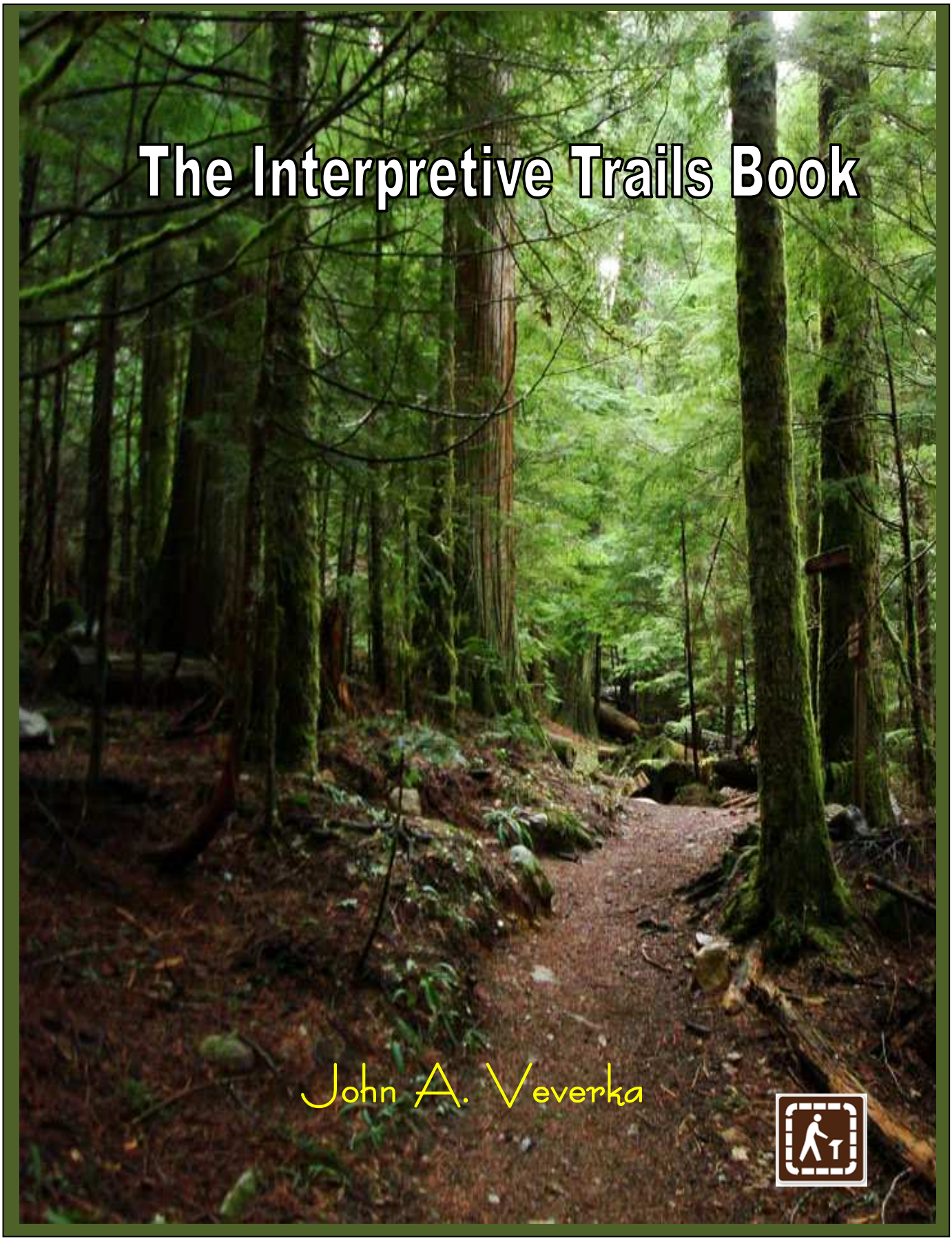
The Interpretive Trails Book
John A. Veverka

The Interpretive Trails Book
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Cordova, Alaska

Chapter 1 - General trail design.

Introduction

Lost Creek Trail, Mt. Hood National Forest, Oregon. Photo by Thomas Iraci.

Most trails are designed just to get the visitor from point A to Point B. Interpretive trails are designed to help the visitor laugh, cry, smile, discover, understand and explore along the way.

When I teach workshops on interpretive trail planning I like to tell the story of how some trails had been planned in the past. You would get a member of the trail planning team fairly drunk and then take the person to the "trail head" site for the trail location to be laid out. Then you tie a string to their ankle and tell them to walk into the woods, pulling the unwinding string behind them, until they hear a car horn blow three times. When they hear the car horn they should start walking back to the sound of the horn. You normally give the walker 20 minutes of walking time out, and then the same for the walk back. After they have returned you simply cut the trail to follow the path of the string. This should give you a loop trail of about 3/4 mile with lots of twists and turns in it.

The Path of Art and Beauty

Unfortunately, many trails that I have been on, or have been involved in "re-habing" look like they were planned with this method. In reality, a trail needs to be planned with the eyes of an artist, explorer and story teller. The trail should be a work of art that transports the visitor to

worlds or experiences that they may have never seen or heard before. It should blend into the environment (natural or built) so that it appears to be a natural part of it. It should also be unassuming, simple and safe.

It is the goal of this book to help the interpretive planner think of the trail that he or she is involved with as more than a connection from point A to B, but a work of communication art. Planning approaches and examples should help planners develop trails, and associated interpretive media, that lead the visitors to paths of greater understanding and appreciation for the natural or historical resources the trails guide them through. Interpretive trails are the ultimate interpretive media - they represent "the real thing" that visitors came for.

We will first begin with a basic understanding of "trails", trail types and general design and function considerations and standards. Following chapters will walk you through the planning and design process for interpretive trails, and planning/designing interpretive trail media such as self-guided trail brochures or panels. This book does not reflect the "right way" - there are lots of "right ways". The ideas and examples presented are ones that we know work and should provide you with a good foundation on interpretive trails planning and design.

General trail planning considerations.

The Pino Alto Interpretive Trail on the Santa Lucia Ranger District, uses the leaflet-marker system (note the interpretive stop #2 on the post). Photo courtesy of the Santa Lucia Ranger District, California).

The design of trails, whether general hiking trails or interpretive trails, must be planned in keeping with the intended use of purpose of the trail. It should provide for the safety and enjoyment of the trail user while having as little negative impact as possible on the landscape. Thus, the trail design must also consider the issue of intensity of use as well as the type of use.

Several key questions which a trail planner or planning team must consider prior to designing any trail or trail system had been identified by the Ministry of Natural Resources, Ontario Provincial Parks, in their draft "The Self-Guided Interpretive Trail: a Manual for Trail Design, Construction and Maintenance" publication. These include:

1. What will the trail be used for? Can it sustain year round use? The answer to these questions will suggest some general guidelines for trail length and gradient, layout and configuration.

2. What element of choice are afforded the trail user? This question is of key importance in planning "interpretive trails" and will be discussed in more detail in the following chapters of this book.

3. What is the expected budgetary requirements for the trail construction and maintenance?

4. Are there any constraints to the trail development?

These are but a few of the questions to be asked when planning a trail or trail system. But hopefully, by providing answers to these questions the trail planning will avoid possible pitfalls and facilitate trail development. We will walk through the total trail planning process in following chapters.

Types of Trails

In general there are about five different trail designs I have seen, with a mix-match of combinations.

A. *Linear Trails*

Linear trails are utilized mainly for long distance hiking and have a definite origin and destination. They are used for access routes connecting specific facilities together, or for general recreational hiking. Lately there has been a successful program converting old railroad right-of-ways to linear hiking/biking trails.

B. *Loop Trails*

Loop trails are advantageous for all trail activities and are the recommended design for self-guiding interpretive trails. The trail ends near the same point that it begins, but the trail user passes a given point on the trail only once, as opposed to having to double back to the point of origin as they would on a linear trail.

C and D. *Stacked Loop and Satellite Loop Trails*

These kinds of trails may provide a variety of hiking options to the trail user both in hiking distance and scenic options. Try to avoid too many loops as it can get very confusing for visitors on the trail if there are not appropriate trail route markers provided as well.

E. *Maze or Web Trail System*

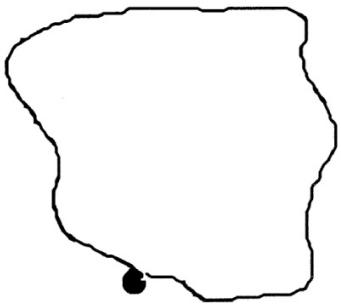
This is the least desirable of the trail system types. They often "make themselves" with trail users making their own short-cuts, etc. Most trail rehabilitation work we do is involved in bringing some order to the chaos of maze trails.

F. *Spooked Wheel Trail System*

This design may be utilized to connect a central point with outlying points while also providing access from one outlying point to another.

General Trail layout designs are illustrated on the following page.

A - Linear Trail or
Connector trail.

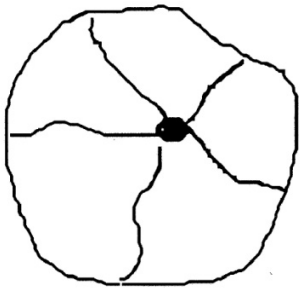


B- Loop Trail

C - Stacked Loop
Trail

D- Satellite Loop Trail

E- Maze or Web trail system.



F - Spoked Wheel trail system.

● Main Trail Head.

The Total Trail

A trail is more than just a path from point to point. Trails are made of lots of parts, materials and physical design considerations. Some of the things we need to consider in physical trail planning include:

* Trail grades
* Tread width
* Tread surfacing
* Stairs
* Water barriers and other erosion considerations.
* Barrier free design considerations
* Developing discovery areas, viewing platforms or other support design services.

The Trail Planning Process

Before we begin to look at each of the elements of designs for any trail, we should first have in mind a general planning approach for any trail. The planning approach I recommend you start with, unless you are already comfortable with a different planning strategy, is based on the interpretive planning model shown as Figure 1 below.

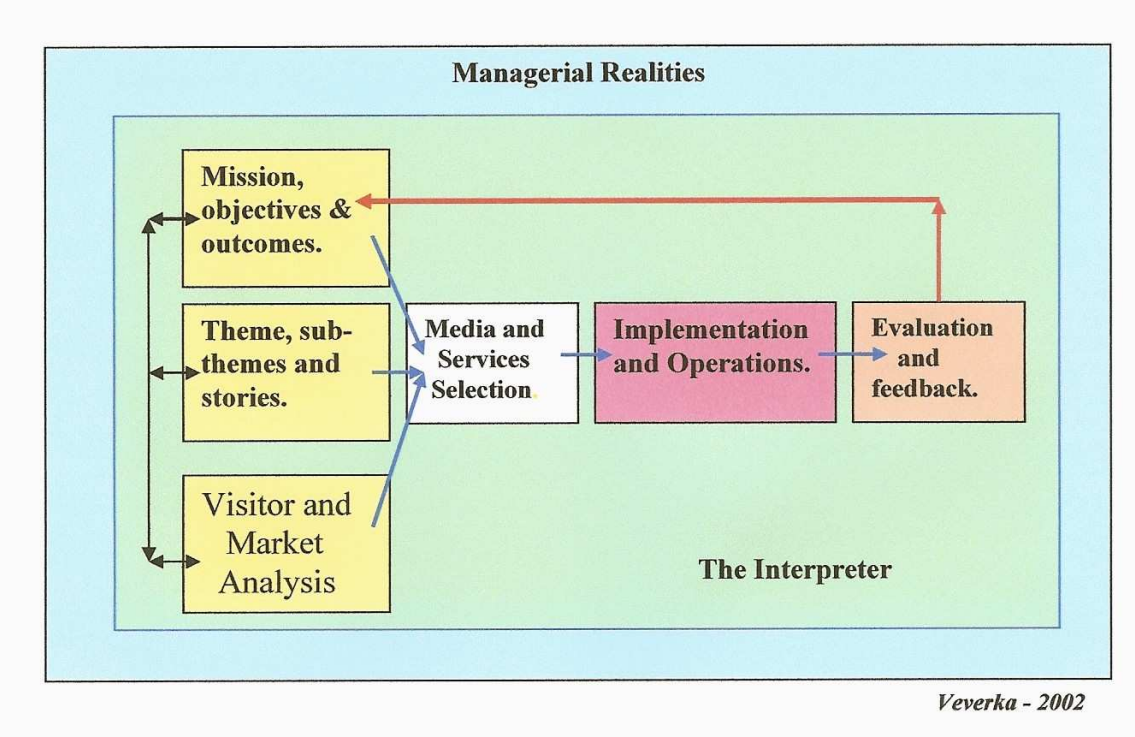


Figure 1 - the Model of Interpretation.

Let's walk through this planning model.

WHY? The why section of the planning process asks us to have in mind or in writing the specific goals or objectives of the trail - its purpose. Is the trail to simply connect or provide visitors access to some points, will the trail be handicapped accessible and need to comply with Universal Access regulations, will the trail need to take visitors to specific points of interest, is the trail needed to protect fragile environments while allowing access to them? What are the learning, behavioral and emotional objectives the trail is to be designed and developed to accomplish. What are the outcomes the planners want the users of the trail to receive?

Theme and stories. For interpretive trails this includes the inventory of interpretive opportunities that trail offers. We will look at this inventory process in more detail in later chapters of this book. Interpretive trail are then designed to illustrate a main interpretive theme, and each stop on the trail is an example of or helps to illustrate that theme.

Visitor and market analysis. In trail planning we need to know who our users of the trail will be such as school groups, families, local residents, dog walkers, tourists, etc. We also need to know about potential numbers of trail users as this may help figure out the best trail surface.

Media and Services Selection. In this part of the planning process we determine the best interpretive media for the trail such as interpretive panels, leaflet-marker system, use of cell phone interpretation, development of demonstration areas, development of viewing decks, and other related media.

Implementation and Operations. In this part of the planning process you estimate your planning, design and construction costs and design/build options such as:

- Cost/linear foot of trail construction for different tread surfaces.
- Person hours and construction staff costs.
- Design, construction, installation of support structures such as stairs, bridges, viewing platforms.
- Work plan for the design and construction of the trail.
- Developing a maintenance strategy and budget for the trail.

We will use this same planning approach for Interpretive Trails which will focus more on the content of the interpretive story and messaging strategy.

A basic overview of trail construction options.

Before we move into the details of how to plan for interpretive trails I think that it is important to have a general understanding of your various physical trail design and construction needs and options to be considered no matter what kind of trail you may be developing.

Trail Tread Surfaces

Trails can go through lots of different geological areas with many different types of soils, drainage and erosion conditions. At the same time the decision for the best kid of trail surface may also depend on the intended use of the trail, length of the trail or anticipated volume of use of the trail. So the trail planner needs to have some working knowledge of what kinds of trail surface options are available and appropriate for their specific needs (soils, use, drainage). And finally, te kind of trail surface will also depend upon funding.

For existing trails there are at least two indicators which suggest to the trail planner that some form of trail surface is required other than natural soil. The first is over-use of the trail which

results in trampling of surface vegetation and soil compacting. The second is unstable soil conditions evidenced by standing water and soil erosion.

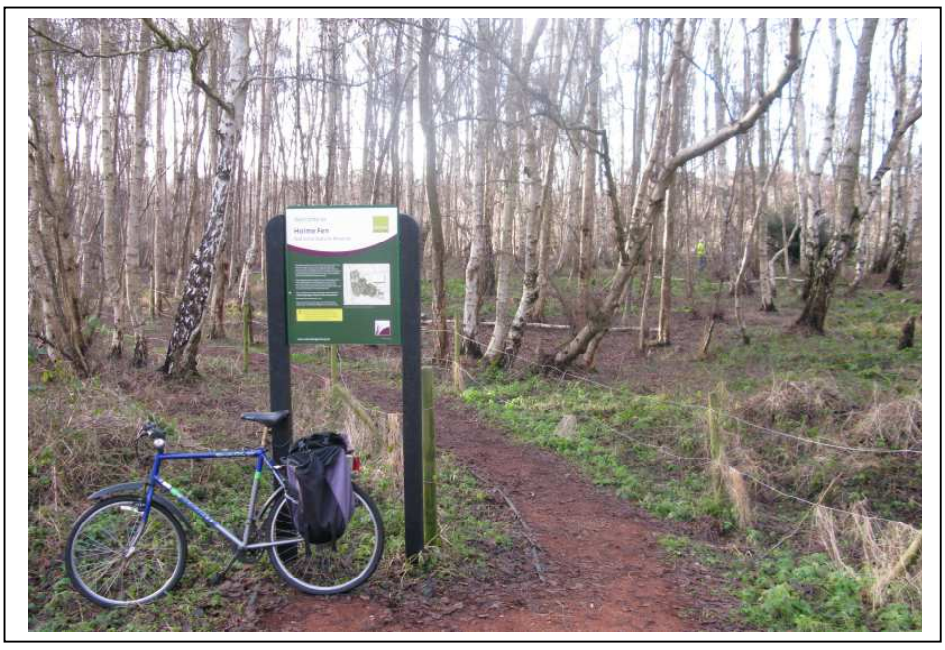
Here is an overview of some of the different kinds of trail surfaces you may want to consider. As there are new kinds of surface materials being developed every year, this overview should serve as a good base line for you - but check into the development of new kinds of surfaces that may be available.

Some of the most common trail tread surfaces include:

- Compacted Soil/ natural untreated soil surfaces.
- Crushed rock (type varies by region).
- Sand (natural soil condition such as in beach areas).
- Soil cement
- Wood Chip
- Concrete blocks
- Geoblock
- Asphalt
- Concrete (i.e. sidewalks).
- Boardwalk.

With all of these options let's take a closer look at each one.

Compacted Soil



Compact sol or "natural" trails are just that. Trails with sol or natural tread surface are the most common of all trail surfaces. they look the most natural, but the wear and tear on this kind of trail surface depends on a lot of different variables such as:

Soil Type:

***** Soil type affects such considerations as trail drainage and water run-off, potential for erosion problems (natural or human impact).

* If the sol is sand, such as interpretive trails on beaches, sand dunes, or very sandy soils such as those found in Florida, wind-blown erosion and damage to native habitats are a concern. Try to avoid sandy trail surfaces. Most I have seen ultimately were turned into boardwalk trails to protect the resource. Sand trail surfaces with moderate to high visitor use will show a lot of wear and have potential high maintenance costs. They are also subject to constant trail erosion or sand being blown onto trail surfaces. The following photo from Cape May National Wildlife Refuge is an example of sand blown trail impact after a storm.

Projected Use:

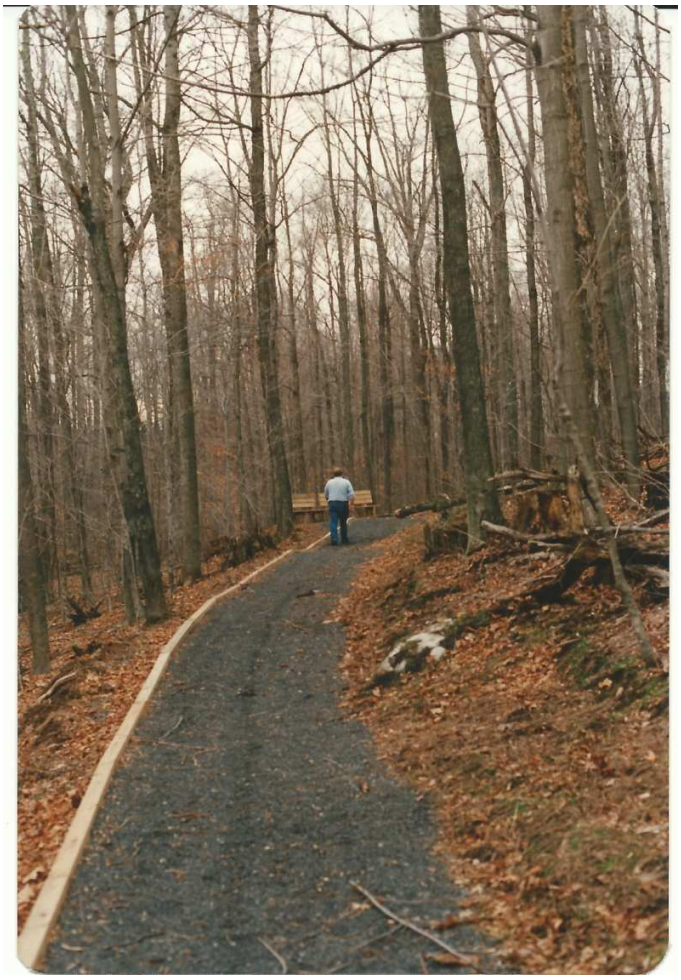
***** Trails with anticipated low use may be able to handle a natural soil surface with a minimum of trail erosion or other human use damage.

* Trails with a projected high use and easily eroded soils may have a very high maintenance need.

* Trails for handicapped visitors or elderly visitors may have too many surface problems (exposed tree roots, rodent holes, erosion ruts, etc.) to be safe for some visitors. Soil or "natural" treads may not be suitable for "universal access" trails.

These are the easiest and least expensive trails to develop. Most of the more developed trail surfaces usually start out as soil tread surfaces and evolve to more expensive trail susrfaces based on visitor needs or resource protection issues.

Crushed Rock/Gravel Trail Surfaces



The Zero Grade Trail in the Fernow Experimental Forest in north-central West Virginia is designed for universal access. The trail features a tread surface of compacted gravel and the curb provides a point of reference for cane users. Fest stop benches provide convenient rest stops. (Photo courtesy of Northeastern Forest Experiment Station, Timber & Watershed Lab, West Virginia).

Probably one of the top three most common trail surfaces, gravel or crushed rock have several issues to consider.

* Can have a natural look depending on the location. In the case of the self-guiding trails where the natural ground surface is "gravel" using different color of gravel can help to define the trail. The photo below illustrated this point. At Chaco Canyon the self-guiding trail surface was made

using a color of gravel slightly "redder" than the natural ground surface. The trail was defined, but was also very unobtrusive - it just fit in!

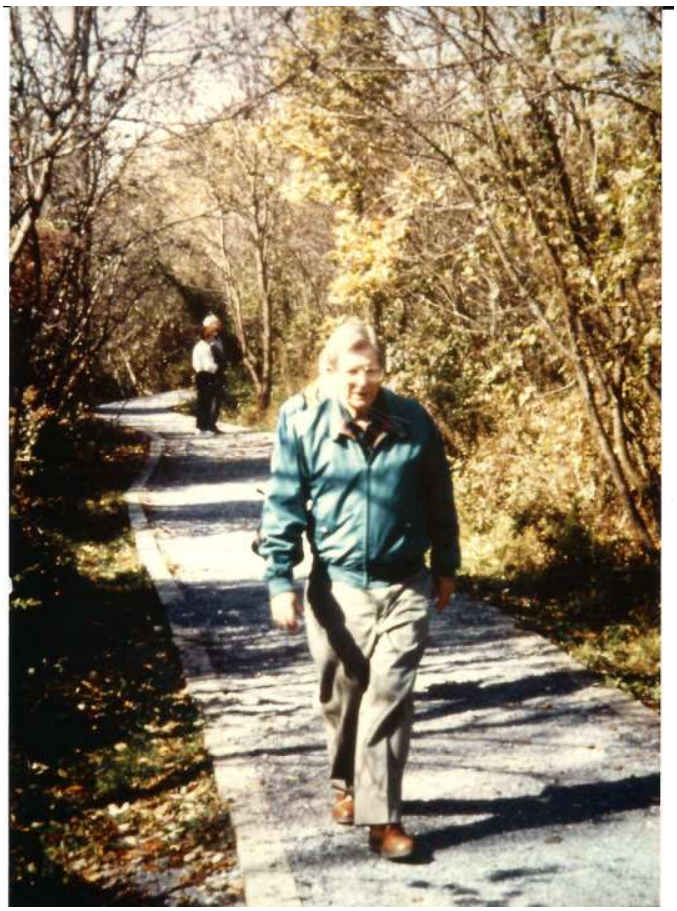
The trail tread surface is the darker "red" gravel seen on the lower right of the above photo. Note the little figure on the rock serving as a trail route marker.

So in the right place, for the right reasons, gravel can provide a very good trail surface. Some of its benefits include:

* Provides good drainage.
* Will not easily erode away (wind or water erosion).
* Can fit into many trail settings and look "natural".

There are also some disadvantages to using gravel. These include:

* Can be very noisy with children's groups. They like to kick it an drag their feet in it and sometimes throw it.
* Can be difficult for walking or wheeling over is the surface is too thick or loose.
* Can shift underweight.
* Is not a good surface for "universal access" is not compacted correctly. Wheel chair wheels might have a hard time moving through it.



The Robert Frost Interpretive Trail, Green Mountain & Finger Lakes National Forests. 6" x 6" timbers were placed 5 feet apart to create a trail wide enough for two wheelchairs to pass. The surfacing is small slate with a high percentage of fine gravel which compact easily. The gravel is about 5 1/2" deep to allow wheelchairs to roll easily on the treadway.

