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Large Wood Stakeholder Committee

Final Report and Recommendations
October 2009

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Photographs courtesy of Josh Latterell & Terry Butler, WLRD

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LARGE WOOD STAKEHOLDER COMMITTEE

INTRODUCTION AND SUMMARY OF RECOMMENDATIONS

October 2009

King County's Department of Natural Resources and Parks, Water and Land Resources Division, convened a Large Wood Management Stakeholder Committee in June 2009 to advise the Division regarding its practices and protocols for large wood management in King County rivers. Specifically, the Committee was convened to address concerns regarding the safety of recreational river users as it relates to large wood.

This report describes briefly the ecological, historical and regulatory context for large wood management, followed by a summary of the Committee's recommendations on three key topics: 1) the need for enhanced outreach and education to recreational river users, 2) procedural protocols to ensure stakeholder engagement in King County's large wood placement activities, and 3) procedural protocols related to the management of naturally occurring wood in rivers. Detailed recommendations on each topic are provided in three companion documents to this report.

LARGE WOOD IN KING COUNTY RIVERS

Pacific Northwest rivers and streams have historically contained large amounts of naturally-deposited logs and log jams. Trees typically fall into rivers as a result of bank erosion, channel avulsion and wind-throw. Wood plays a major role in channel forming and stabilizing processes, physical habitat formation, sediment and organic-matter storage and the formation of flood refuge habitat for fish. Periodic floods may also redistribute wood out of some reaches and into others. However, during the 19th and 20th centuries, logging, navigational improvements and flood control efforts resulted in the removal of most of the large wood from Pacific Northwest rivers, including those in King County.

The historic removal of large wood contributed to the degradation of fish and wildlife habitat, including habitat for several species of fish currently listed as threatened under the Endangered Species Act (ESA). Salmon as well as other fish hold tremendous cultural and economic importance for the State's native tribes. They are also the drivers of a substantial statewide economic sector related to both commercial and recreational fishing.

It is now widely believed that placing large wood in local rivers is vital to the recovery of threatened salmonids. Installation of constructed log structures is frequently included as a major component of habitat restoration projects in local salmon habitat recovery plans and is often required as mitigation for habitat impacts resulting from public works projects and other human activities.

Today, King County places wood in rivers for several reasons. First, actions to repair and maintain flood protection facilities often include installation of large wood in combination with rock and live plant materials. The function of the wood is to stabilize the bank as well as to deflect and slow erosive stream velocities while also providing ecological benefits.

Second, King County is often required by permitting agencies to install wood as mitigation for unavoidable impacts associated with a variety of capital projects. Permitting agencies – such as the Washington Department of Fish and Wildlife (WDFW), the U.S. Army Corps of Engineers (USACE), and the County Department of Development and Environmental Services – routinely require the placement of large wood in rivers as mitigation for in-water impacts.

Finally, the County designs and constructs projects that restore ecological function to wetlands, streams and rivers as a core component of its salmon recovery efforts. Wood is used to improve ecological processes that create complex, productive habitats that are self-sustaining.

It is within this context that the Committee's recommendations address recreational safety in King County rivers. Boating and other water-oriented recreation have a long history in King County's culture. A preliminary 2009 King County baseline study characterized recreational river usage along each of the County's major rivers by type and intensity of use, by river reach and by season. The study found that patterns of recreational use are very diverse, with some river reaches used only by expert groups (e.g., experienced whitewater kayakers)during specific flow conditions, while other reaches are used for a wide variety of recreational activities that span multiple seasons.

It is widely recognized that river recreation, including swimming, boating, fishing and tubing, carry varying degrees of risk. The level of risk is influenced by many factors, including the person's level of experience, skill, and judgment, as well as conditions in the waterway, such as flow levels, depth, turbulence, velocity, temperature, bank form, and instream elements, such as large wood.

The Committee's recommendations highlight the primary importance of outreach and education, and provide for predictable and transparent processes for the County's large wood management activities that ensure consideration of recreational safety.

COMMITTEE COMPOSITION AND ACTIVITY SYNOPSIS

The Committee comprised a diverse group of individuals and organizations (committee members are listed on the sidebar of the first page of this report). King County benefitted

greatly from the variety of perspectives and opinions shared by Committee members. All members are committed to the health of our rivers and understand the role of wood in ecological processes, but initial perspectives differed in several key areas, such as:

- The extent of personal versus government responsibility in assuring the safety of persons engaged in recreational activities;
- The degree to which the County should alter large wood placement projects to reduce recreational risks if those alterations result in reduced ecological value; and
- The role of the County in ensuring safety from risks posed by naturally occurring wood in rivers.

The group met four times between June and September, 2009. The group met for the first time on June 17 to learn about the County's wood management activities and engaged in extensive discussion about King County's placement of large wood in rivers. While not objecting to the use of wood, several members of the group wanted to ensure that these projects are designed to fully minimize any hazards to recreational river users. Other group members agreed that safety is a high priority, but also want to make sure that large wood projects are not so "diluted" in response to safety considerations that those projects essentially lose any habitat benefit or fail to serve their primary ecological or structural purpose. Group members shared their ideas, questions and concerns, establishing a framework for future Committee meetings.

Meetings of the Committee were subsequently held on July 15, August 19, and September 16. The July and August meetings focused on the procedural protocols for the placement of large wood in rivers, while the September meeting was devoted to the discussion of natural wood management, i.e., how the county responds to reports of natural wood that may be hazardous to recreational river users. The topic of education and outreach was a prevalent theme throughout the process.

Committee members agreed that the ability to share divergent views through a constructive process was valuable – not only for King County, but also to enhance the understanding and communication between the various interest groups participating in the process. The Committee encourages King County to continue to reach out to as broad a range of interests as possible in dealing with all aspects of large wood management in the County's river system.

RECOMMENDATION 1: ENHANCE RIVER SAFETY EDUCATION & OUTREACH

River recreation is inherently dangerous. However, most risks can be avoided or substantially minimized through thoughtful planning, preparation and decision making on the part of recreational users themselves. The State, County, cities, schools and non-governmental organizations all have a role to play in educating County residents about river

dangers and how to stay safe on the water. The Committee's specific recommendations can be found in the companion document.

Committee members also wanted to have a better understanding of the extent of the problem. How many people are killed or injured each year on King County rivers? Of those, how many incidents are associated with large wood? How many with wood that has been placed in the river intentionally?

The Committee heard from the King County Sheriff's Office regarding the types and frequency of river accidents over the past several years. The Sheriff's office provided information on a substantial number of accidents, noting that no deaths or injuries could be specifically ascribed to large wood, and that there have been no known incidents in King County involving intentionally placed wood. However, natural wood has caused boats or other watercraft to flip, but other factors – such as inexperience, the lack of life jackets, poor judgment, use of alcohol and/or drugs appear to be the primary factors in most river accidents that lead to injury or death.

Committee members asked that other public safety officials be consulted about the details of river accidents, noting that local fire departments and other rescue groups may have additional data to share. WLRD staff collected accident information from several local jurisdictions that was primarily anecdotal in nature, due to the absence of any formal data collection system. The information largely supported what had previously been provided by the Sheriff's office. All of the accumulated accident information is available by request from the WLRD project manager for this effort.

Although they approach the issue of large wood in rivers from very different perspectives, Committee members unanimously agreed that a greater effort is needed to both inform and educate the general public about the dangers inherent in swimming or floating on King County rivers. King County continues to make improvements in its procedures and design decisions related to large wood projects to address safety for river users, but ultimately each individual must determine how he or she will interact safely with flowing river waters.

To that end, the Committee made a number of recommendations on ways to enhance and improve education to the general public, and those recommendations are attached.

RECOMMENDATION 2: PROVIDE PREDICTABLE, MEANINGFUL AND TRANSPARENT INVOLVEMENT FOR STAKEHOLDERS IN LARGE WOOD PLACEMENT PROJECTS

In March 2008, King County issued a report and a series of protocols related to the emplacement of large wood in the County's rivers. The Committee reviewed the protocol and provided a number of suggested improvements; in particular, ways in which the County could improve stakeholder involvement as projects are being introduced and designed. The recommended protocol is attached as a companion document to this report.

In summary:

- Committee members were highly attentive to issues of safety, and this is emphasized in the recommendations. Members noted that King County project engineers continue to increase their awareness and use of safety elements in their designs, with new solutions being proposed on a regular basis. This enhanced responsiveness to safety considerations is appreciated by Committee members.

- Committee members were very concerned about the possibility of habitat improvements becoming overly "diluted" in order to meet recreational safety concerns, and suggested that "off-site mitigation" be considered in situations where these two important goals cannot be simultaneously achieved. This suggestion is included in the recommendations for a revised protocol. Under an off-site mitigation scenario, a different stretch of the same river might be used as a location for a wood placement project; that is, if similar habitat benefits can be achieved in a stretch of a river that is nearby but not in an area of high recreational activity, then that alternative site might be selected as the location for the large wood project.

- The Committee's recommendations recognize that the responsibility for design decisions rests with the County's multi-disciplinary design teams and licensed engineers. However, the committee also believes that public safety is an important consideration and that the knowledge of stakeholders can in many cases help to produce projects that meet all of their primary design objectives while minimizing risks to recreational river users.

- The group further noted that basic engineering professional standards already require consideration of safety and risk, and that ultimately design decisions must be left to those who assume liability. The Committee's recommendations, then, put a strong emphasis on notification to stakeholders when projects are in the "conceptual" or planning stage. This will provide stakeholders with an opportunity to provide informed input at a time when suggestions can successfully be incorporated into project designs. The recommendations also ask that information continue to be shared as projects near final design, but design decisions are left up to King County engineers.

- Committee members discussed the importance of understanding where rivers are being used the most, and for what recreational purposes, noting that not all wood emplacement projects will be situated in areas of high recreational use. Accordingly, the Committee recommends a "threshold evaluation" that would identify where projects are under consideration, how likely they are to pose safety concerns, and the link between those projects and areas of high recreational use. Stakeholder involvement should be emphasized for those projects where the evaluation suggests a potential for recreational risk.

- While the Committee provided specific recommendations relating to the number and timing of annual stakeholder meetings, all members recognize that there are many

different types of projects undertaken by the County that operate on different timelines. For example, many flood damage repair projects need to be designed, permitted and constructed in a short amount of time (prior to the next flood season), while some restoration projects may be years in the making. Thus, as the County considers these recommendations, the emphasis should be on capturing the Committee's intent for predictable, meaningful and transparent opportunities for stakeholder engagement.

RECOMMENDATION 3: CLARIFY AGENCY POLICIES, ROLES AND PROCEDURES FOR RESPONDING TO REPORTS OF HAZARDOUS NATURALLY-OCCURRING WOOD

King County's March 2008 report also includes a protocol for how the County responds to reports of natural wood accumulations that may pose a hazard to recreational users. In brief, following a joint assessment by the WLRD and by the Sheriff's office, the County may choose to leave wood in place or to respond by repositioning, altering or removing natural wood.

The Committee agreed in large part with the County's current protocol. Recommendations focus on the following topics:

- The respective roles and responsibilities of agencies involved in the response to natural wood need to be better clarified so that the public understands who to contact and who is responsible for subsequent actions;
- The bar should be high for the removal or significant alteration of natural wood and should only be applied in cases where recreational risks cannot be adequately reduced by other means;
- The ecological "cost" of wood alteration or removal must be considered as part of the decision-making process;
- County staff must follow up with individuals who report potentially hazardous natural wood to describe the resolution of the issue.

KEY INFORMATION GAPS AND UNRESOLVED ISSUES

The Committee identified several information gaps that may significantly affect the County's ability to manage both placed and natural wood in a way that appropriately balances sometimes conflicting goals and is consistent with the County's policies. In addition, the Committee identified certain unresolved issues that fall outside of its expertise, but that bear on the matters at hand.

- Currently there is no readily available source for credible, objective data about the extent of river accidents and deaths in general, and much less so for those directly related to large wood. Thus, the scale of the safety problem is not clear at this time.
- The County needs credible analysis of how well modified (and unmodified) large wood placement projects perform in terms of their ecological and structural objectives. Are the ecological objectives being diluted in achieving recreational safety objectives?
- Some of the Committee's recommendations emphasize signage and other efforts to warn users of river dangers. However, the committee recognizes that these actions may affect the level of liability incurred by the County. This is an obviously important legal question that the Committee is not equipped to address.
- Several committee members who are engaged in expert recreation (such as whitewater kayaking) questioned the authority and expertise of the Sheriff's office in evaluating river safety and the justification for river closure in particular. Committee members offered suggestions about how to integrate the knowledge of expert users into decisions about the degree of danger for different user groups during different flow conditions. This is a topic that offers opportunities for future collaboration between river experts and the King County Sheriff's office.

