Washington State Forest Practice Board January 21, 2011
P.O. Box 47012
Olympia, WA 98504-7012

Re Agenda item:
Potential Amendment of FPB Manual 21 – an update on a SFLO Low Impact Template work in progress

Commissioner Goldmark and Members of the Board:

This presentation/dialogue is intended to provide an update on a significant effort that has been, and continues to be ongoing regarding a potential Low Impact Riparian Management Template. This agenda item will not include an "ask" other than that you learn more about the high altitude issues/requirements that folks will be working on in an effort to reach consensus. We will not be getting into the metrics of the attached landowner draft but will share the reasons, intent, concepts, and current status of this effort. The greater your understanding the more prepared you and your constituents will be when this (or something similar) comes to you for action at a later date.

Regarding the draft template attached:

- This is a landowner draft – the state caucus is vigorously working on an appropriate response/alternative so you may not wish to spend time on the template metrics in pages 1-4, or Appendix B & C.
- Please do try to read Appendix A (pages 5-14) as we will cover an overview of these critical factors that will be key to positive evaluations of future drafts.
- Conceptually, the metrics in this draft are intended to:
    - Meet the requirements in RCW/WAC to create an optional, multi-purpose, simple, low impact, statewide template for SFLO's.
    - Utilize a combination of existing metrics/guidance in ways that still provide no/low risks to RMZ functions on a site specific and landscape level basis.
    - Use existing RMZ rules, except reduce "shade" requirements where there isn't any summer water at risk of overheating, & buffer all (rather than partial length) perennial Type N waters.
    - Manage the RMZ's with a combination of thinning, and small patch cuts typically over 2-3 rotations (50-150+ years) to minimize risk and maximize long term: economics; forest health; & forestland retention.
    - We hope that we (all stakeholders) can collectively accomplish all this and bring you a workable and effective template for consideration at your next Forest Practice Board meeting.

Regarding the Distribution of SFLO graphics attached:

- These 2 graphs are a sampling of SFLO Data Base statistics on the Rural Technology Institute website – hopefully helping your visual picture of what we look like individually on the ground & across the landscape – much more info on website, check it out.
- The top graph shows how many SFLO's have various amounts of forestland (acreage). The vast majority of SFLO's have 40 acres or less - perhaps a representation of overall site specific risks?
- The bottom graph shows how many SFLO's have various lengths (feet) of Type F stream reach. The vast majority of SFLO's have 1,000' or less of total Fish stream length- perhaps a representation of individual ownership risks to RMZ's & risks to fish?
- Other statistic's on the website help with potential cumulative effects analysis by WRIA or WAU, as discussed in Appendix A.

We are thankful for the opportunity to provide this overview of an ongoing effort (by landowners and other stakeholders) - we are eager to help your understanding and field any questions.

