Guide
<b>WARRANTY</b>		One-year limited warranty

**ViewSonic®**  
See the difference®



# UP-4XP™ : UltraCompact Loudspeaker



- Dimensions** 13.84" w x 5.54" h x 5.25" d  
(352 mm x 141 mm x 133 mm)
- Weight** 12.2 lbs (5.53 kg)
- Enclosure** Premium birch plywood
- Finish** Black textured
- Protective Grille** Powder-coated, hex-slamped steel with black mesh screen
- Rigging** Top and bottom plates available with 3/8"-16 or M10 threads nuts



The UP-4XP ultracompact loudspeaker is ideally suited for applications requiring a small, inconspicuous cabinet that also delivers high sound pressure levels, low distortion, and uniform directional control. The self-powered UP-4XP offers exceptional audio performance in a compact package with the advantages of a remote power supply. As a standalone loudspeaker, the UP-4XP can be used for vocal reinforcement, frontfill coverage, and delay coverage for under-balcony applications. The UP-4XP can also be paired with an optional subwoofer to create a full-range system.

The UP-4XP boasts a wide operating frequency range of 66 Hz to 18 kHz and a maximum peak SPL of 121 dB, with very low distortion. The unit's high-frequency section includes a 1-inch metal dome tweeter on a constant-directivity, high-frequency horn with a 100-degree beamwidth. The low/mid-frequency section includes two 4-inch cone transducers that work in parallel at low frequencies — delivering a combined acoustic output — with one of the drivers rolling off at higher frequencies to

prevent interference (due to comb filtering effects) in the crossover region. The proprietary UP-4XP drivers, which are manufactured at Meyer Sound's factory in Berkeley, California, are powered by three channels of onboard power amplification that include an active crossover, driver protection, and frequency and phase correction circuitry.

The UP-4XP can be equipped with either a Phoenix™ 5-pin male or sealed SwitchCraft® EN3™ male connector for receiving balanced audio and DC power. Powering the unit from an external source eliminates the need for wiring conduits while still preserving the advantages of self-powered systems. The UP-4XP's amplifier and signal-processing circuits are designed to store DC power and tolerate voltage drops, thereby accommodating light-gauge cables and lengthy cable runs.

UP-4XP loudspeaker systems require an MPS-488 external power supply. The rack mount multi-channel power supply can deliver both balanced audio and 48 V of DC power to four UP-4XP

loudspeakers at cable lengths of up to 150 feet, with just 1 dB of loss in peak SPL using 18 AWG wire. The use of composite multiconductor cables (such as Belden® 1502) allows a single cable to carry both audio and DC power to the UP-4XPs. Longer cable lengths are possible for moderate applications that don't drive the loudspeakers to maximum output, or when using heavier wire gauges for the DC power.

The UP-4XP's durable cabinet is coated with a black textured finish and includes top and bottom mounting plates with 3/8"-16 or metric M10 threaded nuts. QuickFly mounting options include the MUB-UP4 U-bracket, MYA-UP4 cradle-style yoke, and 1-3/8" (35 mm) diameter pole-mount adaptor.

Other options include weather protection (with the sealed EN3 connector) and custom color finishes for installations and applications with specific cosmetic requirements.

\* For details and specifications on the MPS-488 power supply, refer to the MPS-488 Datasheet.

## FEATURES & BENEFITS

- Extraordinary fidelity and power capability in an ultracompact package
- Metal dome tweeter delivers a smooth high-frequency response
- Wide, symmetrical pattern covers a broad listening area
- Unique crossover design eliminates combing and yields a consistent midrange response
- Exceptional SPL to size ratio
- Supports long cable runs with light-gauge cables

## APPLICATIONS

- Frontfill and under-balcony fill coverage
- Theatrical sound reinforcement and special effects
- Portable and installed AV systems
- Compact voice reinforcement systems





## 4.3 Terrarium See sheet 4.1 for detail

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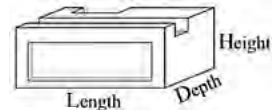
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C241816RG	RedSand Granite		Reg. \$209 <b>SALE \$189</b>	<input type="text"/>	<input checked="" type="checkbox"/> <b>IN STOCK</b>
C241816SS	Sandstone		Reg. \$209 <b>SALE \$189</b>	<input type="text"/>	<input checked="" type="checkbox"/> <b>IN STOCK</b>
C241816GG	Green Granite		Reg. \$209 <b>SALE \$189</b>	<input type="text"/>	<input checked="" type="checkbox"/> <b>IN STOCK</b>



## 5.5 Aquarium

### See sheet 5.1 for detail

#### GLASS COMMERCIAL AQUARIUMS

Commercial tanks are made of heavier glass. (3/4" thick) They are meant to be used in public places such as zoos, nature centers, restaurants, and business establishments open to the public. They can be used in homes but are much heavier built than usually needed.

- **Customizations**
  - Tank Sizes At our discretion tank sizes can be customized to your needs.
  - Overflows We have many types of overflows available that can be added to any aquarium. Please refer to the Overflows category on the left.
  - Holes Holes can be drilled in the aquariums.
  - Tank Tops Tops of tanks can be modified to suit special needs. - Rimless tanks are available for certain sizes: See Rimless Tanks category.
  - Hinged Glass Tops Tops are available. Please view the Glass Tops category.
- **Glass Types**
  - Regular Plate Glass As is common in most aquariums, we use regular plate glass.
  - Starphire (aka low-iron glass) Starphire glass is available at an additional cost. Starphire glass provides a clearer view of colors than regular aquariums.
- **Understanding Sizes**
  - Gallorage is approximate Gallorage is used as a name only. For actual tank sizes please go by their listed dimensions.
  - Dimensions All tanks are listed in this format: length X width X height
- **Stands and Canopies**

Stands and Canopies are sold separately. Please view their categories on the left side of the page.