Finally, the Committee's recommendations also call for a periodic evaluation of the County's procedures pertaining to the placement of large wood in particular. Committee members hope that the County will call on members of this Committee to play a role in that evaluation process in years to come.

LARGE WOOD STAKEHOLDER COMMITTEE

RECOMMENDATIONS FOR EDUCATING RECREATIONAL USERS REGARDING RIVER DANGERS ON KING COUNTY WATERWAYS

LARGE WOOD STAKEHOLDER COMMITTEE

RECOMMENDATIONS FOR EDUCATING RECREATIONAL USERS REGARDING RIVER DANGERS ON KING COUNTY WATERWAYS

The Large Wood Stakeholder Committee has reviewed and discussed information regarding safety education for recreational users of King County rivers.

Committee members agree that there are two categories of river users who must be kept informed about naturally-occurring and placed wood. The first is "professional" river users – river fishing/guiding businesses, for example, or those who are expert at kayaking and canoeing. These individuals know that large wood can pose a danger. They are alert to locations along the various rivers within King County where wood is apt to naturally accumulate, as well as the areas where projects have been constructed using large wood. Likewise, these frequent river users are adept at spotting wood well in advance, and at maneuvering their vessels to avoid any danger. They need to know where there are accumulations of large wood, any dangerous water flow conditions, and locations of large wood emplacement projects.

The second category of concern are the casual recreational users, those, for example, who "float" the river a few times a year and who are unfamiliar with how to read water levels and be alert for wood. Unsupervised children and teenagers are of special concern, since they lack the judgment required to determine if and how a river is safe to float, and often float on inner tubes or other devices that lack maneuverability. The use of alcohol or drugs can also be a factor in impaired decisions.

King County cannot be responsible for individual decisions related to recreational river usage. The Committee emphasizes that, ultimately every individual is personally responsible for how he or she interacts with King County's rivers.

The County's Department of Natural Resources and Parks can, however, in combination with the King County Sheriff's Office, assist with efforts to better inform the public about areas where naturally occurring wood may pose a danger, as well as those river reaches where wood has been deliberately placed to achieve habitat and bank stabilization benefits.

The Committee recommends the following actions to help educate the public about the dangers associated with recreational river uses:

1. Institute a mandatory life vest law.

Currently, Washington State Law requires children 12 years old and younger to wear a life jacket or other Coast Guard approved personal floatation device whenever boating in a vessel less than 19 feet in length. Ultimately more lives will be saved if more users are required by law to wear life vests. Some counties in Washington State already have such laws in place. King County should follow suit and make life vests mandatory for all users on moving water. This should be accompanied by an educational effort similar to that used for bike helmet safety; a campaign that strongly encourages people to abide by the law for their own safety.

2. Target the most vulnerable population.

Available data indicate that the demographic most likely to incur an injury while on the river are young males (approximately 16-22 yrs. old) who ignore river dangers. Educational materials, public service announcements, and other safety campaign efforts should place a particular emphasis on this age group.

3. Place informational/warning signs at popular access points.

Signs warning of potential dangers should be placed at all locations of "easy access" – popular places for casual users/floaters to enter the river. These signs should warn of strong currents, cold water, high flows, and the possibility of being snagged by wood. The signs should graphically demonstrate the types of injuries, or even death, that can occur if users ignore the dangers posed. The signs may be augmented by more general information about "what to see" on the river, its history, and its contribution to healthy ecosystem functioning in King County.

4. Offer alternative access sites.

At areas with a high rate of accidents, signs notifying users of alternative recreational sites should be posted. These would help to steer recreational users away from the most dangerous river stretches.

5. Place "Large Wood Ahead" signs in key locations.

Along recreational river routes, "large wood ahead" signs should be placed well before a user will encounter either deliberately placed wood or known accumulations of naturally occurring wood. These signs will provide ample warning to users to move away from the danger ahead. King County has initiated such a program already in certain locations, and would expand upon this effort as more projects are built within the County's river systems. However, the committee recognizes that it is not desirable to have a multitude of

signs along our scenic river corridors, and that County staff cannot be expected to have knowledge of all natural wood accumulations. Thus, signage should be emphasized in areas of high recreational and where the amount and orientation of wood may pose a significant hazard.

6. Use radio, television, and social marketing to spread information.

Many casual river users are unlikely to consult an official website prior to entering the river, but may be listening to television or radio. Public service announcements should be aired to warn people of the dangers they may encounter when using King County rivers. These efforts should be timed to coincide with known, high-risk seasons, such as unseasonable warm weather during spring run-off conditions. Likewise, social marketing options, such as a Listserv or Twitter, should be employed to warn of known, potentially dangerous conditions.

7. Incorporate safety messages into habitat education programs.

Many school districts offer comprehensive educational programs related to the environment, including a curriculum focused on the importance of our rivers and streams for fish and wildlife. The programs are often delivered by non-profit partner organizations. The river safety message could be coupled to these efforts so that school children will learn that, while our rivers are a precious natural resource, they can also be very dangerous for the casual recreational user.

8. Link river closure/safety information to professional user groups and local jurisdictions.

There are a number of organized river guide groups throughout King County, and a number of cities where access to rivers is easy and popular. King County should make a concerted effort to provide a continual flow of information about river conditions and safety to these entities. This could be accomplished most effectively through the use of e-mail or other electronic alerts that would be issued to these entities whenever a river is running at levels that are too high and fast for safe usage, when natural wood accumulations pose a particular threat, and when projects have been installed that may pose a new danger to users. These professional organizations and the cities involved would then be asked to forward/feature this information on their own websites.

9. Expand and improve existing brochure

King County, in partnership with Washington State Parks and Recreation Commission Boating Programs, has developed a brochure that describes the functions of LW in and along river and stream channels and provides boating safety guidelines, rules and tips.

This brochure's availability should be advertised through links to all applicable river recreation pages, and with links to local river boating organizations. The brochure should include information about specific risks related to large wood, such as the sieve effect and potential snagging.

LARGE WOOD STAKEHOLDER COMMITTEE

RECOMMENDED PROTOCOL FOR CONSIDERATION OF PUBLIC SAFETY IN PLACEMENT OF LARGE WOOD IN KING COUNTY WATERWAYS

LARGE WOOD STAKEHOLDER COMMITTEE

RECOMMENDED PROTOCOL FOR CONSIDERATION OF PUBLIC SAFETY IN PLACEMENT OF LARGE WOOD IN KING COUNTY WATERWAYS

I. BACKGROUND

Pacific Northwest rivers and streams have historically contained large amounts of naturally-deposited large woody materials recruited through bank erosion, channel avulsion and wind-throw. Wood has played a major role in channel forming and stabilizing processes, physical habitat formation, sediment and organic-matter storage and the formation of flood refuge habitat. However, during the 19th and 20th centuries, logging, navigational improvements and flood control efforts resulted in the removal of most of the large wood from Pacific Northwest rivers, including those in King County.

For many reasons, it is neither possible nor desirable to return to the wood clearing practices of the past. The historic removal of large wood contributed to the degradation of fish and wildlife habitat, including habitat for species currently listed as threatened under the Endangered Species Act (ESA). It has become widely understood and accepted that placing large wood in local rivers is vital to the recovery of threatened salmonids. Installation of constructed log structures is frequently included as a major component of habitat restoration projects in local salmon habitat recovery plans and is often required as mitigation for habitat impacts resulting from public works projects and other human activities.

Today, King County places wood in rivers for several reasons. First, the repair and maintenance of streambank protection facilities frequently incorporate bioengineered bank stabilization techniques, which may include installation of large wood in combination with large rock and live plant materials. The function of the wood is to stabilize the bank as well as to deflect and slow erosive stream velocities while also providing ecological benefits.

Second, King County is often required by permitting agencies to install wood as mitigation for unavoidable impacts associated with transportation projects and other activities. Permitting agencies – such as the Washington Department of Fish and Wildlife, the U.S. Army Corps of Engineers, and the County's own Department of Development and Environmental Services – routinely require the placement of large wood in rivers as mitigation for in-water impacts and may exercise their authority to approve final project designs.

Finally, the WLRD Ecological Services Unit designs and constructs projects that restore ecological function to wetlands, streams and rivers. Wood is used to improve ecological

processes that create complex, productive habitats that are self-sustaining, as is necessary for implementation of approved watershed recovery plans. Wood is installed to capture and stabilize sediment, absorb hydraulic energy, create geomorphic complexity such as scour and plunge pools and gravel bars, shade and cool water, recruit food species and other nutrients, and provide refuge areas for fish.

It is within this ecological and regulatory context that the proposed protocol addresses recreational safety in King County rivers. Boating and other water-oriented recreation have a long history in King County's culture. It is widely recognized that watersports, including swimming, boating, and floating, carry considerable risk. This risk is influenced by many factors, including the person's level of experience, skill, and judgment, as well as conditions in the waterway, such as flow levels, depth, turbulence, velocity, temperature, bank form, and instream elements, such as large wood. Many recreational water users consider large wood to be a potential hazard, depending on its location and positioning within the channel.

The proposed protocol provides a predictable and transparent process to ensure that recreational safety is explicitly considered during the design of large wood projects. The committee's recommendations recognize that the responsibility for design decisions rests with the County's multi-disciplinary design teams and licensed engineers. However, the committee also believes that public safety is an important consideration and that the knowledge of stakeholders can in many cases help to produce projects that meet all of their primary design objectives while minimizing risks to recreational river users.

II. PURPOSE

- To define and document procedural standards that address public safety issues in the design of projects involving the placement of large wood in identified recreational waterways (rivers and streams) in King County.
- To define and document procedural standards that give full consideration to impacts on public safety and health and that minimize hazards to recreational water users or property.

III. ORGANIZATIONS AFFECTED

This procedure applies to all departments and divisions within King County

IV. DEFINITIONS

- Large wood (LW): Downed or fallen trunks and limbs $\geq$ 1 m in length and $\geq$ 10 cm in diameter, as well as rootwads. Large wood may be living or dead, but does not include rooted, standing vegetation. (Large wood is also known as large woody debris, course woody debris, snags, and large organic debris.)

- Large wood placement: The *direct human action* of adding large wood to rivers by physically depositing pieces in or near the river, or by installing them in an engineered structure, for any purpose, including flood protection, bank stabilization, mitigation, and habitat improvement or restoration.

- Large wood recruitment: The natural action of adding new pieces of large wood to the river as a whole, or to a specific location in the river. This action results from the delivery of large wood from: 1) forests by tree death and toppling, bank undercutting, wind-throw and breakage, avalanches, and/or landslides; and 2) upstream reaches via transport by water and subsequent trapping by shoals and bars, boulders, trees, and other channel obstructions. Recruitment may be the indirect result of human actions (for example, removal of channel constraints and riparian tree plantings) that restore those natural processes.

- Identified recreational waterways: waterways or waterway segments that are used for water-oriented recreation in King County. These waterways have been identified as those that are readily accessible for recreational use. Proposed changes to the County's original list (per Appendix C of the March 2008 Report) are based on the MacIlroy report (June 2009) and not on the independent work of the committee. These changes are highlighted below with italicized font. It should be noted that this list is based on the best available information as of August 2009. It will be regularly updated and augmented with data about the recreational use of specific river reaches as well as data about river accidents involving wood. The application of this protocol must be based on regularly-updated, objective data.