Sincerely,

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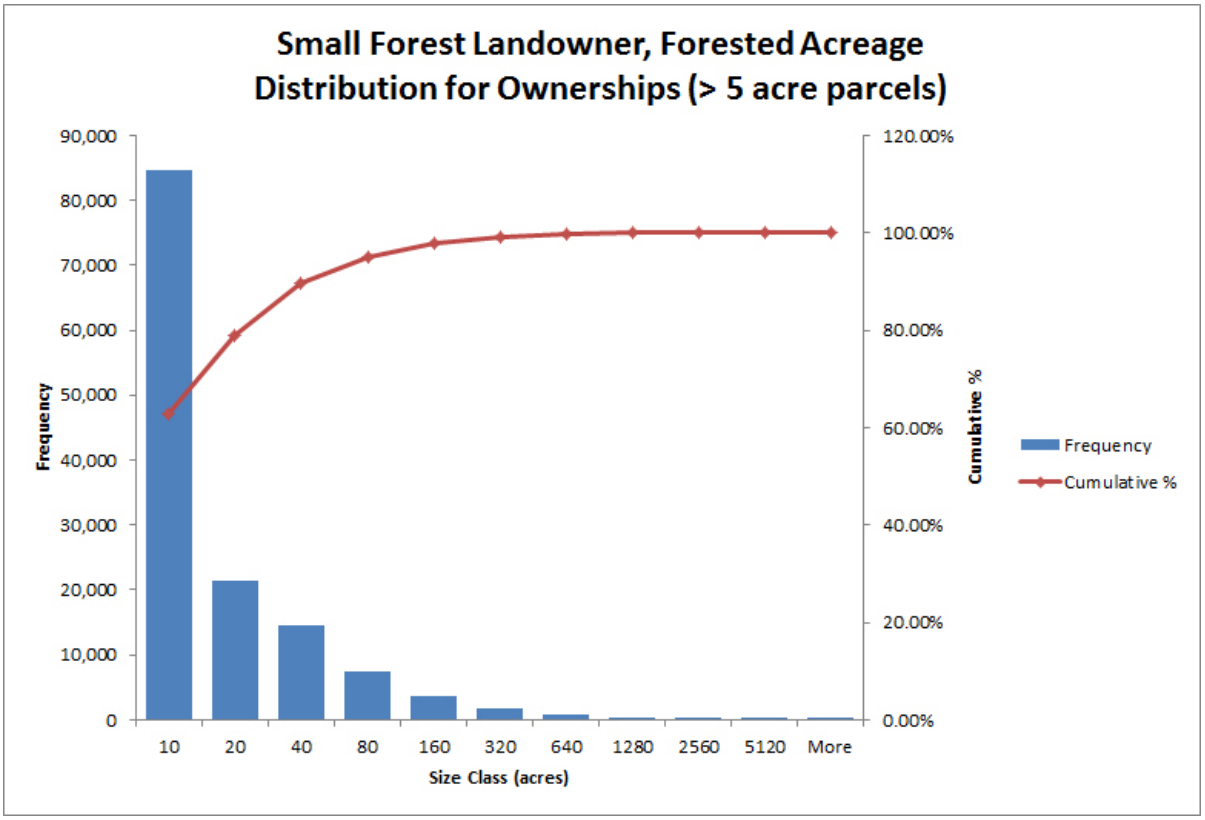
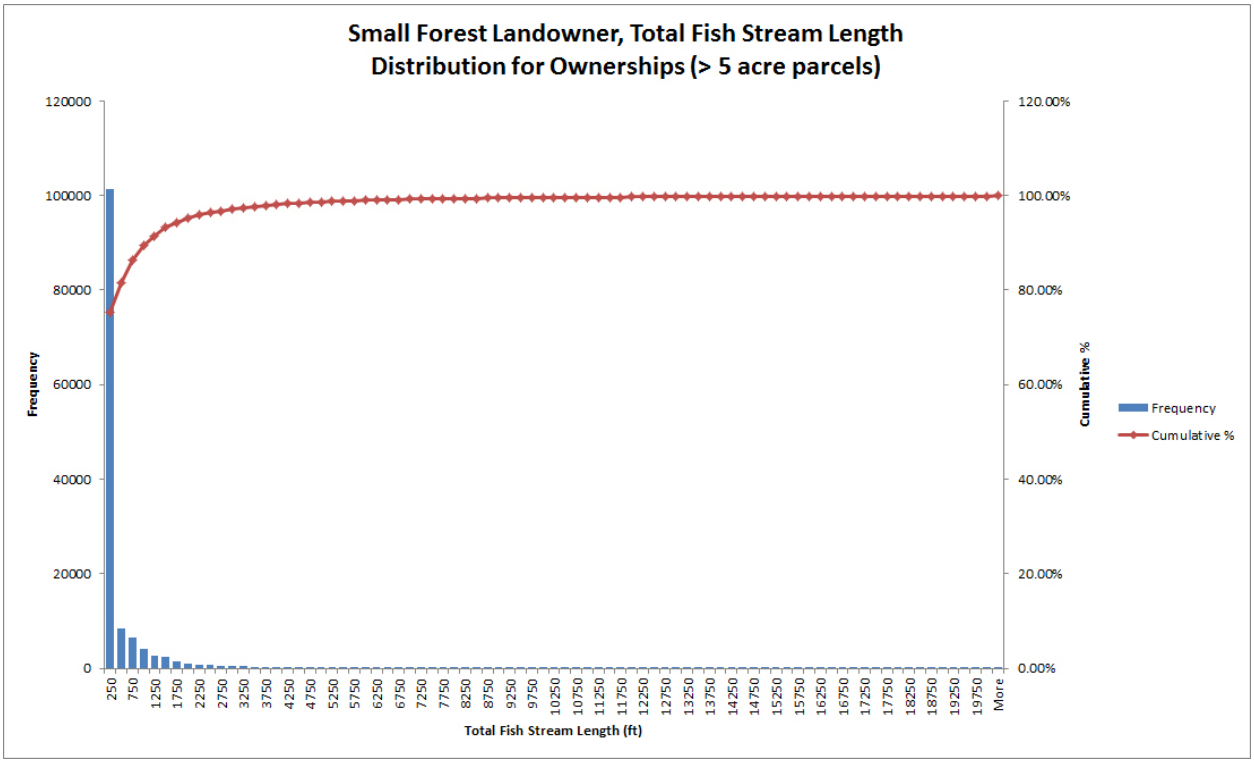
Source: http://www.ruraltech.org/projects/wrl/fldb/tables/other



The vast majority of SFLO's own 40 acres or less, and have 1,000' or less of Total Fish Stream Length



Template 3. Low Impact Riparian Management for Small Forest Landowner's in Eastern and Western Washington

Background

Most Small Forest Landowner's (SFLO's) across the state find the forest practice rules to be onerously complex, expensive to implement, and inappropriately wide and restrictive for harvests significantly smaller than allowed in the standard rules (see also "The Future of Washington Forests" 2007, especially page 51). Development of this alternate plan template achieves the goals in WAC 222-12-040(1) "… as a tool to deal with a variety of situations, including where the cumulative impacts of regulations disproportionately impact a landowner. ….. a plan that provides protection to public resources at least equal in overall effectiveness as provided by the act and rules while seeking to minimize constraints to the management of the affected lands." While the FPA (Forest Practices Application) instructions together with board manual Sec 7 and Sec 21 provide ample instructions, most SFLO's find them difficult to follow and figure out what to do. Water typing, F, Np, Ns and WTM (water type modification) forms further complicate the FPA process for SFLO's. SFLO's should not have to hire a forester to develop an FPA – the ample protections in this template are intended to be more easily understood and with greater compliance. This need for simplification was recognized by the legislature in RCW 76.09.368 &. -370(3), RCW 76.13.110 and RCW 77.85.180(4). The Forest Practices board followed RCW direction in developing the associated WAC's: 222-12-040(1 & 2), -0401, and -0403.