Wood Chip/bark Trail Surface

A wood chip trail surface, Brooks Nature Center, Olgebay Institute, Wheeling, W.VA.

The use of wood chips or crushed bark as a trail surface is probably the second most common trail surface material. This is unusual in that the wood chip trail surfaces offer little 'value added for the trail. I very rarely recommend the use of wood chips for interpretive trails for the following reasons:

* Depending on the thickness of the layer of chips, it can be difficult to walk on for older visitors and is not recommended for "universal access" trails.

* It is easily eroded away by wind, rain and heavy foot traffic.

* Needs yearly maintenance (more chips added).

* Does not stop soil erosion problems.

* May hold moisture in the trail longer than gravel or natural earth.

* May look "out of place" with the natural setting.

* Often looks "messy" - the trail can have an un-kept look about it.

Soil Cement/Hardened Tread Surface

A popular material is something called 'soil cement'. A mixture of breeze gravel (crusher-fines) mixed with cement and coloring, soil cement has a finished look similar to a trail. The cement binds the crushed material together creating a durable path that provides significant resistance to erosion from water and foot traffic.

Many of you may have not been aware of soil cements or hardeners. Using cement treatments consists of mixing a calculated amount of protland cement with native soils. It is a technology that has been in use for many years. Soil cements provide a very firm and stable surface that is natural looking. Most have a long life if the soil has been properly treated. Daryl Gusey of the Naches Ranger District, Wenatchee National Forest was involved in a extensive Trail Hardening Test during the early 1990's. He estimated that the cost for putting in their test strip of trail using soil cement cost $6.67/linear foot. He states that "the trail surface is well hardened, durable, smooth and has a reasonably natural looking surface, i.e. it doesn't look like a sidewalk in the woods". A copy of the test results can be found at:
http://nohvcclibrary.forestry.uga.edu/SCANNED%20FILES/T-0010.pdf

Other Soil-cement considerations:

* Labor intensive installation. The soil must be properly prepared or the hardener may not work.
* Has a very long life of use.
* Good surface for "universal access" trails.
* Moderate long term maintenance costs.

Concrete Blocks for tread surfacing.

Concrete paving blocks/bricks have a smooth, hard surface. They offer a will defined trail edge and weather well. However, paving bricks may not have a natural look in a natural setting and may suffer from winter ground freezing/spring thaws that will uproot paving blocks. They do provide a good trail surface in some historic or other urban trail environments. Average costs for using block tread surface may run over $15.00/linear foot or more.

Geoblock trail surfaces.

Geoblocks were developed to protect lawn areas that are driven over such as the edge of football fields, parking areas in some parks or arboretums, or other related sites. The blocks are placed in grids and filled with earth, then seeded. This provides a firm surface and a natural appearance. This is a good material to use for wet surfaces. There is a high initial cost of materials and labor. You will need to check with local landscape firms or suppliers for current costs/

Asphalt Trail Surfaces.

Asphalt trail surface, Lassen National Forest, CA.

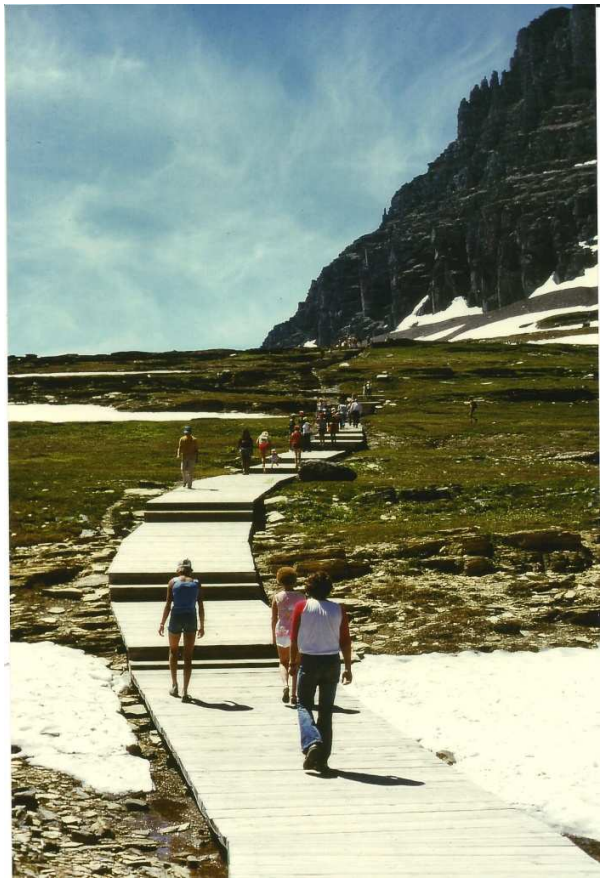
The Rock House Trail located in the Wayne National Forest, Marietta, Ohio. The Trail begins with a 6' wide asphalt path (top photo) that changes to a wooden boardwalk which spans a small creek to access the rock house itself (bottom photo) (Photo courtesy of Susan Reed, Wayne National Forest.

Asphalt is a common material for trail surfacing. It does provide for a smooth trail surface and is a good surface for universal access trails. The choice of using asphalt for your trail surface should depend on sol conditions, erosion patterns and freeze/thaw affects of the trail surface. Asphalt trails in some geographic areas chip and crack after a rough winter. Asphalt can become very sticky and will bleed in hot weather. IF the asphalt trail does not have a defined edge it tends to crack and break off along the trail edges as shown below.

Concrete Trail Surfaces

Concrete trail surfaces look much like a sidewalk in a urban area. they provide a hard, firm, smooth surface that requires low maintenance. It can give a unnatural look, but can be colored to blend in more with the surrounding environment. It can have a high installation costs but that is offset with low maintenance costs.

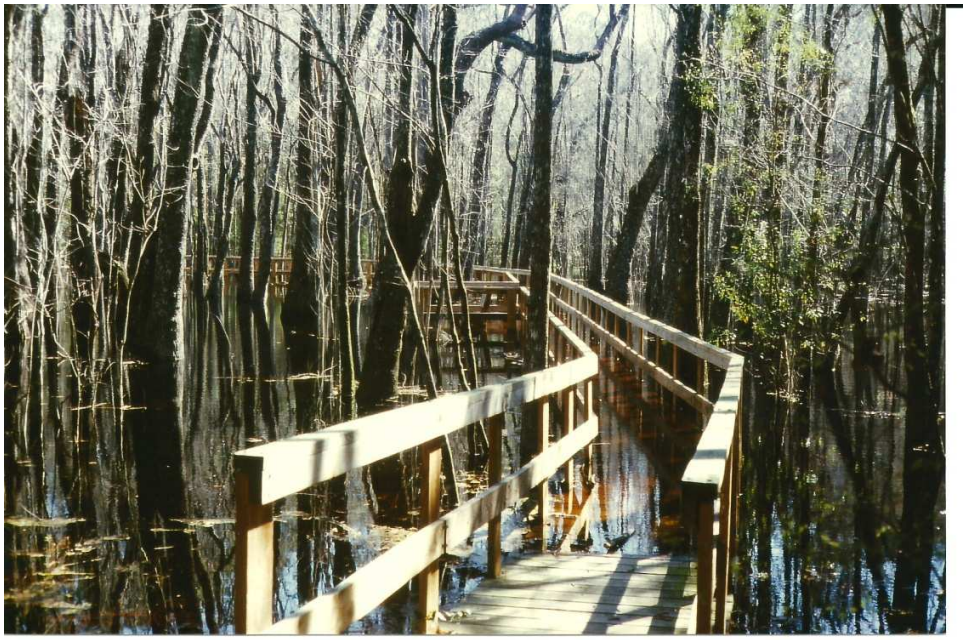
Boardwalks



Self-guiding boardwalk trail to Hidden Lake, Glacier National Park. (Photo by Alan Capelle).

Boardwalks are a means of giving people access to difficult to reach areas. they can nicely define areas where people are to walk, and help protect fragile environments or trail surfaces. There has been a lot of change in boardwalk construction materials and I have seen some boardwalks made out of recycled plastic milk containers and other recycled materials. They are very good materials to consider as the maintenance is very low and they're resist wear and tear. You have to look really close to see that they are not wood.

Boardwalks are great for allowing visitors to go over aquatic habitats and provide access to different wildlife viewing areas and hides.



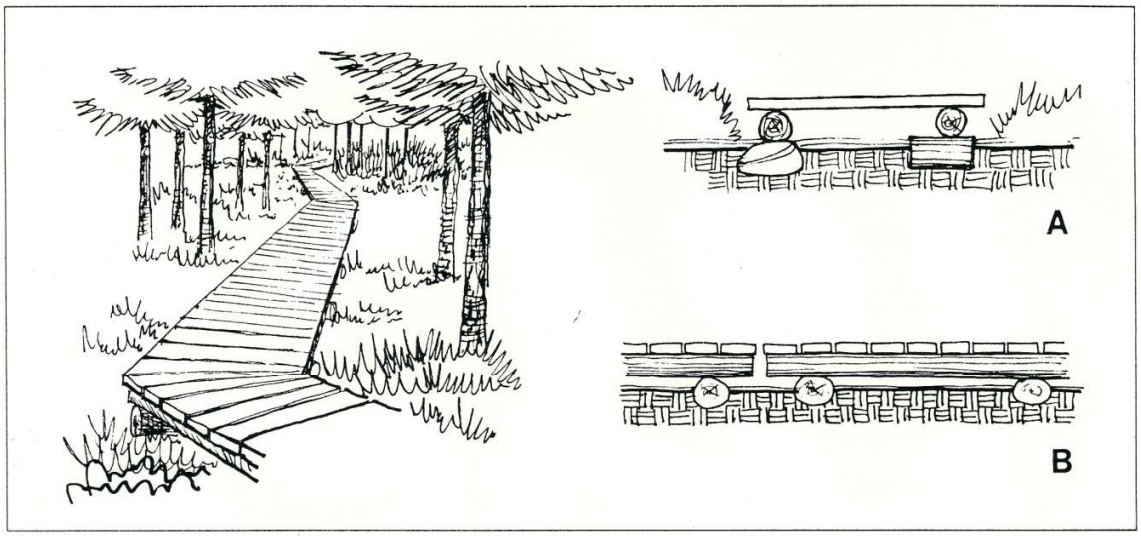
But you have to be careful when you plan your boardwalk over water. In the example above, the boardwalk was planned and constructed in the fall when water had disappeared from this area. In spring, however, when the water came back, large sections of the boardwalk were underwater.

Costs, design and construction needs of boardwalks can vary greatly and you will need to get local cost estimates based on the boardwalk length and related design needs and materials.

The photos above are from the Trampled Track Trail, Olustee Beach; Osceola National Forest in Florida. The trail uses both packed limerock as a tread surface (top left photo of the trail head), and accessible boardwalk through a cypress swamp (right photo). (Photos by Greg Lussier).

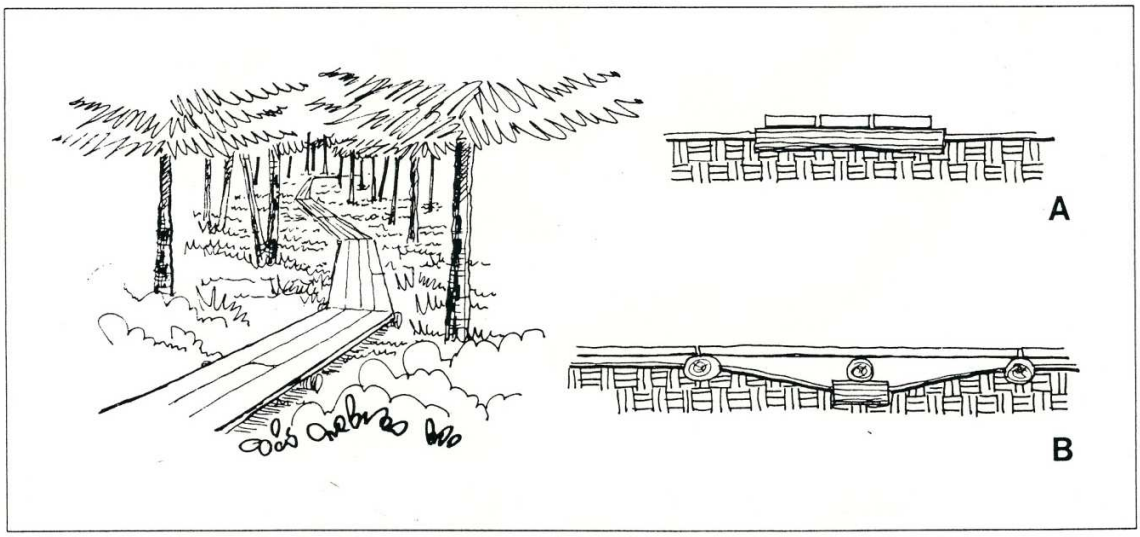
Some designs sketches for boardwalks are provided below.

Plank Decking on Stringers



A Cross-section
B Elevation

Plank Decking on Sills



A Cross-section
B Elevation

Which trail tread surface is best?

The kind of trail tread surface you choose will depend on several variables such as:

* Number of visitors projected to use the trail each year.
* The intended use of the trail (protect the environment the trail passes through, provide universal access, interpretation, etc.).
* The local soil types, trail slopes and grade, geology and climate.
* Cost estimates for different trail surface materials in your area.
* Anticipated trail planning, design and construction budget.

As a resource manager or interpretive planner it is up to you to look at all of the trail "realities, do your research and then make your recommendation based on your best judgment after your analysis of all the options.

Trail Surface Material Summary

The following tables provides a quick overview of each of the trail tread surface materials presented. Again, design and construction costs will vary depending on what region of the country you live in and specific trail route/design needs.

Trail Surface Material Summary

	Installation costs	Cost of Long Term Maintenance	Ease of Installation	Durability	Aesthetics
Compact Soil or natural trail surface.	None	Generally low to moderate, depending on amount of use and soil/slope variables.	NA	High, but depends on individual site.	Excellent
Crushed rock or gravel surface.	Moderate - labor intense.	Moderate - can vary with type of use.	Moderate	Moderate to High.	Can look very natural depending on the setting. If unmaintained can look poor.
Wood Chips	Low to moderate	Moderate - may require frequent maintanence.	Easy	Poor	Poor - easily eroded, can look "messy" if not maintained.
Soil Cement	High - Labor intensive installation.	Moderate long term maintenance.	High - requires proper installation to work.	Excellent - has a long life.	Excellent, can look very natural - uses on-site soil.

Trail Surface Material Summary

	Installation costs	Cost of Long Term Maintenance	Ease of Installation	Durability	Aesthetics
Concrete Blocks	Moderate to high- depends on the type of block - labor intersive.	Low maintenance costs.	Not easy, very labor intense.	Excellent	Excellent for urban park settings, poor for natural environments.
GeoBlock Trail Surface	High - labor intense.	Low maintenance costs.	Not easy, very labor intense.	Excellent	Can look good in both urban and natural settings.
Asphalt trail Surface	Moderate costs, moderate labor intensity.	Moderate maintenance costs. Higher in colder climates where freeze/thawing can crack surface/edges.	Moderate	Poor to moderate depending on climate, etc.	Can look OK in a natural setting, best for urban parks - high use areas.
Concrete Trail Surface	High - labor intense.	Low - tends to be a very stable surface, easy to maintain.	Not easy, labor intense.	Excellent	Not the best for natural areas, best for urban parks and high use visitor trails.
Boardwalk trails	High installation costs.	Moderate to High. Some boardwalks are being constructed out of recycled plastic "boards" and are very durable!	Labor intense.	Good - depending on location and amount of use.	Excellent - may be the best for trails in sensitive sites or for aquatic habitats.

Trail Grade Standards

One of the most important considerations for trail planning and layout is the "grade" of the trail. The term *grade* refers to the slope that occurs along any particular section of the trail. This is sometimes referred to as the gradient or slope of the trail (the slope across the trail tread is referred to as the 'cross slope' or 'crossfall').

Grades are expressed as rations of vertical to horizontal distance (rise to run) as either single rations of percentages or a degree of angle. The ease at which trail users can walk the trail will be affected by the steepness of grades, length of sustained grades and by the proportion of uphill, downhill and level portions of the trail. These factors must be considered in the trail planning as the trail use could be uncomfortable for visitors and even, in some cases, unsafe.

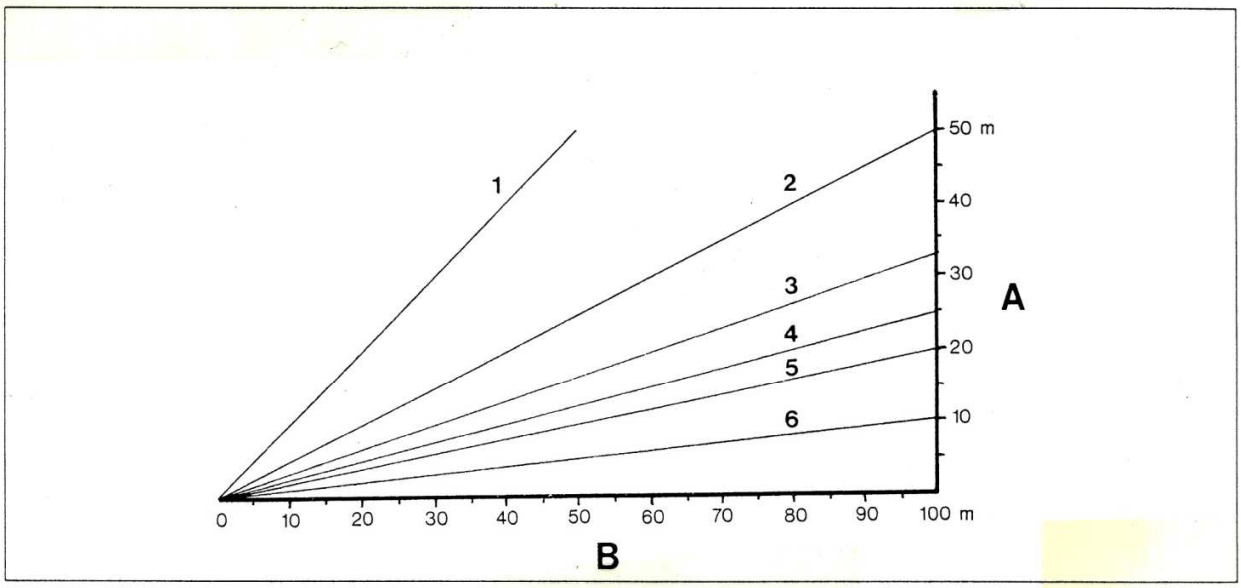
It is advisable to avoid creating long sustained grades and you may want to consider using a system of switch backs or steps to assist the trail user.

Some general planning suggestions are as follows:

* Most desirable range of grades - 0% to 5%.

* Maximum sustained grade - 12%.

Figure 2 below illustrates the expression options for grades (from Parks Canada Trail Manual).



A Rise
B Run
1 1:1 or 100% or 45°
2 1:2 or 50% or 27°
3 1:3 or 33% or 18°
4 1:4 or 25% or 14°
5 1:5 or 20% or 11°
6 1:10 or 10% or 6°

Trail soil erosion issues and control design options.

Trail damage due to erosion on a gravel tread surface (photo below). The trail grade, moving from the top of the photo to the bottom was too steep allowing water to "speed up" flowing down the trail.

Of all of the trails I have seen the most common problem is that of soil erosion resulting from poor trail planning and design. The effects on the environment may include:

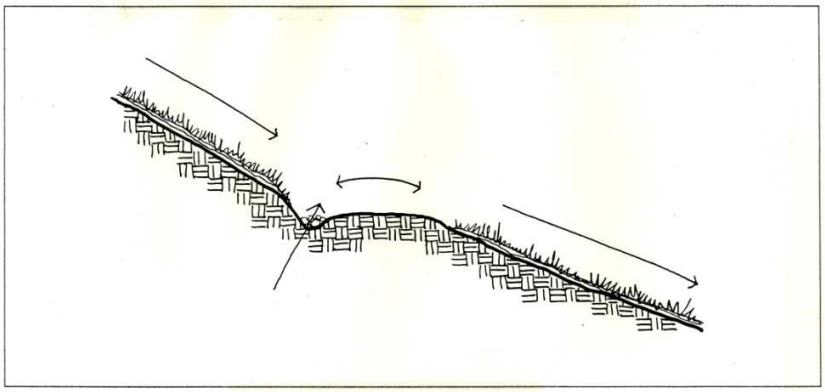
* Tree root exposure. Can stress the tree(s) as well as become a trail tripping hazard.

* Stream sedimentation from trail topsoil and sub soil eroding into the watershed.

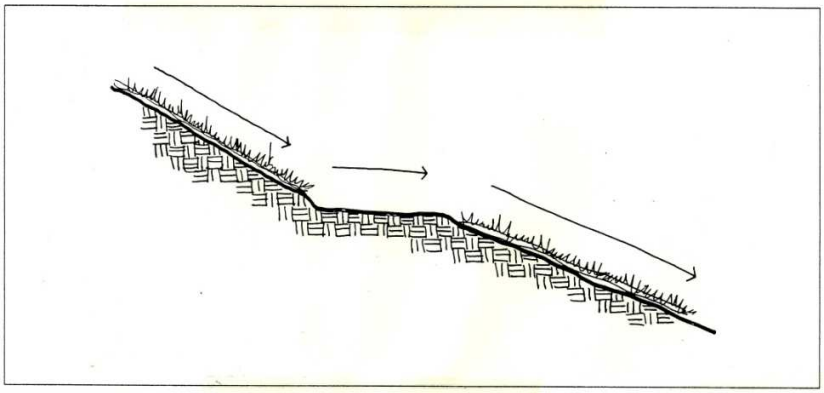
* Soil and bank slides and slumping on steeper graded trails.

Soil erosion is likely to occur where surface runoff is not properly controlled and channeled away from/off the trail surface. This is easily observed on trails with steep grades and no means of diverting the water has been built in. Various water diversion techniques can be used to control the flow of surface water on trails. The following illustrations show a variety of water management examples for trails.