    - South Fork Skykomish River, County Line to Foss River Camp [*possibly several tributary additions per MacIlroy 2009*]
    - North Fork Snoqualmie River, Mouth to Sunday Creek (RM 16) [*according to MacIlroy 2009, recreational use extends only as far as Big Creek*]
    - Middle Fork Snoqualmie River, Snoqualmie Falls (RM 41) to Taylor River (RM 65) [*expand upstream to Hardscrabble Creek*]
    - South Fork Snoqualmie River, Mouth to Twin Falls State Park (RM 11) [*add upstream segment from Exit 52 to Denny Creek*]
    - Lower Snoqualmie River, Mouth to Snoqualmie Falls (RM 40)
    - *Lower Tolt River, Mouth to Forks (RM 8.7) – inadvertently omitted in original protocol*
    - North Fork Tolt River, Mouth to above Yellow Creek (RM 15)
    - South Fork Tolt River, Mouth to Dam (RM 21)
    - Raging River, Mouth to State Route 18 (RM 8)
    - Sammamish River, Lake Washington to Lake Sammamish

- Cedar River, Mouth to Landsburg Dam (RM 21)
- Green River, Mouth to Tacoma Headworks (RM 61)
- Miller River, Skykomish River to confluence of East and West Forks
- White River, County Line to Greenwater River
- *White River –RM 38 to RM 46 (need to reconcile with original above)*
- Greenwater River, White River confluence to Burns Creek
- *Issaquah Creek [recommended by some committee members but level of recreational use appears extremely low]*

V. PROCEDURAL STANDARDS FOR PLACING LARGE WOOD

1. Responsibility and Use of the Protocol

Each affected Department will designate a lead staff or workgroup to track and coordinate the process for consideration of public safety in projects involving large wood installations. The following procedures for stakeholder involvement will be adhered to, with the recognition that some procedures may need to be modified or streamlined to deal with emergency situations.

2. Develop initial project list and project objectives

- Identify list of all projects where large wood is likely to be installed.
- For each project, define the primary purpose of the project and the intended function of large wood.
    - Define goals and objectives for LW placement (e.g., bank stabilization, instream habitat improvement, restoration of natural river and floodplain processes).
    - Describe existing project site conditions, including type, intensity and seasonality of recreational uses, if known.
    - Describe the intended function of the wood, and how it is intended to affect the existing site conditions.
    - Define the context of the proposed project within County program objectives and mandates.
    - Determine the consequence of not completing the project or completing a project that only partially meets the intended goals and objectives at that site**.**

3. Develop conceptual-level project designs

Each project concept will need to be developed sufficiently to describe how large wood is likely to be placed or deposited within the project area. Draft placement locations and designs should be informed by professional expertise in fluvial geomorphology, ecology, hydrology and engineering as well as public safety considerations. The following are public safety factors to be considered but not limited to: flow velocity, depth and direction; wood location, wood elevation, configuration, and anchoring techniques; known recreational uses of the site; backwater flood impacts; and potential impacts on public and private infrastructure.

- Describe or show how large wood is proposed to be placed in the project, including approximate size, shape, location(s), and anchoring technique(s).
- Describe if large wood recruitment is an objective of the project, and if so, how.
- Describe if the wood is expected to remain fixed, or be dynamic (moveable).
- Describe how the wood is expected to function to meet the project's stated goals and objectives.
- Describe how public safety considerations have been addressed in conceptual design, including why and how any impacts to public safety will be minimized through the design of the project.

4. Conduct a "threshold" evaluation for the project list.

Although King County is responsible for numerous projects on an annual basis, not all of those projects are located in areas where they are likely to be encountered by large numbers of recreational river users. Accordingly, to aid in prioritizing project designs, a "threshold" evaluation will be conducted on the initial project list. This evaluation will help to sort and highlight those projects where safety concerns are likely to be most prominent. The threshold evaluation will:

- Determine whether a project is located in an area known for high areas of recreational activity;
- Consider the size, complexity and orientation of the project to determine how it may impact recreational users;
- Consult with the King County Sheriff to assess whether the project is located in an area where there has been a history of accidents involving recreational river users.

Based on this evaluation, King County will assemble a sorted project list that highlights where there is the highest likelihood of ongoing interactions between large wood emplacement projects and recreational users. This prioritized project list will then be broadly shared with interested stakeholders.

5. Conduct Broad Outreach to Interested Stakeholders

On an annual basis, King County will initiate an outreach effort to a broad array of stakeholders. The goal of this outreach program will be to gather as much relevant information as possible for consideration in the design of large wood projects. The program will include these steps:

Step One – Email and Other Notification to Stakeholders

"Stakeholders" as defined in this protocol spans a broad compendium of river user groups, environmental groups, tribes, cities, river residents and property owners, emergency responders and numerous others. The stakeholder involvement process will begin with an e-mail or other notification to all interested parties. The notification process will be designed to be as comprehensive as possible, and, at the very least, will include an on-line subscription service (e.g., Listserv) that will be established for this purpose. Printed/mailed notifications, as well as "social marketing" mechanisms, such as twittering, will also be implemented as appropriate.

The first notification will include the sorted/prioritized project list as developed by King County. The notification will also invite stakeholders to the Initial Project Meetings conducted to introduce and discuss the projects.

In addition to this broad notification, large signs describing projects in areas of high recreational use will be posted at key access points along County rivers; care will be taken to post these signs in areas where large numbers of users are likely to take advantage of readily available access to the river. The signs will invite anyone interested to participate in stakeholder meetings or to provide written comments, and will give definitive time limits for that participation.

Step Two – Initial Project Meetings

Two meetings will be held every year to introduce the project list. The meetings will focus on priority projects identified through the threshold analysis. The meetings will be identical, but will be held at different times and locations to make it as easy as possible for people to attend. One meeting should be held during daytime/business hours, with the other held during evening hours. King County project managers will describe the prioritized project list and their conceptual designs for each project that is 'above the line' based on the threshold evaluation. Attendees will be invited to ask questions and engage in discussion about the project list, including those projects that are not 'above the line' based on the threshold evaluation.

Step Three – Continued Participation as Requested

After an initial review of the projects, stakeholders may request the opportunity to provide additional comments following the completion of near-final designs. Project managers will notify interested individuals about the availability of detailed designs and the duration of any comment periods.

Step Four – Continued Communication throughout Design/Construction

As projects move through the final design and construction phases, King County will maintain a notification list of all interested parties to keep people informed about large wood projects. The notification system will provide information on subjects such as notification of final project design, construction updates, and project completion. The notification system will also keep stakeholders apprised of various educational efforts underway to prevent river accidents. The goal of this effort will be to keep stakeholders informed, and, at the same time, allow for two-way communication between project managers and the public, so there is a continual flow of information back and forth.

6. Consider a range of design options for large wood placement

As final design on projects proceeds, these steps will be taken:

- Evaluation of various strategies for locations and design of wood placement that both maximize project benefits and minimize public safety risks. Large wood placement locations and designs will be proposed based on both quantitative and qualitative factors, including performance criteria (e.g., function, lifespan, and stability), environmental context (e.g., channel morphology, hydrology, and existing riparian conditions), permit requirements and legal constraints, and stakeholder input on safety issues. Required permit conditions may constrain the range of options available for project design.

- Selection of a preferred project design option. An acceptable balance between project effectiveness and risk minimization will be sought. Project proponents, in open communication with stakeholders and appropriate permitting authorities, will determine if this balance can be achieved on a project-by-project basis. In locations where both goals cannot be simultaneously satisfied, efforts will be made to find a new alternative location nearby in the same river where equivalent benefits can be achieved without undue risk to public safety.

- Documentation of the design selection process.

- Report of findings, conclusions, and preferred project recommendations back to interested stakeholders .

7. Final design and permitting

- Complete the permit set of the design plans and apply for all applicable federal, state, and local permits. Permitting requirements and schedule will vary in relation to the type, location, and purpose of each proposed project.

- Modify project design plans, as necessary, to meet permit conditions and requirements. The committee recognizes the authority of permitting agencies to

require modifications to project designs and that soliciting additional input from stakeholders may not be feasible.

8. Monitor project outcome and apply adaptive management strategies

- Post-construction monitoring will be conducted per permit requirements to detect major structural changes or failure, to evaluated project conditions and effectiveness relative to projected outcomes and performance criteria, and to assess the need for maintenance or retrofitting. The timeframe and schedule for post-construction monitoring will vary in relation to the permit conditions imposed on each project.

- Monitoring will also attempt to identify unacceptable risks to public safety due to changes over time.

- Monitoring and adaptive management will be used to assess the need for new actions to avoid unreasonable risks to public safety. Actions may include:

    a. Removing or altering the position of structural components of the LW in order to change the nature of the risk;

    b. Issuing bulletins or news releases or disseminating informational materials to advise the public of the potential risks of the LW in the waterway; or

    c. Signing a waterway as hazardous and unsafe for recreational use, or in extreme circumstances, "closing" a portion of a waterway to recreational use until such time as the safety issue can be adequately addressed.

- If a situation arises that the King County Sheriff's Office or local jurisdiction determines may be life-threatening and requires an emergency response, they will take appropriate steps to secure public safety. King County Sheriff's Office (or other local jurisdiction) will work with King County WLR Division, River and Floodplain Management Unit to mitigate risks. Emergency measures may include, but are not limited to, posting warning signs, dispatching recue personnel, or closing the waterway to recreational use until the emergency situation can be addressed.

9. Final Documentation

- Project proponents will retain documentation of stakeholder involvement and input.

- The Department will maintain electronic or paper records of all LW project documentation.

10. Evaluate stakeholder involvement process and protocol

The Large Wood Stakeholder Committee (or its successor), will continue to serve as an important sounding board for King County's wood placement protocol and program. Each fall (following construction season but prior to flood season), the Work Group will

be convened for 1-3 meetings with DNRP and KC Sheriff staff to accomplish the following:

- Review previous construction season - How many projects were constructed over the summer and where were they located? How did the design process go, and was it satisfactory for all participants?
- Review river accident data compiled by KC Sheriff and other emergency responders. Have there been any accidents involving emplaced large wood?
- County staff will provide updates (if any) regarding changes in known patterns of recreational use. County staff will report on the biological and functional effectiveness of various projects, as that information becomes known and available. Staff will also provide a report on the effectiveness of King County's outreach/education efforts with regard to safety, as well as any other topics of interest to the Work Group.
- Based on the annual review, the Work Group may choose to recommend changes to the design process and protocol, educational/safety outreach program, or other aspects of King County's wood emplacement program.

LARGE WOOD STAKEHOLDER COMMITTEE

RECOMMENDED PROTOCOL FOR RESPONDING TO REPORTS OF NATURALLY-OCCURRING LARGE WOOD IN KING COUNTY WATERWAYS

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RECOMMENDED PROTOCOL FOR RESPONDING TO REPORTS OF NATURALLY-OCCURRING LARGE WOOD IN KING COUNTY WATERWAYS

I. BACKGROUND

Pacific Northwest rivers and streams have historically contained large amounts of naturally-deposited large woody materials recruited through bank erosion, channel avulsion and wind-throw. Wood has played a major role in channel forming and stabilizing processes, physical habitat formation, sediment and organic-matter storage and the formation of flood refuge habitat. However, during the 19th and 20th centuries, logging, navigational improvements and flood control efforts resulted in the removal of most of the large wood from Pacific Northwest rivers, including those in King County.

For many reasons, it is neither possible nor desirable to return to the wood clearing practices of the past. The historic removal of large wood contributed to the degradation of fish and wildlife habitat, including habitat for species currently listed as threatened under the Endangered Species Act (ESA). Since wood removal is no longer a common, accepted practice, we can expect that the amount of natural wood in rivers will increase over time.

Wood in rivers increases the roughness of the channel which in turn helps to slow water velocities. Depending on its location, wood can reduce bank erosion, protecting both public and private infrastructure and other interests in floodplain areas. In other locations, wood jams play an instrumental role in the formation of new channels which may naturally lead to bank erosion.

Today, a fundamental assumption of the regional salmon recovery plan is that mature riparian forests are absolutely necessary for our rivers and streams to support robust salmon populations. Thus, tighter regulations and incentives have been developed to protect existing riparian forests. In addition, riparian replanting is a core long-term strategy for revitalizing riparian forests. One explicit reason used to justify riparian planting is that someday these trees will fall into the river to provide critical habitat functions as large wood. Thus, removal of large wood from rivers represents a setback in salmon recovery efforts that should be performed only as a last resort that must be fully mitigated, consistent with the permitting authority of local, state and federal agencies. This premise applies in all cases of wood removal or repositioning, whether performed for purposes of protecting public infrastructure or to reduce risks for recreational river users.