Purpose

Small Forest Land Owners using this template typically have harvests that are considerably smaller in size than allowed in the rules. This template is intended to offset some of the disproportionate impact of the Forest and Fish rules; to increase the economic incentive for a more sustainable SFLO industry; and to facilitate site specific forest health improvements. These harvest prescriptions are intended to maintain or improve all stream functions over time. See Appendix A for a more extensive discussion of how this template is low risk/low impact; how it fits the purposes of various RCW's, WAC's, FFHCP rules, Alternate Plan Guidance & Approval Standards; Eastside Forest Health issues; and most importantly how this template continues to protect all RMZ functions.

Process

The landowner submits a Low Impact Riparian Management application on a template form, available from DNR. This form provides the technical justification required by WAC 222-12-0401(3) (b), (c), and (d) explaining how the alternate plan maintains or enhances riparian function and provides details of the landowner's plan. The template form must be included with the forest practices application (FPA).

Landowners planning to conduct a Low Impact Riparian Management harvest within a riparian management zone (RMZ) adjacent to Type S Waters (protected by the Shoreline Management Act, RCW 76.09.910) must consult with the city or county of jurisdiction to determine if the proposed activities comply with the local shorelines master plan.

As for any proposed Alternate Plan, an Interdisciplinary (ID) Team may be called to review an application using this Low Impact Template (see WAC 222-12-0401(5)). However, by following the provisions in this template, an ID team will only be necessary if site-specific issues arise. To facilitate the potential site specific desire for ID review, the template application will include a simple layman's language checklist for the landowners to complete to the best of their ability that includes questions like:

Within this harvest unit, are you aware of, or do you have:

- Any significant bank erosion over the last few years?
- Any Type F (Fish) streams/segments that are seasonal or you are utilizing the 50' RMZ?
- Any streams that go underground and/or come out of the ground?
- Any RMZ's that appear to have more than 45 degree side slopes?
- Any trees within the stream adjacent no cut buffer that you are proposing to harvest?
- Any "regeneration/patch" RMZ harvests that are not being done in conjunction with an adjacent upland regeneration/even age harvest?
- Any "regeneration/patch" RMZ that has a different across-stream owner who has recently done a similar RMZ harvest?

A yes answer to any of these questions will not necessarily require a change in your harvest plans, but will aid the DNR Forester (& potential ID teams) review of this site-specific application to assure appropriate protections to overall RMZ functions.

<u>Eligible Stands</u>

This template can be used for RMZs that are:

- Owned by a "Small" forest owner as defined in WAC 222-21-010(13) and RCW 76.13.120(2)(c)
- Adjacent to any Typed S, F, and Np Waters.
- Located in Eastern or Western Washington.

Riparian Management Zones (RMZ's)

This template differs from standard rules by re-defining RMZ minimum widths for this template, although these are somewhat comparable to existing rules. This template also eliminates RMZ's for underground/invisible streams more than 30' from where surface water stops or starts - for both simplicity and functional reasons.

- Western Washington RMZ minimum widths are the Fixed Width Buffers adopted by the Forest Practices Board on February 10, 2010 for all Type S & perennial Type F stream widths: Site Class I = 145'; Site Class II = 118'; Site Class III = 101'; Site Class IV = 82'; & Site Class V = 75'. All seasonal segments of Type F streams will have 50' RMZ's. All Type Np stream segments with year round flowing surface water will have 50' RMZ's.
- Eastern Washington RMZ minimum widths are: Type S Waters = 100'; perennial Type F Waters = 75'; seasonal segments of Type F streams will have 50' RMZ's; & all Type Np stream segments with year round flowing surface water will have 50' RMZ's.
- RMZ's do not apply to intermittent (or underground) portions of Type F or Type Np streams without defined channels that are more than 30' from where the surface water stops or starts.

For purposes of this template:

- RMZ's will be measured along the slope distance from the outer edge of bankfull width (BFW). If the RMZ has a significant side slope and you add some distance to approximate a comparable horizontal distance indicate on your application how much distance you added.
- In situations where there are type S and F streams with stream adjacent wetlands, the RMZ measurement will start from the vegetation line change from wetland to upland plant community.
- No equipment is permitted to operate within 30' from edge of bankfull width.

Riparian Zone Harvest Prescriptions for both Western and Eastern Washington

This template differs from standard harvest prescriptions by allowing low impact management within the RMZ utilizing thinning and very small regeneration harvests - partially for economic viability, but also to improve Forest Health, RMZ Functionality, and begin a trajectory to historical species composition & stocking levels.

