



User Accessibility

Site Location  
Appropriateness

Cost  
Considerations /  
Trade-offs

Environmentally-  
friendly

There are four primary questions to answer in determining a best-suited launch site: How will access be achieved? Which site location is most appropriate? What type of funding is available? Which environmental issues must be addressed?



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## User Accessibility: Broad + Practical

**Universal Design:** Paddlers of all abilities want to launch and land smoothly without capsizing or damaging their watercraft. They need firm and stable surfaces that support their movements and sufficient space to accommodate the length of their watercraft during put-in and take-out.

**Physical Launch Accessibility:** Paddlers must be able to stabilize their watercraft during transition to and from the water. Climbing in and out can be especially challenging when there is significant height difference between seat levels and shoreline or when current or waves create chop.

**Slope:** As close to 5% as possible at water's edge. Stay below 8.33%, whenever possible.



Accessible launch area in a dynamic river setting with high banks at the Charles City, Iowa waterfront.



Ideal launch environment



## User Accessibility: Four Design Factors

Recommendations for designing a launch that addresses the need of paddlers with disabilities:

**Height Above Water:** Design the launch surface as close as practical to water level. If a dock is the only way to gain water access, have the decking be as close to the water level as possible.

**Staging Zone:** Allow paddlers to enter their boats parallel to dock, from the side, allowing paddlers “dry” access to side entry of their boats.

The area for Walking path/Staging area should be a minimum of 5', preferably 6' to 12' wide and long enough to accommodate the typical watercraft to be used at this site.



Example of a launch that is too high!



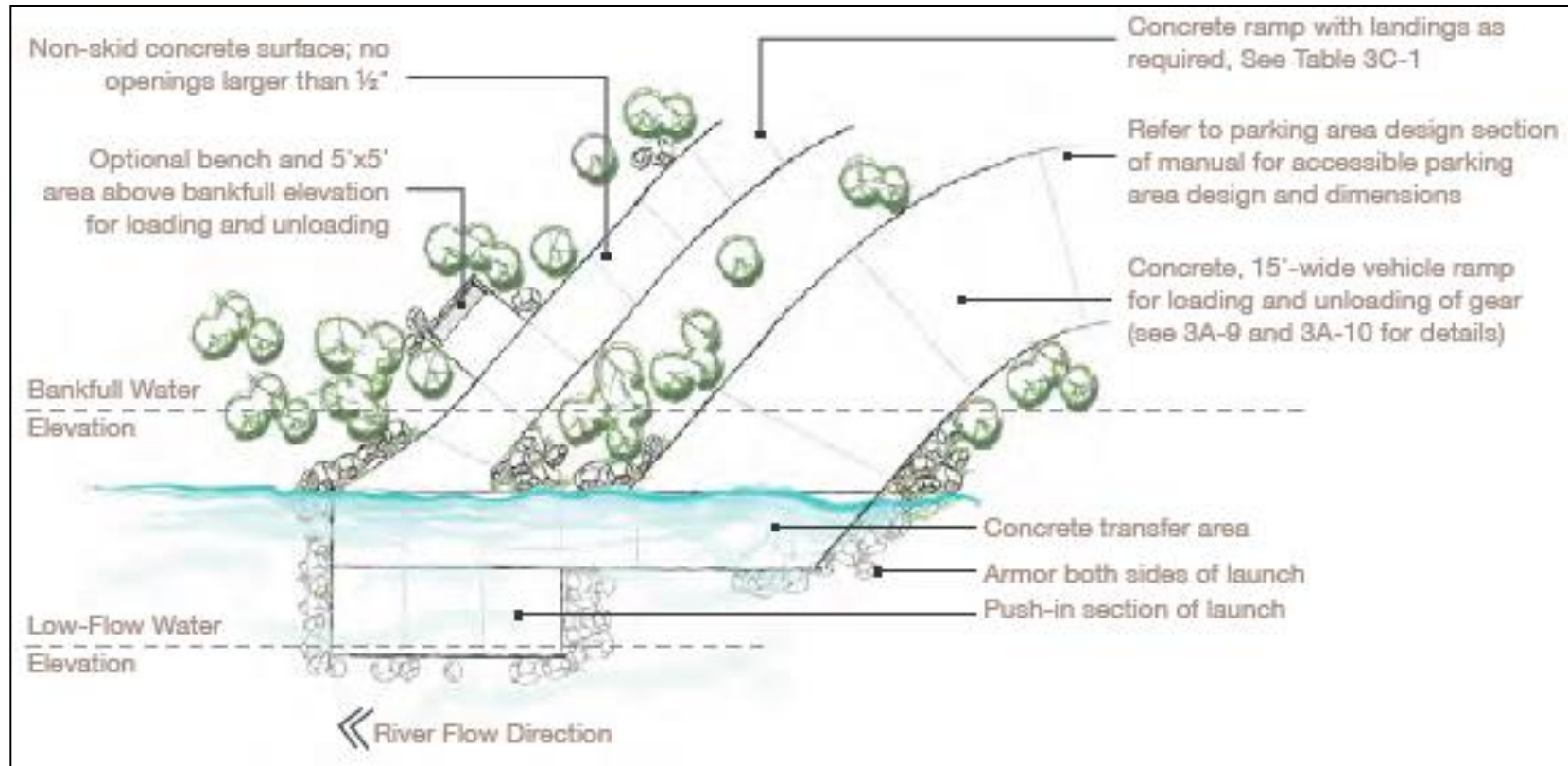
Biathlon Race Boat line up on Potomac River

Photo Credit: [Guidelines for Developing Non-Motorized Boat Launches in Florida](#)





## User Accessibility: Universal Launch Design



Universal design practices seek to construct all facilities in ways that integrate users of varying abilities where possible.

Diagram from [Iowa DNR Water Trails Toolkit](#)



## Site Location Appropriateness

The launch design that is chosen should be appropriate for the characteristics of your site. The type of water body as well as relevant climatic and ecological factors will all influence the launch choice. Choosing an appropriate site will enable the installation of a launch that is inexpensive, long lasting, and environmentally sensitive. The next slide describes what characteristics to look for in a site.



