



Dear Friends of North Cascades,

I am pleased to announce that the National Park Service is beginning a plan that focuses on solutions to the effects of repeated flooding in the Stehekin River corridor within Lake Chelan National Recreation Area. This plan will be crafted with help from you – our neighbors, visitors, and partners.

This planning process is based on the direction given in the 1995 Lake Chelan General Management Plan and 1995 Lake Chelan Land Protection Plan. The plan will articulate steps needed to continue the implementation of the Lake Chelan NRA General Management Plan and Land Protection Plan that are compatible with existing laws, regulations and policies guiding the NPS and other agencies in the Stehekin Valley.

Your role in this process is a critical one – that of helping the NPS to develop the best possible plan for the lower Stehekin valley based on full understanding of all of the issues affecting the area. As this plan is developed, there will be a series of opportunities for public involvement and I invite you to participate in them. We are now receiving public scoping comments.

Among the questions that we will consider in this plan are the following:

- What changes should be made to public roads and recreational and administrative facilities that are being affected by flooding and erosion within the Stehekin River corridor?
- What bank erosion and flood protection measures are appropriate along the Stehekin River to protect public and private property from flooding?
- Should the NPS acquire or exchange lands to allow the Stehekin River to migrate within its natural floodplain?
- How can the interested groups and individuals associated with Stehekin work together to protect the resources of the Stehekin River corridor and maintain a community?

Check the schedule for a workshop near you and plan to attend. Comments may also be provided in writing before the close of the public scoping period and at other times during the planning process.

I hope you will join with me in creating a sustainable future for the Stehekin River corridor. Thank you for your help!

Sincerely,

Palmer (Chip) Jenkins
Superintendent, North Cascades National Park Service Complex

You’re Invited to a Workshop

- To help launch the planning process;
- To learn more about the proposed Stehekin River Corridor Implementation Plan;
- To learn about the current understanding of river dynamics and issues in this corridor;
- To contribute your ideas, concerns, and thoughts;
- To talk with the planning team; and to begin
- To understand the proposed scope of the plan and timeframe for its completion.

We encourage you to attend one of these workshops. Your ideas are important for developing a successful plan. You may also provide written or electronic comments. See information under “Contact Us.”

Tuesday, January 22, 2008, 3:00 pm – 5:00 pm
[Stehekin, Washington](#)

Golden West Visitor Center and Administration Building
Stehekin Landing

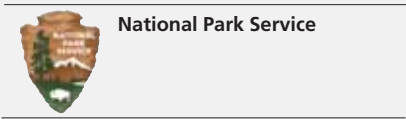
Wednesday, January 23, 2008, 6:00 pm – 8:00 pm
[Wenatchee, Washington](#)

Okanogan – Wenatchee National Forest Headquarters
215 Melody Lane, Wenatchee, Washington

Thursday, January 24, 6:00 pm – 8:00 pm
[Seattle, Washington](#)

Seattle Mountaineers Olympus Room
300 Third Avenue West, Seattle, Washington

The workshops will be conducted in an open house format. Following an initial presentation by the superintendent, the technical committee will present a slideshow illustrating some of the purposes of and needs for the plan, as well as a review of the information about the current river dynamics. Participants will then be invited to share their ideas about issues and solutions within smaller groups set up around the room. Each sub group will be staffed by planning team members.



Contact Us

Please send us your scoping comments:

National Park Service
Lake Chelan National Recreation Area
Stehekin River Corridor Implementation Plan