It is within this ecological and regulatory context that the proposed protocol addresses recreational safety in King County rivers. Boating and other water-oriented recreation have a long history in King County's culture. It is widely recognized that watersports, including swimming, boating, and floating, carry considerable risk. This risk is influenced by many

factors, including the person's level of experience, skill, and judgment, as well as conditions in the waterway, such as flow levels, depth, turbulence, velocity, temperature, bank form, and instream elements, such as large wood. Wood is a potential hazard to recreational river users, depending on its location and positioning within the channel.

The proposed protocol provides a predictable and transparent process to ensure that reports of hazardous natural wood are thoroughly investigated for their potential impacts to infrastructure and to recreational safety. Such investigations must also evaluate the ecological cost of wood removal or repositioning. The protocol articulates the roles and responsibilities of the WLRD and of the King County Sheriff's Office in responding to reports of hazardous wood and for communicating the results of investigations to interested parties.

II. PURPOSE:

- To document the procedure for responding to reports of naturally occurring large wood (LW) in waterways that may pose a hazard to people or property.
- To document protocols for interdepartmental coordination within King County in responding to reports of LW in waterways.
- To clarify the existing policy basis for King County's response to reports of natural LW in waterways.
- To document the procedure for providing feedback to the person(s) who filed the report following implementation of any action(s) in response to the report.
- To describe the procedure for sharing information with the general public about the findings of the investigation and potential hazards of LW associated with recreational uses in waterways.

III. ORGANIZATIONS AFFECTED:

All divisions and offices within the King County Department of Natural Resources and Parks and the King County Sheriff's Office.

IV. DEFINITIONS

- Large wood (LW): Downed or fallen trunks and limbs $\geq$ 1 m in length and $\geq$ 10 cm in diameter, as well as rootwads. Large wood may be living or dead, but does not include rooted, standing vegetation. (Large wood is also known as large woody debris, course woody debris, snags, and large organic debris.)
- Large wood recruitment: The natural action of adding new pieces of large wood to the river as a whole, or to a specific location in the river. This action results from the delivery of large

wood from: 1) forests by tree death and toppling, bank undercutting, wind-throw and breakage, avalanches, and/or landslides; and 2) upstream reaches via transport by water and subsequent trapping by shoals and bars, boulders, trees, and other channel obstructions. Recruitment may be the indirect result of human actions (for example, removal of channel constraints and riparian tree plantings) that restore those natural processes.

- Identified recreational waterways: waterways or waterway segments that are used for water-oriented recreation in King County. These waterways have been identified as those that are readily accessible for recreational use. Proposed changes to the County's original list (per Appendix C of the March 2008 Report) are based on the MacIlroy report (June 2009) and not on the independent work of the committee. These changes are highlighted below with italicized font. It should be noted that this list is based on the best available information as of August 2009. It will be regularly updated and augmented with data about the recreational use of specific river reaches as well as data about river accidents involving wood. The application of this protocol must be based on regularly-updated, objective data.
    - South Fork Skykomish River, County Line to Foss River Camp [*possibly several tributary additions per MacIlroy 2009*]
    - North Fork Snoqualmie River, Mouth to Sunday Creek (RM 16) [*according to MacIlroy 2009, recreational use extends only as far as Big Creek*]
    - Middle Fork Snoqualmie River, Snoqualmie Falls (RM 41) to Taylor River (RM 65) [*expand upstream to Hardscrabble Creek*]
    - South Fork Snoqualmie River, Mouth to Twin Falls State Park (RM 11) [*add upstream segment from Exit 52 to Denny Creek*]
    - Lower Snoqualmie River, Mouth to Snoqualmie Falls (RM 40)
    - *Lower Tolt River, Mouth to Forks (RM 8.7) – inadvertently omitted in original protocol*
    - North Fork Tolt River, Mouth to above Yellow Creek (RM 15)
    - South Fork Tolt River, Mouth to Dam (RM 21)
    - Raging River, Mouth to State Route 18 (RM 8)
    - Sammamish River, Lake Washington to Lake Sammamish
    - Cedar River, Mouth to Landsburg Dam (RM 21)
    - Green River, Mouth to Tacoma Headworks (RM 61)
    - Miller River, Skykomish River to confluence of East and West Forks
    - White River, County Line to Greenwater River
    - *White River –RM 38 to RM 46 (need to reconcile with original above)*
    - Greenwater River, White River confluence to Burns Creek

- *Issaquah Creek [recommended by some committee members but level of recreational use appears extremely low]*

V. POLICIES:

- Departments with authority and expertise in managing river and stream corridors within King County, including but not limited to the Department of Natural Resources and Parks and the King County Sheriff's Office, will coordinate response activities. These activities will involve investigation, development of action recommendations, and implementation of appropriate action(s).

- Reports of naturally-occurring large wood (LW) that may pose a damage or safety risk to homes, businesses, properties, public infrastructure, or recreational users should be investigated and evaluated to develop a recommendation for appropriate action.

- Recommended actions will take into account a wide range of considerations, including the nature of the hazard posed by the LW, the significance of the LW in the context of public safety and ecological functions, the feasibility and safety of workers to implement the action, and applicable regulations and legal mandates.

- Naturally-occurring LW that poses an unreasonable risk to public safety, public infrastructure or critical facilities may be repositioned, cut or trimmed, or removed (2006 King County Flood Hazard Management Plan, Policy RCM-1).

- Actions taken by the County will be done in a manner that is consistent with all other Federal, State, and Local policies and regulations. Examples of King County Policies that support the retention of large wood in rivers and streams and the goal of salmon recovery include the following policies from the Comprehensive Plan:

    - E-405 King County's efforts to restore and maintain biodiversity should place priority on protecting and restoring ecological processes that create and sustain habitats and species diversity.
    - E-406 King County should conserve areas where conditions support dynamic ecological processes that sustain important ecosystem and habitat functions and values. These areas include stream confluences, headwaters, and channel migration zones.
    - E-408 King County should take precautionary action where there is a significant risk of damage to the environment. Precautionary action should be coupled with monitoring and adaptive management.
    - E-422 King County recognizes the value of trees and forests in both rural and urban communities for benefits such as improving air and water quality and enhancing fish and wildlife habitat. The county promotes retention of forest

cover and significant trees using a mix of regulations, incentives, and technical assistance.

- E-438 As watershed plans are developed and implemented, zoning, regulations and incentive programs may be developed, applied and monitored so that critical habitat in King County watersheds is capable of supporting sustainable and fishable salmonid populations. Watershed-based plans should define how the natural functions and values of watersheds critical to salmonids are protected so that the quantity and quality of water and sediment entering the streams, lakes, wetlands and rivers can support salmonid spawning, rearing, resting, and migration.
- E-471 River and stream channels, stream outlets, headwater areas, riparian corridors, and areas where dynamic ecological processes are present should be preserved, protected and enhanced for their hydraulic, hydrologic, ecologic and aesthetic functions, including their functions in providing large wood to salmonid-bearing streams. Management of river and stream channels should consider other beneficial uses of these water bodies, including recreation.

VI. PROCEDURES

1. Initial Response to Reported Incidences of Naturally-Occurring Large Wood in River Corridors

All reports provided by the public or other agency personnel based on observation of LW in a King County waterway should be directed to the King County Sheriff's Office (KCSO), Marine Unit.

- Initial contact for the KCSO: James Knauss, Marine Unit Sergeant, at 206-296-7558 (w), or 206-423-8546 (c), or james.knauss@kingcounty.gov.
- Back-Up contact for the KCSO: Special Operations Captain, 206-205-8251 (w), 206-423-4742 (c).
- King County's website at http://www.kingcounty.gov/recreation/boating/rivers.aspx also includes information about how to contact the Marine Unit of the Sheriff's Department to report hazardous wood in rivers. The website includes both telephone numbers and email addresses for these contacts.

2. Emergency Conditions

If the KCSO determines that there may be a life-threatening situation, requiring an emergency response, they will take immediate steps to secure public safety. Emergency measures may include closure of the waterway to recreational use until a thorough assessment can be made of

the size, location, and orientation of the naturally-occurring wood. Wood will be removed as a last resort, and only if in the judgment of the responding officer poses an imminent, life-threatening situation that cannot be addressed by other means. KCSO will consult immediately with KC WLRD about the situation, in order to include fish biologists and fluvial geomorphology experts in the assessment. Any wood repositioning or removal requires an Hydraulic Project Approval (HPA) permit from the Washington Department of Fish and Wildlife prior to commencement of work. A verbal HPA may be secured in an emergency situation by calling WDFW's emergency notification hotline at 360-902-2537.

3. Preliminary Response

The King County Sheriff's Office (KCSO) Marine Unit will:

- Write up the initial report on an LW Investigation Form (see attachment A);
- Transmit a copy of the initial report to the Water and Land Resources Division (WLRD), River and Floodplain Management Unit; and
- Contact the WLRD to set up a joint inspection of the LW:
    - Initial contact for WLRD: Manager, River and Floodplain Management Unit, at 206-296-8011.
    - Back-up contact for WLRD: Engineer, River and Floodplain Management Unit at 206-296-8062.
- As a courtesy, contact the individual who notified the Marine Unit to let them know the information has been received and is being processed and assessed through the Sheriff's Department.

The WLRD will:

- Identify known flood protection facilities, easements or other river or stream access points in the vicinity of the reported LW;
- Make a preliminary identification of known infrastructure or facilities that may be near or affected by the LW; and
- Notify the WLRD Director of the initial report and will keep informed of subsequent findings.

4. Site Investigation

The KCSO and the WLRD will jointly:

- Identify location of LW based on report and determine time and location for a field inspection meeting, including the identification of proposed access point for the investigation work. Representatives from WLRD will include an engineer and either a fish biologist or fluvial geomorphologist. The Washington Department of Fish and Wildlife will also be called in as appropriate.
- The KCSO and the WLRD will inspect the LW together to:
    - Identify the potential risk posed by the LW to public infrastructure, flood protection facilities, or other critical facilities;
    - Identify the potential risk posed by the LW to other structures or property;
    - Identify the potential risk posed by the LW to recreational users within the waterway;
    - Identify the potential risk of LW mobilization during a flood, and consequent risk to downstream structures;
    - Evaluate the ecological function and habitat value of the LW;
    - Identify, if possible, known local fish use or redd (i.e., salmon nest) location in proximity of the LW;
    - Describe the conditions and complete an LW Investigation Form; and
    - Contact the King County Office of Emergency Management (OEM) Duty Officer at 206 296-3830 (24-hour number) to notify of LW situation, when warranted.

5. Evaluate Findings

The KCSO and the WLRD will collaborate to:

- Assess the risk relative to river or stream conditions (e.g., high or low flow conditions, high recreational use location or timing, and condition of existing facilities or infrastructure);
- Evaluate the risks to public safety due to flood hazards based on the policies in the 2006 King County Flood Hazard Management Plan and professional judgment of the KCSO and WLRD;
- Evaluate the risks to public safety for recreational users, based on professional judgment; and
- Assess ecological function of wood and impact to proximate fish use;
- Determine if an action to modify the LW should be recommended based on the risks to: a) public safety due to flood hazards; or b) public safety for recreational users.

6. Recommendation

In cases where it is determined that the LW poses a risk to public safety **due to flood hazards,** the WLRD will take the lead in coordinating with the KCSO and in making an action recommendation.

- If the WLRD recommends modifying the LW, it will be done in a manner consistent with the Policy RCM-2 in the adopted 2006 Flood Hazard Management Plan. RCM-2 states:

  "Repositioning or relocation of naturally-occurring large wood should be accomplished using the technique that results in the least disturbance to the river channel and riparian corridor. If repositioned or relocated, the wood should be put back into the river in a manner that does not create new flood or channel migration risks. If it is not practical or reasonable to return the large wood to the channel, it should be incorporated into an adjacent riparian corridor."

In cases where it is determined that the LW poses a risk to public safety **for recreational users**, the KCSO will take the lead in coordinating with the WLRD and in making an action recommendation. This action will follow the Flood Hazard Management Plan policies listed above.

7. Implementation of Recommended Action

Recommended actions may involve: a) removing or altering the position or structural components of the LW in order to change the nature of the risk; or b) employing other tools and strategies (such as signage and public education campaigns) to inform recreational users and to reduce exposure to the risk of the LW.