1. **RMZ harvest prescriptions using this template may include either or both of the following:**
    A. **Commercial Thinning Harvests** using the outcome based limitations shown in Appendix B for Western Washington and Appendix C for Eastern Washington.
    B. **Small Regeneration/patch Harvest** prescriptions that do not individually exceed 500'of stream reach, and additionally:
        i. Are no closer to BFW than 30' on Type S and perennial Type F Waters, except in situations on type F waters where topography, stream orientation, brush, and hardwood trees will provide sufficient riparian function, then small regeneration harvests can occur within the 30 feet, *but only* when approved by the DNR forest practices forester in collaboration with any ID team members.
        ii. Are no closer to BFW than 20' on Seasonal Type F and Type Np Waters, except in situations where topography, stream orientation, brush, and hardwood trees will provide sufficient riparian function, then small regeneration harvests can occur within the 20 feet, *but only* when approved by the DNR forest practices forester in collaboration with any ID team members.
        iii. All combined do not exceed the greater of 500' total, or when more than 500' total do not exceed 40% (each side) of the forested stream reach in the Harvest unit.
        iv. Whenever the total stream reach harvests exceed 500' the individual small regeneration/patch harvests must be separated by forested areas at least as long as the individual stream reach regeneration/patch harvests.
        v. Where applicant owns both sides of the stream, these small regeneration/patch harvests cannot be directly across the stream from one another.
        vi. In the event Large Woody Debris (LWD) recruitment trees are not available in the no harvest zone, a minimum of 15 of the larger trees/1,000' of stream reach that are clearly leaning towards and most apt to eventually fall into the stream naturally shall be left.

vii. In the event DNR or WDFW determine there is a shortage of in-stream woody debris they may condition this FPA with directional falling instructions - and provide any applicable permits.

viii. Prior to subsequent small regeneration/patch harvest activities (FPA's) a landowners adjacent (or directly across stream ownership) previously RMZ harvested areas must be well stocked with an average height of dominant and co-dominant trees equal or greater in height to bankfull width plus 6'. On streams that are greater than 34' in width, the average height of dominant and co-dominant trees does not need to exceed 40'.

Appendix A

Why this is a low risk/low impact template

This template creates some small economic opportunities for landowners willing to follow the low risk/low impact prescriptions in this template. This Appendix A confirms the low risk/low impact in a variety of ways at both the site and landscape levels:

- Risk to resources & risk to "Forest and Fish" integrity,
- Landscape level risk evaluation,
- Riparian Functions – using Alternate Plan Guidelines and best available science,
- Returning our eastside Riparian Zones to more historical and sustainable conditions,
- How this template meets the Alternate Plan Approval Standards in the Rules and RCW's.

Risk to resources and risk to "Forest and Fish" integrity

The function requirements and approval standards are both about managing risk at the site specific level. However, from a Policy standpoint it's also important to look at risk management from a larger view. Following are several favorable risk factors that result in de minimis landscape level effects that should be considered from an "overall effectiveness" viewpoint:

1) **Size of Regeneration/Patch harvest within the RMZ is low impact/low risk**– generally limiting these to less than 1 acre each (1 ½ max) and a maximum of 40% of the stream reach is accomplished while also maintaining/protecting stream functions at all times. Additional Regeneration/Patch harvest entries (new FPA) in this stream reach are not permitted until a prior regeneration harvest is fully forested. Therefore the potential "risk" never exceeds 40% (800' total of a hypothetical 2,000' stream reach) of one or both sides. Over a very long time, several generations of landowners could theoretically harvest the entire stream reach (except for 20-30' buffers) but it would normally take at least 3 crop rotations (& 3 FPA's) over several decades, probably a century or more – and still never exceed the 40% stream reach impact at any point in time. It's highly unlikely the regeneration/patch harvest option in this template would be used except for when an adjacent upland regeneration harvest occurs so it's likely these patch cut harvests would be on a 150 year rotation, if that short.
2) **All Fish** Water **& All Non-Fish Perennial Water buffered all the time –** Even when small Regeneration/Patch harvests are allowed, at least the first row of trees (20-30') are left to fully provide most functions and partially provide others during regeneration. Additionally, for simplicity and additional resource protection, all perennial Np waters are buffered full length instead of just portions.
3) **Forest Health issues in RMZ's can be partially addressed –** Long term forest and RMZ health issues, particularly on the Eastside can be treated using the light touch thinning and small patch cut options in this template. The inability to efficiently & sustainably manage our RMZ forests creates and perpetuates risk of catastrophic disturbance events that adversely affect RMZ functions, forest health, and economic viability. RMZ forests are the best Eastern Washington growing sites and without the ability to actually manage the Riparian **Management** Zone, economic viability is significantly impacted which in turn is a disincentive for intergenerational ownership tenure. Full blown Alternate Plans are too complicated and expensive for most SFLO's, particularly on the eastside forests which have lower productivity & multiple forest

health issues. Using the low risk/low impact prescriptions in this template will help establish economically feasible pathways to healthy, sustainable RMZ forests, and greater economic viability for family forests.