Contact Information

Address
810 State Route 20
Sedro-Woolley, WA
98284-1239

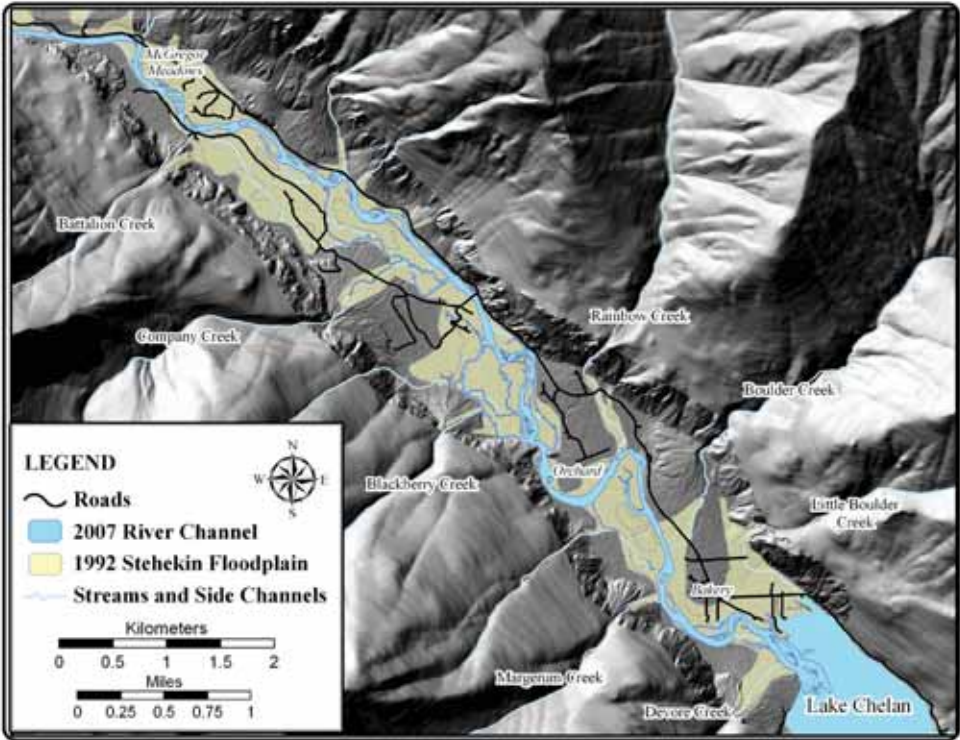
Fax
(360) 856-1934

Comments may also be submitted online at this Planning Website:
<http://parkplanning.nps.gov/noca>

What is the Stehekin River Corridor Implementation Plan?

In accord with §102(c) of the National Environmental Policy Act (NEPA) of 1969, the National Park Service (NPS) is undertaking a conservation planning and environmental impact analysis process to determine future management of public and private lands in the lower Stehekin River Valley within Lake Chelan National Recreation Area (Lake Chelan NRA).

An Environmental Impact Statement (EIS) will be prepared for a Stehekin River Corridor Implementation Plan and a revised Land Protection Plan for Lake Chelan NRA, which would guide land exchanges and purchases in lower Stehekin Valley. The EIS and Land Protection Plan will provide updated, detailed management direction for continued implementation of the 1995 General Management Plan.



Due to the severity of many issues and the need for urgent solutions before the next big flood, this implementation plan is being developed within a short two-year time frame.

Completion is scheduled for fall 2009. All proposed actions will follow existing laws, regulations, and policies, as well as identify sources of funding and responsible parties.



Purpose and Need

Based on a preliminary review of flooding and erosion issues on the Stehekin River, the NPS has developed a working draft statement of purpose and need for the Stehekin River Corridor Implementation Plan (SRCIP). The statement of purpose and need is an essential part of the preparation of a Draft Environmental Impact Statement (Draft EIS) for the plan and is therefore required to comply with the National Environmental Policy Act (NEPA). Based on this statement of purpose and need, issues are defined and alternative management actions are developed.

Purpose and Need: The three largest recorded floods on the Stehekin River have occurred within the past twelve years – in 1995, 2003 and 2006; prior to this, the last large flood of similar magnitude occurred in 1948. Because of ongoing impacts to federal lands and private property in the lower Stehekin valley from the increase in the magnitude and frequency of flooding, sustainable management strategies and actions are needed to fulfill the intent of the Lake Chelan NRA General Management Plan (GMP) (NPS, 1995) to allow for natural processes associated with the Stehekin River to occur; to maintain park facilities (including the road system, nearby campgrounds, and administrative areas); and to help ensure the persistence of visitor services provided by the Stehekin community.