*(All customizations carry additional costs. - Prices listed below are for the base tank only.)*

Name	Description	Price
180 C 3	48 x 25 1/2 x 36 1/2	\$1050
270 C 3	48 x 37 1/2 x 36 1/2	\$1470
300 C 2.5	96 x 25 1/2 x 30 1/2	\$1470
280 C 3	72 x 25 1/2 x 36 1/2	\$1470
210 C 4	36 x 36 x 48 1/2	\$1470
240 C 4	48 x 25 1/2 x 48 1/2	\$1575
290 C 2.5	72 x 31 1/2 x 30 1/2	\$1575
350 C 3	72 x 37 1/2 x 30 1/2	\$1680
360 C 3	48 x 48 x 36 1/2	\$1785
405 C 3	72 x 37 1/2 x 36 1/2	\$1890
375 C 3	96 x 25 1/2 x 36 1/2	\$1890
370 C 4	48 x 37 1/2 x 48 1/2	\$1890
390 C 2.5	96 x 31 1/2 x 30 1/2	\$1890
410 C 2.5	130 x 31 1/2 x 25	\$1995
480 C 4	48 x 48 x 48 1/2	\$2100
460 C 2.5	96 x 37 1/2 x 30 1/2	\$2310
460 C 3	96 x 31 1/2 x 36 1/2	\$2310
500 C 2.5	130 x 31 1/2 x 30 1/2	\$2520
540 C 3	96 x 37 1/2 x 36 1/2	\$2625
550 C 3	72 x 49 1/2 x 36 1/2	\$2730
610 C 2.5	130 x 37 1/2 x 30 1/2	\$2940
730 C 3	130 x 37 1/2 x 36 1/2	\$3675

When emailing or faxing us, please include your location and zipcode.

E-Mail: [glasscages@gmail.com](mailto:glasscages@gmail.com)

Phone: (615)-446-8877

## Custom size: 36 x 24 x 24

<http://www.glasscages.com/?sAction=ViewCat&ICatID=47>

Glasscages.com

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**AQUARIUM WARRANTY**

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## **Glasscages.com LLC**

### **90 DAY SEAM LEAKAGE WARRANTY**

#### **GALLON SIZE OF ALL AQUARIUMS IS APPROXIMATE**

The aquarium is warranted by Glasscages.com LLC, not to leak or come apart at the silicone seams for a period of ninety (90) days from date of purchase.

This warranty is void if the **SET UP INSTRUCTIONS** are not followed and/or if you cut or alter the silicone seams of the aquarium.

This warranty is void if the aquarium is chipped or shows any glass damage.

This warranty is limited to replacement of the aquarium and does not cover fish loss, personal injury, property loss or direct, incidental or consequential damage arising out of use of this aquarium.

Chipping and breakage are not caused by manufactured defects and therefore are not warranted and no free replacement is available. Breakage that occurs after the aquarium is accepted is caused by improper set up or accident.

#### **SET UP INSTRUCTIONS**

All aquariums must be set up on commercially manufactured stands only. A sheet of 3/4" Styrofoam (reaching completely side-to-side and front-to-back) must be placed between the tank and the surface of the stand. Aquariums should not be set on wood furniture, stereos, televisions, or other surfaces that have not been designed to support an aquarium. Setting up the aquarium on a homemade stand or on a surface such as the ones mentioned above can result in stress breakage of the side or bottom glass panels of the aquarium. Breakage is **NOT** guaranteed. It is very important to follow the **INSTRUCTIONS**:

- Each leg of the aquarium stand must sit flat on the floor.
- Each corner of the aquarium must sit flat on each corner of the top of the aquarium stand.
- If either the legs or the corners of the aquarium do not sit flat then proper shimming is required. The shimming referred to here is the placing of thin strips of tile, wood, or paper under the leg or corner of the aquarium to make the leg or corner sit flat.

#### **IMPORTANT!!**

Special setup is required on a carpeted floor due to the fact that carpeting tends to cover up uneven floors which can cause stress breakage. If the aquarium is set on carpeting, the carpeting should be pulled back to expose the bare floor. Then follow setup instructions above. After the stand and aquarium have been checked and proper shimming done, if necessary, the carpeting can be put back in place and the stand and aquarium should be placed in the exact same position as before on top of the carpeting. The stand and aquarium should be reset up using the same shims, if any were needed, in the same position that was used when the stand and aquarium were set up on the bare floor.

#### **CONSUMER INFORMATION**

If the aquarium is defective within ninety (90) days from the date of purchase, return it to Glasscages.com LLC, along with sales receipt. Provided the aquarium has no broken or chipped glass or altered sealant, Glasscages.com LLC, will replace the aquarium at no charge, shipping not included.

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## 7.2 Orientation map See sheet 7.0 for detail



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[BPS-100](#)

For material up to 3 1/2" wide



[LHF-S130](#)

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For material up to 4 1/8" wide



[4W104](#)

Four pocket  
For material up to 4 1/8" wide



[BPS-700](#)

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