**Poor Design: Steep slope, rugged terrain**



**Good Design: Wide, sturdy staircase**





## Site Location Appropriateness: 7 Site Location Characteristics for a “Best-Suited” Launch

1. Is constructed in accordance with applicable regulations, particularly the accessibility requirements.
2. Provides safe access away from potential hazards at various water levels and user conflict
3. Can withstand flow levels, currents, and exposure to elements
4. Designated with consideration for multiple types of users and carrying capacity of launch, parking, and waterway
5. Provides a firm surface for launching, despite changes in sedimentation levels
6. Will not be easily damaged due to climatic or seasonal conditions
7. Does not cause damage to riparian habitats or vegetation during construction and is unlikely to cause environmental impacts over time.





## Site Location Appropriateness: Launch Design Selection Criteria

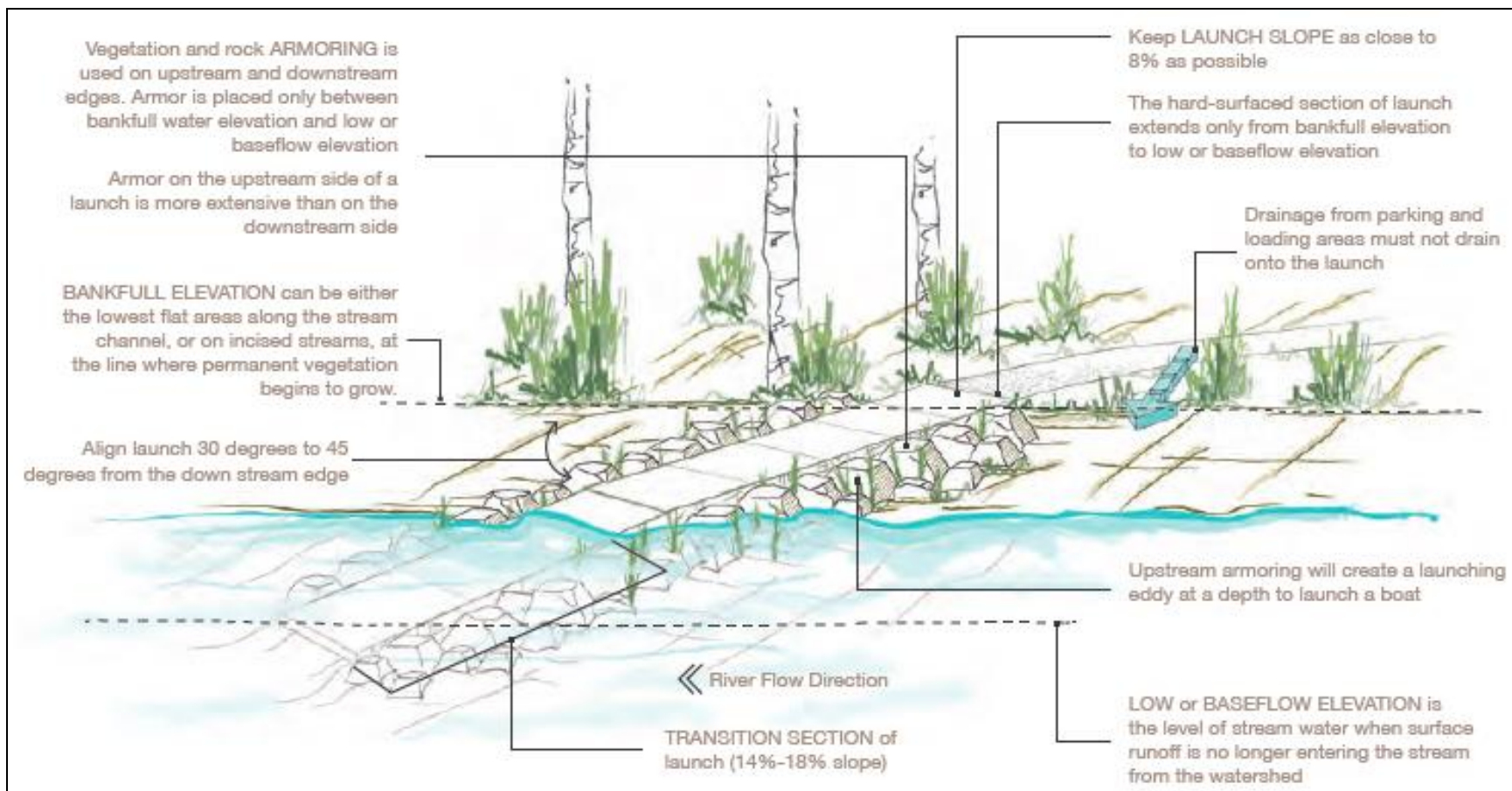


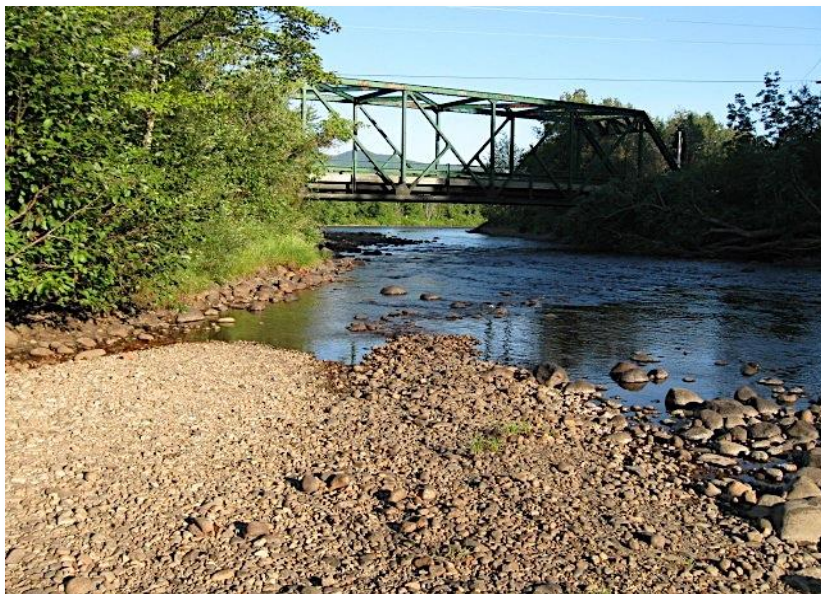
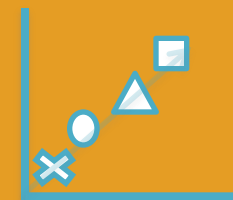
Diagram from [Iowa DNR Water Trails Toolkit](#)



## Cost Considerations

The cost of your project will depend upon the complexity of your launch design. While you will want to keep your launch design as simple as possible, the potential for erosion, high use, and steep banks are just a few examples of factors that may require a more complex design, as well as materials and anchoring that go beyond your initial projection.