Some of these management strategies and actions were identified by the 1995 Lake Chelan GMP. Among other actions, the GMP called for the relocation of park facilities out of the floodplain. The GMP and accompanying Land Protection Plan (NPS 1995) also called for the continued purchase and/or exchange of private lands within the floodplain. While based on the GMP, this Stehekin River Corridor Implementa-

tion Plan would provide more detailed management guidance based on continuing research and monitoring. This plan is also intended to update the Lake Chelan Land Protection Plan.

Changes in the origin, magnitude and frequency of floods have led to a shift in floodplain boundaries, and a recurring threat to public and private facilities. Prior to the late 20th century, like most rivers on the east slope of the Cascade Range, the Stehekin River was prone primarily to spring snow-melt flooding. Since the 1970s, however, the Stehekin has become more likely to flood during fall rain-on-snow floods, which rise quickly and occur from mid-October through December. Because of channel changes associated with the most recent three large floods, smaller floods now inundate areas that were not within the 100-year floodplain prior to 1995. Other areas that were within the floodplain have now become part of the active river channel. These changing hydrological conditions and the rapid accumulation of large woody debris and flood-deposited sediment along the Stehekin River have led to a landscape that requires management changes not envisioned by previous plans or treated holistically in actions on federal lands or private property to date. This plan will identify the most effective and sustainable strategies and actions for future management of the Stehekin River Corridor based on the laws, regulations and policies that guide the administration of NPS lands.

Current Information about the Stehekin River

This section of the newsletter summarizes the current state of knowledge about the Stehekin River. More detailed information will be available at the January public meetings. Knowledge about the Stehekin River is built upon inventory, monitoring, and research conducted primarily on the lower 10 miles of the river above Lake Chelan since the USGS installed a flow gage in 1911.

The Stehekin River drains an area of 220,000 acres (344 miles²) of mostly public lands within Glacier Peak Wilderness Area, Lake Chelan National Recreation Area, and North Cascades National Park. Steep slopes, a dense network of tributary streams, and the location of the river's headwaters along the Pacific crest lead to the frequent and rapid rise of floodwaters on the river, perhaps more so than any other river in eastern Washington.

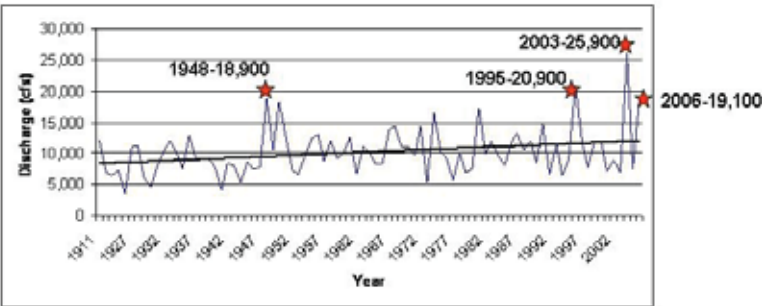
The shape of the watershed results in the junction of three major tributaries within a five-mile reach above the lower valley. Deep bedrock canyons within this zone deliver water, sediment, and large wood quickly to the wide, lower valley below High Bridge. The narrow box canyons are ideal sites for the formation and failure of temporary debris dams, which add an unpredictable nature to flooding on Stehekin River. Some evidence indicates that the temporary formation and rapid failure of a debris dam on the Stehekin River above High Bridge led to the record peak flow of 26,000 cfs in October 2003.

Analysis of nearly 100 years of flow records indicates that in about 1975 the Stehekin River switched from a system dominated by spring snow melt floods to one dominated by larger, more frequent fall rain on snow floods. The three largest floods on record occurred in the past 12 years and were fall events. Although more research is needed, it appears that this shift is a result of climate change.