1. Modification of LW position or structure within waterways

   The WLRD will take the lead, in coordination with KCSO, in implementing the recommended actions to modify the LW within the waterway. Actions may include cutting, repositioning, relocating, or removing the LW, and will be performed as follows:

   - If the recommended action requires resources beyond those of WLRD, WLRD will coordinate with King County Department of Transportation's Roads Services Division, Special Operations Unit, to further evaluate the methods and feasibility of implementing the recommended action. King County will not perform actions that would put the safety of County workers at risk.
   - If the recommended action is determined to be feasible, WLRD will obtain the necessary permits or approvals, and work will be performed by WLRD, Roads Services Division or their designated contractors at the earliest practicable opportunity. The WLRD will share information with the KCSO regarding the anticipated timing and techniques involved in implementation.

- The King County Office of Emergency Management (OEM) will provide assistance, upon request by the KCSO or WLRD, in obtaining necessary resources for implementing LW modification actions.
- If it is determined that the recommended action is not feasible, does not meet permit requirements, or cannot safely be implemented, then alternative LW modification strategies will be explored. If no reasonable LW modification can be identified, then the WLRD will share this information with the KCSO. The KCSO may identify other strategies that can be implemented (see section G2 below).
- WLRD will monitor the remaining LW for changes in condition over time. New conditions may warrant a new field investigation and re-evaluation at a future date. This re-evaluation will be particularly important after flood events.
- If the modification results in loss of ecological function, the WLRD will mitigate for this loss in an area of the river that is close to the original LW site.

2. Strategies to Reduce Public Exposure to Risk from LW in waterways

- The KCSO will take the lead, in coordination with WLRD, in implementing the recommended actions to reduce public exposure to risk by increasing public awareness and managing allowable uses within the waterway, as follows:
  - KCSO may use its authority to close a waterway or portion of a waterway to recreational use if they determine its use may pose a significant risk to public safety under King County Code 12.44.
  - KCSO and/or WLRD will issue bulletins or news releases or disseminate informational materials to advise the public of the potential risks of the LW at the location in question. These bulletins will be posted on the King County website, with links from all applicable recreation pages, and coordination with local river boating organizations.
  - OEM will provide available resources, upon request by KCSO or WLRD, to assist in performing outreach to local jurisdictions to advise them of the potential risks of the LW in the waterway.

8. Final Documentation

- The investigation team will complete the LW Investigation Form and ensure that a copy resides with WLRD.
- The WLRD will maintain electronic or paper records of all LW Investigation Forms.
- The person who reported the LW will be contacted by KCSO or WLRD to be notified of actions taken. This communication will take place either via telephone or email.
- The OEM Duty Officer will be informed of the situation and the actions taken, as necessary.

LARGE WOOD STAKEHOLDER COMMITTEE

Meeting Summary

June 17, 2009

King County Department of Natural Resources and Parks
Large Wood Management
Stakeholder Work Group
June 17, 2009

Mercer Island Public Library

-- Meeting Summary --

Attendees

Committee members
Tom O'Keefe, American Whitewater
Martha Parker, At-large
Dave McCoy, Emerald Water Anglers
Chris Grieve, Northwest Flyfishers
Casey Garland, Rescue 3 Northwest
Judy Fillips, River Safety Council
Abby Hook, Tulalip Tribes (Alternate)
David Brock, Washington Department of Fish and Wildlife (Alternate)
Micah Wait, Wild Fish Conservancy
Keith MacDonald, Water Resource Inventory Area (WRIA) Forums – Salmon Recovery

Staff and guests
Margaret Norton-Arnold, Norton – Arnold Company (Facilitator)
Janne Kaje, King County (Project manager)
Mark Isaacson, Director, KC Water and Land Resources Division
Steve Bleifuhs, KC Water and Land Resources Division
Sandy Kilroy, KC Water and Land Resources Division
Nancy Faegenburg, KC Water and Land Resources Division

WELCOME

- Margaret Norton-Arnold welcomed members of the committee and thanked them for the time and energy that they have committed to this important effort. Norton-Arnold Company was hired by the King County water and Land Resources Division (WLRD) to serve as the facilitator for this process. She emphasized that the goal of this first meeting is to identify key issues and to share perspectives. In subsequent meetings we will spend time on identifying common ground and on developing potential solutions.

- Mark Isaacson, the director of WLRD, thanked the committee for their participation and explained how the committee's work will support the efforts of the division to

balance several important objectives, including flood protection, salmon recovery and public safety. The King County Council introduced an ordinance two days prior to the meeting that requires the County to develop administrative rules to address public safety in the emplacement of large wood in county rivers. Assuming that the ordinance will pass, the committee's advice will feed directly into that process [Note – Ordinance 2009-0367 passed the full council on June 29, 2009].

COMMITTEE INTRODUCTIONS

The committee members have a broad suite of interests, life experiences and levels of expertise in river recreation. The following descriptions are not meant to represent any single participant, but to demonstrate the breadth of interests and experiences on the committee. In many cases, several of the descriptions could be applied to the same participant. The committee comprises:

- Lifelong river recreation enthusiasts with extensive experience in whitewater kayaking, canoeing, rafting, etc.
- River fishing guides who often boat on King County rivers and believe large wood is integral to fish recovery and habitat restoration.
- River safety advocates concerned with the risks posed by wood to inexperienced river users in particular.
- Public agency personnel with responsibilities for salmon recovery.
- Environmental organizations, public agency and tribal representatives concerned with restoration of habitat processes and fish recovery.
- Expert river guides with substantial experience in river-safety training and rescue.

All committee members are familiar with the ecological role of wood in rivers, though to differing degrees. Some committee members have been involved in the large-wood management issue in King County for many years, while for others this committee is their first exposure to the large wood – river safety discussion. Committee members have in common their dedication to King County rivers, a desire to restore fish populations, and an understanding of the very real risks posed by large wood to river recreation.

KING COUNTY STAFF PRESENTATIONS

Sandy Kilroy, Rural and Regional Services Section manager for WLRD, described the multiple objectives and program areas that are housed within WLRD, including river management (e.g., flood program) and watershed management (e.g., salmon recovery, water quality, watershed planning). The division has been working for many years with this issue and with recreational interest groups to reduce risks to river users. The protocols for wood placement and for natural wood response are working well, but there

is always room for improvement and the formation of this committee is yet another important incremental step in the process. The division's large wood initiative includes several other components that complement the committee's work:

- A consultant has been hired to investigate the policies and practices of other jurisdictions regarding large wood and recreational safety. The committee will hear about the results of that effort in the near future.

- A second consultant has been hired to produce an initial description of the type, magnitude, location and season of recreational activities within the county's rivers and major tributaries. Several committee members have participated in that effort through written surveys and interviews.

- Division staff are working on a Cedar River Pilot Project to map out areas of natural wood accumulation, recreational activities, and critical infrastructure. This effort focuses on the development of management tools regarding large wood that recognize the uniqueness of river reaches from both a recreational and ecological perspective.

- The division also recognizes the importance of education and outreach in promoting river awareness and safety for all citizens in King County.

Nancy Faegenburg served as the lead staff member for the development of King County's March 2008 report regarding large wood management. She described the history of the large wood management issue over the past twelve years and highlighted key features of the protocols for wood placement and natural management, both included as appendices to the March 2008 report. These protocols are being actively used by all departments in King County with responsibility for wood placement and natural wood response. Consistent with the wood placement protocol, the County seeks community input regarding river users, risks and risk-minimization actions that should be considered in the context of a specific project. Project designs are often amended to reduce recreation risks. The natural wood management protocol defines the working relationship between the King County Sheriff and the divisions. The two entities work together to identify the best recourse for natural wood accumulations that pose hazards to boaters. Nancy also described a "gray area" that involves both protocols – the placement of wood that is subsequently intended to recruit natural wood.

Steve Bleifuhs, River and Floodplain Management Section manager, described how the number of river projects (and thus the number of projects that include large wood) will increase as a result of the new King County Flood Control Zone District which operates with an annual budget of approximately $35 million. Roughly 86% of the total budget is dedicated to capital project implementation. Hence, there is a greater need for public input . Steve noted that currently the program lacks a robust monitoring system at the project, reach and river scale, but that monitoring plans are currently under development. Steve described some of the projects that have been completed in recent years, as well as recent responses to natural wood accumulations that posed risks to recreational users.

DISCUSSION THEMES

The following 'themes' highlight some of the key discussion topics from the first meeting. They have been grouped into several general topic areas, but with the recognition that the topic areas have substantial overlap. As noted above, the goal of the first meeting was to share interests and perspectives, and to identify areas where the committee needs more information from County staff and perhaps others in order to develop informed recommendations. Hence, the themes do not represent conclusions or areas of agreement (except where noted), but a list of key topics explored during the first meeting. In some cases, the theme simply represents an expressed opinion of one or more committee members.

Technical/Ecological

- Different projects have different goals. In some cases wood is placed for both structural and ecological purposes, while other projects are constructed purely for ecological reasons.

- Complexity of large wood is related to its habitat benefits and to its potential risk to recreations. The more complex a wood jam, the more valuable to fish and likely the more dangerous to boaters/floaters.

- It is important to understand that wood and wood jams are dynamic over time. Both the structures and their functions (and thus benefits and risks) typically change over time. Wood may move, recruit additional wood, break apart or leave the system entirely.

- Several members are concerned that in addressing safety, the ecological value of wood may be substantially "diluted". This topic triggered a discussion about off-site mitigation and whether it may be appropriate/desirable (in the case of bank stabilization projects) to place wood elsewhere in a manner that emphasizes ecological value rather than integrating wood into the project itself.

- Wood location matters. WDFW requires that wood placed as mitigation must be in contact with water even at low flow to provide maximum benefits. Certain restoration projects have focused on placing wood structures in the floodplain where they will help to restore river processes during high flows but may have less direct benefits to fish during low flows.

- Similarly, wood placed in slackwater habitat may provide habitat benefits to a different suite of species than wood placed in faster-flowing portions of the channel.

Safety

- Regarding wood placement, the highest perceived risk associated with bank stabilization projects, rather than habitat restoration projects. Bank stabilization

typically occurs on outside bends of rivers which tends to also be the natural line of descent for boaters/floaters.

- Some committee members shared their perspective of large wood as the primary killer in river environments. The committee would like to receive information regarding the scale of the safety problem, i.e., the number of injuries, deaths, etc. associated with large wood in county rivers.

- Director Isaacson stated that King County public officials are absolutely committed to public safety as a high priority, especially in areas of high recreational use.

Policy

- Committee members questioned whether there is an underlying presumption of navigability in all of the county's rivers. Do all reaches need to be kept open to all users?

- The group discussed the role of individual responsibility in river recreation and the level of 'boating proficiency that we manage to'.

- Many bank stabilization-type projects are completed as emergency actions, but this leads to the avoidance of important permitting steps and associated opportunities for review and comment.

- One member asked whether the Endangered Species Act allows for thinking about different river reaches as having a different level of ecological importance. While the legal question was not answered, the committee discussed the fact that different types of reaches serve different functions for different species and lifestages. While it may be possible to prioritize certain reaches for a single species, there are multiple listed salmonids in King County rivers and non-salmonids may also be listed in the future.

<u>Note:</u> the last theme in this section may be placed in a 'parking lot' for future discussion as they are somewhat outside the primary emphasis of the committee's area of focus.

- Some committee members questioned the authority of the County Sheriff to close rivers to recreation. The group also discussed the expertise of the Sheriff's office in judging the safety of rivers for expert users. The closure of the Green River was described as an example. Members suggested that perhaps Sheriff's office could draw upon the expertise of local whitewater training/safety experts to assist with the assessment of river conditions.

Outreach

- Different users access information in different ways and may require different types of information to gauge river conditions. Are there ways to improve the provision of real-time river information regarding river conditions? WDFW was described as

having an effective e-mail distribution system for real-time changes in fishing regulations.

- The committee discussed the idea of developing river- and perhaps reach-specific relationships between flow levels and the level of risk to certain river recreation activities. For example, a particular reach at a certain flow level may be rated as "highly dangerous for all users, only the most expert whitewater users should attempt a descent".

- Some members noted that the County's website is not at all user-friendly in terms of finding the relevant information about river conditions, wood placement projects and warnings about natural wood.

- The internet is an effective tool for some users (mainly serious enthusiasts and professionals), but most casual river users need outreach, education and information through broader efforts, such as television public service announcements.