4) **Inherent resource protection tendencies of Small Forest Landowners** - While there are always exceptions that need to be dealt with using existing regulations, it is very clear that the vast majority of family forest owners are not inclined to bend the rules. Aside from the fact that anyone that physically works the land is more inclined to protect it, there are two other significant factors that inherently preclude bending the rules: 1st) Economics, while very important, are generally further down the list of reasons individual families own timberland, and 2nd) they are generally fearful of unintentionally breaking rules, to their economic detriment. Forest Practice policy makers can legitimately consider that from a realistic landscape level risk assessment standpoint the following tendencies will generally continue to exist for the "Smalls" eligible to use this template:
    a. Less frequent harvests & longer crop rotations.
    b. Avoid complexity (even this simpler template) and thereby tend to cut at the most restrictive/protective line. (Confirmed by prior State Forester testimony at Forest Practice Board meetings.)
    c. Family forest owners like to grow and look at big tree's – just as many folks will stay outside the most protective line (b. above), others will be motivated to use the thinning option in this template to grow bigger and better trees, but not want to harvest any/many of the remaining RMZ tree's they have nurtured for a lifetime. The risk of even a majority of eligible family forest owners using all the options in this template is very remote.
    d. Even where rules are simple &/or understood (or special rules requested in Alternate Plans) this class of landowner is most likely going to hold back to further avoid risk of regulatory issues. (Confirmed by compliance monitoring, DNR reports on 20-acre exempt harvests, and Conifer Restoration Alternate Plans Field Survey Results)

   The bottom line is that whatever prescriptions are in this template, the landscape level resource risks are even less because most family forest owners eligible for this template will still not maximize its economic opportunities.

5) **FPA's utilizing Templates may still require Interdisciplinary (ID) team review** (WAC 222-12—401(5)) - By adhering to the guidelines in templates the need for an ID team will be minimal and only necessary if specific issues arise – therefore from an overall (or site specific) risk standpoint, any unanticipated risks can easily be managed. A user friendly landowner checklist will help identify potential site specific risks for department or ID team consideration.

6) **Templates are more readily revised** - Unlike regular rule or legislative changes that take much more time & process to change; unanticipated problems with a template can be corrected more promptly. Because corrections, if needed, are easier to make this allows more creativity, boldness, & trust in finding those prescriptions that best fit all the goals of Forest and Fish (including economic viability) without all the paranoia needed when trying to write a rule to cover every single potential risk – a formula that too often results in unsatisfactory and ineffective results.

7) **Templates are part of Forest and Fish** - If templates can utilize Forest and Fish processes to resolve small landowner issues (and fulfill Forest and Fish promises) the risks to the statewide HCP are much lower than other alternatives outside Forest and Fish.

8) **Forest & Fish regulations are viewed as a significant impediment to staying in forestry –** Private landowners disillusioned with forest practice regulatory practices are less likely to stay in forestry or get the next generation to keep the family land in forestry. Ironically, appropriate

regulations that are not considered "user-friendly" are a significant risk to our natural resource agencies long-term ability to fulfill their mandates.

Landscape Level Risk Evaluation

The analysis below comes from an understanding/interpretation of the following documents:

1. The 2007 Washington State Forestland Database that Mary forwarded earlier: http://www.ruraltech.org/projects/wrl/fldb/pdf/The_2007_Washington_State_Forestland_Database.pdf
2. A spreadsheet from the RTI website that focuses on actual stream miles by WRIA owned by SFLO's potentially able to utilize the draft template: http://www.ruraltech.org/projects/wrl/fldb/tables/05_SFLO_stream_miles_WRIA.html
3. Some new additional statistic's/histograms from the Washington State Forestland Database to add more landscape-exposure perspective in numerical and graphical format: http://www.ruraltech.org/projects/wrl/fldb/#tables

Our landscape–risk conclusion: Assuming the strategies/prescriptions in the draft template credibly protect all RMZ functions at the site level as required in the Alternate Plan Guidelines, **the landscape level risks are diminimus** - just as in full Alternate Plans.

Discussion: By definition, **SFLO's have inherently smaller ownerships and smaller harvest units**. The Histograms (#3 above) clearly show the limited RMZ exposure most SFLO's could have. The Forestland Database indicates that 91.47% of SFLO's (> 5 acre parcels) have 1250' or less of fish stream reach – the minimum needed in the draft template to even consider additional small patch cuts beyond 500'. The other 8.53% of SFLO's with larger ownerships aren't likely to harvest all their land at once, and even if some do, the small regeneration/patch harvests are limited to 40% of the stream reach. **Going through the full Alternate Plan process is simply not practical for the vast majority of SFLO's** – it's an option in theory only. The template format/process makes Alternate Plans accessible to far more folks as intended in our RCW's & WAC's, without the downsides of actual rule changes.

SFLO Stream reach harvest potential – what are landscape level stream reach distances of concern?

Crunching the numbers from the RTI table (#2 above) clearly points towards diminimus potential landscape level impacts. This conclusion assumes, as we do, that there are no significant site specific RMZ functionality issues in the template prescriptions. Following are some take away perspectives using the SFLO ownership by stream reach data; a calculator; and then some common sense (order of magnitude) assumptions to look at how much potential risk to the resource/stream reach exposure we are really looking at with this template.