Complexity  
vs.  
Cost



**Natural Design - most cost-effective, when possible.**



**The more complex, the more expensive!**





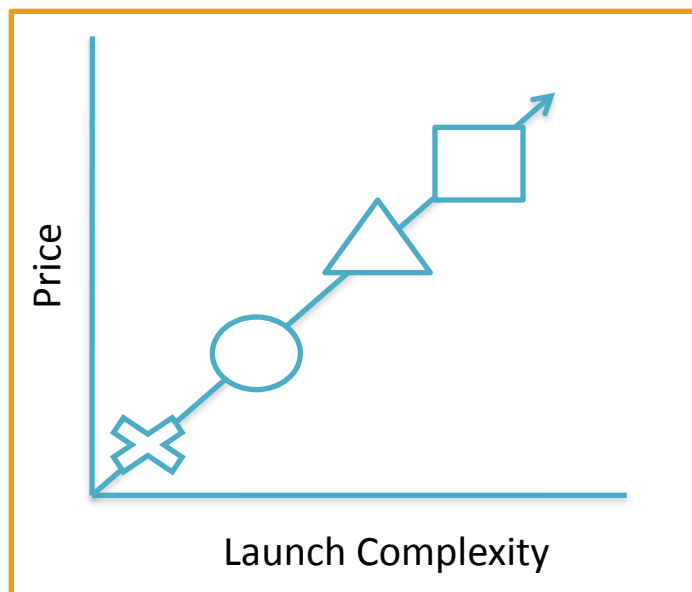
## Cost-Saving Design Tips

1. **Minimal Construction:** Keeps costs low and helps maintain a natural appearance along a shoreline. If construction is necessary, durable materials will reduce the need for later repairs or replacements.
2. **Weathering Impact:** The speed at which materials weather will depend on climatic factors and level of exposure to currents and winds.
3. **Existing Structures:** In some cases, existing docks used by motorized boats can provide stable surfaces for paddle craft access, but many standard docks rise too far above the surface of the water to enable a safe and easy put-in for paddlers.
4. **Minor Modifications:** Some boat docks may be modified to make them more paddler-friendly, including being lowered, lengthened, or widened. Ramps can be made less steep or step-downs may be added with handrails, [cleats](#), or windbreaks.
5. **Shoreline Features:** Features such as boardwalks can be combined with floating docks to enable the launching of hand-carried craft.





## Launch Complexity vs. Cost



As complexity increases, so does cost. We have provided four launch examples that fall in different pricing tiers.

\$ - Natural Surface



\$\$ - Natural Stairs



\$\$\$ - Concrete Launches

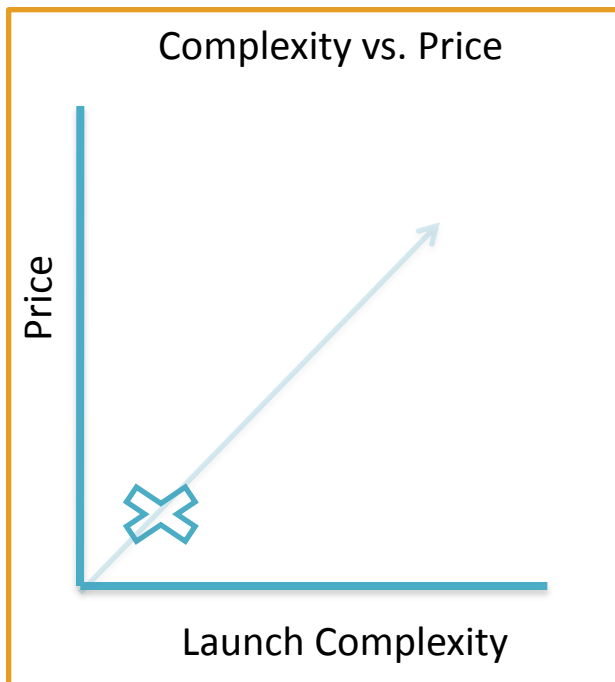


\$\$\$\$ - Steep or Urban Launches



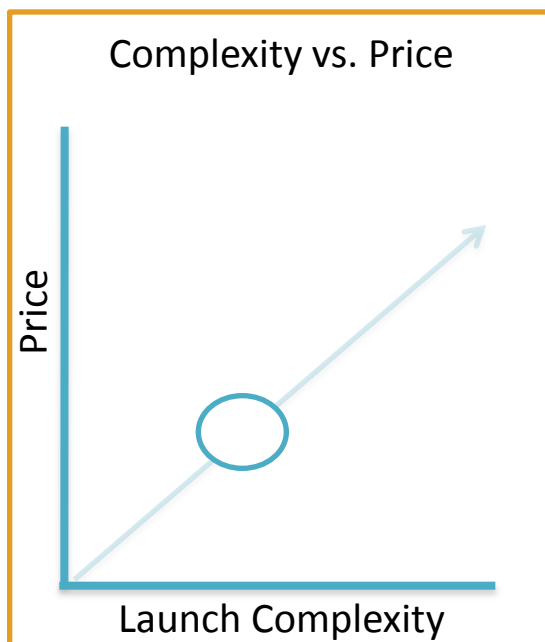
## \$ - Natural Surface Designs

Natural surface designs are always the most cost efficient design choice and should be used whenever possible. Small additions to your site, as well as armoring the launch to protect it from the effects of erosion, can make a site more user-friendly. The boulders in the picture below offer such an example. The upstream placement of the boulders creates an area of calm water for the paddler to launch and helps prevent bank erosion.