- It is important to emphasize the value of wood in education efforts and to explain why we place wood and/or allow it to accumulate.

- There are effective school-based education programs on topics of watershed health and salmon recovery. These should be linked explicitly with education about the importance of wood and the dangers of river recreation (example: education programs offered in schools by the Stilly-Snohomish Fishery Enhancement Task Force).

- Outreach and education should be multi-agency efforts, both horizontally and vertically, i.e., across county programs, as well as together with city, state, tribal and federal programs.

COMMENTS REGARDING PROTOCOLS

- There is a perception that outside of County staff, people are not aware of the protocols nor of how they are applied.

- One member noted that the March 2008 report has a valuable discussion of the importance of large wood, but the protocol itself is "diluted" to focus only on safety.

AREAS OF AGREEMENT

- Committee is interested in learning about opportunities for better wood placement that meets ecological objectives AND reduces safety concerns.

- Wood is ecologically important and placing wood is OK.

    - *but needs to be done safely [source of disagreement about the extent of safety consideration that is appropriate.]*

- Better education and outreach is needed.

THORNY ISSUES / TOUGH QUESTIONS

- What is the level of personal responsibility that we should expect of river users who engage in an inherently dangerous activity? What is the 'baseline management target'?
- Should all river reaches be kept navigable?
- If projects are ecologically diluted to promote safety, when is it more appropriate to require off-site mitigation with ecologically constructed large-wood projects?
- How big is the safety problem? How many people are injured or killed in our rivers, and of those how many are associated with wood? Placed wood? Natural wood?

LARGE WOOD STAKEHOLDER COMMITTEE

Meeting Summary

July 15, 2009

King County Department of Natural Resources and Parks
Large Wood Management
Stakeholder Work Group
July 15, 2009

Mercer Island Public Library

-- Meeting Summary --

Attendees

Committee members
Jennie Goldberg, American Whitewater (Alternate)
Martha Parker, At-large
Dave McCoy, Emerald Water Anglers
Chris Grieve, Northwest Flyfishers
Casey Garland, Rescue 3 Northwest
Mike Grijalva, River Safety Council (Alternate)
Al Barrie, Trout Unlimited
Abby Hook, Tulalip Tribes (Alternate)
Stewart Reinbold, Washington Department of Fish and Wildlife
Micah Wait, Wild Fish Conservancy
Keith MacDonald, Water Resource Inventory Area (WRIA) Forums – Salmon Recovery

Staff and guests
Margaret Norton-Arnold, Norton – Arnold Company (Facilitator)
Janne Kaje, King County (Project manager)
Steve Bleifuhs, KC Water and Land Resources Division
Josh Latterell, KC Water and Land Resources Division
Nancy Faegenburg, KC Water and Land Resources Division

JOSH LATTERELL – PRESENTATION

Josh Latterell is a senior ecologist with the King County Water and land Resources Division. His doctoral research at the University of Washington focused on the function, distribution and persistence of large wood in rivers.

His presentation, titled "Effects of natural and placed wood on rivers and habitat", highlighted the many different types and functions of large wood in rivers. He contrasted natural wood and engineered wood placements in terms of their ability to provide key ecological functions, and the effects of design modifications on performance. The full presentation is available at: ftp://green.kingcounty.gov/transfer/Large_wood_committee/

In summary, Josh's presentation demonstrated that:

- Wood can function in many different ways, depending on how and where it accumulates, and its structural features. For example, a large wood jam at the apex of a gravel bar functions very differently than wood that is along the edge of the channel.

- Wood functions best when it strongly interacts with flow and sediment. This is not only a function of the location (i.e., within the low-flow channel versus floodplain edge), but also of orientation. For example, a log that is perpendicular to flow interacts more strongly and differently with flow and sediment than a log that is parallel to flow.

- Placed wood tends to maximize a small number of desirable functions, relative to natural wood. For example, wood that is integrated into a bank stabilization project must first meet the structural functions of the project, so the ecological functions are more limited. Also, design modifications (whether for safety or other reasons) can also diminish the ability of a structure to provide certain functions. For example, if a wood jam is constructed with a solid core to prevent a sieve-effect, then the jam likely provides little internal rearing habitat for juvenile fish.

- Modifications with the greatest potential to reduce function are: 1) placement location, 2) piece orientation, 3) structural complexity, 4) stability.

SGT. KNAUSS REVIEW OF RIVER INCIDENTS

Sergeant Jim Knauss represents the King County Sheriff's Department on the committee. As a follow-up to questions posed by committee members at the June meeting, Sgt. Knauss surveyed members of his department in an effort to collect data regarding the prevalence of river accidents, deaths or rescues and the role of large wood, if any. Sgt. Knauss was not able to compile quantitative data, but rather presented a summary of incidents from various County rivers since roughly 2004.

Sgt. Knauss' report included incidents of rescues and deaths by drowning. The primary cited cause of drowning was the lack of life jackets. Of the nine deaths by drowning reported by Sgt. Knauss, only one victim was wearing a life jacket – an experienced kayaker on the Green River in 2008 who apparently became entrapped in the hydraulics surrounding two rocks with no wood involved.

Sgt. Knauss reported that natural wood had caused a raft to capsize on the Green River in 2004, but that all members of the party were rescued. Also, more than one drowning victim has been recovered from submerged natural wood jams or other natural debris, but the cause of the drowning in each case was attributed to lack of life jacket, alcohol or other factors. There have been several incidents of stranded swimmers without life jackets being rescued from natural wood jams, such as near the popular Blue Hole on the Middle Fork Snoqualmie River.

Many of the incidents described by Sgt. Knauss involved alcohol and poor choices, such as an attempt to drive across the White River in a vehicle that led to two deaths. Moreover, several incidents occurred during hot days early in the season when flows fueled by snowmelt can be extremely treacherous.

Sgt. Knauss summarized that he is aware of no deaths or rescue incidents in King County where placed wood has been implicated as a cause. Moreover, while natural wood has played a role in some river accidents and body recoveries, he characterized wood as a minor factor relative to others, such as alcohol and lack of life jackets coupled with naturally hazardous conditions.

Committee members asked if Sgt. Knauss could provide his observations in writing. He subsequently brought a summary of his report to the August committee meeting that will be distributed to the committee electronically.

Committee discussion

Several committee members commented that it seems large wood is not a major factor in King County river accidents, and asked whether in Sgt. Knauss' view, we are making a 'mountain out of a molehill'. Sgt. Knauss noted that the sheriff's office is not the only group that responds to river accidents, but that in his view wood is a small factor compared to others. He feels strongly that education efforts targeted at the use of life jackets and general river safety education would be extremely worthwhile.

COMMENTS REGARDING WOOD PLACEMENT PROTOCOL

The committee engaged in a section-by-section discussion of the current County protocol for the consideration of public safety in placement of large wood in waterways.

Identified recreational waterways

The current protocol lists waterways throughout the county where the protocol is to be applied. The list includes substantial portions of all of the major rivers in the county, as well as certain principal tributaries. Committee members asked whether the list of waterways in the current protocol is set in stone. Janne Kaje (project manager for King County) explained that the current list is not necessarily fixed and that the committee could certainly provide recommendations as appropriate. He also noted that the recent consultant-prepared recreational survey indicated that the list may need to be updated based on known recreational patterns. However, he suggested that the committee's time will be best spent on shaping the protocol itself while county staff can consider the recent report and other available information to update the geographic coverage of the protocol.

Ms. Parker noted that the Lower Tolt River (below the confluence of the forks) should certainly have been included as this is a major tributary with active recreational use. In addition, Ms. Parker provided descriptions of the upstream and downstream limits of

recreational use in the White River and Greenwater River that differ from the current list. These comments were passed on to county staff.

Procedural standards for placing large wood

The bulk of the discussion focused on the procedures for the consideration of recreational safety. Steve Bleifuhs (King County River and Floodplain Management Section manager) explained that for the current year, King County is constructing roughly 25 projects that include wood in some manner.

- Committee members inquired whether the protocol also applies to non-governmental organizations (NGOs) or only to King County. The protocol currently applies only to King County, including all of its departments. NGOs and other privately sponsored projects do not have any similar requirements at this time.

- Following a discussion of the desire of the Washington Department of Fish and Wildlife to have placed wood be in contact with flow throughout the year, committee members recommended that the project purpose and conceptual design descriptions need to include a description of wood elevation relative to flow benchmarks (such as the thalweg, ordinary-high-water mark, or other reference). This is important for understanding the ecological function of the wood and the effects of possible design modifications.

- Several members noted that provisions must be made for emergency situations or projects with a very tight timeline due to urgent public safety concerns, such as flood protection. There may not be sufficient time in all cases to engage stakeholders in extensive discussions regarding recreational safety.

- The committee discussed the concept of a threshold evaluation – conducted by county staff – that would identify those projects that are more likely to pose a conflict between project purpose and recreational safety. By considering things like the size of the project, geographic location, recreational use patterns (if known), the outreach efforts could focus on projects where the recreational concerns are greater. A system of river reach "Tiers" as presented in the consultant report may be a useful tool for a threshold evaluation.

- Committee members expressed varied view points regarding the need for detailed project designs in order to provide input related to recreational safety. Several members expressed the view that engineers should be "allowed to do their job" and that non-engineers are not qualified to gauge the merits of a specific design. They felt that conceptual designs are sufficient for the purpose of soliciting input. One member expressed the contrary view – that it is not possible for her to give meaningful comments absent detailed design drawings.

- Nancy Faegenburg (King County) explained that often projects are at different stages of design when the County holds its annual public kick-off meeting for projects that

involve large wood. Thus, some projects have fairly complete designs and permits while others are still at a conceptual stage when feedback is being solicited.

- A suggestion was made for outreach (via conferences, etc.) to engineers to inform them about practices that can alleviate some safety concerns, while retaining structural and ecological functions.

- Some committee members shared their view that the conceptual designs and other project documentation should also include a more in-depth discussion of the ecological purposes of the wood and how the functions are affected by modifications to address recreational safety.

- The committee discussed the concept of off-site mitigation for those situations where safety-oriented modifications dilute the ecological effectiveness of a project. Stewart Reinbold (WDFW) explained that WDFW often requires wood placement as mitigation, but that in many cases the wood is needed exactly at the project site, rather than at a different location. For example, when a levee or revetment is failing on the outside bend of a river where velocities are highest, the addition of wood to the bank is critical because it increases roughness which helps to reduce water velocity. This in turn encourages sediment deposition which may help over time to shift the river's preferred flow path away from the bank. In this type of scenario, some modifications may be available to reduce recreational risk, but off-site mitigation may not be an appropriate response.

- Committee members commented that we still have little understanding of whether modified project designs actually improve safety, and whether they work ecologically.

Education and outreach

The committee continues to see education and outreach activities as the key to improving river safety by recreational users. Committee comments and recommendations included the following [see committee document regarding outreach and education for more detail].

- Signage at popular put-ins could provide recommendations for safer reaches where risks due to wood and other factors are lower.

- Signage regarding dangers of river recreation should be very visible with graphic messages about potential hazards.

- Members inquired about whether it is possible to regulate inner-tube rental businesses, or to require them to provide life jackets or safety information.

- Non-governmental organizations, such as the Regional Fishery Enhancement Groups and Go Outside and Play Washington were identified as potential partners in outreach and education.

KING COUNTY COUNCIL ORDINANCE

The committee had a brief discussion about the recent Council ordinance and the role of the committee in the rule-making process. County staff explained that the development of the rule is the county's responsibility, but that they hope to integrate the committee's recommendations into the protocol that will be the basis for the rule.

Members asked whether the committee was charged with making the protocol explicitly consistent with the ordinance. Specifically, some committee members expressed strong reservations about doing so because they are not comfortable with the ordinance's explicit identification of recreational safety as the primary consideration in large wood placement to the exclusion of other considerations, such as ecological goals or the structural needs of the project. County staff responded by reminding the committee that the group was formed prior to the issuance of the ordinance and that it is ultimately the responsibility of county management and staff to shape the final rule. The committee should simply do its best to develop recommendations that they believe will result in an informative and consistent consideration of recreational safety for large wood placement projects.

NEXT MEETING

The next meeting is scheduled for August 19, 2009, 2:00-5:00 PM.