1. **18% of the fish stream reaches are owned by SFLO's**. There are about 57,976 statewide miles of fish streams, of which only 10,536 are owned by SFLO's.
2. **0.36% of the fish stream reaches would/could be subject to adjacent harvest in an average year**. Assuming 50 year adjacent upland harvest rotations (probably conservative for smalls), then (18%/50 years = 0.36%). Certainly this could vary from year to year to take advantage of markets, albeit less responsiveness to markets than larger landowners.

3. **0.14 %/year is the average stream reach RMZ that could potentially have a small (partial) regeneration/patch harvest**. Assuming **all** SFLO's take **full** advantage of the draft template, it only allows a maximum of 40% stream reach patch cuts. That takes the average 0.36% stream reach patch cut harvest rate potential down to (0.36%x40%=) 0.14%.
4. **0.04 %/year stream reach risk (hypothetically)**. Further extending these assumptions is likely ridiculous but does help with perspective/significance/diminimus. However, hypothetically it seems that if we assumed all of the site specific regeneration harvests had a 30% chance of some temporary functional issue (a false assumption in our opinion) the hypothetical risk would be limited to (0.14% x .30% =) 0.04% of the stream reach/year. Even if folks wanted to assume 30% of the harvest sites had functional deficiencies the theoretical deficiencies aren't necessarily cumulative as downstream factors often self correct upstream deficiencies.
5. **Zero stream reach risk at landscape level**. We believe these patch cuts as proposed have no added risk to RMZ functions because the prescriptions are believed to cover all the required functions (see Appendix A). We are confident that our LWD strategy could actually speed up the recovery of some RMZ functions rather than depending on the very expensive, slow, and unpredictable natural selection paradigm we are stuck in. We believe active, but low impact, management will enhance long term RMZ functions; forest health; and economic viability which will keep more forestland on the landscape to the benefit of all. We see more emerging scientific opinions that low impact management is likely to provide more optimal/historical RMZ benefits.
6. **Worst case WRIA scenario is still diminimus from a landscape point of view**. Even if the assumptions/calculations above are off by several factors it doesn't appear to significantly affect the risk/area of concern to public resources. Using the stream reach data from the WRIA with the highest % of SFLO ownership (#2 San Juan WRIA - 57% SFLO fish stream reach ownership) and the same assumptions above provides a worst case WRIA scenario. In reality, this WRIA is mostly TYPE S precluded from regeneration harvests by county rules – a more appropriate worst case WRIA would be Kitsap (at 46% SFLO stream ownership) but we've stayed with San Juan to **ensure a credible worst case WRIA scenario:**
    - **57% of the fish stream reach is owned by SFLO's** (134 miles of fish stream/76 miles of SFLO fish stream)
    - **1.14% of the fish stream reach would/could be subject to adjacent harvest in an average year.** (57%/50 year rotations)
    - **0.46 %/year is the average stream reach RMZ that could potentially have a small (partial) regeneration/patch harvest.** (1.14% x 40%)
    - **0.13 %**/year **stream reach risk (hypothetically**). (0.46% x 30%)
    - **Zero stream reach risk at landscape level.** (Based on our belief/intentions that the site specific prescriptions protect all functions as stated above).
7. **None of these risk factors are cumulative, beyond 10-20 years of green up**. (to the extent our LWD prescriptions are robust as advertised),
8. **Nearly all the significant template harvest prescriptions come from existing rules**, so by definition should be considered adequate resource protection under Forest and Fish. Numerous, far more aggressive regeneration hardwood conversion prescriptions have been approved by I.D. teams and subsequently found to meet all functions by follow up I.D. teams.

Riparian Functions – using Alternate Plan Guidelines & Best Available Science.

The following information explains the potential effects of thinning and small regeneration/patch harvests on various riparian functions. There are multiple riparian function purposes of thinning & small regeneration/patch harvests: overstocking, tree health, tree growth, nutrient enhancements, fire risk, & unnatural species competition. To be economically feasible this riparian management for the long term RMZ benefit has to be profitable or at least break-even financially to justify doing - and hopefully, to partially offset the acknowledged disproportionate impact of Forest and Fish on smalls.

Resources with generally similar conclusions that were used to support the Riparian Function discussion below:

- Washington Forest Practices Board Manual Section 21 – Guidelines for Alternate Plans
- "Scientific Literature Review of Forest Management Effects on Riparian Functions for Anadromous Salmonids" prepared by Sound Watershed Consulting for The California State Board of Forestry and Fire Protection. This document represented a comprehensive review of 179 scientific literature articles (over 40,000 pages) provided by the California Board of Forestry.
- "Modeling the Effects of Riparian Buffer Width on Effective Shade and Stream Temperature." Washington Dept of Ecology Publication No. 07-03-028
- Two reviews of more recent studies supplied to the Dept of Ecology by the Washington Forest Protection Association in support of DOE's 2009 Clean Water Act Assurances:
    - "An assessment of Timber Harvest Effects on Stream Temperature in headwater Streams and Risk of Exceeding Water Quality Standards" by Dr. Douglas Martin of Martin Environmental.
    - "A review of Research on the Effectiveness of Washington's Forest Practices Act Rules to Protect Beneficial Uses and Water Quality – Sediment" by Dr. George Ice, of the National Council for Air and Stream Improvement.
- USDA Riparian Adaptive Management Symposium: A Conversation between Scientists and Management – December 2010, PNW-GTR-830
- Oregon State Society of American Foresters – "Managing Riparian Forests" 8/26/2010

Bank Stability: Retaining trees within 20-30' (first row of trees) provides the root mass generally necessary to stabilize a stream bank. Although roots can extend beyond the drip-line of a tree's crown, the bulk of the root mass is contained within this area. In areas of undercut banks, or active erosion, a larger setback may be required. 30' equipment limitation zones in this template have been shown to add significant further protections to this RMZ function. The buffers and equipment limitation zones will avoid significant risk – additionally it should be recognized that some bank erosion is a natural component essential for aquatic functions, particularly Large Woody Debris recruitment with attached root wads. Any significant issues can generally be resolved with water bars, grass seeding, mulch, or logging slash.