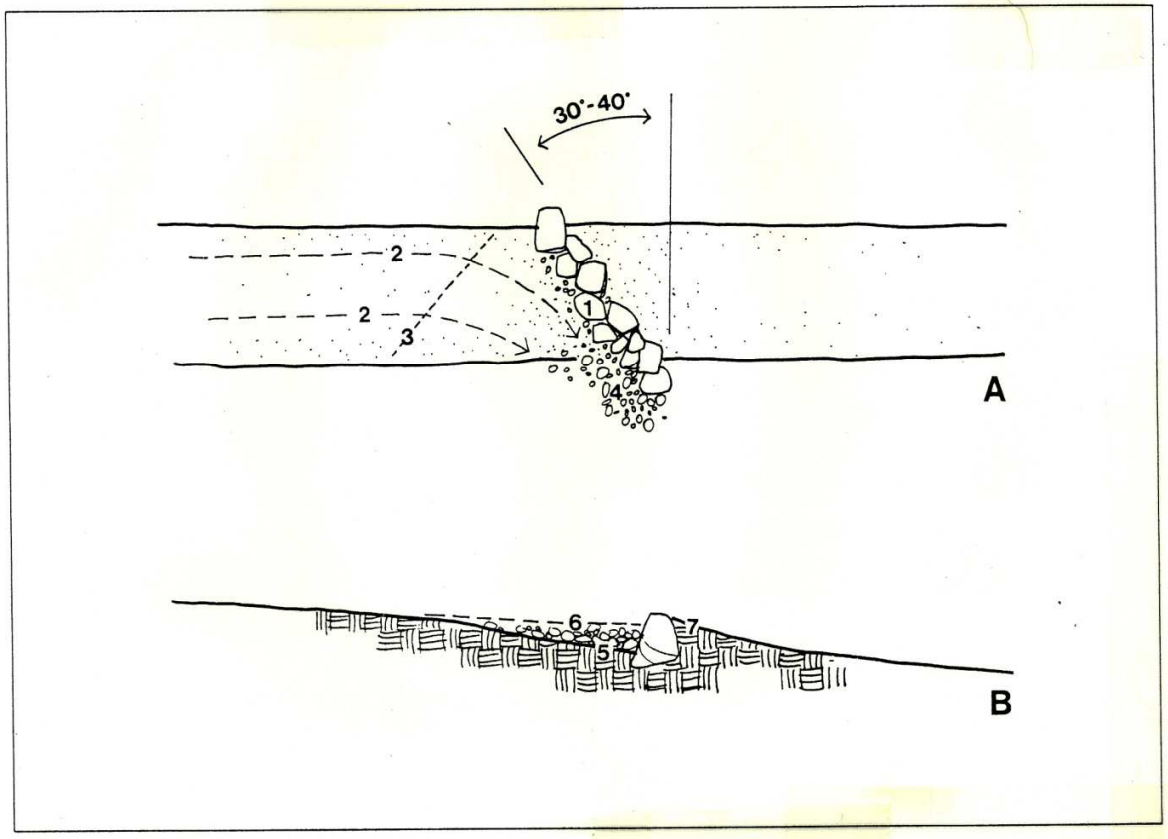
Drainage Intercepted



Drainage Across Trail



Rock Waterbar

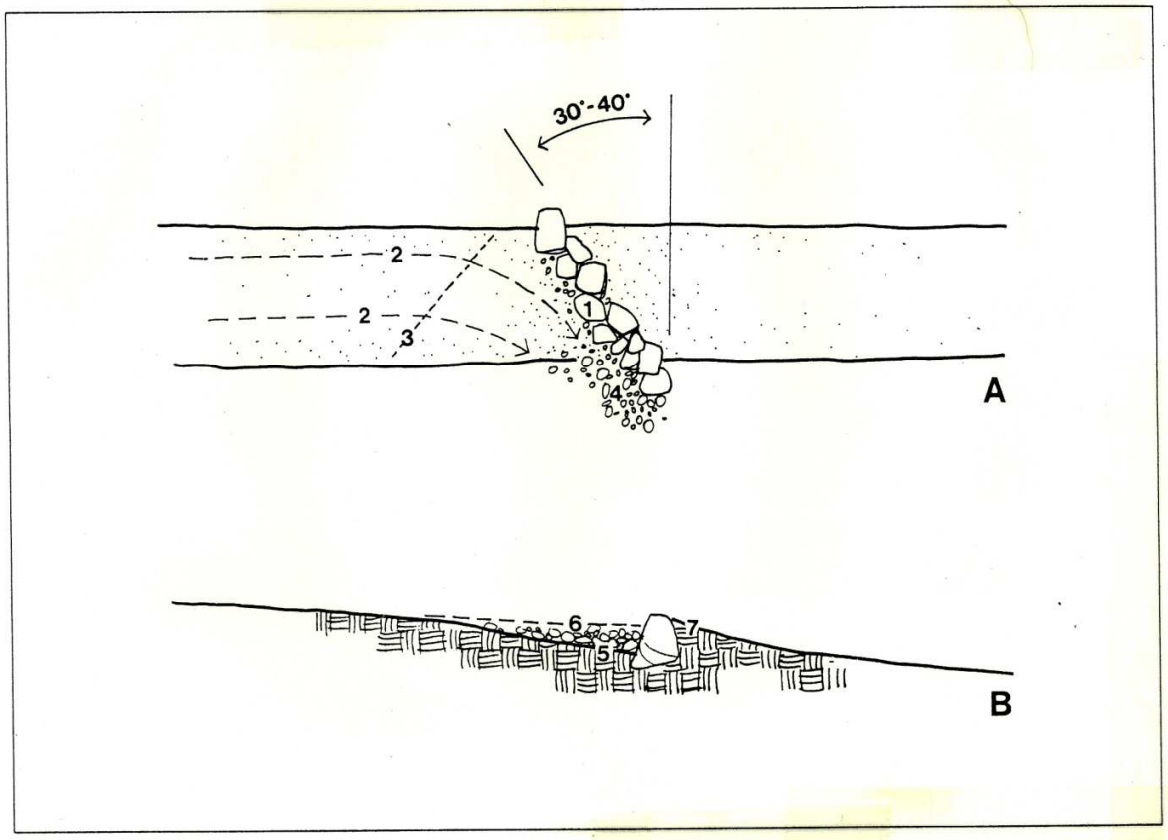


A Plan view

B Longitudinal-section

1 Rocks, 150 mm > in diameter
2 Direction of drainage flow
3 Outside edge of tread dropped starting 2 to 3 m in front of rocks
4 Stone placed in front of and at lower end of rocks to reduce scouring
5 Outside edge of tread
6 Inside edge of tread
7 Tread raised to top of back of rocks

Rock Waterbar



A Plan view

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5 Outside edge of tread
6 Inside edge of tread
7 Tread raised to top of back of rocks

Water bars like the one shown above can be useful in catching, slowing and re-directing water from the trail surface.

General Trail Design Standards

Having reviewed several different agency trail standards (all of which varied in some way) I have developed a "general recommendation" for train standards. This is provided as a general baseline from which you can modify as needed for your particular trail needs.

General Hiking Trails

Width - (a) low use trails 3 feet wide with a cleared width of 5 feet.
(b) moderate to heavy use trails - 5 feet wide with a cleared width of 7 feet.

Height - cleared to 8 feet.

Interpretive (self-guiding) Trails

Width - 3-5 feet.
Length - about 3/4 mile loop or a 45-50 minute walk to complete the loop.
Height - Cleared to about 8 feet.

Rock House Trail, Wayne National Forest, Ohio. A barrier free design with asphalt path, benches and interpretive panel. (Photo by Susan Reeds).

Universal Access (wheel chair accessible) Trail from California State Parks Design Standards.

- If the trail width is less than 5 fee, 5' x 5' passing spaces should be provided every 200 feet.
- Slopes of 5% or less.
- Rest areas provided every 200-300 feet.
- Slip resistant trail surface.
- The cross slope of a trail should not exceed 2%.
- The comfortable viewing zone for wayside exhibits to be easily read by visitors in wheelchairs is between 48" and 67" above the ground at a distance of 6".

Trail user Scott McDonald on the Maywood History Trail, Little Bay de Noc Recreation Area, Manistique Ranger District, Michigan. The trail is 4 feet wide with a maximum slope of 5%. It uses a lay and limestone mixture for the trail tread and has rest benches spaced every 2-- feet. The wooden slats are located by interpretive stops. (Photo courtesy of Manistique Ranger District).

Bicycle Trails

Width - 8 feet surfaces with 10 feet width on corners with a radii less than 20 feet.
Grade - optimum grades for bicycle trails should not exceed 4% within a distance of 300 feet.

Equestrian Trails

Width - minimum tread width of 3.2 feet, maximum of 8 feet. Trail width cleared to 3 feet on either side of the tread.
Grade - maximum grade of 20% for a maximum distance of 100 feet.
Cleared Height - minimum of 10 feet.

Trail Furniture

Trail furniture is the term I like to use for other trail design function needs such as:

- Stair
- Viewing Platforms
- Bridges

These structures can be an important part of the overall trail plan and need to be included in the initial construction budget. The actual design of each structure will depend on the individual trail needs and objectives, but here are some general design ideas to get you started.

Trail Stairs

Examples of trail stairs, Cheguamegon National Forest, Wisconsin. Photo by Alan Capelle.

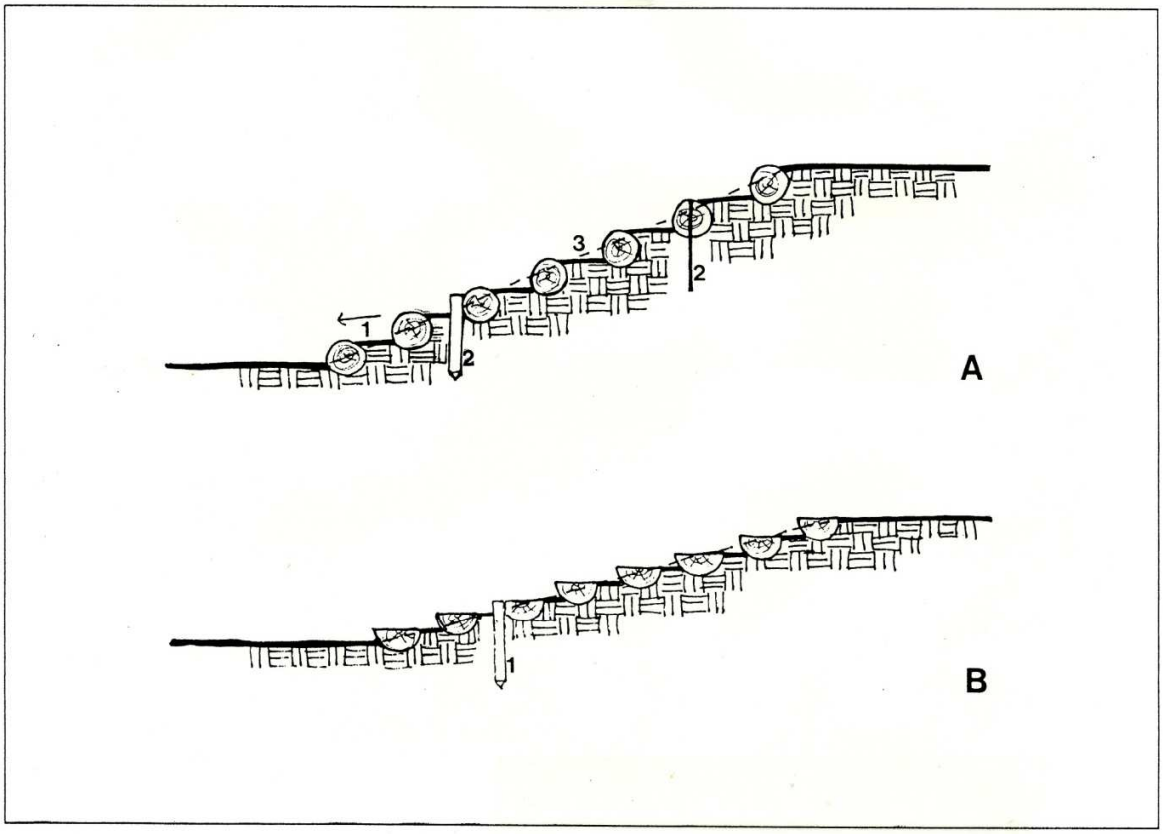
Trail stairs are designed to prevent erosion caused by foot traffic and surface runoff on steep slopes. They also make it easier for the trail user to ascent or descent steep parts of trails safely.

If possible stairs should be constructed of locally available materials like logs, flat stones, etc. rather than sawn timber. Treated railroad ties can also be used. All logs and timbers should be pressure treated with a wood preservative like pentacholorophenol in oil or pentox in oil. Other wood treatments types can be used as well.

A variety of step designs are presented on the following pages to serve as ideas for you.

Types of Steps
Types of steps are categorized as follows: steps made of logs or timbers set into the ground; steps supported on stringers (this is suitable where steps cannot be set into the ground, i.e. where the ground is too rocky or where there would be excessive damage to tree roots); steps made of boulders; ramped steps (these can be used where it is necessary to level out gentle slopes).

Log Steps



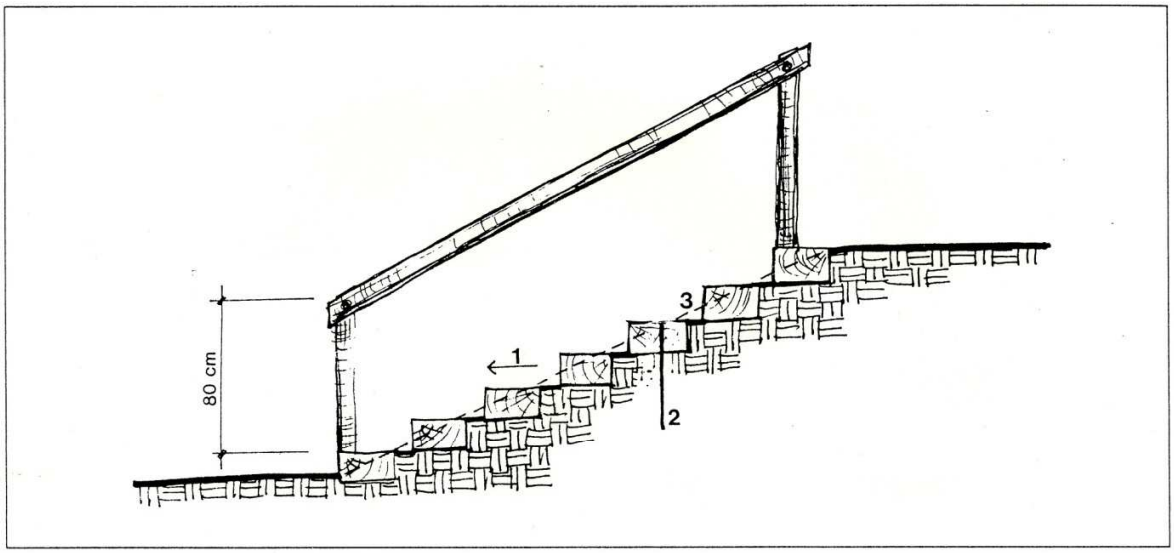
A Full logs
Longitudinal-section

1 Tread sloped for drainage
2 Wooden or steel stakes
3 Surface of adjacent slope

B Half logs
Cross-section

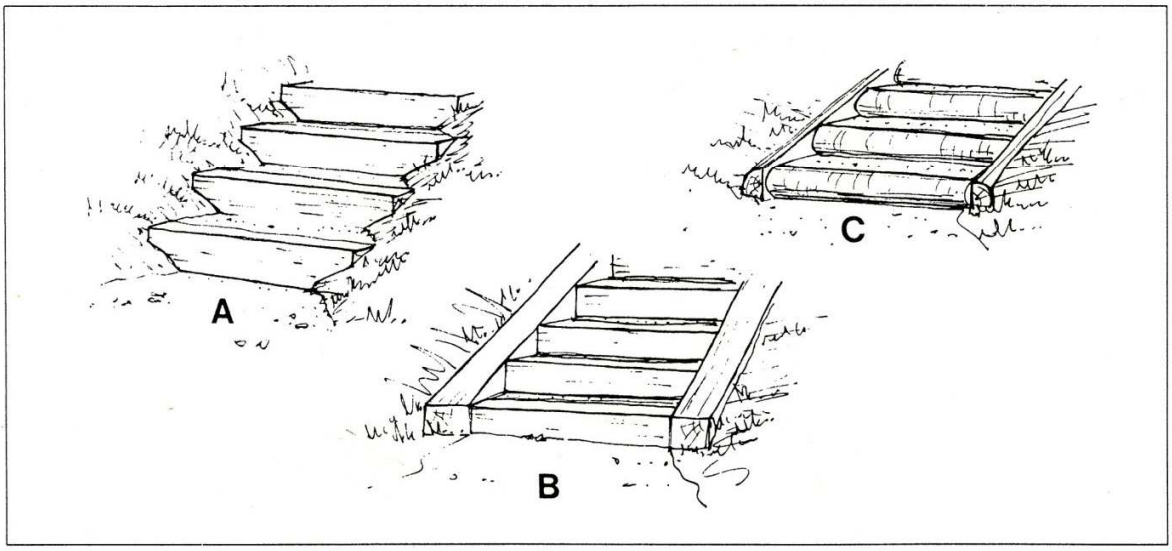
1 Wooden stake

Timber Steps



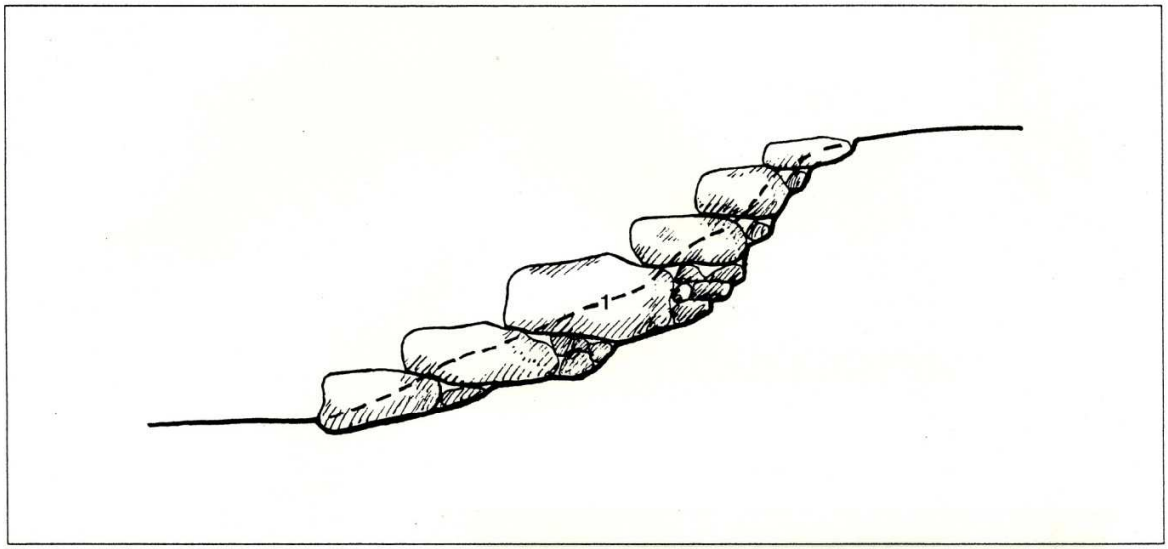
Longitudinal-section
1 Tread sloped for drainage
2 Steel stake
3 Surface of adjacent slope

Step Edge Details



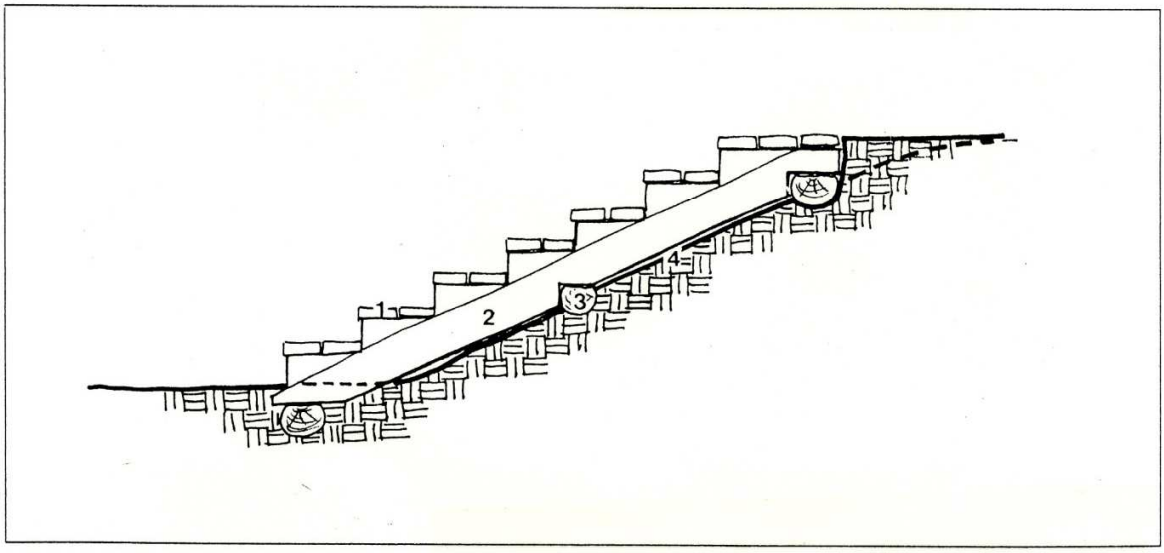
A Timber steps without stringers
B Timber steps with timber stringers
C Log steps with half log stringers

Boulder Steps



Longitudinal-Section
1 Surface of adjacent slope

Steps on Stringers



Elevation
1 Plank tread
2 Plank stringer
3 Log sill
4 Soil surface beneath steps

Stairway connecting the upper and lower loops of the Mesa Falls Trail, Targhee National Forest. Note the absence of railing once the boardwalk is on the ground (by the visitors in the Photo) Photo courtesy of the Targhee National Forest, Ashton, Idaho.

Viewing platforms and decks.

(Photo by Alan Capelle).

A very common feature of a lot of trails is a viewing platform or deck. These can give visitors visual access to lots of interesting sites and vistas. The actual design of viewing decks should be based on a number of factors including:

* Physical design constraints based on the site geology, sensitivity and purpose.
* Projected visitor use (allow about 16 sq/ft of space per person on the deck as a minimum, 25 sq/ft. per visitors is optimum.
* Construction and long term maintenance costs.
* Review any safety issues that might be a concern.

The following are a few examples of viewing platforms. If you "google" park viewing decks you will find lots more.

Viewing deck with interpretation, Carlisle Lake (a Corps of Engineers park), Illinois.

Rosselle Park Observation Deck, Ada Township, Michigan

Viewing platform at Mesa Verde National Park.

Bridges for hiking/interpretive trails.

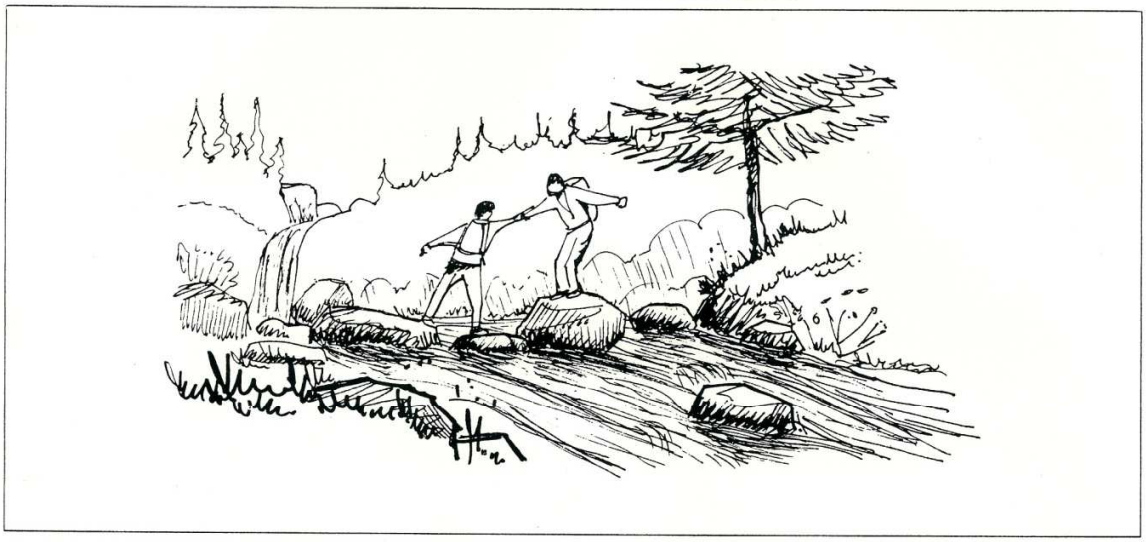
When developing a trail or trail system the need may arise for the use of a bridge. Trail bridges can range from simple stepping stones and flat-topped logs up to multi sectioned structures designed to support motorized vehicles and horses. Bridges should be considered when:

* Trail re-routing is impractical.
* Safety and comfort of the trail user is otherwise compromised.
* Trail traffic up and down stream banks will cause erosion and stream siltation.

In general, bridges should be constructed during late summer or fall when the stream banks are dry and stable. Care must be taken to record the spring high water mark and build the bridge at least 1-2 feet or more above that mark. You should consult an architect, landscape architect or engineer if you are considering more than a simple short span bridge as bridge construction and engineering standards will be in place with many agencies.

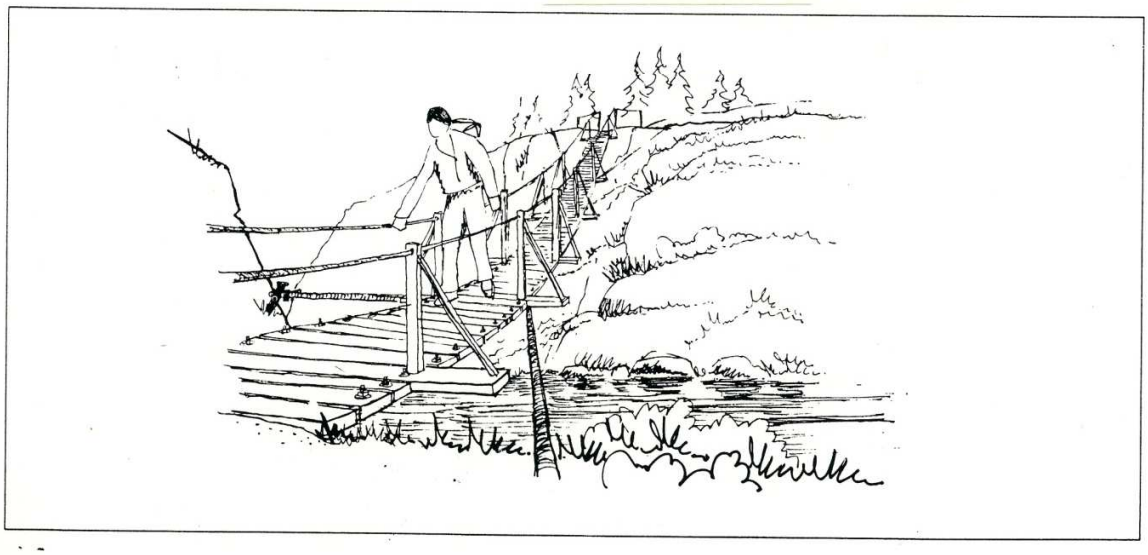
Some simple bridge design sketches are provided on the following pages.