## \$\$ - Natural Stairs and Retrofits



The steepness of the site might require a more complex launch design to provide safe access to the water. If you do not have the space to make a low-gradient ramp, stairs are an alternative solution for steep banks. Natural stairs are more complex and more expensive than a natural surface ramp. Using materials available on site such as the rocks in the image to the right can reduce construction expense considerably.

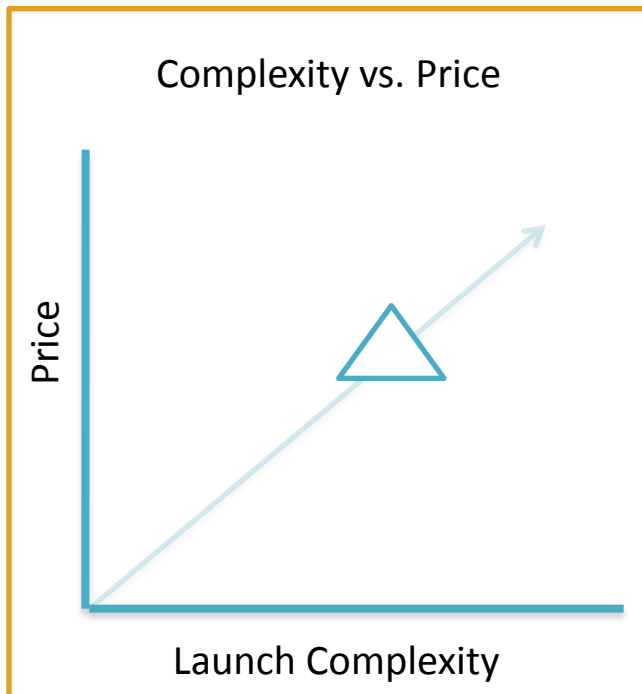


Installing launches in marinas such as the one in the image to the left may require a more complex design. This complex launch addresses heavy boat traffic while providing safe access from an elevated pier. Modifying an existing launch to be more paddler-friendly may be just as effective and less expensive!



## \$\$\$ - Concrete Launches

Concrete launches provide an extremely stable surface for loading people and gear into a watercraft and sliding into the water. However, they also require heavy construction which can increase the price of a project. Concrete launch installation may require that the site be dry and coffer damming may be necessary. For a more cost efficient approach, precast concrete planks with a rail system do not require dewatering the submerged section of the launch.

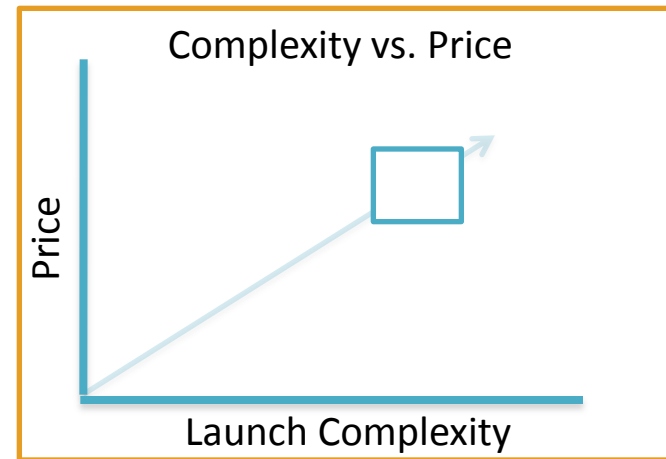




## \$\$\$\$ - Steep or Urban Launches



Some sites require launches that are extremely complex and expensive. Long steep slopes, like the site in the picture to the left, require large constructed staircases to provide access. One option when faced with steep banks is to look for another site where it will be less expensive to construct.



Urban launches present an array of unique challenges. The example to the left shows banks of the river with an aesthetically appealing natural look while still maintaining stability. Railings are necessary to prevent access in areas that are not safe.



## Four Cost-Effective Design Recommendations: #1

**Limit Construction:** Use construction only when absolutely necessary. In many cases, an actual launch structure may not be needed; firm or sandy banks, level rocks, and beaches can often provide sufficient access.



Sturdy gravel beach on Nulhegan River, VT



Sandy Beach on Amelia Island, FL



## Four Cost-Effective Design Recommendations: #2

**Minimize Exposure:** Choose access sites with minimal exposure to winds and heavy currents, preferably near calmer water, such as eddies. If this is not possible, consider creating a vegetative or other type of buffer to provide protection from the elements.

The example on the right exemplifies this minimized exposure launch.



Minimal exposure, natural surface launch on the lower Tuolumne river in California



## Four Cost-Effective Design Recommendations: #3

**Modify Existing Structures:** To reduce construction expenses, modify existing boat docks or shoreline structures to welcome both non-motorized and motorized craft.

*Example to right:* Airboats use these wooden slats to 'dry launch' from a trailer but they are also utilized by paddlers to decrease hull damage from the concrete surface. Modify existing launch structures by adding wooden or PVC slats to make a launch non-motorized boat-friendly.

Note: If launch improvements are likely to create a traffic bottleneck at the launch site, consider widening the launch with features that appeal specifically to non-motorized users.