LARGE WOOD STAKEHOLDER COMMITTEE

Meeting Summary

August 19, 2009

King County Department of Natural Resources and Parks
Large Wood Management
Stakeholder Work Group
August 19, 2009

Mercer Island Public Library

-- Meeting Summary --

Attendees

Committee members
Tom O'Keefe, American Whitewater
Martha Parker, At-large
Dave McCoy, Emerald Water Anglers
Judy Fillips, River Safety Council
Al Barrie, Trout Unlimited
Abby Hook, Tulalip Tribes (Alternate)
Kurt Nelson, Tulalip Tribes
Stewart Reinbold, Washington Department of Fish and Wildlife
Micah Wait, Wild Fish Conservancy
Sgt. Jim Knauss, King County Sheriff
Keith MacDonald, Water Resource Inventory Area (WRIA) Forums – Salmon Recovery

Staff and guests
Margaret Norton-Arnold, Norton – Arnold Company (Facilitator)
Janne Kaje, King County (Project manager)
Steve Bleifuhs, KC Water and Land Resources Division
Marc Isaacson, Director, KC Water and Land Resources Division
Sandy Kilroy, KC Water and Land Resources Division
Kate Akyuz, KC Water and Land Resources Division

WOOD PLACEMENT PROTOCOL DISCUSSION

The committee discussed the proposed edits to the large wood placement protocol, prepared by Margaret Norton-Arnold and Janne Kaje following the July 15 meeting.

- Several members commented that it is important to include an introductory section that includes a purpose statement and to provide context for the committee recommendation. This should be done in the protocol document itself, rather than referencing a separate document. The introduction should talk about the ecological context of large wood and describe King County's different wood placement efforts

and obligations, i.e., bank stabilization, mitigation (required by other agencies) and restoration.

- The protocol language should also emphasize the necessity of collecting and incorporating objective data regarding recreation patterns as well as river accidents and rescues. As reliable data sources become available via studies and multi-agency reporting systems, the relevant data sources should be specifically identified in the protocol.

- The protocol should also acknowledge the role and authority of permitting agencies in the process. In many cases, King County does not have exclusive authority over the location and design of its large wood placements.

- Mr. Barrie noted he attended the Salmon Recovery Funding Board meeting on August 13 where very pertinent questions were raised regarding the placement of wood "high and dry" and how ecological functions can be achieved with that kind of approach. He also warned against conveying to the public that rivers are safe or can be made safe through our actions. This is simply no the case.

- In response to the committee's recommendation for increased signage regarding planned or existing large wood placements, Steve Bleifuhs (King County WLRD) shared that signs placed by King County are almost immediately vandalized or removed and for this reason cautioned against relying too heavily on signage as a means of notification and outreach.

- Regarding signage, committee members reiterated the need to produce "multi-message" signage that conveys habitat benefits of wood and other educational material with messages regarding river safety.

- Mr. Reinbold explained why it is often not possible to meet a project's structural or habitat objectives if the wood is moved to a different location. One very good reason for placing wood into the face of a streambank repair site on the outside of a river bend is to increase the roughness of the bank. This, in turn, reduces velocity which protects the bank from erosion. Lower velocities promote sediment deposition, hence encouraging the river thalweg to move away from the vulnerable bank over time. So, it may not be possible to relocate the large wood portion of a project in this type of scenario without severely compromising both structural and ecological purposes of the project.

- Mr. Reinbold also shared design drawings of approved King County projects that demonstrated the integration of techniques that help to reduce risk to boaters/floaters while also meeting the structural and ecological objectives of the project. He noted that these types of approaches can be implemented in high recreational use areas but not necessarily in others.

- Ms. Fillips suggested that the initial public meetings proposed in the protocol should occur both daytime and nighttime to increase the likelihood that interested members of the public will attend.

- Ms. Fillips also suggested that the county should not rely on a snapshot of recreational use data, in part because use patterns will change as a result of population growth. She explained that a consideration of likely locations for population growth should be integrated into the county's consideration of current and future recreational risk. Other committee members noted that the most heavily used recreational areas are not in close proximity to heavily developed areas. A large fraction of river users is presumed to consist of residents of Seattle and the urban core areas, rather than residents of rural cities along the major rivers where much of the recreational use occurs.

- Committee members acknowledged that the design and permitting schedule can be very different for different types of projects, depending on their urgency, permitting requirements and other factors. The committee agreed that the protocol recommendations are meant to capture the process and general pattern of stakeholder involvement. County staff should subsequently take the intent of the recommendations and craft a project schedule or schedules that accommodate the diversity of project types.

"SUMMARY OF RECOMMENDATIONS" – DOCUMENT DISCUSSION

Following the July meeting, Ms. Norton-Arnold and Mr. Kaje drafted a summary of recommendations document that is intended to provide an overview and additional context to the committee's recommendations.

- Members reiterated the need for a discussion of river accident data and rates so that the scale of the safety issue may be out into perspective. If objective, robust data are not yet available, the discussion paper should explicitly acknowledge that and encourage the County to collect the necessary information.

- Mr. Reinbold also suggested that the summary document should include a discussion of the importance of fish and fishing to the state's economy. This point has been lost in the discussions about recreational safety.

- Ms. Hook emphasized the cultural and religious significance of salmon and of the rivers themselves to northwest tribes and recommended that the document include a reference to these highly important factors.

- Several committee members expressed some frustration at the lack of knowledge regarding the extent of liability or the lack thereof that stems from large wood placement or the funding of such activities. Members asked if the County had given a

thorough examination of this issue and whether the County Council has received legal guidance on this matter.

- Mr. O'Keefe (American Whitewater) suggested that the committee should communicate the fact that the protocol recommendations have a primary purpose of helping to get projects done and not to create barriers. Safety considerations are important but they can be addressed through design and outreach.

ROUND TABLE DISCUSSION

Ms. Norton-Arnold encouraged committee members to engage in a round-table discussion in order to "take the group's temperature" on how we are doing as a committee and our comfort level with the products to date.

Al Barrie - I question what the value added is of this whole process. We are just amateurs here working on safety issues. We don't have the expertise to do this. I think we should be leaving this up to the experts.

Judy Fillips - We are making progress on the safety issues. I want to make sure we have more discussion on striking the right balance between safety and fish.

Micah Wait - I'm looking for some firm accident statistics, and we haven't seen that yet. Do we really need to be setting the bar that high when we don't know the reality of what is causing accidents? I'm also very interested in, and want to make sure we have ample time, for discussion of the natural wood protocol.

Stewart Reinbold - The accident statistics are really important. We need those. We have to be proactive and think of all of the ways we can do a better job of promoting safety. But these wood projects in the river are really vital to fish. Our concern over safety – especially when we don't have the objective accident data – cannot trump the need to improve fish habitat.

Keith MacDonald - The three documents we have created to date are good. I have some fundamental concerns about the lack of accident data. In doing this work, we have been dependent on data we don't yet have. Why are we doing this now when we don't have the data to support the need? Perhaps we should be promoting more of a pilot program in this regard. We can't restrict habitat projects everywhere.

Jim Knauss - I think our work group is doing good work. I'm eager to get into the natural wood discussion. I wonder about existing statutes and about the liability King County would incur if accidents do become more prevalent in the future. There are a lot of pressures on us to get the right balance in this situation.

Dave McCoy - We have hashed the safety side of things to the nth degree. We have discussed a lot of important parameters and methods for wood placement that cannot be

overlooked. I want to make sure we have adequate banter about the fish as well, especially in the natural wood discussion. We need to get around to the subject of fish.

Kurt Nelson - The documents we've reviewed today are fine and good. I'm anxious to talk about the naturally occurring wood. We can't go back to the way things were in the 60s and 70s and start taking wood out of the rivers again. We have to stress the importance of life jackets and good signage.

Abby Hook - There has been a political upswelling about safety, but I don't want to see fish habitat compromised. I don't want to undermine that. The natural wood discussion will be really important.

Martha Parker - I like the way our discussions have gone. I hope we can continue to reach some accommodation about how wood is placed in the river. Talking about things like reflective logs is a good step in that direction. Wood used to be removed from the rivers, it's only since 1995 that we stopped taking it out. That's not a very long period of time. I don't want to see recreational use become so limited in the future that no one has access to the rivers anymore.

NATURAL WOOD MANAGEMENT PROTOCOL DISCUSSION

The committee ran out of time to engage in a discussion about the natural wood protocol although for many this issue is of greater concern ecologically than wood placement. Committee members agreed to conduct a thorough review of the protocol and to send comments by e-mail to the facilitator. The comments will then be distributed to the whole committee. Ms. Norton Arnold an Mr. Kaje will also begin to develop proposals for amending the protocol in response to the comments prior to the next meeting.

NEXT MEETING

The next meeting is scheduled for September 16, 2009, 2:00-5:00 PM.

LARGE WOOD STAKEHOLDER COMMITTEE

Meeting Summary

September 16, 2009

King County Department of Natural Resources and Parks
Large Wood Management
Stakeholder Work Group
September 16, 2009

Mercer Island Public Library

-- Meeting Summary --

Attendees

Committee members
Martha Parker, At-large
Dave McCoy, Emerald Water Anglers
Judy Fillips, River Safety Council
Al Barrie, Trout Unlimited
Abby Hook, Tulalip Tribes (Alternate)
Kurt Nelson, Tulalip Tribes
Stewart Reinbold, Washington Department of Fish and Wildlife
Micah Wait, Wild Fish Conservancy
Sgt. Jim Knauss, King County Sheriff

Staff and guests
Margaret Norton-Arnold, Norton – Arnold Company (Facilitator)
Janne Kaje, King County (Project manager)
Clint Loper, KC Water and Land Resources Division
Sandy Kilroy, KC Water and Land Resources Division
Kate Akyuz, KC Water and Land Resources Division

REVIEW OF COMPLETED WORK PRODUCTS AND ACCIDENT DATA

The committee briefly reviewed the final recommendations regarding large wood placement as well as outreach and education. All committee members agreed that the wood placement protocol recommendations are complete and reflect the views of the committee. Committee staff will finalize the documents and send the final versions to the group.

Both the wood placement protocol and outreach and education recommendations suggest an increased role for signage to educate river users and to alert them to known wood accumulations and/or new wood placement projects. Al Barrie emphasized the importance of word choice in these materials; he recommended that signs should not refer to "dangerous wood" since in his view wood is not inherently dangerous. Rather, wood can pose a danger if users are unskilled or unprepared. Mr. Barrie feels that it is

appropriate to use signs to warn users about log jams, but that signs should not convey the message that wood in rivers is a dangerous thing that should be removed.

Committee members also recalled a previous discussion regarding signage and the group's general opinion that having a multitude of signs on our scenic rivers is also not a preferred solution. Thus, general signage should be concentrated at known, high-use river access points while project-specific signs (for wood placements) may need to be along the river corridor.

Sandy Kilroy responded to a question about the County's liability related to signage. For example, if some areas have signage and others do not, does the county incur liability for dangers in areas where signs are absent? Sandy clarified that the legal issues surrounding signage and liability have not yet been resolved, but agreed that this is an important issue for the County to consider.

Several committee members reiterated their concern regarding the lack of data regarding the frequency of recreational river accidents across King County, and specifically any associated with large wood. Prior to the meeting, committee members received copies of all correspondence from neighboring jurisdictions that had been received to date regarding river accidents and rescues. In general, while some river accidents involved natural wood (such as a branch puncturing an inflatable boat), the role of wood in documented accidents seems low. In fact, in more than one case, wood jams have provided a place for victims to hold on while awaiting rescue. The committee's main concern is that the scale of the problem is not clear or well documented, and thus the appropriate response may be out of scale as well. The committee reiterated the importance of establishing a reliable tracking system for compiling river accident data across jurisdictions. [The compiled accident data from other agencies are available from the Project Manager (Janne Kaje; janne.kaje@kingcounty.gov).]

NATURAL WOOD RESPONSE PROTOCOL

The remainder of the meeting was focused on a section-by-section review of the proposed changes to the County protocol for responding to reports of hazardous natural wood (Appendix D of March 2008 report).

Regarding the Background section of the proposed protocol, Ms. Parker noted that while large wood in some instances stabilizes stream banks, it can also cause or accelerate bank erosion. The committee agreed that language should be added regarding the natural role of wood in channel formation and erosion.