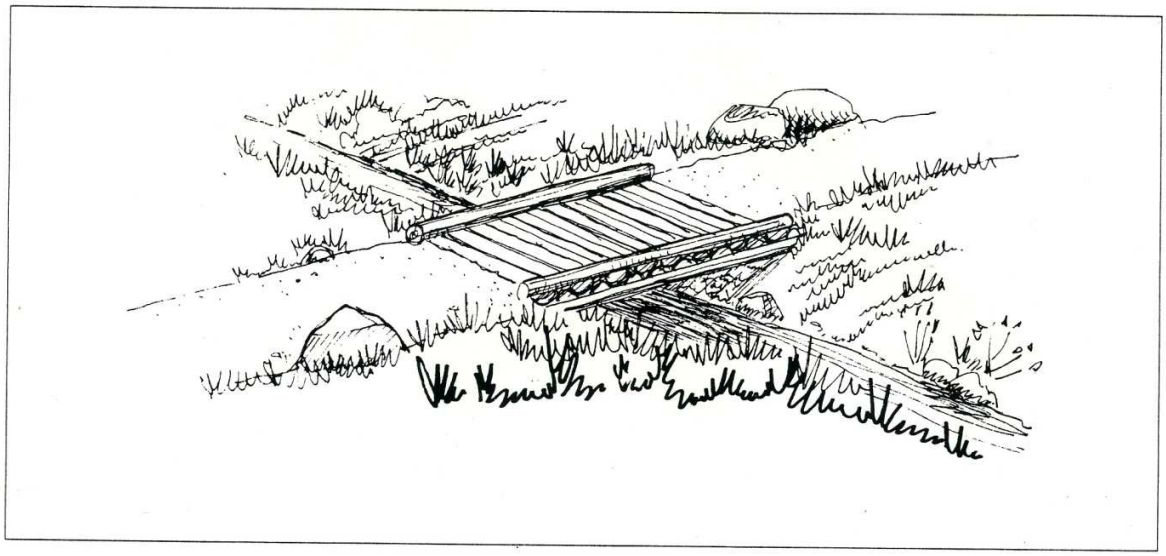
Stepping Stones

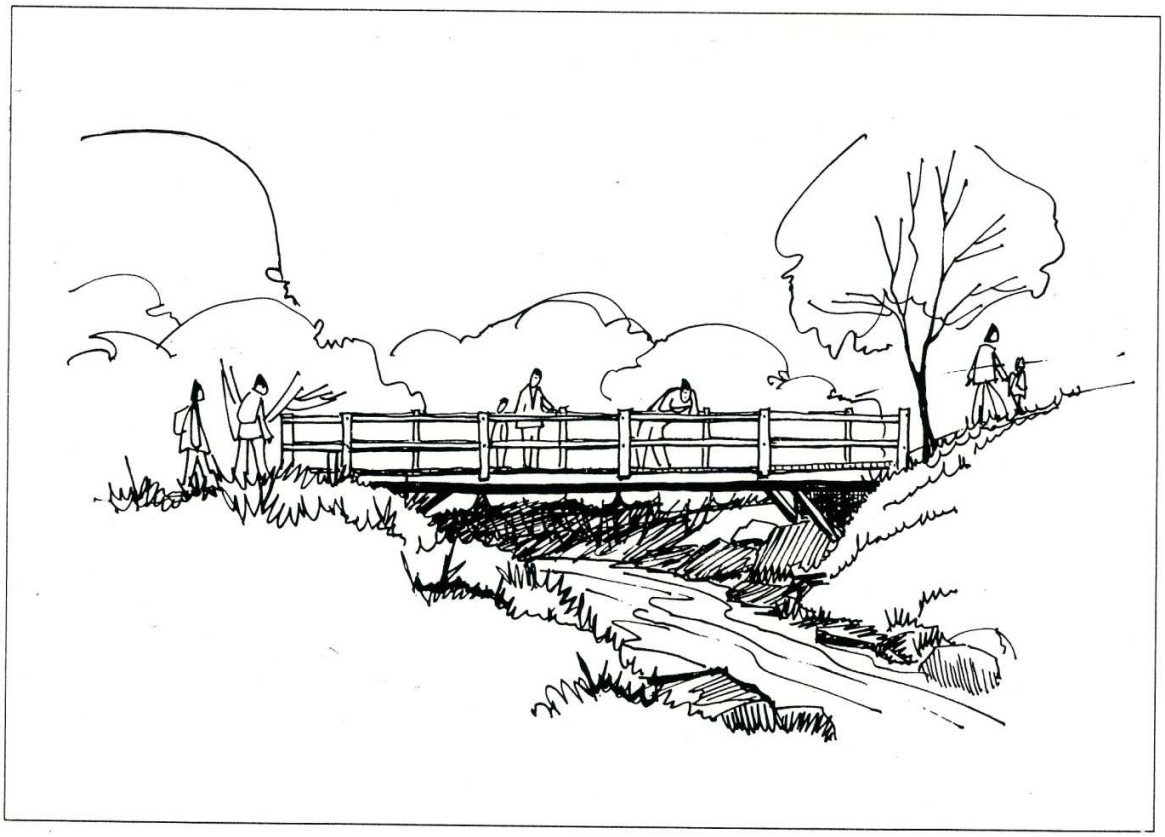


Less conventional types of bridging can be used on wilderness trails for crossing gorges, ravines, etc. These also have value in that they provide additional trail interest.

Suspension Bridge







A few sample bridge designs - a starting point in considering the best bridge type for your trail and your visitors.

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Parks Canada (1985) *Trails Manual.* Ministry of Indian and Northern Affairs, Ottawa, Ontario, Canada.

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AMC Staff (2012)- *Trail Building and Maintenance* - Appalachian Mountain Club Books (2012).

Chapter 2
Interpretive Trail Planning Process

In planning an interpretive trail it is important to understand several aspects of the visitor, how they learn and remember, and a review of the basics of what makes the interpretive trail "interpretive". Let's look first at the visitor part of the success equation. If you are planning an interpretive trail and its related media, just how do visitors learn and remember the story or information from your interpretive trail experience?

Trail user psychology and recreational learning.

You can be the best interpreter in the world and try very hard to made your interpretive trail experience interesting and exciting for your visitors. But if you don't know how to get the visitors to actually want to learn and remember the story or details your trail is interpreting to them they will quickly forget all that you presented. The experience needs to be a "recreational learning experience" for the visitor.

What is recreational learning? You probably do it all the time. Anyone who has a hobby, learns about nature, history, birds, historic architecture, etc. does recreational learning. You learn as it is a part of the fun, enjoyment and of intrinsic interest to you personally. The learning makes you feel good. You just don't think of it as "learning".

Guided interpretive trail program, Wheeler National Wildlife Refuge, Alabama.

Being a recreational learning experience means that the visitor "self-selects" those learning experiences that he or she finds intrinsically interesting for them personally. As an interpretive planner your must be aware that this is the frame of mind that most visitors are in. They are not here to become experts in the topic of the trail, they just want to enjoy casual learning about the topic the trail is illustrating. Remember that Freeman Tilden said that "the chief aim of interpretation, not instruction". Give the visitor an provocative overview and leave them asking for more.

Sp how can we get visitors to learn/remember our stories and information in a recreational learning environment such as a self-guiding trail? Here are some key learning concepts to keep in mind.

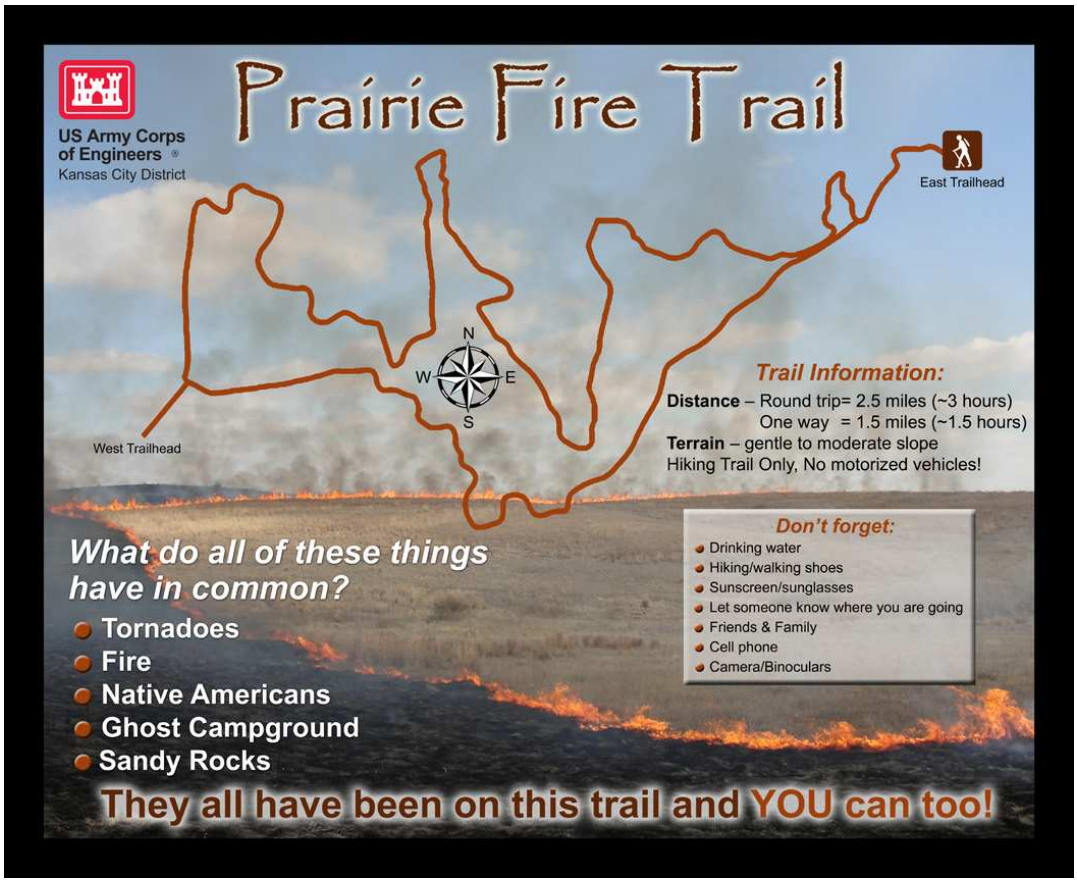
Learning Concepts

1. **We all bring our pasts to the present.** This means that what and how we learn is influenced by our past experiences, our past knowledge on the topics being presented and our perceptions of those topics as they relate to us. If a person has an interest in Civil War history and visited many other civil war sites and trails, they will have an interest in your Civil War trail to see if they can learn or experience anything new to add to their experience and knowledge collection.

2. Categories can blind us. How you market an interpretive trail may allow visitors to "categorize it" based on their past experiences with interpretive trails. For example, what category would they put on "nature trail" as opposed to "discovery trail"? Which would you think would be more fun? Visitors will make decisions about interpretive trails almost instantly upon seeing the advertising for that opportunity and make a judgment of that activities use or intrinsic interest to them, based on their experience, if any, with past attendance or participation in that opportunity. So if the last "nature trail" they walked was boring, they may categorize all nature trails as boring as well.

How would you categorize this trail if you were a first time visitor?

3. **First impressions are especially important.** This is key to any marketing plan for our interpretive services in general. The first impression only takes a few seconds to occur. This may be based on the front page of the interpretive trail guide or the first impression from the Interpretive Trail Head Sign. We will talk more about designing powerful first impressions in the media design chapter of this book.



What is your first impression of this interpretive trail experience? Do the background graphics get your attention and fire up your curiosity?

4. Unless helped, we often fail to find, see or comprehend. This means that the visitor may not see the "habitats" in the landscape in front of them. The job of the interpretation iss to help the visitor find, see and comprehend the resources of the trail.

What do you see in this photo? During the US Civil War in the 1860's you would have seen Confederate Army Artillery emplacements here. Without interpretation the story is lost.

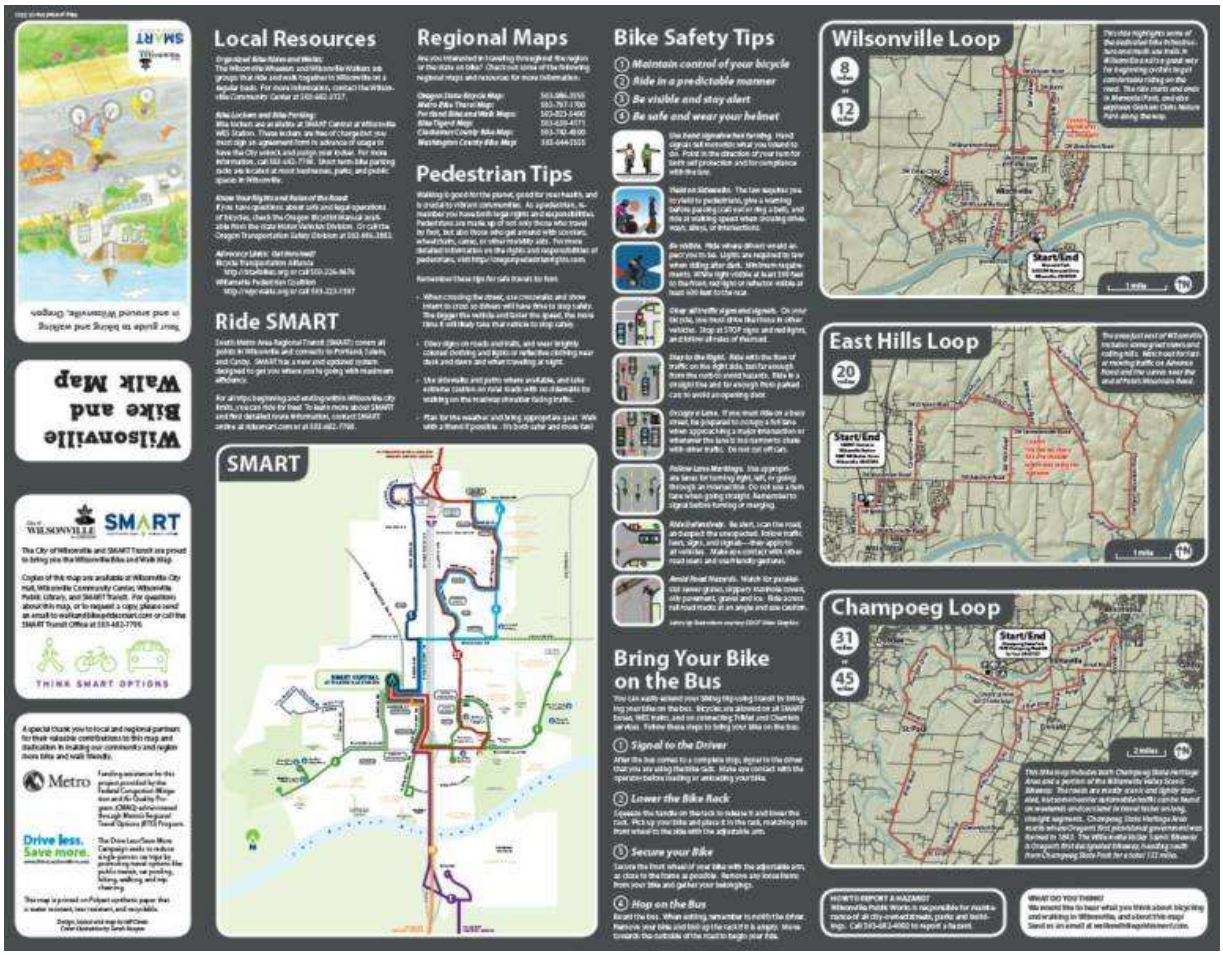
5. Meanings are in people, not in words. This learning concept means that we all carry a "visual dictionary" in our heads with our own definitions of such common things as a "tall tree" or a gravestone marker. Depending on what kinds of trees you may have seen in your lifetime, a tall tree can be very different from person to person. when the text of an interpretive trail guide or panel is describing something not pictured then they default the mental image to their past personal experience visual directory.

There are also many words that most people have no visual directory of and therefore, even though they recognize the word, can't really describe it very well. Here are a few examples.

* Acre - most visitors have never seen one all by itself.
* Board Foot - most visitors don't know what one looks like in forestry terms.
* The water leave the spillway at 2300 feet per second. What does that look like?
* Habitat - Most visitors don't know what that looks like or what makes up a habitat.
* Are not aware of most "in house" technical terms you may use on panels or in brochures.

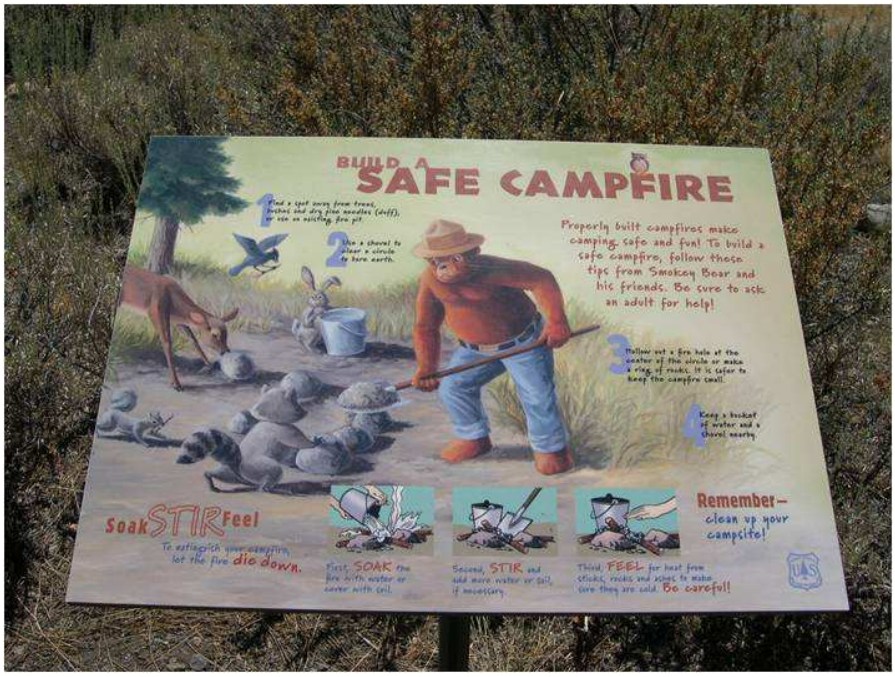
So choose your words carefully in writing any interpretive text or audio copy.

5. Circuit Overload caused distortion and fatigue.



I have seen some trail studies where the interpreter observed that visitors tended not to look at the interpretive panels or read the trail stops in a brochure for the last have of the self-guided trail because they got "burned out" from too many trail stops or panels so full of visual entanglement that they just didn't want to read it. We need to keep self-guiding trail stops to about 10 or less. This will be covered in more detail later on in this book.

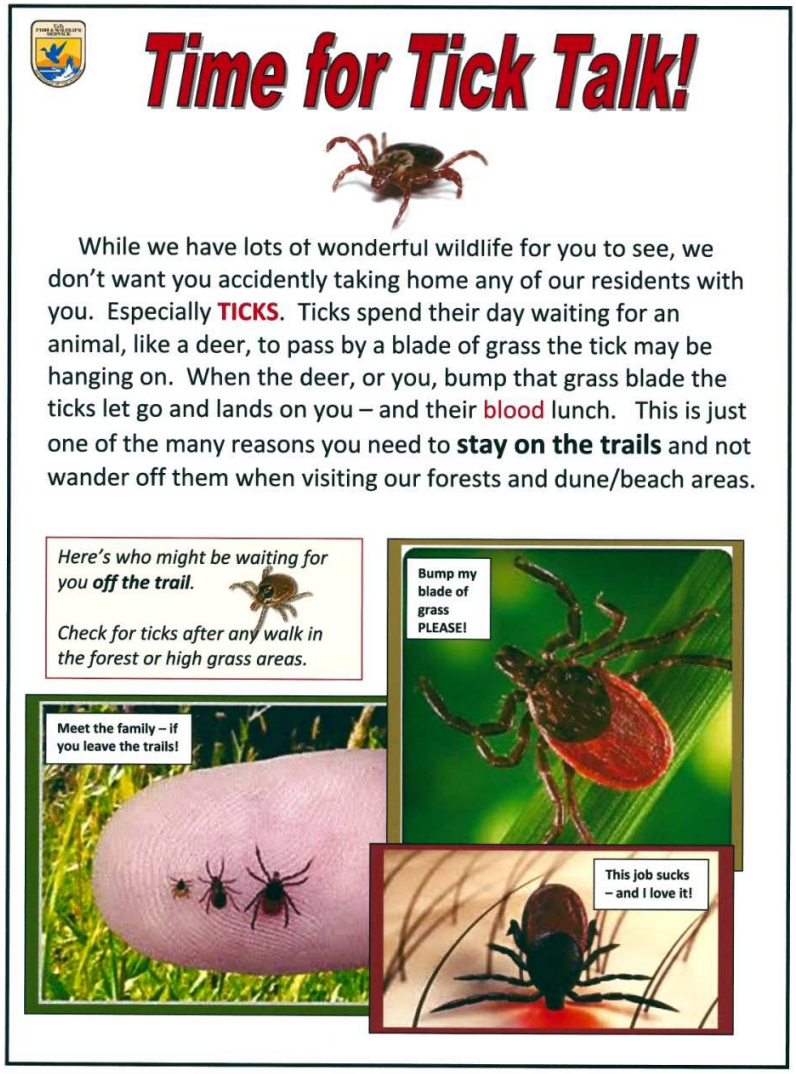
6. Simplicity and organization clarify messages.



What this learning concept means is that the more information you try to give the visitors, the more likely they are to forget it all. This is especially true if you don't have one focused interpretive theme for the trail that all trail stops work to support or illustrate.

We'll talk about this in more detail later on in the trail panning section, but in general, we have found that the best interpretive trails have only one main interpretive theme. We also try to not have more than 7-10 trail stops. The first stop introduces the main theme, each stop illustrates the main theme, and the last trail stop "tells them what you told them" - summarizes the theme or main message of the trail.

7. A picture can be worth a thousand words (but it can be the "wrong" 1000 words)!



What do these pictures make you think of or "feel" ? Probably a ughhhhh response?

In general we all are visual learners. We can look at a site photo or graphic and make our personal general assessments of what we are seeing. For example, it's better to show visitors a photos of a upland forest habitat than to "describe" one. Good interpretive trail media should be graphic or photo rich. Let photos do most of the hard work to illustrate a point or create a emotional feeling list the interpretive panel above.

Learning Principles Summary

1. People learn better when they're actively involved in the learning process.
2. People learn better when they're using as many senses as appropriate.
3. People prefer to learn that which is of most value to them at the present time.
4. That which people discover for themselves generates a special and vital excitement and satisfaction.
5. Learning requires activity on the part of the learner.
6. Friendly competition stimulates learning.
7. Knowing the usefulness of the knowledge being acquired makes learning more effective.
8. People learn best from hands-on experiences.
9. Questions an be effectively used to help people derive meanings.
10. Giving people expectations at the beginning of an activity will focus attention and thus improve learning.
11. The ways in which people are responded to affects their learning.

What do visitors remember in general?

Besides the learning concepts and principles presented, here are some other details about visitor memory retention.

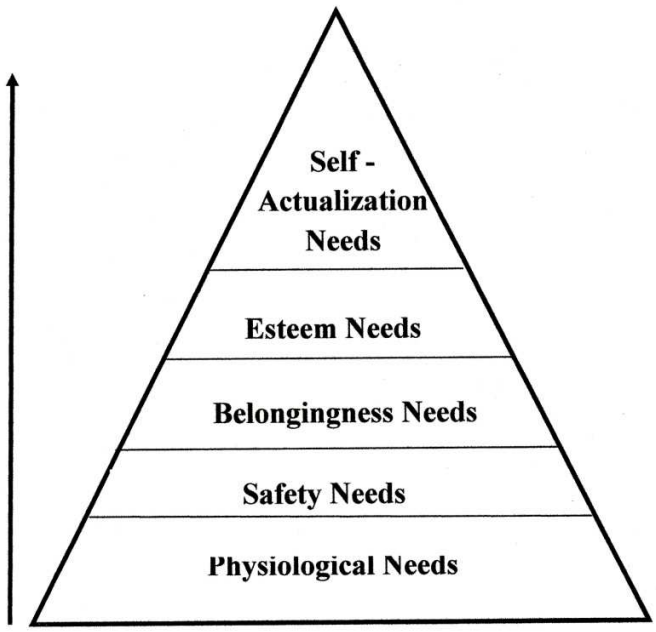
Visitors remember about:

10% of what they hear.
30% of what they read.
50% of what they see.
90% of what they do.

We will talk more about the implications of this information and the learning concepts and principles in the media development chapter of this book.

Visitor motivations and expectations - considerations for interpretive trails.