Photo Credit: [Guidelines for Developing Non-motorized Boat Launches in Florida](#)

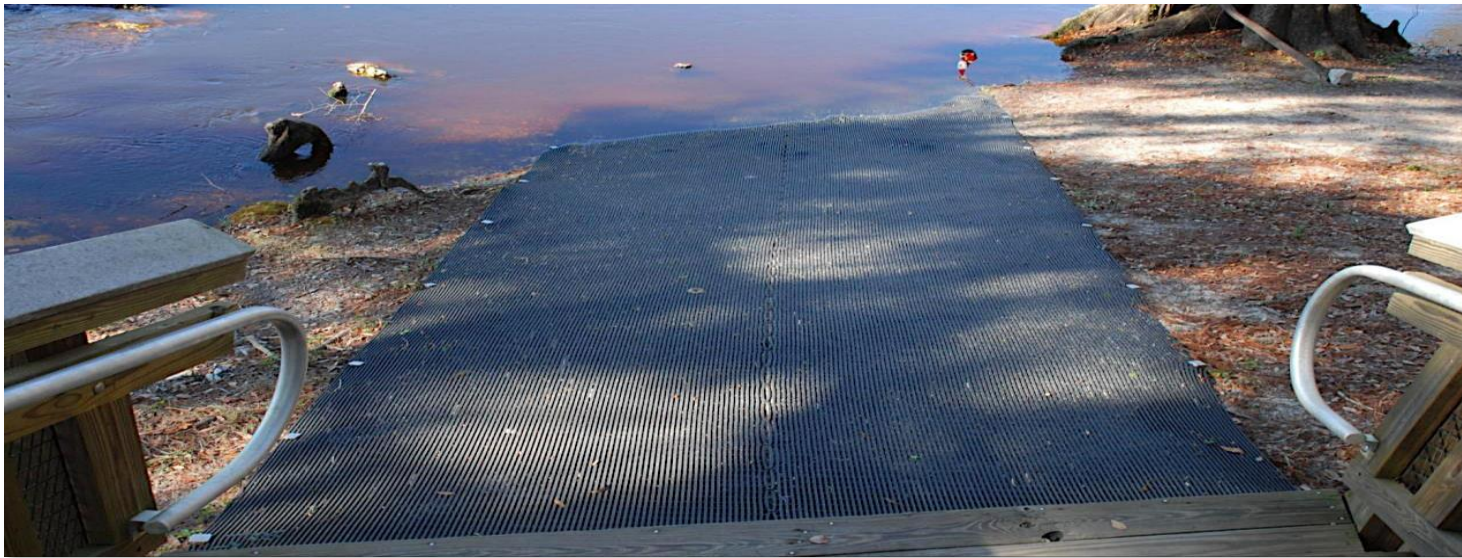




## Four Cost-Effective Design Recommendations: #4

**Multiple Uses:** Construct launches that serve multiple purposes, such as mitigating erosion or restoring wetland vegetation; simple ramps or implanted beaches may help to stabilize a fragile bank or provide “soft treatments” while also enabling access.

*Example Below:* Synthetic industrial matting is used to stabilize the surface on this launch along the Suwannee River. It can also be used to stabilize banks with a 2-4% slope and allows vegetation to grow through matting. It is anchored with 18-24” stainless steel pins and requires little maintenance. This launch is submerged frequently and has survived several flood events with no problems.





## Humboldt Bay Trails, Arcata Marsh and Wildlife Sanctuary: Cost-Efficiency Study

**Problem:** The existing boat ramp is usable at only the highest tides, and at low tide the nearest channel is approximately 150 feet from the boat ramp (*see image below*). In the past, the concrete boat ramp was used by motor-boaters backing their boats into the water, but the narrow window for high-tide access now generally prohibits motorized boating at this facility.

The existing floating portion of the dock, adjacent to the boat ramp is non-functional as it broke apart several years ago and is too short to be of use. Paddlers wishing to use the Marsh facility are generally forced to use the steep and slippery concrete boat ramp. The existing parking lot has recently been repaved and is approximately 24,000 square feet, but lacks any appropriately striped accessible parking. There is one portable ADA-compliant toilet on site at the north end of the parking lot.



[Humboldt Bay Water Trails Implementation Program](#)





## Humboldt Bay Trails, Arcata Marsh and Wildlife Sanctuary: Cost-Efficiency Study

**Solution:** The dock facility represented in the accompanying figures should provide non-motorized boating access at most tide levels. This conceptual dock design addresses issues with low tide access, and comments from regional boaters who have expressed concern for docks that incorporate 90-degree turns in order to comply with slope guidelines. The Arcata Marsh design increases the length of the dock to avoid turns. The dock design presented here extends to the parking lot edge. In this configuration, the dock slope is never greater than 8.33%.

This conceptual design proposes using a polyethylene, snap-together, cell style of dock (such as one manufactured by Connect-A-Dock, Inc.) requiring very little maintenance and offering multiple configurations. The low profile cells are ten inches thick. Extra flotation is available in case more is needed, but it would increase the dock height. Also available from the manufacturer are accessories such as handrails, and wheel chairs can also operate on this material. The docks can support the expected load at the Arcata Marsh.