Woody Debris: Periodic large woody debris input is vital to properly functioning riparian and aquatic systems. Thinning & small regeneration/patch harvests near a stream may reduce the potential sources of woody debris in the short term. Trees closest to the stream have the highest potential to fall into the stream. This area of <u>potential</u> short term shortage is between the first row of trees (20-30' leave tree area) and a distance equal to 75 percent of the 100-year site-potential tree height of the dominant RMZ trees. If no thinning occurred, the woody debris that would recruit to the

stream is that which is immediately adjacent to the bank. Thinning also typically results in larger diameter trees that will serve as a source of higher quality naturally recruited large woody debris sooner than would be available from an unmanaged stand. This template limits regeneration/patch harvests to one side of that particular stream reach area, further limiting risks of a shortage of wood recruitment to stream segments.

It should be recognized that the majority of woody debris comes from a combination of natural bank erosion, streamside landslides, & other disturbance events – only 10-30% typically comes from RMZ tree fall, yet easily half our economic losses of wider buffers are to "naturally" provide this relatively small % of recruitment. Additionally the majority of LWD recruitment that does come from tree fall, comes from within 30-50' of the stream, particularly the high quality LWD - nearly all comes from within 100'. This template further targets & protects those tree's (leaner's) that are most likely to eventually reach the stream.

If a stream is determined to be deficient in woody debris, DNR (with the advice and help [any permits required] of WDFW) can require the applicant to artificially place (directional falling) Woody Debris in the stream as a stop-gap until more natural recruitment occurs in sufficient volumes. This provides an immediate benefit (to the stream, and the landowner) and is preferable to waiting for random recruitment to occur over the long-term. Directional falling or pushing selected trees over can be the quickest, most effective, and most economical way to provide Woody Debris, whenever appropriate agencies determine more is needed. Proactive enhancement (as provided in this template) is increasingly viewed as an overall benefit to Salmonids.

Leaf Litter / Nutrients: Reducing the canopy density of a timber stand in a small portion of the riparian area may result in a short-term reduction in litter-fall to the stream. Needles and leaf litter are an essential component of the nutrient cycle of a stream by serving as food sources for insects and fish. When stands are thinned the crowns develop and main trunk epicormic branching occurs. Stands that have been thinned or had a small regeneration/patch harvest may also result in increased growth and diversity of understory vegetation, further improving nutrient cycling in the riparian area and duff development on the forest floor. Long term management that favors conifers will be most beneficial to Nutrient functions of the RMZ.

Additionally, any small sections of filtered/full sunlight will likely contribute further to stream nutrients and fish productivity - but may negatively affect stream temperatures if excessive sunshine. In opening the canopy, even partially as in this template there may be a trade-off between increasing aquatic productivity, which is beneficial to fish, and increasing water temperature. This template is targeting the middle ground in this trade-off with a combination of retained buffers, very small regeneration harvest openings, and the knowledge that these partial openings are very temporary.

Sediment Filtering: Thinning and small regeneration/patch harvests may result in 1-2 years of exposed, un-vegetated soil. Depending on the slope of the site, there may be a risk of overland runoff due to decreased canopy interception of rainfall. Management practices such as equipment limitation zones, retention of stream-adjacent trees, leaving ground vegetation undisturbed, and distribution of slash in the core zone can minimize the risk of sediment delivery until groundcover is reestablished. Areas influencing sediment filtering are <u>usually</u> within 30 feet of the outer edge of Bankfull Width.

Although this template manages the risk of excess sediment, we need to recognize that sediment is a natural component and is essential for aquatic functions. Most sediment comes out of watersheds

during extreme events. In general, sediment production from harvest activities is relatively low when compared to other sources. The amount of fine sediment (>2mm in size) is more closely correlated to the lithology and soils of the watershed than to forest management practices (mostly from forest roads, not harvest sites). There is a broad middle ground between too much and too little sediment in salmonid habitats. Stream adjacent buffers and equipment limitation zones ensure staying in this middle ground. Any significant issues can generally be resolved with water bars, grass seeding, mulch, or logging slash. Delivery from harvest erosion features is usually zero by the second year following timber harvests, even with pre-Forest & Fish buffers.