Years ago in graduate school I came across Maslow**'s** (1954) hierarchy of needs. What I learned from this and other works on motives and expectation reinforced the point that to be a good interpretive planner was that you have to have some understanding of the visitors you are planning experiences for. Let's look at Maslow's hierarchy of needs an how this concept can be applied to planning interpretive trails and related media.



Maslow's Hierarchy of Needs.

This hierarchy of needs begins with physiological needs and moves up to self-actualization needs. Let's take a closer look at these needs visitors have and how it impacts our interpretive planning considerations.

Psychological needs

These are our basic and primal needs. Their needs must be met before visitors can have a mental state to fully enjoy interpretive opportunities such as a self-guiding trail. they include such needs as having to use a restroom, being to hot or cold, being bothered by insects, getting tired out during a hike or any other physical condition that can distract us. This is important to remember in trail planning, and relates to understanding what visitors you will have on the trail. Will there be benches along the way for when they need a rest? Will there be an shade areas on trail routes through mostly non-forested areas? Should visitors be advised to take water with them, be advised of trail conditions (wet areas for example) or be advised to use insect repellent?

I have planned two trails over the past two years that, because of mosquito problems in the summer, have been designated mainly spring/fall trails. During the summer months, because of the mosquito problem, most visitors would have a bad time on the trail battling bugs! They would not pay any attention to trail interpretation. Thus there is a warning to visitors to be prepared for the bugs. However this can also be a learning opportunity. One of the main topics covered in the interpretation of this trail is the mosquito story with interpretive theme of "Mosquitoes play an important role in the natural history of wetlands", At stop #5 the visitor is

interpreted as an important food source and how the blood taken from them will be used to produce eggs for a new generation of mosquitoes.

Just remember - visitors who are uncomfortable in any way will not be able to fully focus on any trail interpretation and this "negative" trail experience may keep them from enjoying other trail walks in the future.

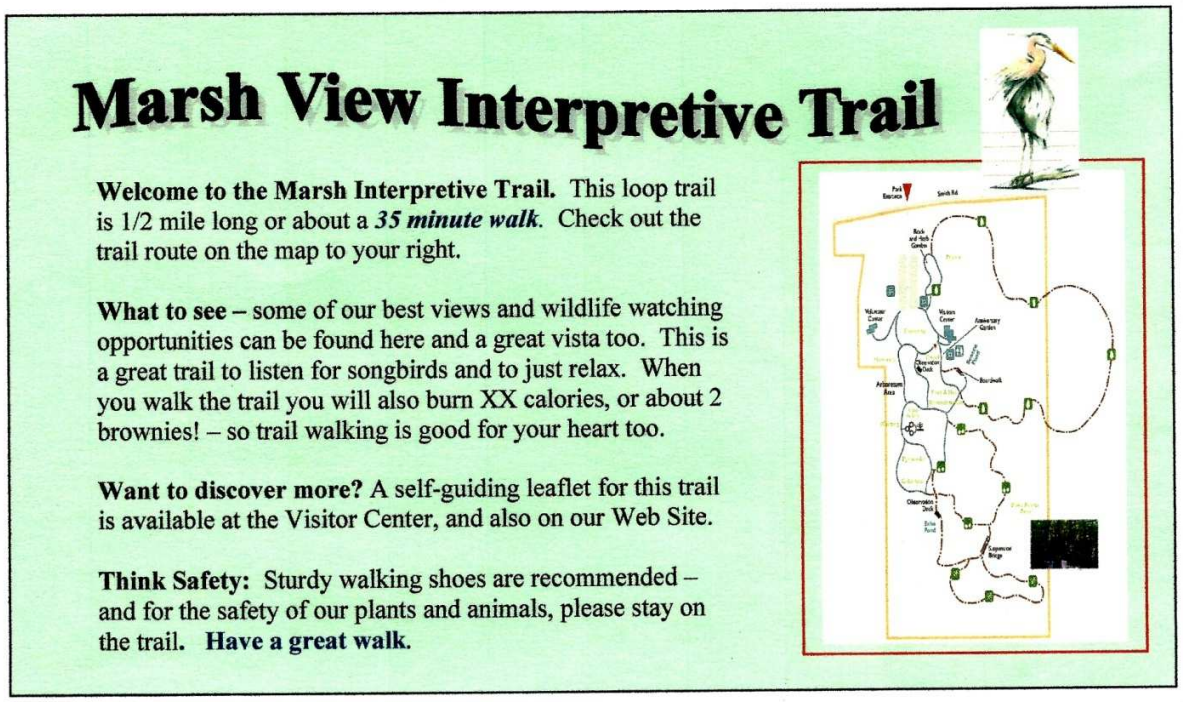
Safety Needs

All visitors want to feel safe and secure about any event or activity they take part in. That is true for interpretive trails as well, particularly for elderly visitors who might wonder what they would do if they tripped or fell during their trail walk.

To help address these safety needs of visitors it is important to provide any safety information on the trail head sign or other orientation information. Some of the information that should be presented on trail head signs includes:

* Walking distance but most importantly, walking time.
* Trail difficulty (easy walk, steep trail grades, etc.).
* Watch out for poison ivy or other "look out for's".
* Kind of shoes or clothing recommended for a safe walk.
* Should they take water with them?
* Any other safety information they may need for a particular trail experience.

Here is a sample trail head sign that illustrates these concepts.



Here is a good example of a trail head sign. Note that the map on the left shows where various interpretive stops are and has a "photo" of each one on the panel in this draft concept design.

Belonginess Needs

We are a culture that likes to be with someone. You very rarely find anyone walking an interprtive trail alone (except dog walkers). To facilitate the famile or group use of interpretive trils you might consider developing such trail guie supplements as "the parents guide to the trail" or a "child's guide to the trail", or a "Teachers guide to the trail", with instructions as to how to best facilitte activities for the person you are walking with, such as a class.

Esteem Needs

People like to try new things and build on their self-esteem**.** Learning in any form contributes to that self-esteem. In interpretation tis is a major motive for visistors attending interpretive programs or walking self-guided interpretive trails. Thuis is where all of the material previously presented on "recreational lerning" comes into play. Helping the visitor to see, explore, learn and disover all contributes to the esteem needs in all of us.

Self Actualization

Maslow says that we never fully self-actualize, but are always working toward it. The best eampe of this is the Army recruiting slogab to "be all that you can be". If you are actively involved in a hobby, sport or other activity where you are always learning more or improving your abilities, you are working on your self-actualization.

These are the basic motives that all visitors have and bring with them to any interpretive activity. By understanding the vvisitor and their motives for selecting ad attanding interpretve programs opportunities for them.

What makes an Interpretive Trail "Interpretive"?

Before we go on to look at the interpretive planning process it is important to understand what an "interpretive" trail actually is. Ironically, most interpretive trails that I have seen are not the least bit interpretive. They were educational, informational, or "word-sickles". Word-sickles are pseudo-interpretive messages (on panels, brochures or audio) that was just text like from field guide of history book. So just what makes the message presentation "interpretive"?

The definition of Interpretation

Interpretation is a communication process designed to "reveal" meanings and relationships of our natural and cultural heritage, to the public (visitors) through first hand experiences with objects, artifaacts, landscapes or sites.

For the message to be interpretive it needs to be based on Tilden's Interpretive Principles. That means the construction and presentation of the message (both in graphics and text) needs to:

Provoke the attention and curiosity of the visitor.
Relate to the every day life of the visitor.
Reveal the essence of the story through a unique or unusual viewpoint.
Adddress the Whole - contribute or help illustrate the main interpretive theme.
Strive for message unity - Use sufficient but varied repetiton of cures to crete and support a the interpretive theme, mood or aura.

So for the trail communication to be interpretive there needs to be a focused theme for the trail and each stop's interpretation should provoke, relate and reveal the story of the trail to the visitor. Not just give information but translate information into the everyday language of the visitor.

Here is an example of an interpretive panel. Can you spot each interprtive principle?

Developing the Interpretive Trail Plan

The key for success of any interpretive trail is the quality ofeffort tht goes into planning it. The basic model of interpretation presented earlier is our planning model for trails too. Let's look at each part of that model and the specific kinds of iformation we will need to help us develop the interpretive trail.

For our exercise here we will assume that the interpretive trail plan is for a totally new trail .

Frist, where should the new trail be located? Here's a hint. Put the trail where the visitors are. Most visitors don'tlike to have to drive or go out of their way to find and use an interpretive trail. The first places I look for potential new trails are:

* Near existing campgrounds.
* Near eisting recreation reas and picnic areas.
* Near amphitheaters and interpretive facilities like visitor ceners.

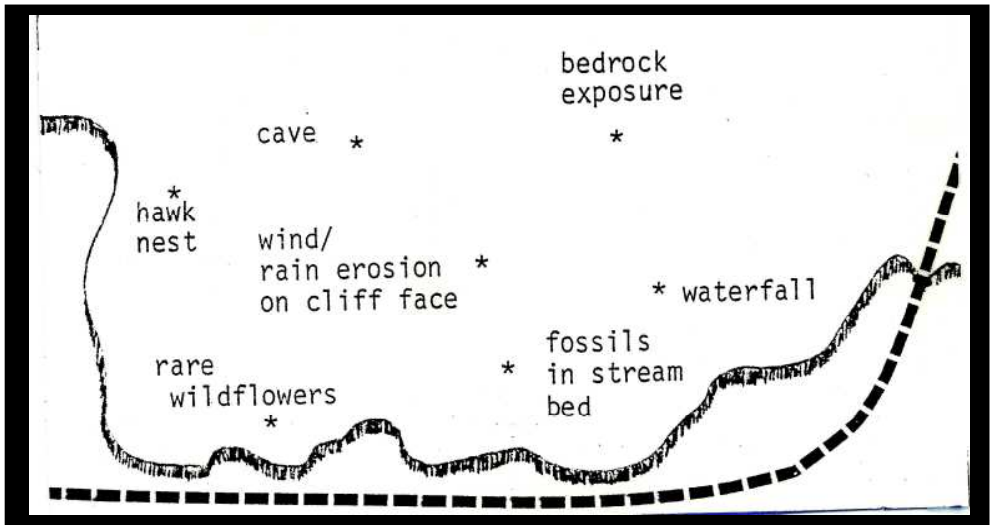
The inventory of interpretive opportunities.

First I look to see if the park, historic site or center already has an Interpretive Master Plan for the total site. Is there a main interpretive theme for the total site that the new interpretive trail has to work to illustrate. This will play a role in final trail location.

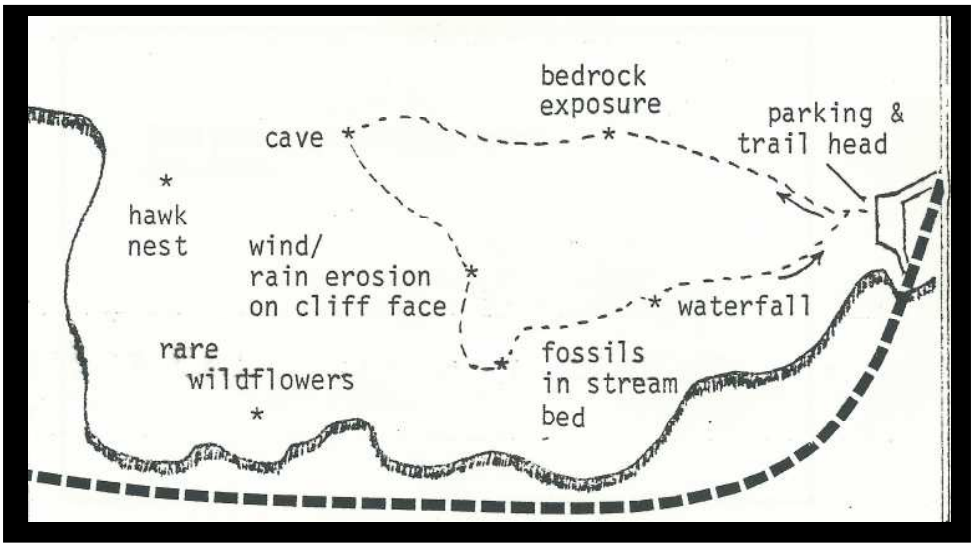
Once we have decided upon a general location for the new trail we start out by doing an inventory of the major potential interpretive stops and stations. I often use a "google map" of the potential trail location or a park map, to note locations for potential interpretation, particularly as they might relate to being examples of the park or sites interpretive master plan. If the site doesn't have an interpretive plan then I inventory all potential sites within the trail area. This can be any resources for potential interpretation. This might include:

- Different habitats.
- Ecological zones
- Geological features
- Seasonal wildflowers
- Animal dens or bird nests.
- Vistas or viewpoints
- Locations for potential demonstration areas.
- Resource management areas.
- Invasive species interpretation

The illustration below is a sketch of the location for example interpretive sites.



Then, based on what the resources are you have in the area, a possible theme or topic might begin to develop. From this inventory, and being mindful of landscape issues, grade, wet areas, etc. you can plot the trail to "**connect the dots**" for a possible theme as shown below.



From this analysis it look like we have the resources for interpreting a geology topic. In this way the trail is designed to take the visitor to each key resource that is part of the defined story. A possible interpretive theme for this new trail might be ***"The rocks and landscape of Smith Forest reveal many secrets about their past***". Remember, each stop on the trail will need to illustrate this theme.

What is an interpretive theme - guidelines to remember.

A theme, as illustrated above, is the central or key idea of any interpretive presentation. When the trail walk has been completed the visitor should be able to state the main point or theme of the trail in one sentence. Development of a theme provides organizational structure and clarity of understanding for the planning of the trail or any interpretive program. Once the theme of a trail has been decided, then the rest of the trail planning and interpretation quickly falls into place.

Themes should:
* Be stated as short, simple, complete sentences.
* Contain one basic idea or concept.
* Reveal the overall purpose of the trail interpretive story.
* Should be provocative and interestingly worded.
* Makes it clear to visitors what they will be seeing and experiencing (and learning about).

Developing your interpretive objectives for your trail.

This part of the interpretive trail planning is also a key step. This is where you clearly define the "products" for visitors from the trail experience. This helps you decide on what to be interpreted, how sites should be interpreted (hands on experiences) and how interpretive text should be researched and written.

We recommend three kinds of interpretive objectives for your interpretive trail planning.

- Learning objectives. These are the things you want the visitor to learn about the resources or stories the trail is illustrating. Here are a few examples of learning objectives:

* At the completion of the trail walk the majority of the visitors will be able to describe three ways we are managing the park for wildlife.

* At the conclusion of the trail walk the majority of visitors will be able to identify three kinds of geological features unique to this park.

- Behavioral objectives. These are the most important objectives. These are the ones that help you focus on the product of the trail walk - how you want the visitor to USE the information or "inspiration" they received from the trail interpretation. They are the pay-off objectives that deliver real outcomes for the money spent on the interpretation. Here are some examples of behavioral objectives.

* Visitors will stop picking wildflowers in the park.
* The majority of visitors will consider attending other park interpretive program or walk other interpretive trails.
* The majority of visitors will consider planting native plants for their home landscaping.
* The majority of visitors will understand and support our management plan for this park.

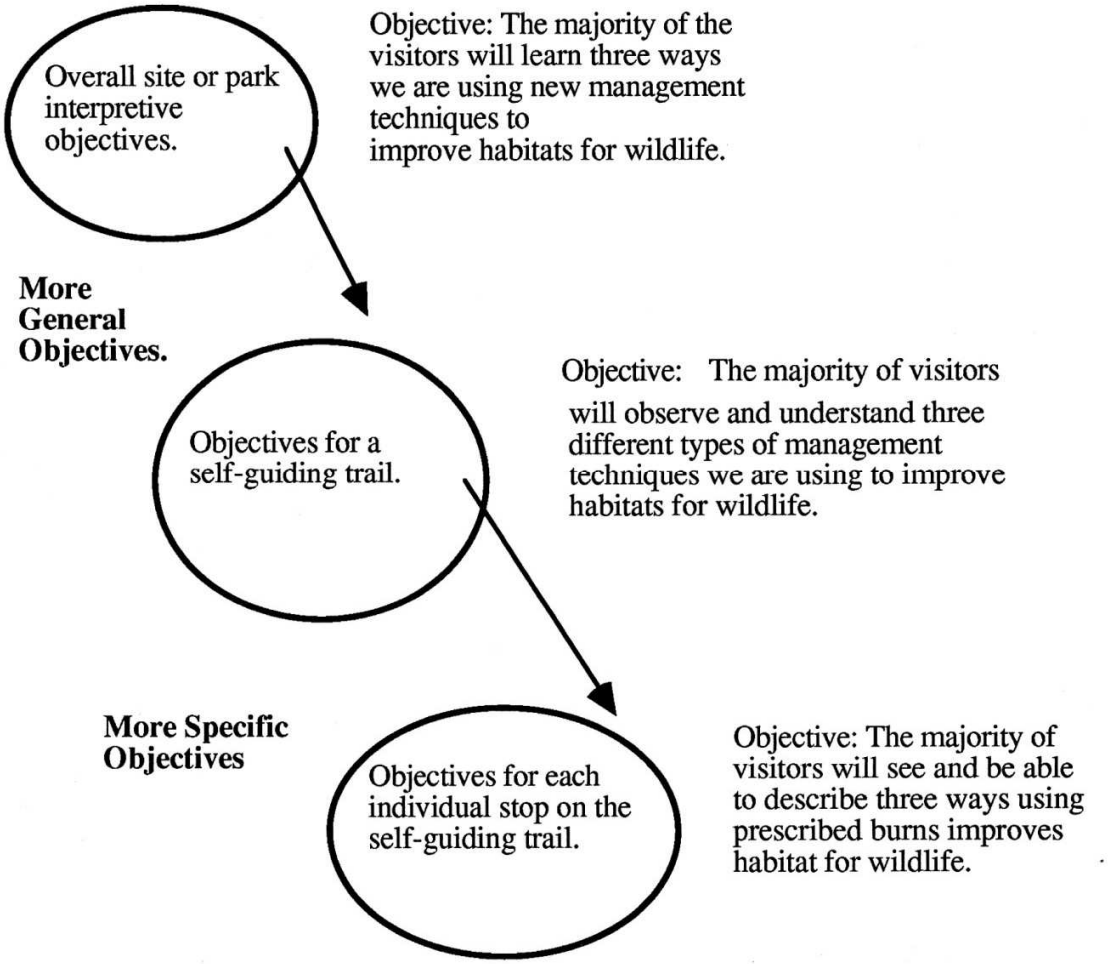
- Emotional Objectives. It is the emotional objectives that drives the behavior objectives. That is a basic advertising rule. Visitors have to **FEEL** that doing the intended behavior is something that they want to do or should do. Here are a few examples of emotional objectives.

* Upon completion of the trail walk the majority of visitors will feel a sense of pride about the preservation of this resource and story.
* Upon completion of the trail walk the majority of the visitors will feel that they would like to learn more about the natural and cultural history of this site.

* Upon completion of the trail walk the majority of visitors will think that the agency is doing a good job managing this site and support their conservation work.

Levels of Objectives

When you are developing your interpretive trail you will have at least two or three levels of objectives to consider as illustrated below.



With this layering of objectives it is important to note that you should have interpretive services objectives from your sites interpretive master plan to help give you direction for what the interpretive trail's interpretive mission is to be. We move down the layering from more general

objectives to the very specific objectives for the interpretation at each individual interpretive trail stop. You will see more examples of how this is used for developing each trail stop in the Interpretive Media Development chapter.

Let's stop and think here for a second.

As you are developing your interpretive objectives for your total interpretive trail story presentation and for each individual interpretive trail stop there are two questions you should ask yourself about each objective your are writing.

1. The first question is: **Why would a visitor want to know this?** There may be several reasons they might want to know this information from the interpretive media:

- It will help them enjoy interacting with the resource.
- It will help make their use of the trail safer.
- They will be able to use some of the information from the trail at their own home (such as landscaping with native plants, leaving cover for wildlife, putting up bird feeders.).

There is no "right" answer to the question, but it does make you think about the outcomes from the trail experience you really want.

2. The second question: **How do you want the visitors to USE the information you are interpreting to them?** If they can't use it then why are your giving it to them? This relates to your behavioral objectives and emotional objectives as well.

Remember that the objectives are a tool for you. Try to keep the objectives reasonable and "doable".

Who are your potential trail users - visitor analysis.

Another part of the interpretive planning model is considering just who your audiences with be. For example, will the trail users be:

- School groups as part of an environmental education program.
- Other organized groups (such as bird watchers).
- General visitors (families, couples).
- Visitors who may be handicapped.
- Visitors who like short, or medium, or long trails.
- Seasonal visitors (spring wildflowers, bird migration).
- People camping in the park or site.
- Local residents (may be dog walkers, etc.).

Depending on the specific trail user groups that will be your main market groups you will have to plan and design the physical trail and trail media accordingly. For example if you have more elderly visitors you may need to plan more benches and rest stops. If you have more handicapped visitors, there are standards for trail design to keep in mind. If it is for school groups you may need to plan different activity areas for environmental studies and demonstrations.

Trail carrying capacity.

Part of the visitor analysis you will be assessing is that of the potential demand for use of the trail. If you anticipate a lot of visitors per day using the trail, will the trail surface, if left natural, suffer a lot of erosion and soil compacting? The more visitors you project will have an impact then on your selection of the best kind of tread surface that we talked about in Chapter 1. Will if this will be both a hiking and bike trail, that will change your trail width. Same for a horse/hiker trail combination. On the other hand, if you project limited trail use or only seasonal trail use, that will impact the trail surface and also the amount of funding you want for trail interpretation. Maybe printed brochures or stops with cell phone interpretation would be more cost effective than expensive interpretive panels? All things to think about.

Media and Services Selection

This part of the interpretive trail planning process involves you considering how, when and where you will develop the trail, and accomplish your interpretive objectives for the trail. This will include:

* How the trail will be designed and constructed, trail standards and surface materials, trail route, trail length, and any trail stops.

* Consider any seasonal variations that may occur along the trail such as seasonal flooding, seasonal bug problems, migratory birds for observation, seasonal wildflower blooms and any other related seasonal needs assessments.

* Detailed planning for each individual trail stop to include:
    - Interpretive media (panels, self-guiding brochures, audio, cell phone interpretation).
    - Development of any demonstration areas.
    - Any trail furniture such as viewing decks.

Implementation and Operations - going from plan to construction.

This is where the business world and the interpretive world meet. In this part of the interpretive trail plan you will need to consider all of the variables and costs involved in getting the trail from pen and paper to actual construction and media development. Some of the things you will need to consider include:

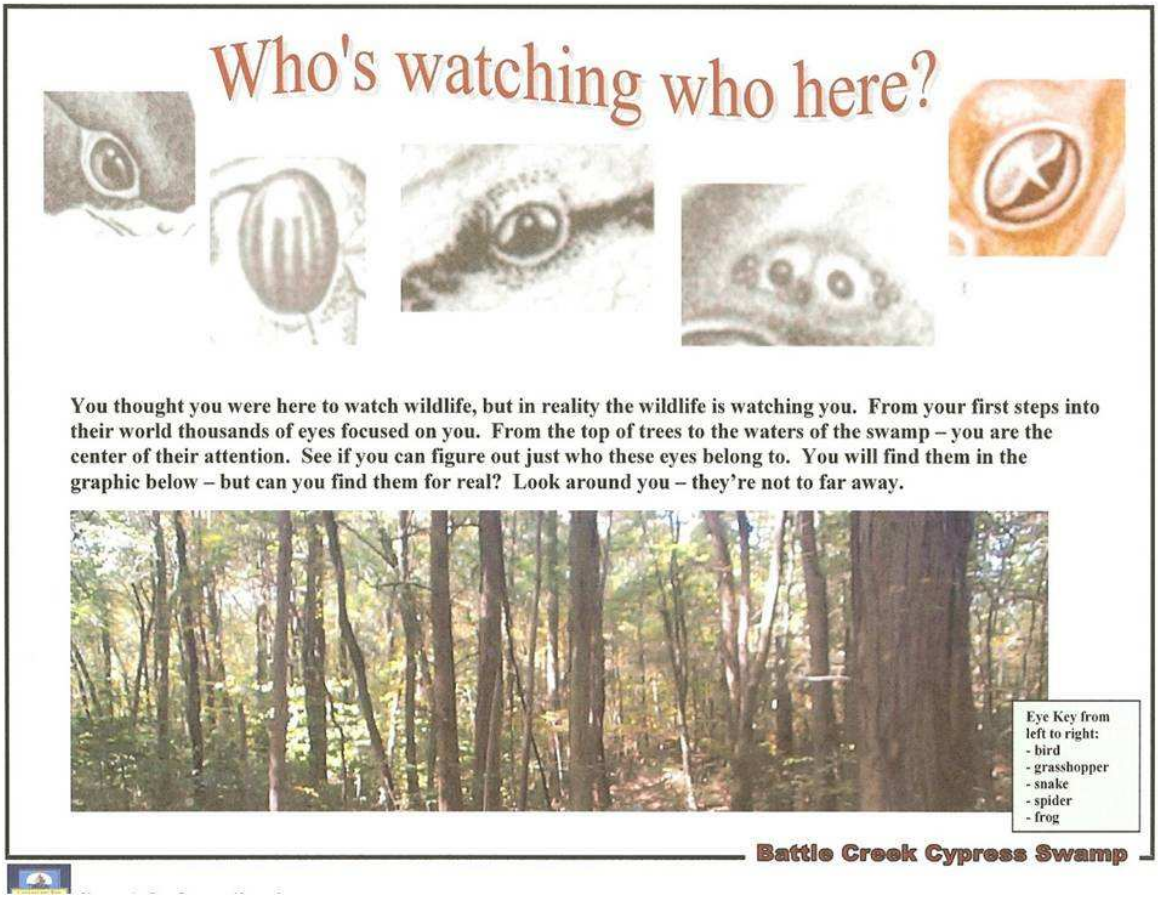
* Who will do the interpretive trail plan and design work?