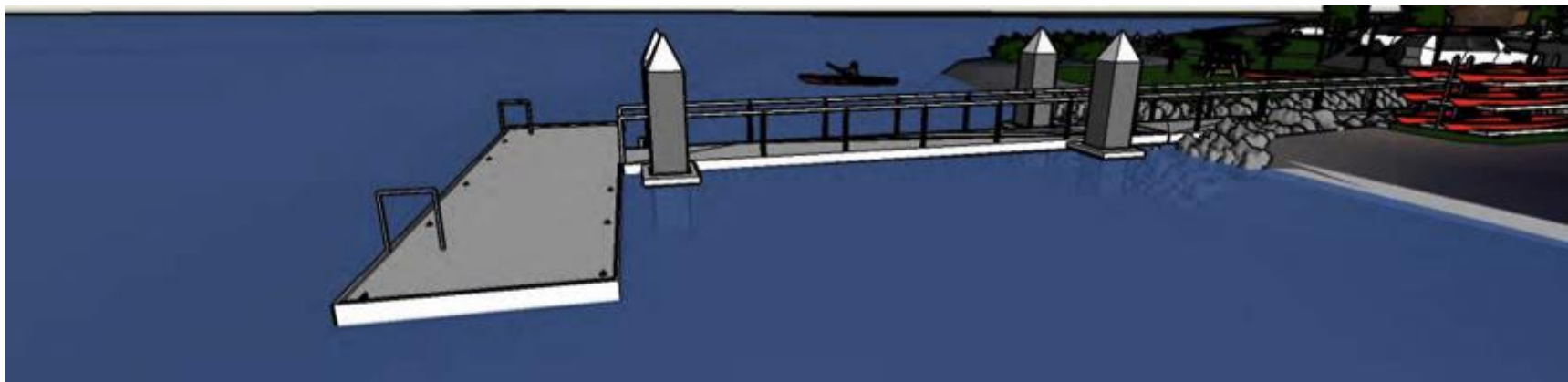




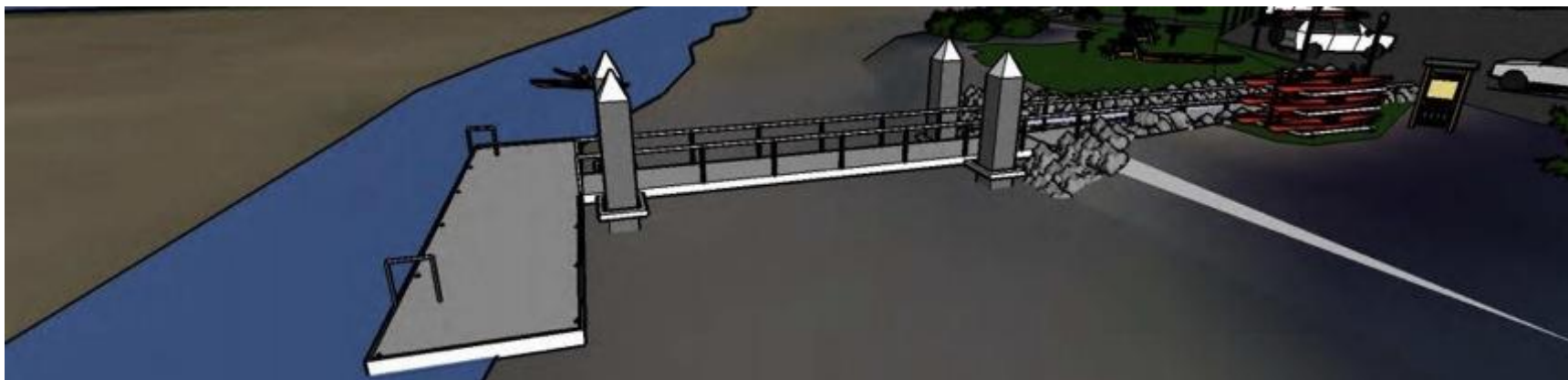
## Humboldt Bay Trails, Arcata Marsh and Wildlife Sanctuary: Site Overview