The committee discussed whether natural large wood that is transported around dams and placed in downstream reaches should be regarded as natural wood or placed wood for purposes of the committee's recommendations and document definitions. As an example of this type of program, the U.S. Army Corps of Engineers is required to transport large wood that accumulates in the reservoir above Howard Hanson Dam into the Green River

below. Committee staff pointed out that King County does not engage in wood transport around dams and thus the issue is a moot point for purposes of the Committee's recommendations; the Committee then agreed that the issue does not need to be addressed in the Committee's products.

A significant element of the natural wood protocol is the assessment of risk to infrastructure and to recreational safety. The former is evaluated by the WLRD while safety is assessed by the Sheriff's office. Committee members expressed doubt as to the Sheriff's ability to evaluate the level of risk to recreational users associated with a particular log jam or individual piece of wood. The consequences of that determination can be ecologically significant if a decision is made to remove or alter the wood, and for recreation if a river reach is closed to all users.

To address ecological concerns, the Committee recommended that a river ecologist should participate in the assessment of natural wood hazards so that 1) the ecological effects of intervention can be evaluated more accurately, and 2) in instances where mitigation is required, the type and location of mitigation can be properly identified.

Stewart Reinbold (WDFW) noted that a Hydraulic Project Approval (HPA) is required for all actions to reposition or remove wood, even in emergency situations. However, a verbal HPA can be secured quickly by telephone.

Members suggested that the emergency provisions of the protocol should be moved to the end of the document in order to clearly signify that the full protocol should be followed in all but the most extreme cases. Members agreed that the bar should be very high (in terms of risk to recreational users) to justify large wood removal. Some also believe that river closure should also be a last resort. Sgt. Knauss explained that river closure is not a step that the Sheriff is eager to take and that it is seldom used in King County.

The Committee considered whether to recommend specific procedures for resolving disputes regarding the chosen course of action regarding recreational safety and natural wood. For example, what kind of recourse does a member of the public have if they disagree with a decision to leave a piece of wood in the river unaltered, or, to remove a piece of wood? Following discussion, the committee agreed that the recommended protocol provides a transparent and thoughtful consideration of risks to infrastructure, habitat function and safety. But, people always have options for contacting management and elected officials if they choose to do so. The Committee did not feel it was needed or appropriate to address conflict resolution as part of the recommendation.

Sgt. Knauss explained that there is no easy way to identify a middle ground between "open" and "closed" rivers. While it may be tempting to recommend the development of a rating system that links river conditions to specific levels of recommended expertise for river users, it would be difficult to implement in practice. Legally it would be difficult for the Sheriff's office to exclude some users (e.g., tubers) while allowing others (e.g., expert whitewater kayakers) to use the river.

The Committee again reiterated its top-tier recommendation to require the use of life vests while recreating on rivers. In previous discussions, Al Barrie referred to Spokane County regulations regarding use of life vests. The code states that "All persons regardless of age shall wear a personal flotation device while on moving water." (Spokane County Code 6.03.020), with "moving water" defined as specific reaches of the Spokane River.

Committee staff will revise the natural wood protocol to capture the committee's intent and specific recommendations and will send a final version out for review.

NEXT STEPS

This is the final scheduled meeting of the Committee. On behalf of Division Director Marc Isaacson, Sandy Kilroy thanked the Committee members for their contribution and their dedication to this important issue. As a next step, County staff will review the recommendations specific to large wood placement as part of preparing a public rule pursuant to the King County Council Ordinance. After that, staff will also carefully review the committee's recommendations related to natural wood management as well as outreach and education.

Later this fall or early winter, the Division would like to ask committee members to participate in a presentation to the King County Council. Staff will communicate with the Committee about the timing and content of the presentation.

LARGE WOOD STAKEHOLDER COMMITTEE

Accident data compiled from first responders

River Accident Data

Sgt Jim Knauss – King County Sheriff's office. Marine Unit.

Green River

- 2004
  - Fishermen Drifting hit a natural log in the river and got flipped, raft damaged, no life jackets, cold & wet.
- 2005
  - Palmer Kanasket portion of the river, alcohol involved, swimming and drown later found in natural occurring wood.
- 2007
  - Cheap raft, early in the season with high flow, no life jacket, weak swimmer, large girl that by herself was over the weight limits of the raft, the raft submerged as she was getting in, fell out and became tangled in the line, trapping her ankle. Drown in head down river position when raft snagged on small root along the bank.
- 2008
  - Early high flow, first hot day of summer, many tubers in trouble over 8 throw bag rescues, no life jackets on any of the 8 rope rescues.
    - 2 persons drown
      - One could not swim, no life jacket, fell off his tube getting into the river, was seen struggling and went under 100 yards later. Found in natural debris in pool. No wood large enough to match diameter descriptions, but many twigs and natural small woody material.
      - One was an experienced kayaker with life jacket and safety gear, caught in the hydraulics of two rocks.
    - 5 additional persons were on a submerged island with natural wood to cling to until rescuers could air lift them. Without natural wood on this island they would not have been able to get out of the current. No life jackets.
  - 1 drowning no wood, no life jacket, swimming in pool, slipped on rocks and presumably bumped his head as he fell, and when into the water.
- 2009
  - 6 river rescues
    - All no life jackets
    - No wood involved, natural current, and sand bar placements have created a scary place for inexperienced river users.
    - 5 teen males went river rafting, no life jackets, one big tube.
      - Put in at Palmer Kanasket, expected to arrive at Nealy Mansion in 3 hours … 12 hours later were found in gorge tired and sore. Not enough water in river, walking with no shoes. Education needed.

Snoqualmie River

- 2006
  - Upper River 5 to 6 rescues on natural trees falling into main channel, down stream of Blue Hole, no life jackets, totaling an estimated 10 or more teen kids, actions by Sheriff was to close the river until hazard could be eliminated.
  - Blue Hole, 1 drowning, no life jacket, constant teenager hangout and swimming hole, many injuries not amounting to rescues most are falls with bumps and cuts. No wood.
- 2008
  - 1 male non-swimmer on tow behind your boat large tube. Fell off tube after bumping rock, no life jacket, high cold flow. Drown. No wood.
- 2009
  - 1 male swimmer, no life jacket, attempted to swim through rapids below Snoqualmie Falls was caught in flow. Became stranded on far bank too cold, tired and scared to make swim back. No wood.
  - 1 male swimmer, no life jacket, attempted to cross river below Snoqualmie Falls, became stranded on far bank, cold tired and scared. Taken out up the power house access.

Tolt River

- 2009
  - 3 males floating, raft popped when it hit a tree branch on a fallen natural log along rivers edge. No life jackets, all on far bank and hiked along river edge to first house, waited for daylight and called to home owner for help crossing river.

Raging River

None

White River

- 2005
  - 4X4, 2 males attempting to drive across river, no life jackets, no wood involved in incident, drowning did not appear to involve wood although 1 victim was found in natural wood some distance down stream.
- 2009
  - 4 kids 2 males attempted a crossing, girls stayed on bank, no life jackets, males caught in current and swept down river. Made it to rivers edge, rested and went home not telling girls they got out. Rescuers found them home asleep. No wood.

Submitted by Renton

From: Gregory G Hartman [mailto:GHartman@Rentonwa.gov]
Sent: Sunday, September 06, 2009 10:01 AM
To: Jimenez, Cathy
Subject: RE: Fire and Emergency Services Department Dive Team

Good morning, sorry for the delay in getting back to you. The interesting data regarding water rescues in swift water environments depends a lot on the flow and level of the river. Strainers caused by large woody debris are one of the single most dangerous and obstacles that we face as river rescue technicians. But most of the rescues over the last several years have been people stuck on gravel bars or in automobiles in the river. During last year's floods we had a large debris build up on the Williams Street bridge, we had to bring in crews with heavy equipment to remove the debris, there were logs that were chained together that wrapped around the bridge abutment and required cutting to remove them, this was a full days effort to clear the channel. I teach swift water rescue and during my classes on the Cedar River I have found logs that were chained together and presented a hazard to the untrained floater. I will forward you an e mail from King County regarding the lower Cedar River.

From: Knauss, James [James.Knauss@kingcounty.gov]
Sent: Monday, April 20, 2009 13:35
To: Bennett, Michelle; Somers, Scott; Mark Hill; Gregory G Hartman; Dana Schutter
Subject: Cedar River log hazards Map
Attachments: Map04202009.jpg; Cedar River Hazards.est

Cedar River Log hazards continue

This year we have many more hazards in the rivers then we have seen in many years, the Cedar River appears to be one river that has been greatly affected by the last flood water. The river has changed course in many locations, trees and logs litter the river in almost every mile. The river is not the same tame river the tubing and rafting public will expect when they jump in with the coming warm weather. We all need to be collectively telling everyone about river safety and the need for pre-scouting the river and proper river gear which must include life jackets and a float plan left with family or friends.

Slightly unrelated … Rafting season must be here, this past weekend King County Sheriff Marine Unit responded to our first river rescue on the Tolt River outside of Carnation. Three young men in an inflatable raft were toss from their sinking raft after it struck a log and popped. The 3 were stranded, cold and wet and forced to spend the night along the river over night. The river was running fast and cold but luck was with them and all survived. They had no life jackets, food or cold water gear.

We deployed two swimmers to the far bank to contact the victims and establish a high line. Off the line we sent our zodiac river raft across to ferry victims to safety. All and all it

was a good event. Injuries were fortunately limited to small cuts, scratches, cold and hungry.

Sgt James Knauss
King County Sheriff
Marine Rescue Unit
206-205-0579
james.knauss@kingcounty.gov

Submitted by Maple Valley

From: Ingrid Fine [mailto:IngridF@maplevalleyfire.org]
Sent: Wednesday, August 19, 2009 2:26 PM
To: Jimenez, Cathy
Subject: FW: Maple Valley Fire

Hi Cathy,

I'm writing to let you know that after our conversation, I had the opportunity to speak with several of our department's Special Operations Team members whom have been involved in local swift water rescues.

Upon asking the questions that you posed as to if the incident was directly or indirectly related to "large wood debris" being "intentionally placed" or unintentionally, the general consensus was that there was no documentation of whether or not any wood debris was involved or to blame for the incidents.

It was brought to my attention that it would be very difficult to determine, by our staff, which, if any large wood debris was to blame for an incident and if it was placed intentionally or not.

The stats for water rescues for the last two years are as follows:

4 in 2008, 3 from the Cedar River, 1 in Kent's jurisdiction off Meeker St.
1 popped raft, (undetermined cause), 1 swimmer, (unknown if on raft prior), 1 rock jumper who struck head, 1 unknown why in water.

3 in 2009, all 3 rescues from residence's flooding from storm water rising.

I hope this was helpful to you and if you have any further questions, please do not hesitate to contact me anytime.

Ingrid Fine
Administrative Assistant
Maple Valley Fire & Life Safety
(425) 433-2133 desk (425) 413-2040 fax
"Luck happens when preparation meets opportunity"

Kent Fire Department

Swiftwater Rescue Responses

2000-2009

4/18/2000

Green River – Two juveniles overturned a canoe, one removed from a log, the other removed from the river bank.

5/02/2003

Green River – Car in the river, driver self extricated.

2/12/2004

Green River – Assist Auburn Fire with a search of a missing person in the river. Person was not located, search called off.

5/29/2004

Green River – 4 people rescued from two overturned canoes, canoes hit a large snag in the river and overturned. The river was at flood stage at this time.

3/24/2006

Green River – Vehicle in the river, no driver located. Search discontinued.

5/8/2006

Green River – 2 teenagers rescued from a tree in the river. No further information is available.

3/31/2007

Cedar River – Zone 3 Water Rescue Response with Renton Fire Department for a vehicle in the river with 4 people. All persons rescued. Vehicle left the roadway.

10/25/2007

Green River – Zone 3 Water Rescue Response with Tukwila Fire Department for one person in the river. No person found, search discontinued. Person was eluding police at the time of the incident.

9/08/2008

Green River – Zone 3 Water Rescue Response with Maple Valley Fire Department for a possible drowning. Search located one victim who was trapped underwater. Victim was removed by King County Dive Team. DOA

11/16/2008

Green River – One female fell into the river at night, victim was rescued and removed from the river.

3/10/2009

Green River – Vehicle in the river. Search conducted with no person found. Search discontinued.

5/29/2009

Green River – Two males rescued from the river after their raft was punctured by a tree limb in the river.