* Who has to approve the final trail plan and budget?
* What is the projected budget for all work, including media?
* Who is going to build the trail?
* Who will do the trail surfacing?
* Who will do the trail signage and interpretation?
* Who will build any trail furniture (bridges, stairs, viewing decks)?
* What will the selected interpretive media cost?
* When is the best time for trail construction?
* Can we use volunteers to help with trail construction?
***** How long will the trail construction take?
* How long will it take to have the trail interpretive media prepared and installed?
* Who will approve any interpretive graphics and text?

It is always good to look at your new trail potential location in the spring, particularly after a good rain. That will tell you something about trail flooding and drainage issues.

Evaluation and pre-testing interpretive media.

It is always recommended to pre-test any interpretive media you are planning for your trail with trail/park/site visitors. You can do mock-up interpretive panels printed off your computer, and mock-up brochures too. It is also easy to pre-test any audio interpretation and APP's linked to your website. Here is a mock-up interpretive panel done on a computer using Microsoft WORD and text boxes. This can be taken to a print shop and enlarged, mounted on some cardboard or foam core and then shown to visitors to check on vocabulary, graphics, interest in the subject, etc.



Sample draft mock-up interpretive panel.

Standard Interpretive Planning Forms.

When I do interpretive planning for parks, historic sites or other agencies and organization I use standardized interpretive planning forms that help me remember all the interpretive topics I need to cover based on the interpretive plan outline and model of interpretation.

The following is a sample of an interpretive planning form set for a proposed new self-guiding interpretive trail from a past project as an example.

Story Development
Great Bridge Battlefield & Waterways Park

Site Index #: GB-11

Site Name: Marsh View Trail

Interpretive theme or topics: The main interpretive topics for this location would be to introduce visitors to the approaching historic landscape, and acquaint them with what the early natural history of this location would have looked like, and what wildlife would have been here. We also want then to experience the marsh landscape to help them understand why the causeway and bridge over this area was so important.

Site Objectives:

- Flag the proposed new additional loop for the trail.
- Develop the trail entrance sign location (see photo).
- Develop steps on to/off of the back loop burm.
- Clear brush of the trail surface from the back burm – widen as necessary.
- Design a viewing deck/platform out to the edge of the marsh.

Interpretive Objectives:

The majority of visitors will:

- Understand that the historical marsh landscape of 1775 looked pretty much like it does today.
- Learn why the road over and through this marshland was so vital.
- Learn some of the native plants and animals they can see from this location.
- Feel that this trail system is a relaxing and enjoyable learning experience.
- Be motivated to learn more about the history of the Battle of Great Bridge.
- Enjoy watching wildlife.

Interpretive Media or Services:

Interpretive media for this Self-guiding trail could include:

- One 3’ x 4’ interpretive trailhead sign kiosk with fiberglass embedment panel.
- Several stationary 2’ x 3’ interpretive panels at select watchable wildlife locations. Final number and location to be determined.
- One self-guiding trail leaflet keyed to numbered stakes. This leaflet could be made available on the sites website.

The bottom photo shows the current entrance to the proposed self-guiding trail.
The top photo shows that same entrance area with a trail head sign/kiosk added (by computer).

A draft of the recommended trail head sign is provided on the following page.

Approximate location for the recommended Self-guiding Trail Loop, and recommended watchable wildlife viewing deck.

Sample Trail Head Sign Design

Highlight each trail on the trail head map. Show a few photos of key attractions or features visitors will encounter.

Trail head sign basics (a standard design for all three trail head signs.

1. **A trail location map.**
2. **Note trail length and, more importantly, the average walking time.**
3. **Have the trail name, and identify trail marker icons for visitors to watch for.**
4. **Message about trail theme and sites/features.**
5. **Safety message.**
6. **Availability of additional trail interpretation media.**
7. **Parks Logo is optional based on policy.**

The next step for this example.

For this trail example, the next steps would be as illustrated earlier starting on page 73.

- Based on the interpretive theme that is part of the Interpretive Master Plan for Great Bridge we would walk the trail to look for potential stops and viewing areas to help illustrate the main theme and accomplish the interpretive objectives.

- Recommend the final interpretive trail media (such as interpretive panels).

The final step would be the budgeting/funding for the final design and fabrication of the interpretive trail head sign and interpretive trail stop panels.

Developing Interpretive Trail Guides - Sample

One of the other main tools for interpretive trails is that of a self-guiding brouchure. The sample on the following pages was purposfully developed for a 8 1/2" x 11" format as the main audience at this site was older visitors and we wanted to make reading the text and viewing the graphics easier.

The brochure was done on a computer so the client could print out copies whenever they wanted, as well as be able to make any changes.

Once they printed out about 5-10 copies of the guide, it was hard laminated (made waterproof) so visitors could return it when they finished the trail walk, and recycle it for the next visitor. Hope you enjoy the walk :)

Seasons of Change Interpretive Trail

Welcome to the Seasons of Change Interpretive Trail! Did you know that the natural environment you see around you is in a constant state of change? Do you know why these changes are occurring and how they affect all of the living things you see around you? These are just some of amazing things I will help you discover as we walk along the Seasons of Change Trail.

Before you start here are some things you might want to know. The trail is a loop that will take about an **hour** to walk, and bring you right back to the Mill parking lot. I recommend that you wear sturdy walking shoes (no sandals), and you might want to take some water with you too.

Look for the trail head sign behind the Mill, and I'll meet you there.

Stop # 1

You are surrounded! The plants of an autumn prairie are all around you. This is one of the prairie restoration areas here at the Franklin Creek State Nature Preserve. Once prairies like this covered the entire mid west, from Ohio through the plains states. Now only a few remnants and restorations of these once expansive prairies can be found – and you are lucky enough to see the autumn prairie flowers in bloom. They will be changing soon, going to seed. In a few weeks if you walk this trail again, this site will look completely different. Come back for a look and see the changes.

Stop # 2 Life on the Edge.

It's all about diversity. Look to the left (toward the Mill) and see how many habitat edges you can find. Edges are the places where two or more habitats meet, such as the prairie habitat you just saw meeting with the old field growth, and the old field growth meeting the cornfield. Some plants and animals can only live in their own habitats, just like we probably wouldn't do to well living at the North Pole. These habitats are always in a fight, one wanting to take over the other. This is called "*succession*". Which of these three habitats do you think would be the winner if we just left things along here for nature to take control of?

At your next stop you can see what the answer might be. I'll meet you there.

Stop # 3 Can you see the difference?

The King of the Hill. In the world of battling habitats, the Burr Oak Savanna you are standing in would be the clear winner here. Once savannas like this were all over the ancient prairie ecosystem. The only thing that kept the prairie a prairie (grass and flowers – no trees) was fire. The fire kept the young trees and woody shrubs from growing and kept the prairie habitat stable. How did the prairie plants and grasses survive? The roots of prairie plants may go down over 12 feet deep into the ground. The fire might destroy the top of the plants, but the roots lived on!

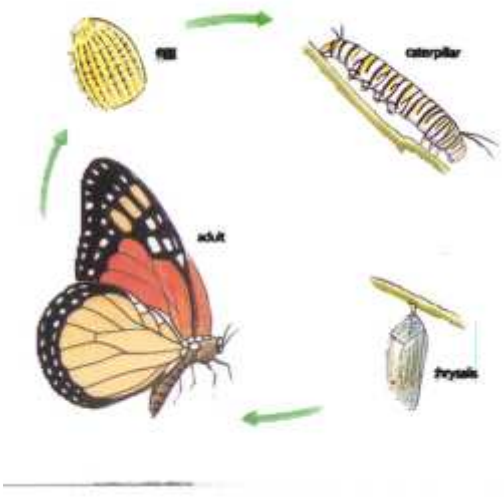
Edges everywhere! How many can you find from this vista? I will take you down into the field below to give you a closer habitat experience. When you're ready I will see you at stop # 4. But take your time and enjoy the view.

Stop # 4 Food and bedroom for a migrating traveler.

Monarch legacy. You have probably heard the story of the relationship between the Monarch butterfly and the milkweed plant you see here. The monarch lays its eggs on the milkweed plant. The caterpillars hatch, and eat – you guessed it – milkweed leaves. If you break off a leaf you will notice a white sticky sap, which, I am told, tastes horrible – don't try it – it's poisonous. But not to the monarch. When they are ready, the caterpillar turns into a chrysalis and then into a monarch butterfly. The bright orange color warns birds that this bug tastes real bad (from eating the milkweed), thus protecting the butterflies from predators.

The picture to the right illustrates the basic life cycle I have been talking about. In September and into October, you will probably see Monarch Butterflies during your walk, so keep you eyes open. And for heaven sakes, don't eat it!

The next stop is the Cats Meow! You'll see why when you catch up with me at stop #5.



Monarch Butterfly Life Cycle

Stop # 5 Cat got your tongue? Well, this cat could save your life!

Well, as you probably guessed by now I have been talking about Cattails. Something you probably knew about cattails was that they loved water. You always see them in ponds, or flooded roadsides. So why are they here? You probably noticed Franklin Creek – well some of the ground water that flows into the creek from the higher ground in front of you can leak into the surface, making the ground wet. In the spring of the year (remember seasonal changes) you would be standing in water right now! It is the wet soil that creates the habitat for cattails to be able to grow here.

How can they save my life? In a survival situation (they taught me this in the Army), you can make a pancake type of batter from the cattail head pollen, eat the cattail roots (taste like cucumber – or chicken), use the fluff in the autumn to start fire from sparks, and weave the leaves to make mats to sit on. Not to bad for one plant. **Time to move on. See you at #6.**

Stop # 6 When worlds come together.

Can you find the edges. This is a great place for me to show you more edges. How many can you find? Have they changed any since this picture was taken – how?

Let's keep moving on to stop # 7 for a closer look.

Stop # 7 Stop, Look, and Listen!

This is one of the busiest places I can show you. The stop, look, and listen will tell you about the many different plants and animals that live here where so many habitats meet. Listen for deer in the cornfield, insects chirping in the grass, and in the trees, birds singing in the trees. This area has undergone many changes since spring when it was flooded here. Then you would have heard frogs too. Take some time to look around – you will see more than you can imagine if you look closely.

Stop # 8 Here is something completely different!

Are you ready for this? This is how this area will look in a few months – and again in early spring. The yellow arrows point to the tree line in front of you and to your left - you are standing - and will be walking where the yellow arrows are. This is called a Riparian Zone – where there is a small stream flowing the direction of the arrows to empty into Franklin Creek. This is a new habitat, can you find any differences from what you have seen before – running water is a hint.

Speaking of running water – there is more on the way. See you at stop #9.

Stop # 9 When they all come together… you get this!

Changes on the way. This is how this area will look in a few months. Franklin Creek is fed from many smaller streams and springs, like the one you have been walking by, all along its route. Like veins and arteries in your arm, the smaller streams feed into bigger ones. Do you know where the water you see here today will end up? How about the Gulf of Mexico! Stop in the Interpretive Center to find out more about the Franklin Creek Watershed and where this water comes from, and goes to.

Stop #10 Changing the landscape!

If water is so soft, how can it cut through soil and rocks? These two photos give you a seasonal look at the soil erosion that Franklin Creek is causing. This is a NATURAL event, as rivers and streams are always changing their courses. It is the constant wearing away of the soil, especially during spring floods, and runoff from rain storms, that erodes the soil along the banks and carries it off downstream. Remember, the Grand Canyon in Arizona was formed by water. Where do you think Franklin Creeks channel was 1000 years ago?

Do you want to race to the race? See you at stop # 11.

Stop # 11 Who won the Race?

If you look at the ground carefully you can see a historical artifact. It's the location of the original tail race where the water that powered the mill wheel flowed from the mill into Franklin Creek. This tail race is from the original 1847 mill. It is easier to see in the winter through early spring, so if it is hard to see today, come back in a few months.

Stop # 12 Water Wear Where?

Sharp water? Here is another good example of what water can do over time. It can cut through rock or wear it away like it has here. And the cutting is going on right before your eyes, a grain of sand at a time. You will see another example of the power of water at last stop at the end of the trail. This might be a hint of where the Franklin Creek channel might have been hundreds of years ago, at least at this location. Can you find any high water marks on the cliff face? What would that tell you?

Stop # 13 Life is looking up?

Here is something tree-mendous. I want you to look at the top of the exposed cliff face – can you see the pine trees and cedar trees. This is the first time we have seen these trees – this must be a new kind of habitat, with different soils and environment that allows these trees to hold on to life here. Be sure to look into Franklin Creek here – I usually can spot some fish, and look for animal footprints in the wet sand.

Stop # 14 The End – or the Beginning?

It's really both. While you are at the end of the trail, it is the beginning of the autumn and winter cycles of life here at Franklin Creek State Natural Area. All of the habitats you have seen are undergoing slow and predictable changes as Fall and Winter approach. This landscape will look much different then, and I hope you will walk this trail often to witness natures cycles at work. As winter approaches many of the birds you have seen will be moving south, and the insects will be gone soon too, many spending the winter underground, or in protective cocoons. Soon when you walk here you will only hear the wind – but there are stories to be told then too.

If you have any questions about any of the plants or wildlife, feel free to ask the staff at the Mill Interpretive Center, and ask about our other trails, programs, and activities. There is something here for everyone.

Well, its time for me to go to, I enjoyed walking the trail with you today and hope to see you again soon.

This project was funded in part by the Illinois Department of Natural Resources C 2000 Program through a grant to the ***Franklin Creek Preservation Area Committee.***

Advantage and Disadvantages of Self-Guiding Interpretive Trails

As you do your planning for trails you should keep in mind some of the main advantages and disadvantages of interpretive trails, just in case you have to justify doing a SGT to your manager or agency director. Here are a few of eah for you to consider.

Advantages of self-guiding trails.

1. There may be no substitute for the friendly tutelage of the conducted tour or hike but personal tours are often limited. The SGT released interpretive personnel for other duties including conducted activities in more appropriate areas. Thus the SGT becomes a reasonable alternative to the conducted tour.

2. Visitors may use the SGT at their own pace and convenience. And they can use the trail as often as they wish.

3. Using the concept of "mass customization", any SGT could have 10-20 or more different themed topics, and be available in different languages and knowledge levels. The leaflets can be downloaded for the agency website or found via a cell phone APP.

4. The self guided trail can provide interpretation in out-of-the-way areas where it is impracticle to have interpetive staff work.

5. On a SGT (with a parents guide), patrents can take their time to learn, discover and enjoy the trail with their children and not be constricted by the schedule of a guided tour. This is a great advantage for home schooling parents and students.

6. The SGT allows the use of the trail (carrying capacity) to be spread out rather than having the impact of a large group waling the trail at once.

7. The SGT is a simple way to admitting people to and hannelingtheir movements in and through a sensitive area, especially via a boardwalk trail.

8. SGT interpretation can utilize a variet of media, from Braille and large print to audio and printed media in different languages. They can also use APPs for cell phone interpretation that can incorporate video interpretation.

Disadvanteges of the SGT

1. The SGT story can't reveal everything and the communication might just be one-way.

2. The SGT with its usually fixed story has the almost impossible task of telling/relating the story to a variety of individuals with different learning styles and knowledge levels.

3. Unless very well written and pre-tested, it may be easy for the visitor to loose interest in the trail interpretation.

4. On a SGT vandalism may go undetected for many days, much to the annoyance of trail users. So the trail with fixed media (like panels) must be regularly checked.

5. Some of the trail stops couild become obsolete so the trail stops/media mau need to be changed or updated.

6. The SGT has the problem/challenge of telling a story in a orderly manner as the resources appear along the trail.

Types of Interpretive Trails

Fir the purpose of this book the tpes of interpretive trails refers to the kind of media you may select for the trail. Of course, any trail can use a mix of media such as panels and cell phone interpretation.

* Leaflet marker trail.
* Sign-in-place trail.
* Audio trail.
* Cell phone/video trail
* Braille trail

Let's look at each one in more detail.

The Leaflet and Marker Trail

This type of interpretive trail utilizes a printed leafleet which is carried by the visitor and is keyed to a trail marker of stops.

Leaflet/marker trai, Lassen National Forest, CA.

Advantages of the leaflet-marker trail.

- Leaflets can be developed for a variety of themed topics, in different languages and at different knowledge levels. Leaflets can be available via the agency web site for downloading to a visitors smart phone, or printed off at the agency office or visitor center.

- For a trail with a low number of visitors this can provide a better cost/visitor contact.

- Geven the fact that leaflets can be computer generated they can be easily updated.

- They can provide a take-home souvineer for the visitor.

- They are the best way to pre-test tdrail interpretation prior to developing expensive interpretive panels for the trail.

- They can be less obtrusive on the environment. Interpretive markers (numbers) can be painted on rocks or even on sandbags.

Here are some examples of leaflet marker trail brochure disbribution systems for sites that print off brochures and have them available at a trail head.

Trail leaflet disbribution box with an "honesty" donation for brochure payment.

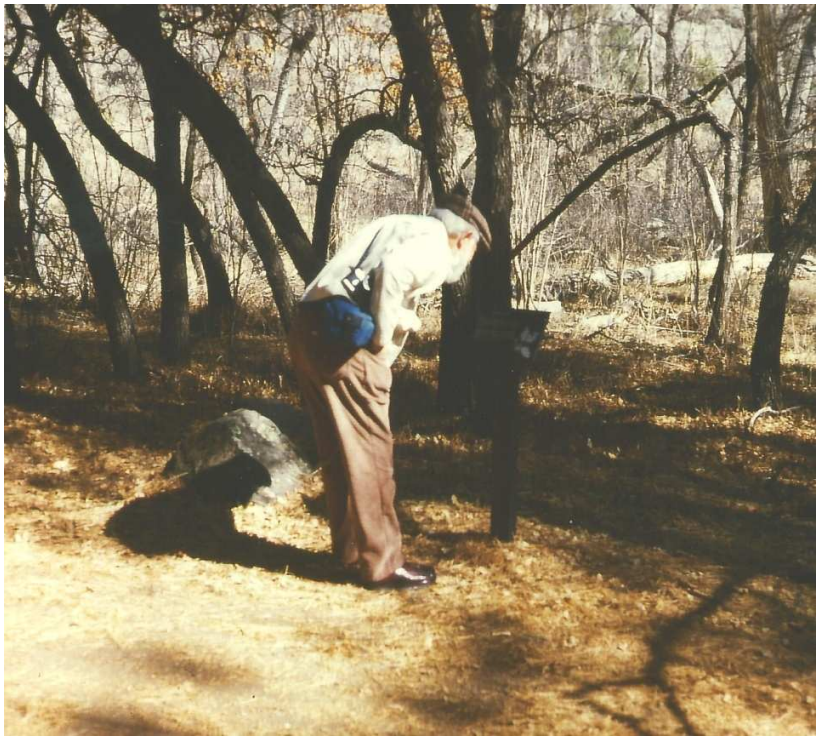
A "water proof" trail brochure distribution system.

Another "honesty" trail brochure system. Remember, the brochures have to be checked to be sure they are stocked, and the money removed.

I put this trail guide distrubution box here becaue for some reason they always collect "stuff" at the bottom of the box, including bugs and bees. This is one reason having trail guides via a cell phone, smart phone, iPad, etc. is quickly replacing this system.

The sign-in-place trail

Interpretation via an interpretive panel (sign-in-place) has been around for years and is still popular today. Today these panels can be make out of a wide variety of material and research had been done on everything from panel design to the amount and size of label copy.



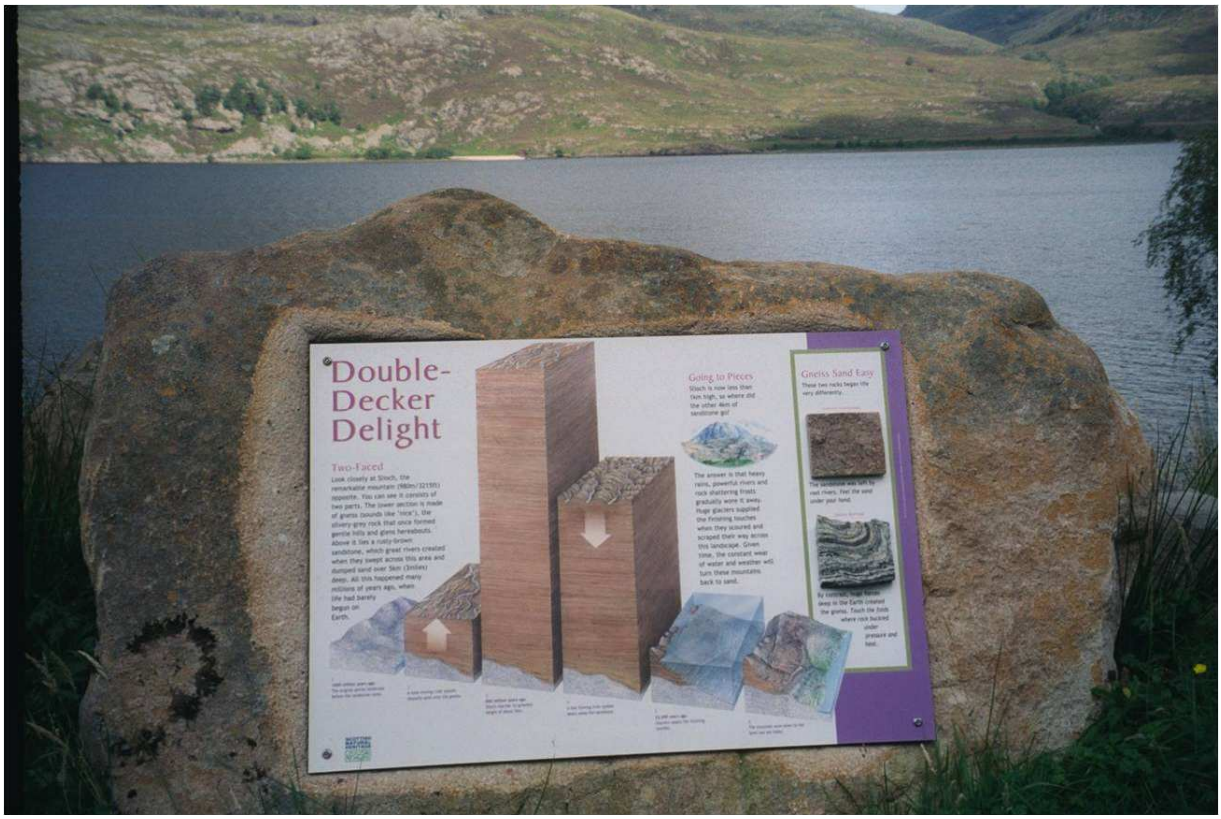
Dr. Bill Lewis trying to read an interpretive panel. Note that this panel has many problems with it, but in general a visitor should not have to bend over and squint to read you panel.

Let's look at a few innovative interpretive panels found along self-guiding trails.

This interpretive panel uses a nice panel mounting system as well as a frameless design.

These two trail panels use both lazer cut *high pressure laminant* panels using a more natural looking panel mounting system.

In interpretive panel interpreting Salmon - with a salmon cut design.



An interpretive panel from a trail in scotland interpreting geology, and mounted on a geological feature.

Some countries are bi-lingual. This panel at Jasper National Park - Canada is in English and French.

Audio and Video Interpretive Trail Media

Audio and visual interpretation has becom more and more accessible with the development of new technoogy. We can use cell phone interpretation for audio and visual (assuming we have cell phone interpretation), or use new digital audio, like the photo on the left below) for sites with no cell phone reception.

Which trail has the best cell-phone reception?"