## Humboldt Bay Trails, Arcata Marsh and Wildlife Sanctuary: Profile of Dock



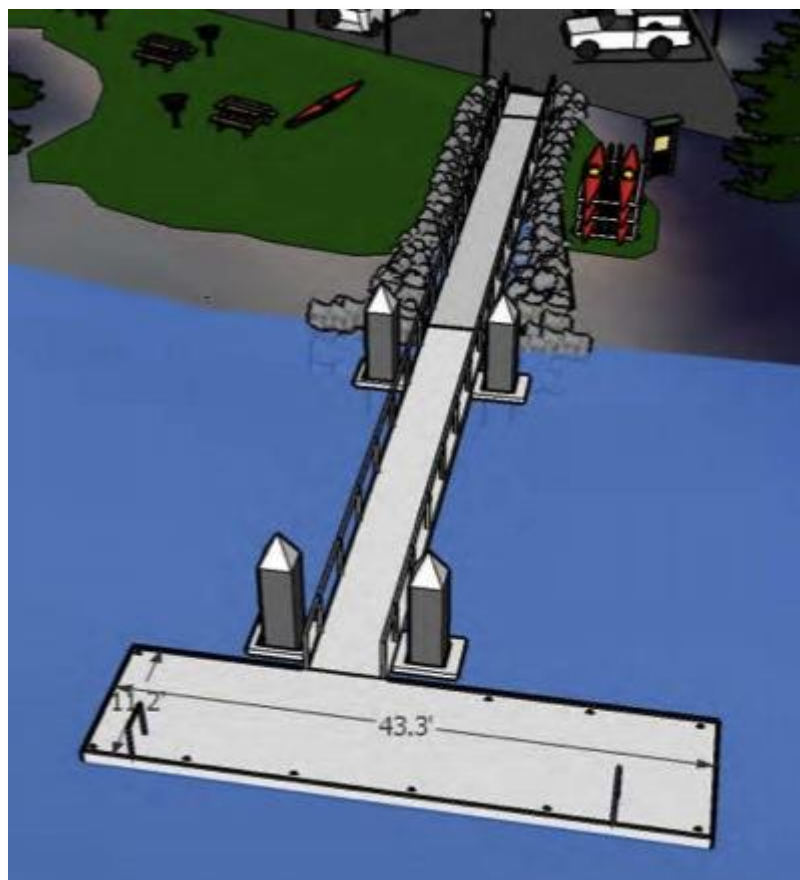
Profile of dock at high tide



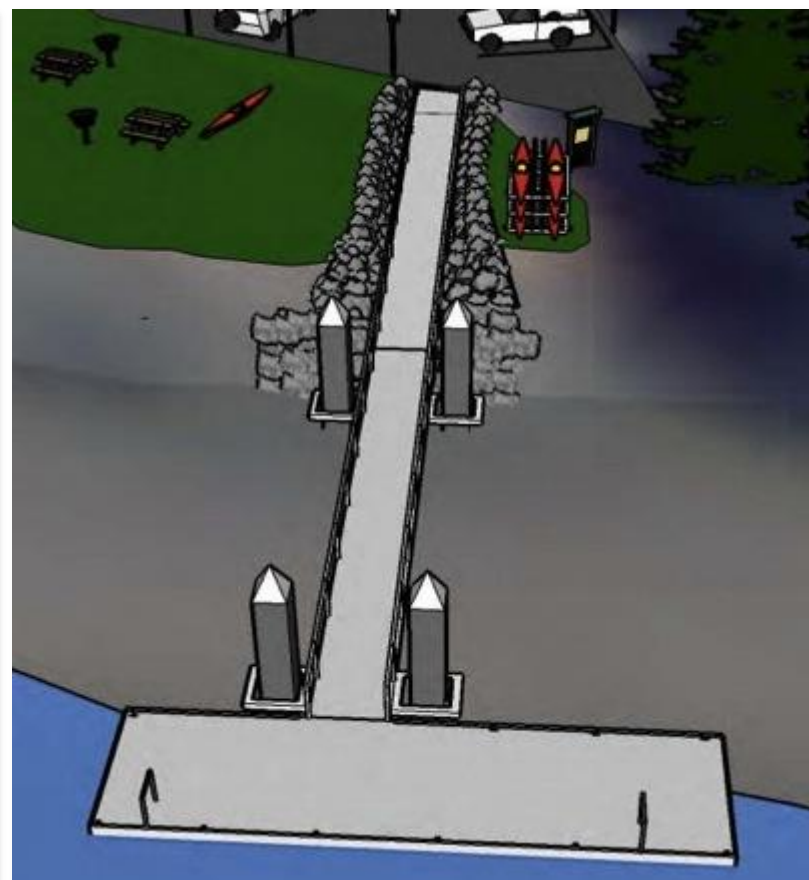
Profile of dock at low tide



## Humboldt Bay Trails, Arcata Marsh and Wildlife Sanctuary: Planned View of Dock



Profile of dock at high tide



Profile of dock at low tide





# Environmentally-Friendly Launch Considerations

Use of low-impact designs and non-toxic materials is essential to watershed health. Consider water quality and vegetation when providing sustainable recreation. There are usually environmental compliance requirements for projects on the bed and banks of rivers.



Existing Natural Site - Robinson Preserve, FL

Photo Credit: [Guidelines for Developing Non-motorized Boat Launches in Florida](#)



# Environmentally-Friendly Launch Recommendations

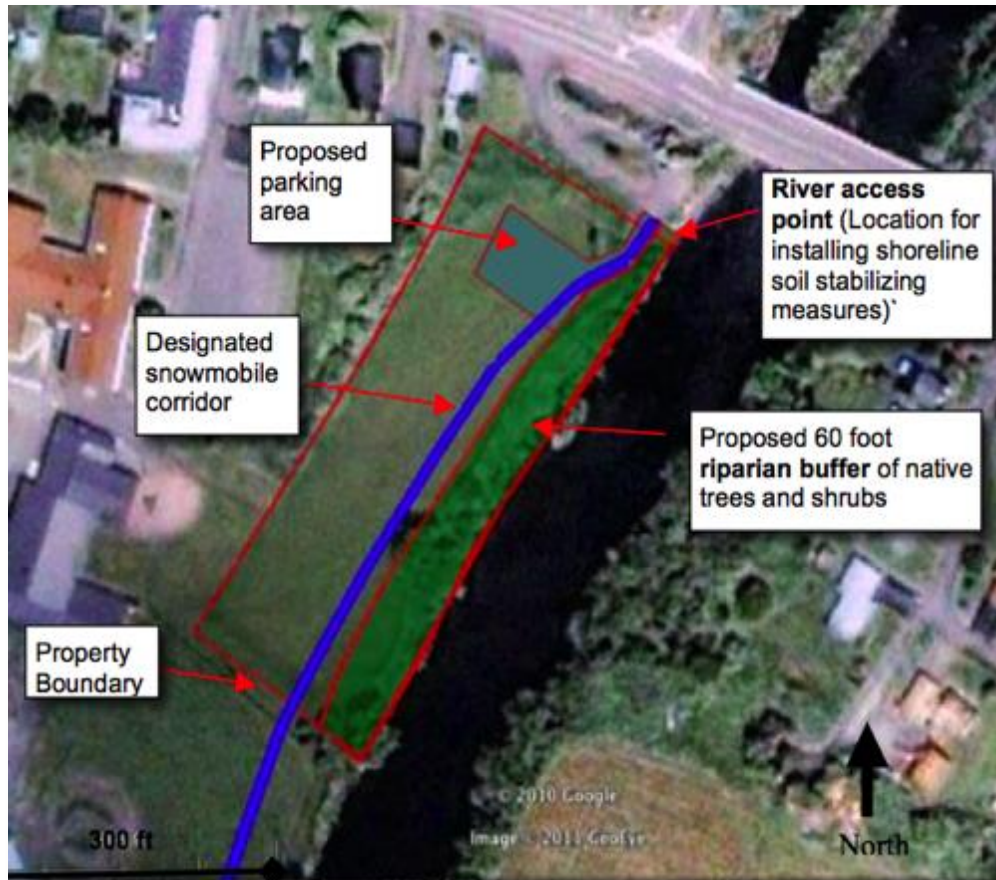
- Investigate applicable regulations; develop launch designs in accordance with these regulations.
- Use structures requiring minimal construction or alteration of the shoreline.
- Consult with a local natural resource specialist during the planning and construction phase to identify ecologically sensitive nesting sites, rookeries, spawning areas, or endangered species; an optimal put-in site may not be feasible for ecological reasons.
- Merge the needs of natural functions and the desired recreational uses of the water; with rivers and streams, avoid making any channel modifications and preserve in-stream habitats as much as possible.



Erosion can be prevented with good siting and proper access design.