The gradient of the river at its confluence with Agnes Creek is about 80ft/mile, decreases to 50 ft/mile above McGregor Meadows, and to 25 ft/mile just above Lake Chelan. However, gradient steepens locally in reaches with straight, narrow channels where the river encounters large tributary alluvial fans of Company, Rainbow and Boulder creeks (river kilometer 2-3, 6-7, and 11-12). The relatively straight, steep reaches are net transport zones for sediment and large wood, and as a result are areas of relative channel stability. Wood and sediment storage zones between these reaches are characterized by the existence of massive log jams, multiple side channels, and channel instability. Examples include the McGregor Meadows area and where the river meets Lake Chelan.

Annual total sediment load of the Stehekin River is estimated at 32,000 yd³/year; with

Stehekin River Flood History

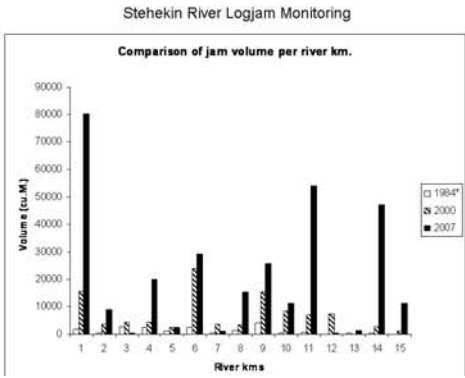


Current Information about the Stehekin River

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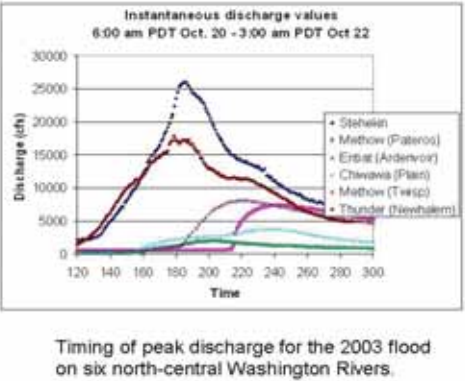
about 17%, or 5,600 yd³/year, transported along the bed of the river as gravel. Gravel movement past any one point along the river probably varies annually by 100%, or more, with larger quantities of sediment moved during large flood events.

As recently as 1972, the U.S. Army Corps of Engineers, under contract with the Federal Disaster Assistance Administration (the precursor to FEMA), removed most large logjams on the Stehekin River below Harlequin Bridge. The Federal Disaster Assistance Administration funded this removal of large woody debris as an attempt to reduce the flood and erosion risk to private property. Three comprehensive inventories of large wood accumulations in 1985, 2000, and 2007 have documented a significant increase of large woody debris accumulations on the lower Stehekin River. There are currently 166 logjams consisting of 10 or more pieces on the lower river that contain a total volume of 400,000 cubic yards. In the 2000 survey, there were 101 logjams with a total volume of about 130,000 cubic yards. In response to bank instability along the lower Stehekin River, the NPS and private landowners have installed numerous bank protection measures. A recent inventory identifies more than 40 sites, with most concentrated in the McGregor Meadows and river mouth areas. Most of these sites



have rip rap bank protection, but rock barbs have become the favored approach in the past 15 years, with a total of 30 structures at 8 sites. Five of the rock barbs placed on the Stehekin River before the 2003 flood are submerged in sediment and ineffective hydraulically less than 15 years after installation.

The U.S. Geological Survey studied the effects of rock groins and rip rap on stream velocity (Nelson, 1986). The National Park Service examined the hydraulic effect of rock barbs using two-dimensional models at upper Company Creek Road and at Stehek-



in Road mile 2.2. Based on the models and direct observations, the effect of the barbs is generally confined to the same side of the river, about 100-200 feet downstream of the lowest barb in a series.

Only one extensive flood control project is in place in the lower Stehekin valley. A 400 ft long, 4-5 ft tall levee was constructed by the NPS in the early 1980s along the upper Company Creek Road at mile 5.5. Flooding in the lower valley is influenced by the level of Lake Chelan. Chelan Public Utility District showed in a 2000 study that the backwater effect of Lake Chelan at full pool extended nearly ¼ mile upstream of the river mouth, raising the 100 year flood elevation ½ foot.