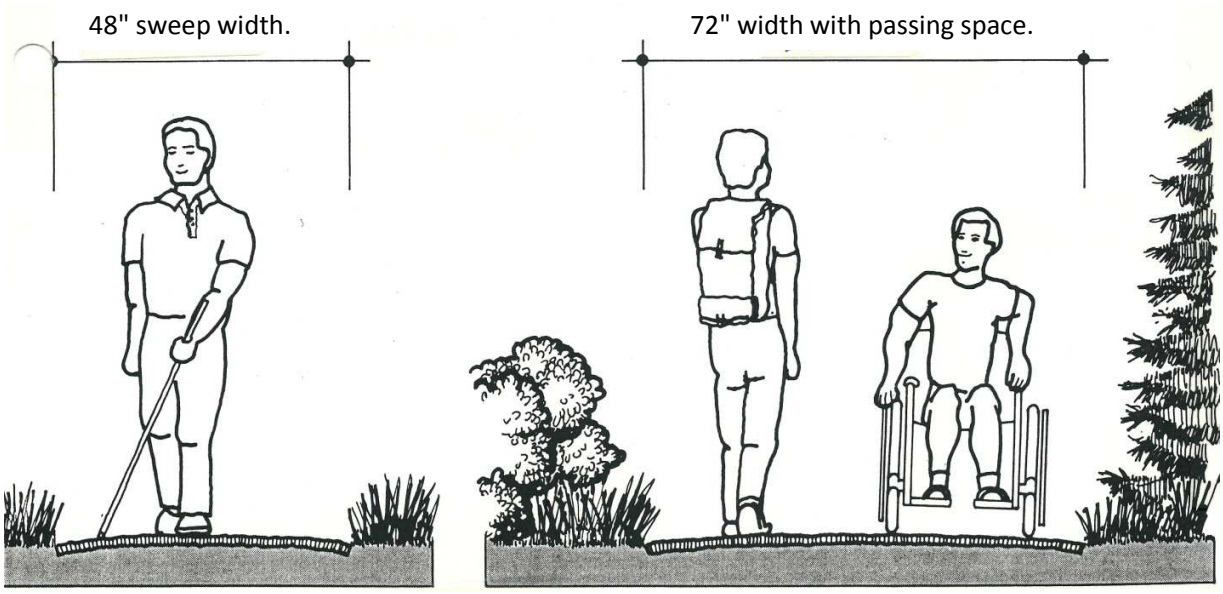
This is cool - developed by Black Box (http://www.blackboxav.co.uk/audio-bench-added-to-our-product-range) is an audio interpretive bench. The audio is for bird calls. The top photo shows the audio box from behind the bench.

Handicapp accessible trails.

In general I like to try to plan every trail possible for universal access. The following is a summary of general trail planning guidelines from a variety of trail manuals from different organizations. I have found that many different organizations have their own trail planning standared (and state laws) that guide the development for universal access trail. So depending on what state, region or country you live in you should check with your park or heritage site authority to see what (and if they have any) their all access/universal access standards and policies are.

Universal Access Trail Design Recommmendations.

- Trail width - 3-5 feet (average 4' if possible).
- Passing space of between 5-6 feet.
- Slopes of 0-4%.
- Cross slope should not exceed 2%.
- Rest areas provided every 200-300 feet.
- Slip resistant trail surface.
- Confortable giewing zone for wayside exhibits or vistas to be easily read by visitor in wheelchairs is about 48" and 76" above the ground at a viewisng distance of 6 feet.



Interpretive Sign Media

Jean Harrison
US Army Corps of Engineers

This handout is meant to be used as a stepping stone – the first step in determining which types of sign media might work best for your specific site. Once you've narrowed down the choices, visit the web to learn more about the fabricators and get updated prices.

Engraved Stone Stone Imagery 760 434-4493

Materials

- Text, line art and photographs can be included on the panel
- Main process is engraving on stone slabs
- Full color photos or prints are produced as high-pressure laminates that are inset into the stone panels
- Wide variety of stones available
- Can use with mixed media, including metal

Pros

- Durable, long lasting
- Stone highly vandal resistant
- Natural, blends w/landscape
- Aesthetically appealing
- Ages gracefully

Cons

- Heavy
- Limited colors except for inset

Estimated Life Span

- Indefinite

Cost

- Range from $125 - $250 per square foot and up.
- Small trail signs begin est. 87¢ per square inch but check for current prices.

Fiberglass Embedments

Materials

- Text and graphics are silk screened or, more commonly today, digitally printed onto archival-quality paper
- Paper is embedded in clear polyester resin with UV inhibitors. The resin is reinforced with sheets of woven mesh behind the print.
- Available thicknesses range from 1/16” to 1/4”
- High resolution can be achieved

Pros

- Can use full color illustration, photos, maps, line art
- Panels resist adverse weather and impervious to moisture
- Resists chipping and peeling
- Fairly high degree of vandal-resistance
    - Graffiti (e.g. crayons, spray paint) can be removed; a non-abrasive cleaner or solvent will remove paint and markers
    - Will not shatter if hit by bullet or object
- Occasional polishing needed to correct weathering
- 10-year life span

Cons

- Don’t hold photos well
- Color subject to fading and yellowing
- Easily scratched but minor damage removed or diminished with marine wax
- Fabric texture shows

Estimate Life Span

- 6-10 years

Cost

- 36” x 48” full color panel (include. 15 silkscreen prints, 2 of which are embedded) = $3650

Replacements

- Multiple paper prints are made and can later be embedded as needed
    - Helps keep replacement costs lower

- Unlike digital prints, once an image is silk screened, you cannot make any changes to it without having to go through the silk screening process again

Porcelain Enamel

Technique

- Made of steel with a fired ceramic coating
- Images are created on film and silk-screened using ground glass colored with mineral oxides, then the panel is fired in a kiln, fusing glass to steel sheets
- Very labor intensive; problems can occur in the firing process
- Highest resolution and truest color of all media

Pros

- Does not fade over time, even in direct sun
- Full-color, high resolution photos
  - Quality of the photographic images is superior
- Finely detailed illustrations and maps
- An occasional buffing with auto wax helps maintain lustrous appearance
- Considered most durable; 25-year guarantee
- Grafitti-resistent

Cons

- If panels are hit with rocks or bullets, the porcelain chips, exposing metal to rust
  - Companies will provide touch up paint, but the color may not match the chipped area
  - Even when cleaned with naval jelly (to remove any rust before touch-up) the metal beneath the touched-up area is more prone to rusting
- In coastal areas where the panels are subject to constant salt spray, the edges rust
  - It is difficult to coat the edges with porcelain, so the edges often have a thinner layer of enamel that erodes and rusts
- Most expensive option
- “Looks like a refrigerator”

Estimated Life Span

- 25 years

Cost

- 36” x 48” flat panel, base color + 2 additional spot colors = $1650 + labor costs

  - e.g. adding hand painting adds $400 - $800 to price
- 36” x 48” flanged panel, 4-color process throughout = $4920 + labor cost.

Replacement cost

- Exact duplicates cost 65% of price of first panel

High Pressure Laminate (Phenolic Resin)

Materials

- Full color digital output on specially developed paper is impregnated with synthetic resins and bonded together under high heat and pressure with a UV-resistant laminate
- Medium resolution

Pros

- Impervious to moisture
- Will not bubble, peel or delaminate
- Clean with soap and water
- Very vandal resistant
  - Can remove graffiti and can be cleaned with mild soap and water or with a solvent to remove paint and markers
  - Hard to scratch
  - But! Nicks or light scratches concealed w/car wax

Cons

- Color may shift (get a bit more yellow) on thicker panels due to the number of layers of resin

Estimated Life Span

5-10 years; companies typically offer a 10-year warranty

Cost

- $65.00 per square foot for 3/4” thick
- Different thicknesses are available, from 1/16” – 1”
- Although thinner panels are cheaper, they will need to be mounted on a strong backing e.g. marine grade plywood
- There are two grades: interior and exterior

Replacement Cost

- Same as original

Micro Metal Imaging

Materials

- Film negatives or positives of text, line art and photos are etched on anodized aluminum or laser cut on stainless steel

Pros

- Reproduces line art and black and white photos well
- Very durable
- High level vandal resistance

Cons

- Very limited colors (ca. 2 per sign)
- Consider your audience's level of expectation for visual sophistication

Estimate Life Span

- Indefinite

Costs - Check for current prices.

Replacement Costs

- Same as originals

PVC Laminate

Materials

- Digital paper print is bonded to PVC (e.g. Sintra) with 5mil polyester overlaminate
- Medium quality resolution

Pros

- Inexpensive
- Changes are easy and inexpensive to make

Cons

- Edges of type appear slightly fuzzy when viewed close up
- Panels have a tendency to bubble and delaminate with time
- Kids pick at the edges, delaminating them and allowing moisture to seep into the print

Estimated Life Span

- 1-4 years

Cost

- 36” x 48” full color panel = $550

Vinyl Digital Prints

Materials

- Digital image created using UV pigmented ink printe on vinyl with 5 mil polyester overlaminate
- Vinyl has adhesive back that is mounted to aluminum, HDO plywood or other smooth material
- High - medium quality resolution

Pros

- Changes are easy and inexpensive
- Good track record
- Guaranteed for 7 years when properly applied and displayed
- Cleaning with mild soap and water and a periodic coating of an automotive wax will extend the
- life of the panel

Cons - still needs more research.

Estimated Life Span

- 1-4 years

Cost

- 36” x 48” = estimate $250 (not including mounting) - check for current prices.

Wood

Materials

- Wood can be carved, routed or sandblasted
- Color hand painted or silk-screened

Pros

- Natural, blends with landscape
- Aesthetically appealing
- Ages gracefully
- 3-D effect
- Absorbs gunshot

Cons

- Limited graphic and text capabilities
- Easily carved by vandals

Estimated Life Span

- "Will be way outdated before it wears out"

Cost - depends on wood type and work to be done.

Replacement Cost

- Multiple copies cost about the same

Note that there are new interpretive panel signage materials being developed and improved upon so you should check the interpretive journals for sign companies and call/write for samples and warranties. Prices are always changing too with new printing and production techniques.

Thanks to Jean Harrison, US Army Corps of Engineers for sharing this handout/analysis.

Summary of general guidelines for planning self-guiding trails.

1. The best length for a self-guiding trail is between 1/2 to 3/4 of a mile long or about a 45 minute walking time.

2. A SGT should be on as level ground as possible to make the trail easily accessible for all visitors (a grade of 4% or less).

3. The SGT should be located as close to where the visitor are or congregate such a picnic area, campgrounds, amphitheaters or day-use areas.

4. The best number of stops for a SGT is 7 to 10 . Too many stops wear people out. The first stop (panel or leaflet-marker) should introduce the theme of the train. Then each stop "illustrates" the theme. The last stop on the trail provides a summary of what they saw (repeats the theme).

5. SGT's should be a loop trail. Most visitors like to know where they will end up after the trail experience.

6. Consider visitor safety and comfort in the layout of the trail, including benches, stairs and rest stops.

7. Be sure you have a clearly defined trail head sign. We have shown examples of these. Important content includes:

* Trail map.
* Trail length and WALKING TIME.
* Introduction to the theme and trail experiences.
* Any safety messages.
* Any interpretive media access information (cell phone, download trail guides, etc.).

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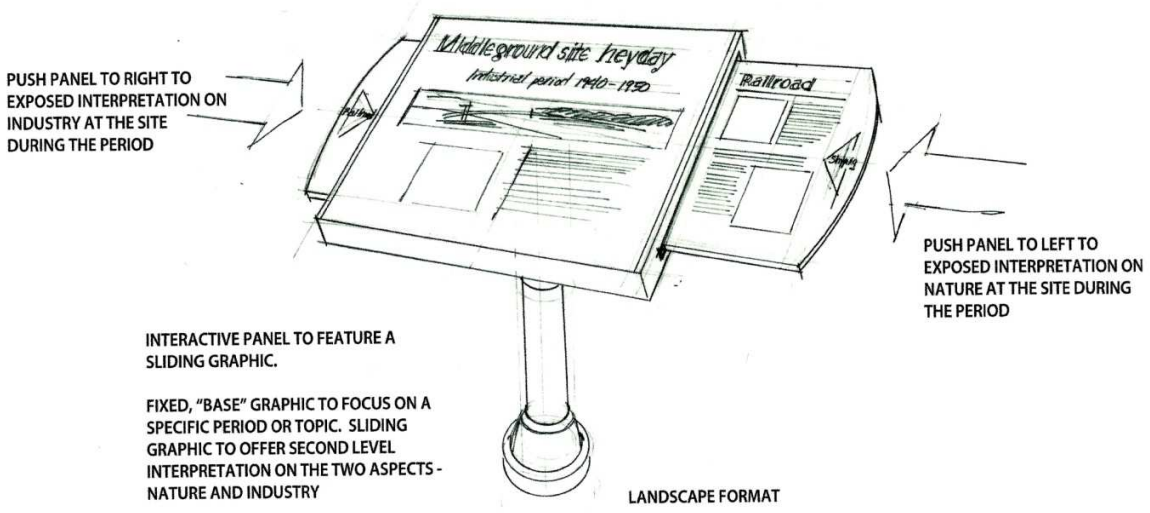
Chapter 3
Planning and Design Standards For Interpretive Trail Media.



Kaser Design, http://www.kaserdesign.com/

In this chapter I want to show some standards for interpretive trail media, particularly Interpretive Panels as they still continue to be used by parks, forests, heritage sites world-wide. We developed a interpretive graphic standards for interpretive trail panels that illustrates what we feel are example of current "best practice" for outdoor panels.

Planning Interpretive Panels

Plan for your total site interpretation and your media mix .Before you begin planning for one or more interpretive panels you should first consider the main story or theme of your total site and other interpretive media and services that will make up your message media mix. What is a media mix? To illustrate and interpret the total site story to your visitors you may use a variety of media including printed leaflets, visitor center exhibits, outdoor demonstrations, living history, guided tours, self guiding audio devices and interpretive panels. The variety of media you use for interpreting your total site is your media mix. In the interpretive plan for your total site you should have determined that for a given site, resource or location, interpretive panels were the best or most cost effective media for interpretation at that location. But the panel(s) is only one of many different media you may be using to illustrate/interpret your total site theme. So, you should consider, as good planning practice, where and how the panel will fit into your total media mix presentation of your site story. Is a panel the best media? Do you need an interpretive panel? Remember, you are interpreting the "whole site", and a panel(s) for an individual location should be planned and designed to fit into the total site story presentation and design look (media

graphic standards). The bottom line - the interpretive panel should fit in and help illustrate your total site interpretive message.

Interpretive panel planning considerations.
Once you have decided that an interpretive panel(s) is the BEST media for interpretation at a particular site or resource, here are the key steps I recommend in planning and designing interpretive panels.

1. Story and theme analysis. Identify the key concept that this particular panels will be designed to interpret. The best way to determine the theme is to ask yourself "if a visitor only remembers one thing or message from this panel, I want that one thing to be _____". The answer is the theme. Note that there is a big difference between a theme and a topic. A theme is a complete sentence and a topic isn't. For example:

Topic: Birds of the park.

Theme: We manage this habitat to attract three species of migratory birds.

The THEME is what the panel graphics and text will need to "illustrate".

2. Audience analysis. Once you have the theme you want the panel to interpret, you also need to consider just who will be reading the panel. Will the audience be: experts or people with little knowledge; local residents or tourists; children or retired folks, etc. The market group that the panel is designed for will translate into the kind of text, graphics, and "relate" approaches you use in the final design.

3. What are the objectives of the panel? This is the area where most planning falls short. I would guess that most panels in the countryside today are "objective-less" panels. That means that no one can explain why they are there other than that "we got funding for 5 boards and had to do something!" The ONLY way you can be sure that your panels are working are to have objectives for them. I like to use three different objective levels in panel planning:

* **Learning objectives**: Upon completion of reading/looking at the panel, the majority of the visitors will be able to list the three ways that wildlife preserves benefits wildlife and people.

* **Behavioral objectives**: These are the most important of the objectives as they determine the real results or purpose of the panel.
- Upon completion of reading the panel, the majority of the visitors will use this resource In a safe and stewardship-like manner.
- Upon completion of reading the panel, the majority of visitors will stay on designated trails only.

* **Emotional objectives**: These are the objectives where you describe how you want the audience to FEEL upon completion of their interaction with the panel. It is the emotional objectives that drive the Behavioral objectives quite often.

- Upon completion of reading the panel, the majority of the visitors will feel that protecting natural areas is important for them and their children.

- Upon completion of reading the panel, the majority of the visitors will feel the desire to help support the (agency, etc.) that manages this preserve.

The true success of the interpretive panel is dependent upon you having clear and accomplishable objectives. How can you "plan" a panel if you don't know what it is you want the panel to accomplish?

4. The two questions!

After you have developed your objectives, or as you consider what you want the objectives of the panel to be, ask yourself these two questions:

* **Why would the visitor want to know this?** This is my "who cares? or so what? question. If you cannot answer this questions - you will have a problem in the panel being successful. Be careful not to have your panel giving answers to questions that no one is asking! If you can think of a good reason that the visitors will want to know this information - use that statement as part of the panel header (Provoke). For example: This plant can save your life! Would you want to know more?

* **How do you want the visitor to USE the information you are giving them?** If you don't want the visitors to use the information on the panel in some way, then why are you giving it to them? The answer to this question can become your behavioral objective(s), such as to "have a safer experience", or to "consider becoming a volunteer at the Centre". Again, there is not a right answer. But you need to consider the question carefully. You have spent a lot of time and money on developing this panel - WHY? What do you want as a result of your panel investment?

5. **Determine How/When/Where to Use Interpretive Boards or Panels**. This planning consideration concerns itself with such issues as selecting the panel materials that would be best for your site/use. Kinds of materials can range from Fiberglas and porcelain signs to photo metal, lexan, and other materials. Each sign material has its benefits and limitations. It's good to ask for material specifications and samples from different sign manufactures to see what your options and costs are. Remember, the visitors don't care what kind of panel material you use - they only care about the quality of the message presentation! How/When/Where questions you also need to consider are:

- Panel locations. What kind of mounting system will you need, what will the impact on the panel mount have on the environment or on the "view"?

- Panel maintenance. Can the panel and mounting system be easily maintained should any vandalism occur or the panel needs to be changed in the future?

- What is the "life" of the Panel - how long do you intend to have it in place as is? The answer to this question might reflect on your choice of panel manufacture materials.

- Will the panel topic be for a seasonal presentation or a year round presentation?

- Will any of the information presented on the panel be likely to change in the near future?

6. **Evaluation.** This is an important step in the interpretive planning process that is almost always left out. Before you spend $2000.00 on a panel or board, wouldn't you like to be sure that it works (that its objectives are being accomplished)? I recommend that you make a simple photo copy of the proposed draft panel and pre-test it with a sample of your visitors to see if they understand the message, etc. When you have the panel text and graphics working at a 70% of greater level of objective accomplishment - then send it out for final production.

7**. Implementations and Operations**. This part of the planning process focuses on the real costs, time and logistics involved in getting from the "lets have a panel" stage to the final installed product. Some of the questions you need to consider include:

- What is the budget, and what are our media fabrication options for that budget?

- What should the panels be made out of (material options)?

- Will there be a warranty with the panels?

- When do we need it by, and how long does it take from plan to fabrication?

- Who will do the contract, manage the contract, etc?

- Who will do the research, write the label copy, select graphics, do final design, and do the actual fabrication?

- Who is responsible for approvals (drafts, text, design, etc.)?

- Who (will you) do any pre-testing evaluation studies?

- Who will install the panel(s) and maintain them?

Remember the visitor!
In planning and designing interpretive panels it is important to remember some basics about how visitors learn and remember information.

- People learn better when they're actively involved in the learning process.
- People learn better when they're using as many senses as possible.
- People retain about:
* 10% of what they hear.

* 30% of what they read.
* 50% of what they see.
* 90% of what they do.

Make sure that the visitors use the panel to help them look at and understand the resource the panel is interpreting. Use behavioral considerations in the panel design and text such as: "look for the...", or can you find the... in the site in front of you", "go ahead and touch the....", "listen for the....” These action steps will help design some “minds on and hands on” activities for the “90% of what they do” communication information retention process.

General Interpretive Panel Graphic Guidelines

1. **Point Size**. This means the size of the text you will use on the panel. Here are some sample point sizes for illustration:

☐ This is 12 point type.

☐ This is 14 point type

□ This is 20 point type

□ This is 28 point type.

A lot of research has been conducted by the US National Park Service, and other agencies that use thousands of interpretive panels. The research recommends that the **smallest type size** to be used on interpretive panels is 28 – 30 point. It has been learned that this is the minimum size that is easiest for visitors to read while standing between 3-5 feet away from the interpretive panel. *A visitor should never have to bend down to read an interpretive panel!*

2. **Font design.** This is the shape of the letters you can use. As you know, most computers have lots of different fonts. For example this font is “Times New Roman”. Here are some other fonts that are recommended to be used on interpretive panels. Again these have been researched for the fonts that are easiest for visitors to read, but you are free to try others. If you not sure – test them with your visitors, at about 30 point size, to see which they find easiest to read.

☐ This is Vernada

☐ This is Palatino Linotype

☐ This is Rockwel

☐ This is Arial Black

3. You can also use colors and different fonts to illustrate a point or theme in your interpretive panel. For example.

☐ **You can bold in the first part of a sentence** to attract visitors to some key part of the message (provoke).

☐ You can use color to illustrate a point such as interpretation of **fire management.**

☐ You can bold in key words that you want visitors to focus on or when introducing new vocabulary words such as **habitats.**

☐ You can use different fonts to illustrate points such as ***FAST*** vs. fast (note the letters are tipping, or HEAVY vs. HEAVY.

4. **Amount of text for interpretive panels**.

As a general rule of thumb, again coming from research on readability for interpretive panels, we know that interpretive panels should not have more than 100 words (about two 50 word paragraphs). Within these guidelines, it is recommended that the first sentence of each paragraph be **bold** to attract the visitor's attention to what the paragraph/text is about (like newspaper headlines).

5. **Mounting angles.** In general interpretive panels would be mounted at about a 45 degree angle. This is the easiest angle for visitors to read at.

Frames and mountings.

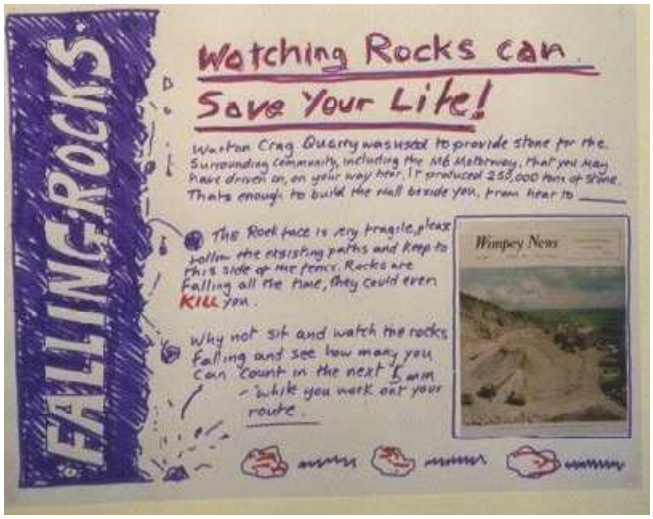
Remember that your panel will need to be held up by a framing system. Frames can vary widely in design, shape and materials, from mental to wood, from angular to vertical. You need to think about which framing system and materials would work best for you.

These are just a few of the possible mounting systems. Check with different interpretive sign companies for their brochures illustrating the sign framing systems they may have available.

Developing draft designs for your interpretive panels.

It is generally recommended that you first develop a draft design and text of what you want your panel to look like, based on your learning, behavioral and emotional objectives, and using Tilden's Tips of Provoke, Relate and Reveal. This gives you a chance to think about your audience, final sign placement, vandalism issues, and content. You can also pre-test your draft designs with your visitors before going to a designer for the final design/layout and artwork – then being sent to a company to have the panel manufactures.

Here are some samples of DRAFT or Mock-up Interpretive Panels collected from interpretive panel design workshops to give you an idea of how a mock-up interpretive panel might look.



This is a really good draft example. Note the use of PROVOKE in the header, and look for how the objectives were blended into the text. Can you spot the other interpretive tips (relate and reveal)?

Trail Head Signs.

Self-guiding interpretive trails use two different types of signs: one large trail orientation sign (called a trail head sign) and several smaller trail stop/station signs located at various stops along the trail.

The role of the trail orientation sign at the beginning of the interpretive trail is to give the visitor a general overview of what the trail is about and what kinds of experiences to expect. Based on this information, the visitors can decide whether or not to walk the trail. Every trail orientation sign should include:

1. The name of the trail.

2. A brief introduction to the theme of the trail.

3. Walking distance and time. Note: for most visitors the walking time is the most important element to present.

4. A trail map so visitors can see where the trail ends.

5. Any necessary safety information (i.e. sturdy hiking shoes recommended, steep hills, etc.).

The general size for a trail head sign is about 24” x 36”, but sizes and shapes can vary widely as illustrated below.