# Environmentally-Friendly Launch Recommendations, cont.



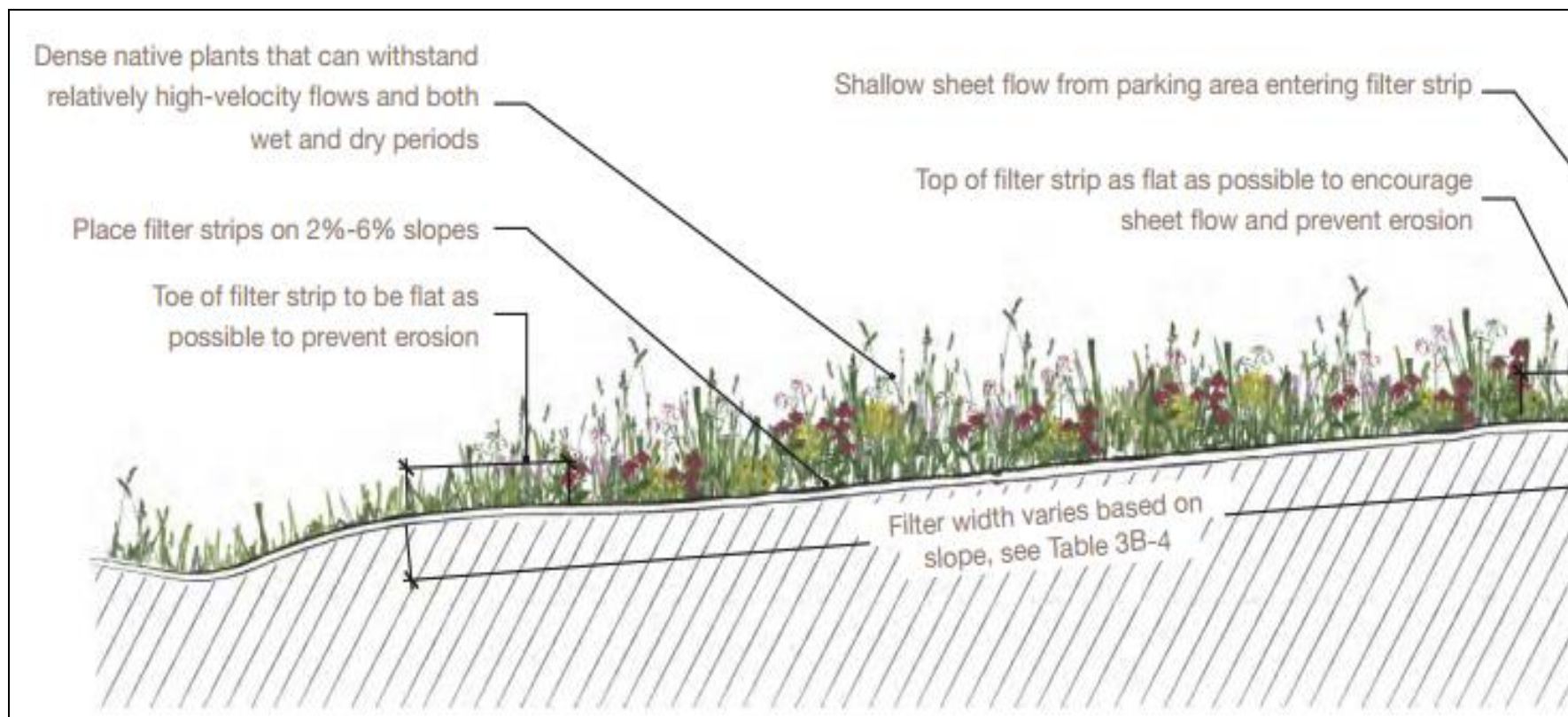
A riparian buffer planted with native species to provide wildlife habitat and to protect water quality on the Connecticut River in Canaan, VT

- Monitor watershed conditions and changes in stream morphology.
- Gather data from local or state agencies that monitor water levels and flows to develop a launch that will accommodate the conditions of the water body.
- Avoid using hard reinforcements (e.g. concrete, steel, rock) where shorelines are eroding. Instead, use [bioengineering](#) methods, such as developing a riparian buffer planted with native species, to protect vegetation and habitats and stabilize shorelines while sheltering the launch area.
- Avoid using toxic or hazardous materials, or items that have contained these materials, wherever possible.





## Environmentally-Friendly Launch Recommendations: Filtration Design – Vegetated Filter Strip



In areas where the seasonal water table is < 4' deep, there is frequent flooding, and the slope is > 15%, the vegetated filter is a great way to minimize impact to water resources at a launch site.

Diagram From [Iowa DNR Water Trails Toolkit](#)





# Bibliography/Resources – Chapter 1

## References

- Iowa DNR - [Iowa Water Trails Toolkit](#)
- Florida Fish & Wildlife Conservation Commission - [Guidelines for Developing Non-motorized Boat Launches in Florida](#)
- [ADA Standards for Accessible Design](#)
- Humboldt Bay Trails Cost Study - <http://www.nrsrcaa.org/baytrails/>  
[http://scc.ca.gov/webmaster/ftp/pdf/scbb/2010/1008/20100805Board3D\\_Humboldt\\_Bay\\_Water\\_Trail\\_Ex2.pdf](http://scc.ca.gov/webmaster/ftp/pdf/scbb/2010/1008/20100805Board3D_Humboldt_Bay_Water_Trail_Ex2.pdf)
- NOAA Buoy Data - <http://www.ndbc.noaa.gov/>
- American Canoe Association – <http://www.americancanoe.org> / 'Adaptive' tab





# Photo Credits – Chapter 1

## Photo List

- Slide 10: Charles City waterfront in Iowa, Nate Hoogeveen, Iowa DNR
- Slide 13: Courtesy of the National Park Service
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- Slide 19: Courtesy of the National Park Service
- Slide 20: Courtesy of the National Park Service
- Slide 20: Courtesy of the National Park Service
- Slide 21: Trestle View Park, Winnepesaukee River, Franklin, NH – Charlie Tracy
- Slide 22: Courtesy of the National Park Service
- Slide 22: Courtesy of the National Park Service
- Slide 23: Left Image - Courtesy of the National Park Service
- Slide 23: Right image - [Guidelines for Developing Non-motorized Boat Launches in Florida](#)
- Slide 24: Courtesy of the National Park Service
- Slide 26: [Guidelines for Developing Non-motorized Boat Launches in Florida](#)
- Slide 27: [Humboldt Bay Water Trails Implementation Program](#)
- Slide 33: [Guidelines for Developing Non-motorized Boat Launches in Florida](#)
- Slide 34: [Guidelines for Developing Non-motorized Boat Launches in Florida](#)