Several features of the Stehekin valley underscore the need for careful land use planning to avoid repeated flood damage. These include the flood prone nature of the Stehekin watershed, large gravel transport, rapidly growing logjams, channel instability, the potential for the formation and sudden failure of debris dams in canyons above High Bridge, and a history of river manipulation to manage bank erosion and flooding. A shift in the last 30 years from spring

floods to larger, more frequent fall floods makes comprehensive planning even more critical.



Damage caused by flood waters from the Stehekin River.

Chronology and features of the ten largest floods on the Stehekin River			
Date	Flood type	Discharge cfs	Recurrence Interval
October 20, 2003	Intense rainfall	25,900*	100-500 years
November 29, 1995	Rain on snow	20,900	100 years
November 7, 2006	Rain on snow	19,100	100 years
May 29, 1948	Snow melt	18,900	100 years
November 7, 1948	Rain on snow	18,400	50-100 years
December 26, 1980	Rain on snow	17,300	50 years
June 16, 1974	Snow melt	16,600	25 years
November 24, 1990	Rain on Snow	14,700	10 years
June 2, 1968	Snow melt	14,400	10 years
June 10, 1972	Snow melt	14,400	10 years
June 21, 1967	Snow melt	13,900	10 years
* flood discharge an estimate due to gage malfunction			



Stehekin River Corridor Implementation Plan Issues

The following preliminary issues have been identified based on discussions with NPS and interagency staff and the Stehekin Community. They are a starting point for public involvement and comment, and include:


- Sustainability of public and administrative roads within the Lower Stehekin Valley. Public and administrative roads are now threatened by flooding and erosion in several locations. Comprehensive analysis to determine what steps would be needed to maintain the public and administrative road system is needed, including identifying possible reroute locations out of the floodplain and the associated environmental impacts.
- Possible relocation or modification of recreational and administrative facilities within the Lower Stehekin Valley. Changes in the river have caused significant shifts in floodplain boundaries for the 100-year flood. Developed areas which did not flood before 2003 now flood frequently, placing some recreational and administrative sites and facilities in the Lower Stehekin Valley at risk.
- Updating the Lake Chelan Land Protection Plan: The Land Protection Plan was designed in large part to protect the river corridor from development. An update is needed to determine how previous land protection priorities would be modified by new information and by lands acquired since the plan was developed.
- Providing guidance for erosion and flood protection measures in the Lower Stehekin Valley, including management of large, woody debris and restoration of riparian areas. Public and private erosion and flood management have not been coordinated, and more comprehensive analysis of the impacts of flood and erosion structures is needed. Large wood accumulations affect bank erosion, flooding and recreational use of the river. Two areas of particular concern are McGregor Meadows and where the river meets Lake Chelan.

Potential Management Actions

Potential management actions for the plan may include combinations of the following or other actions identified during the planning process. All proposed actions will follow existing laws, regulations, and policies, as well as identify sources of funding and responsible parties.

- Continue reactive response to periodic flooding by installing bank erosion protection devices or relocating the Stehekin Valley Road on a case-by-case basis;
- Continue to be available to respond to requests from private landowners regarding appropriate actions to take to evade the consequences of flooding;
- Continue to evaluate the suitability of lands for exchange as requests for exchanges are made or as the NPS acquires new land;
- Use new floodplain mapping to identify new threats to private and public structures;
- Reinvigorate the land exchange process to remove development from the floodplain;
- Use new floodplain mapping to identify what lands can be managed sustainably under existing conditions (with structures or facilities);
- Update the Land Protection Plan to identify potential new exchange lands outside the floodplain;
- Continue research to determine the efficacy of long-term bank stabilization (erosion protection) measures;
- Analyze stability and effect of log jams to determine if limited manipulation would protect certain areas from major flood and erosion damage;
- Relocate parts of the public road system from the floodplain;
- Work with landowners to remove endangered private facilities from the floodplain;
- Remove derelict structures and debris piles from floodplain;
- Remove non-native plants from floodplain;
- Relocate campgrounds or campsites;
- Restore native riparian vegetation in developed areas to slow channel migration and improve the biological integrity of the riparian zone.
- Accept some facilities in floodplain.