Trail head sign for Barton Broad Boardwalk. This trail head sign uses a sand-blasted cedar outter rim with a gel-coated panel insert.

Trail head kiosk with several introductory panels, bulletin board panel insert on the right and trail guide brohure dispenser. Ranwood Broad, UK.

Designing Interpretive Panels

As presented earlier, there are a variety of recommendations in developing interpretive panels. Here are some "rules of thumb" and examples of some "best practice" in interpretive panel design and writing.

1. Design the interpretive panel (size, colors, and shapes) to fit the landscape and/or location where it will be positioned.

2. Design the interpretive panel to accomplish specific objectives (learn, feel, do).
3. Develop the design, content and text using Tilden's Interpretive Principl (Provoke, Relate, reveal, address the whole and message unity).

4. Keep it SIMPLE. One graphic that CLEARLY illustrates the concept and about 100 words of text.

5. If you can't get your concept across in 15 seconds, you probably won't.

6. Pre-test your design and copy. While a picture might be worth 1000 words, they could be the wrong 1000 words!

7. Remember to have the visitor DO something with the panel interpretation (look for the… smell the… can you find the… touch the).

8. Keep your sentences short.

9. Avoid using technical or unfamiliar terms or vocabulary unless you illustrate the new vocabulary word for the visitor.

10. Use active verbs.

11. Add touches of humanity. Use first person quotations, make references to people's common experiences, and write with warmth and emotion.

12. Encourage visitor involvement (emotional or behavioral objectives).

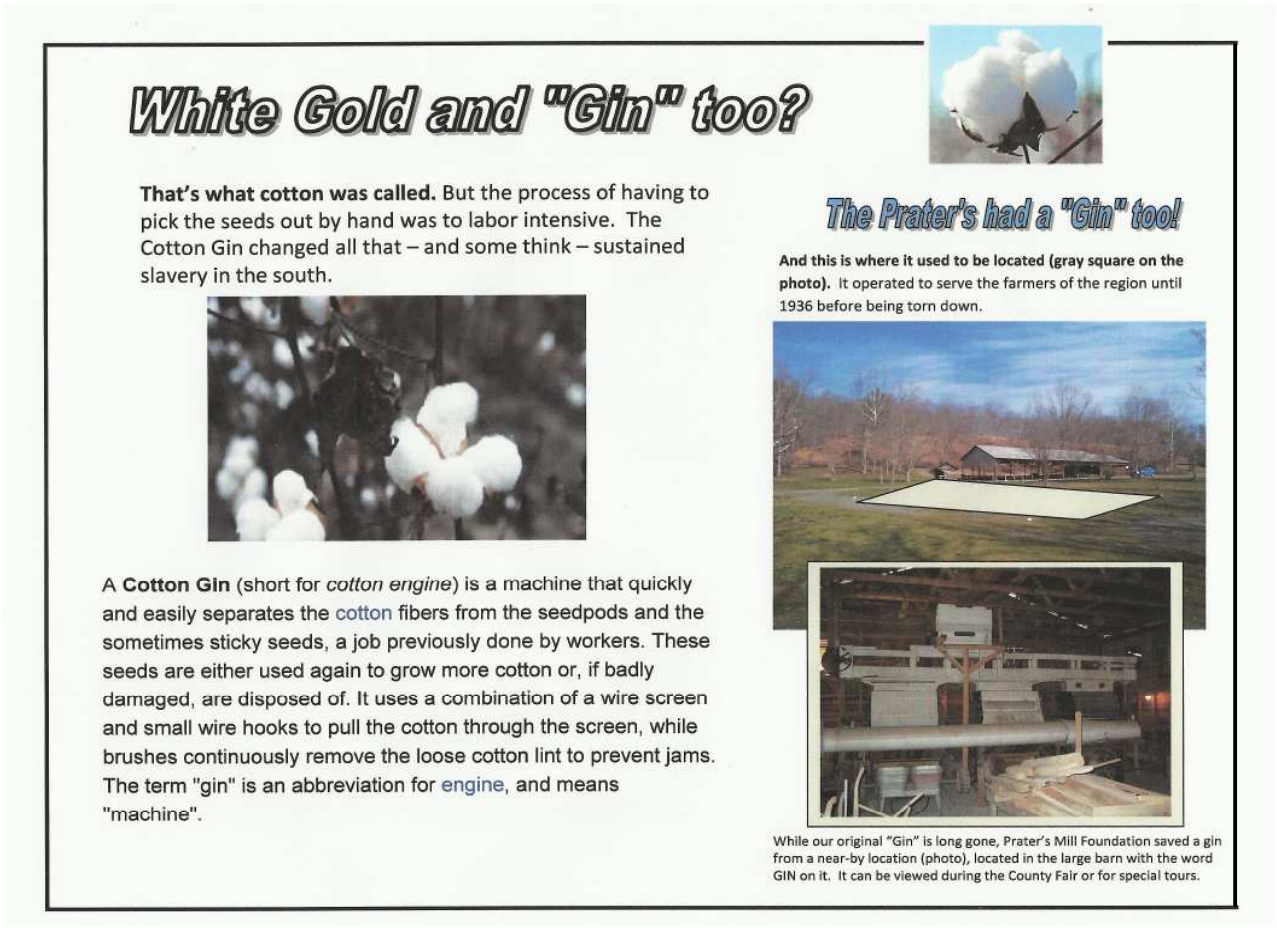
13. Use colorful language (metaphors, puns, quotations, etc.).

14. Make the interpretive panel contact with the visitor enjoyable so they will be drawn to look for other panels.

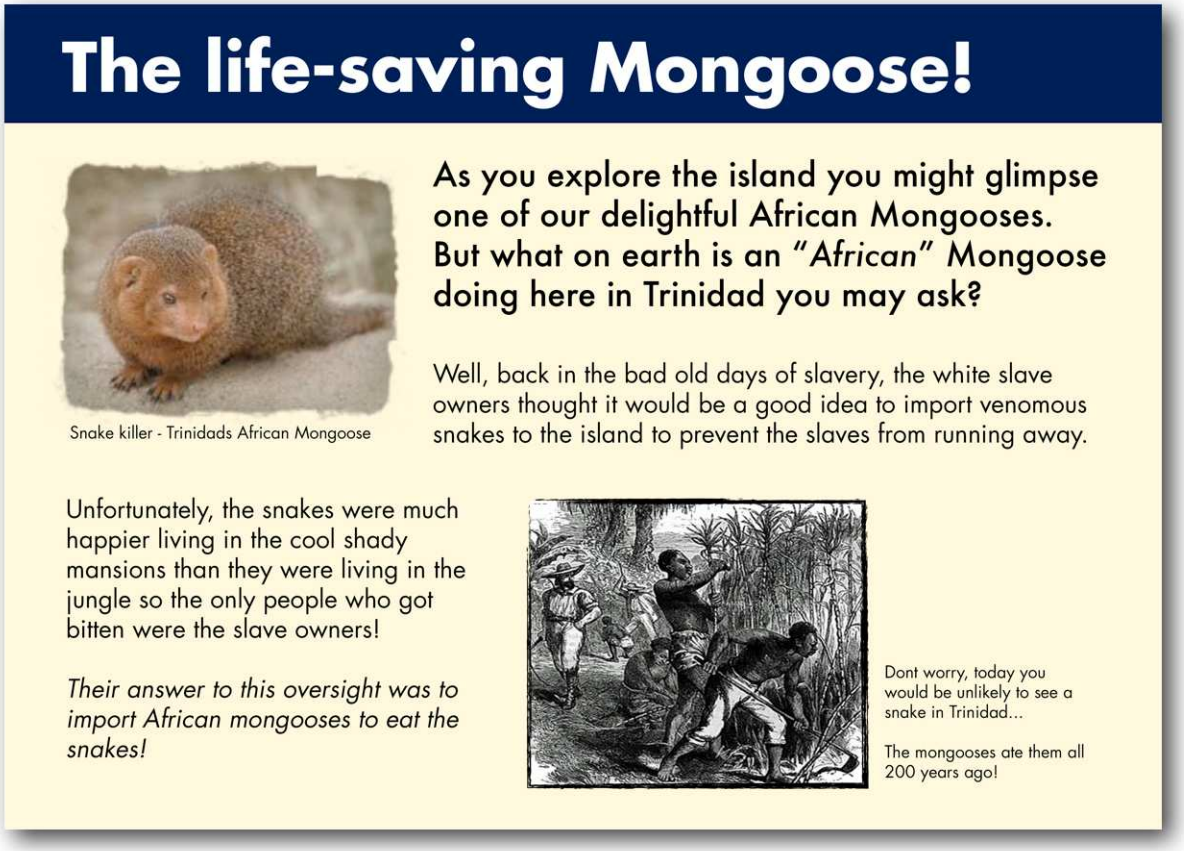
15. If the panel is boring it is NOT interpretive!

If you remember 50% of what you see, here are a variety of interpretive panels that we feel illustrate the main points presented in this graphic standards document. Feel free to add your own examples you may see when you visit other interpretive sites to add to this collection.

An interpretive panel designed to serve as a management tool.



This panel was designed for a historic site self-guiding tour.



Panel designed by Cris Emberson (HDC Consulting).

Planning interpretive panels and having a "tool" to help is something I have always used. Our interpretive panel planning worksheet is on the following page. One form would be filled out for each panel on the trail.

Remember, there should be objectives for the total trail and an interpretive theme for the trail that each panel would work to illustrate.

Interpretive Panel Planning Worksheet

Project:

Panel #:

Theme or Topics:

Panel Header (Provoke):

Main Concept to be interpreted:

Panel Location:

Panel Objectives:

Learning Objectives:

Behavioral Objectives:

Emotional Objectives:

Audience (vandalism issues?)

Panel Materials and specifications (size, shape, etc.)

Maintenance issues:

Framing System:

Panel add on interpretive elements

(3-D attachments, audio devices, activities):

Warranty (yes, no):

Evaluation Pre-testing

Planners notes:

Panel Design Check List:

____ Provocative header

____ Provocative graphic

____ Text in 30 point size or larger

____ Use headline effect – larger for main copy, smaller for secondary copy.

____ Text around 100 words or less.

____ Use of Provoke in text.

____ Use of Relate in text.

____ Use of Reveal in Text.

____ Used simple language, analogies, metaphors, etc.

____ Warranty

____ Framing System

____ Appropriate for its landscape location

Using Interpretive Leaflets for your trail interpretive media.

With the advent of computer in-house design and publishing the use of interpretive leaflets and broucures allows you to expand the interpretation on your trails base a sign-in-place trail. Remember, the exact same planning process goes into play for leaflets and publications as was used for interpretive panels.

Think of a interpretive trail guide as "10 really tiny interpretive panels". Really.

- The trail still has to have a main interpretive theme.
- Each trail stop has to illustrate that theme.
- Each trail stop can use similar graphics as for the panel - just less.
- Each trail stop should be about 50 words or not more than two 50 word paragraphs.

But as the printed trail guide is done on a computer, for one trail you can do "mass customizaaton".

- Have a spring, summer, autumm and winter printed trail guide.
- Have the printed trail guide in different languages.
- Have the trail guide at different knowledge levels.
- And the trail guide needs to follow Tilden's Interpretive Principles.

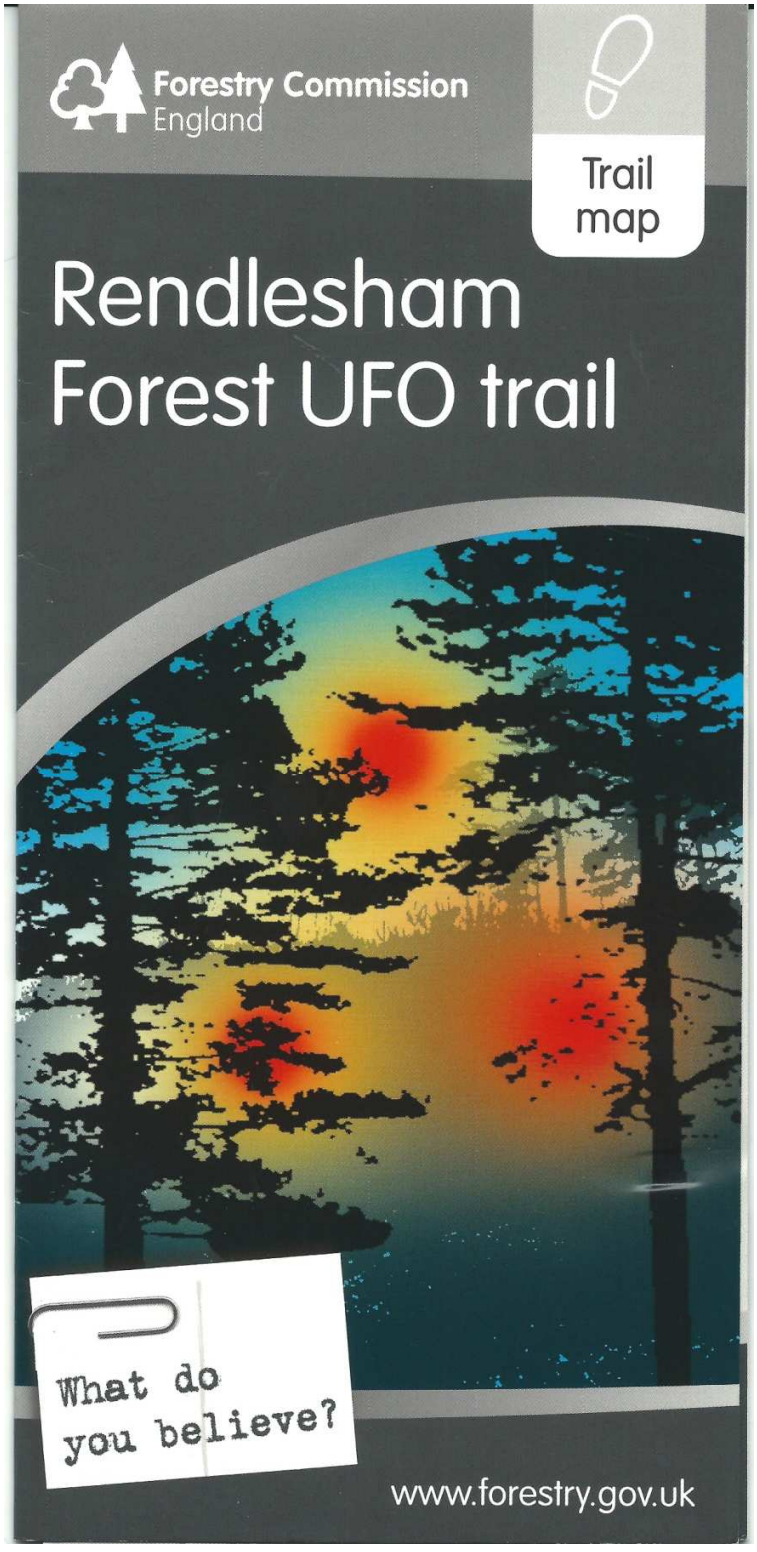
With the trail guides being computer designed and printed in house, gives you the chance to pre-test evaluate the guide and your stops and easily make any corrections.

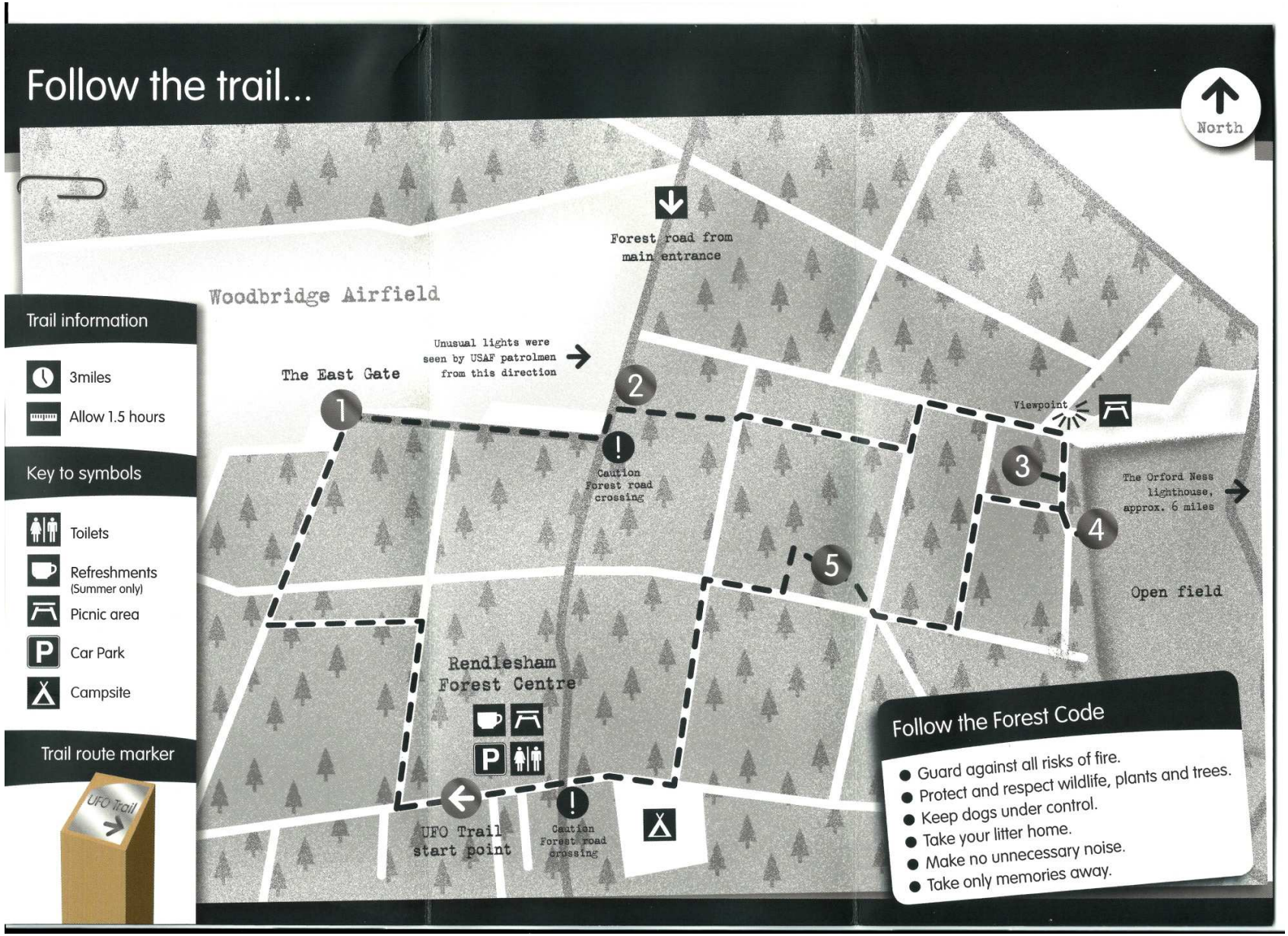
Distribution:

- You can have distribution boxes as previously illustrated at trail heads.
- You can have the trail guides as PDF's on your web site and visitors can print their own copies or download the guide to their smart phones.

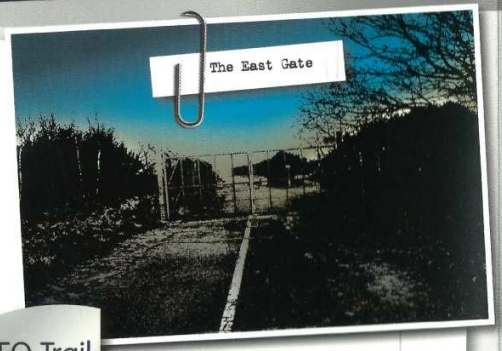
As you would have a minimum cost in production, this can be a very cost-effective interpretive media that gives you a maximum of design and content flexibility.

I wanted to give you another example of a really nice and "unusual" trail guide developed by a person attending one of my interpretive training courses. If you are a UFO believer then you will recognice the location for this self-guided trail and trail guide.


Forestry Commission
England
Trail
map
Rendlesham
Forest UFO trail
What do
you believe?
www.forestry.gov.uk


Follow the trail...
North
Forest road from main entrance
Woodbridge Airfield
Unusual lights were seen by USAF patrolmen from this direction
The East Gate
1
2
Caution Forest road crossing
Viewpoint
3
The Orford Ness lighthouse, approx. 6 miles
4
5
Open field
Rendlesham Forest Centre
UFO Trail start point
Caution Forest road crossing
Trail information
3miles
Allow 1.5 hours
Key to symbols
Toilets
Refreshments (Summer only)
Picnic area
Car Park
Campsite
Trail route marker
UFO Trail
Follow the Forest Code
Guard against all risks of fire.
Protect and respect wildlife, plants and trees.
Keep dogs under control.
Take your litter home.
Make no unnecessary noise.
Take only memories away.

Read the story...



UFO Trail 1

The East Gate

Just after 2am on the morning of 27th December 1980, two USAF security police patrolmen saw unusual lights through the trees outside the East Gate to RAF Woodbridge Airfield. Could they have belonged to an aircraft from an unfriendly power? The patrolmen obtained permission from their on-duty flight chief to leave the airfield and investigate. They were joined by two further USAF personnel, but one was ordered to remain on patrol at the East Gate, and so three went into the forest on foot.

UFO Trail 2

As you cross the forest road, imagine the search

The first sightings from the air base had been of lights in the sky – a strange glow. As the men entered the forest, radio contact with the air base began to break down and so one of the search party remained on the edge of the forest to keep contact. Two men therefore continued deep into the forest until they approached the eastern edge. It was here they reported seeing a shape in a clearing! Walk on to Point 3 on the map.

UFO Trail 3

Imagine the sighting

At the clearing towards the edge of the forest the patrol were to report that they had spotted a conical object about the size of a car, floating on beams of light just 12 inches above the ground.

There was a mist surrounding it and the craft appeared to be metallic with black markings on one side. They tried to approach the object – it was like walking in slow motion. Suddenly the craft rose rapidly in a flash of light and disappeared. Had the patrolmen been spotted?

The search party returned to base to report their observations. They wondered if the craft would return.

The next day air force personnel searched the area. Some of the trees surrounding the clearing had broken tops, and they found three small triangular depressions on the ground, 1.5 inches deep and 7 inches wide. Radiation levels were taken – they were 10 times the normal background level. What did all this mean?

In 1980 the trees around the clearing were tall and mature rather like the areas you have just walked through, since first crossing the forest road. The sector immediately in front of you has been replanted since the reported incidents. However, there are clearings within the recent planting where trees did not re-grow. Had the strange lights somehow contaminated the area?

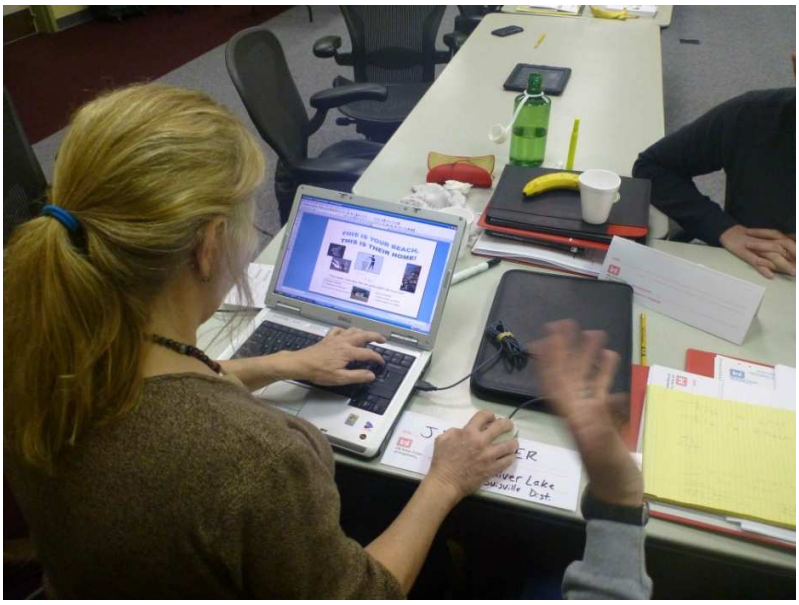
I hope you enjoyed seeing this example - great story, nice design and well written. A good interpretive trail guide is one that the visitor would want to keep. Would you want to keep this one? Would you like to walk this trail and discover more.

This trail could also have cell phone interpretation to accompany the trail guide too.

In this section I wanted to give you some solid baseline information on creating and using interpretive media for your interpretive trail, expecially if you are new at interpretive trail planning and design, and in developing interpretive trail media.

Visit other sites, walk other trail and take photos of their trail media and designs that you like - build your own photo and example library, and try new design and media ideas. If you come up with some really great ones, do an article on your work or present your concepts at a interpretive conference.

When you have done interpretive planning for a while you will quickly learn that there is more than one good idea or design. You just have the job to pick the best one for your theme, audience and objectives. Good luck.



Interpretive panels being created in a COE interpretive services course.

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