National Park Service
U.S. Department of the Interior

North Cascades National Park Service Complex
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Sedro-Woolley, WA
98284-1239

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View of Lake Chelan

Lake Chelan National Recreation Area and North Cascades National Park Service Complex

LAKE CHELAN NATIONAL RECREATION AREA IS ONE MANAGEMENT UNIT WITHIN the North Cascades National Park Service (NPS) Complex. The Stehekin Valley is part of Lake Chelan National Recreation Area (Lake Chelan NRA). The North Cascades NPS Complex is comprised of North Cascades National Park, Ross Lake National Recreation Area, and Lake Chelan NRA, a complementary suite of protected lands, united by a contiguous wilderness overlay. Combining these three distinct units under a single unique administration recognizes their shared purpose of preserving the core of the greater North Cascades ecosystem and wilderness while also advancing their individual purposes.

SRCIP Planning Team

NATIONAL PARK SERVICE STAFF from North Cascades NPS Complex, the NPS Pacific West Regional Office, and the NPS Denver Service Center have been selected for the SRCIP Planning Team. The core team consists of those individuals that will have sustained involvement during the planning process, while the extended team members will be called upon regularly to provide needed information. The core and extended teams will be assisted in data gathering and analysis of information by a Technical Committee, which consists primarily of individuals from other public agencies, but includes a private consultant with experience in Stehekin. Residents of the Stehekin Valley, public individuals and non-profit groups will also contribute to the development of the plan by helping to identify issues and assisting with a review of alternatives and their potential impacts.



Rafters on the Upper Stehekin River.

Stehekin River Corridor Implementation Plan Schedule

Planning Steps	Date	Public Involvement Opportunities
Determine the Scope of the Project and What Issues to Address in the Plan Determine issues and concerns, and gather and analyze information, both internally from NPS staff and partners and externally from the Stehekin Community and general public, as well as from non-profit organizations and community groups. Create a preliminary list of resources that would be affected by the proposed plan (impact topics).	January – February 2008	√ Attend a public scoping workshop and provide comments. √ Provide written comments until March 1, 2008. √ Read Public Scoping Summary newsletter and send in your comments. √ Check the project website for detailed information.
Develop and Evaluate Preliminary Alternatives Identify a reasonable range of alternative management actions, conduct a preliminary assessment of their potential impacts, analyze public comments, and select a preferred alternative.	March – June 2008	√ Attend a public alternative development workshop and provide comments. √ Read Summary of Alternatives newsletter and send in your comments. √ Check the project website for detailed information.
Prepare a Draft Environmental Impact Statement (EIS) Prepare a draft plan describing the scope of the plan, how it is derived from previous planning documents and how it will solve the problems it discusses through management alternatives. Identify the relative impacts of each alternative. Summarize the differences among alternatives and their impacts. Publish and distribute the plan.	March 2008 – June 2009	√ Read Draft Stehekin River Corridor Implementation Plan / EIS and send in your comments. √ Check the project website for updated information.
Prepare a Final EIS Analyze internal and external (public) comments, revise the draft plan and publish and distribute the Final Environmental Impact Statement.	July – September 2009	√ Check the final plan to determine how your comments were addressed.
Prepare a Record of Decision (ROD) Write and facilitate approval of ROD. Discuss differences between draft and final plans in ROD and changes wrought by public comments.	September – October 2009	√ Await final decision. √ Check the project website for updates.
Implement the Approved Plan Complete management actions as allowed by time and funding.	Following waiting period after publication of ROD.	√ Track implementation of the approved plan. √ Check park website for updates.