Stream shading to maintain cool stream temperatures: A thinned stand or small regeneration/patch harvests may increase sunlight penetration to the stream. When thinned, the leave tree crowns develop and main trunk epicormic branching occurs. Small regeneration/patch harvests in this template are limited to stream reach lengths unlikely to affect stream temperatures according to numerous studies. Stream adjacent trees retained in this template on <u>all</u> waters exposed to summer sun will continue to provide some shading to maintain cooler stream temperatures. Sunlight increases the growth of deciduous shrubs to partially mitigate the temporary loss of overstory shade and the rate of recovery is related to channel width – small streams can be effectively shaded within one year after harvests. The trees closest to the stream (& left in this template) are the most important for shade – effective shading can be provided by buffer widths ranging from 30 to 100', with most effective shading occurring within 40-50'. This template limits regeneration/patch harvests to one side of that particular stream reach area, further limiting risks of excessive sunshine on this stream reach. Additionally, the total stream reach potentially affected is shorter than what most studies would suggest is needed to exceed Clean Water standards. Downstream canopy closures normally adjacent to these thinning, or small patch cut harvests, typically return stream temperatures to equilibrium.

In opening the canopy, even partially, as in this template there may be a trade-off between a slightly increased stream temperature, which is potentially harmful to fish (but not always) if excessive, and sunshine enhanced aquatic productivity which is beneficial to fish. Excluding vegetation management in the RMZ buffer strips may forego opportunities to increase fish growth rates and biomass. Excluding vegetation management also increases chances of disease & increased fuel loads which risk huge RMZ disturbances. Shade conditions can inversely influence biotic and nutrient exchange functions. This template is targeting the middle ground in this trade-off with a combination of retained buffers, very small regeneration harvest openings, and the knowledge that these partial openings are temporary. Recent stream temperature studies show that summer water temperature can be highly variable and associated with a number of factors other than just shade such as: groundwater inflow, hyporheric exchanges, flow rates, valley or channel orientation, streambed substrate composition, or understory vegetation.

Other Riparian Features: Fire suppression and forest health treatments in uplands combined with increased fuel loading in riparian areas may increase the occurrence of crown fires in the riparian zones, causing much more risk/disturbance in riparian areas. Microclimate features such as ambient air temperature may be impacted depending on the extent of upland management. RMZ stands that have been thinned or had small regeneration/patch harvests may result in temporary soil temperature increases that can affect groundwater and instream water temperatures. However, as vegetation fills in and as the canopy of the residual stand recovers, temperature fluctuations will be reduced, resulting in a low likelihood of impact to groundwater or instream temperatures. Additionally, wildlife diversity and abundance is likely to improve as the understory develops and slash is utilized as habitat. Recent (December 2009) Pacific Northwest Research Station "Science Findings"

indicates that RMZ management can contribute to increased summer flows, which in turn can contribute to cooler waters. Clearly there are dynamic interactions among and between riparian exchange functions that alter the importance of these functions for any particular setting - these are complex systems adapted to both small and large disturbances. Rather than simply have a "protection" strategy, general themes in recent literature suggest it may be more appropriate to manage the ecosystem processes and functions to provide more desired riparian conditions – manage the risks with smaller/low impact management techniques.

Returning our eastside Riparian Zones to more historical and sustainable conditions

Over the last 100 years fire exclusion and selective timber harvest (high grading) have dramatically altered historical species composition and stand structure in E. WA forests including riparian forests.

Research has demonstrated that the primary reason for the differences between historical and current stand structure has been the change in disturbance regimes. Fire history research in dry eastern WA forests indicates that current conditions reflect a fire frequency 9 to16 times longer than at any time since the 16th century. This change in disturbance regimes, primarily fire exclusion, has resulted in, (Schellhass *et al.* 2009):

- Stand densities (TPA) increased with up to 12 times over historical conditions. This increase was likely the result of decreased mortality of small trees with the absence of fire over the past 100 years.
- In more recent decades stand density has decreased in many stands, due to competition induced mortality, while basal area has continued to significantly increase over historical conditions.
- Competition induced mortality has led to heavy concentrations of forest fuels that can result in high severity wildfire.
- Historical stands of Ponderosa pine and western larch maintained by periodic low intensity fires have been replaced by more shade tolerant Douglas fir and grand fir.
- Where it once occurred, shade intolerant western larch has been reduced.
- Increased stocking levels (BA/ac) predisposes these stands to insect and disease mortality adding to the fuel load and unacceptable risk of catastrophic wildfire.

Restoration to, and maintaining historical species mix with radial growth <15 RPI (rings per inch) with proper stocking levels will ensure vigorous, healthy trees which in turn will reduce risk of epidemic insect and disease attacks [primarily bark beetles, defoliators, and root disease] and catastrophic wildfire and thereby maintain historical riparian forest function. Historically, fires have not discriminated between riparian and upland forest with up to 50% of fires burning through the riparian areas. Disturbance events may need to be planned for in defined riparian buffer areas to protect long-term ecological integrity of riparian and adjacent upslope forests, (Everett *et al* 2001).

How the Alternate Plan Approval Standards will be met

Alternate Plans (& templates) "must provide protection for public resources at least equal in overall effectiveness to the protection provided in the act and rules". (WAC 222-12—0401 (6))

The "equal in **overall effectiveness**" clause is met by:

- meeting all 5 functions noted above in the short or long run
- improving the health and functions of our RMZ's over time and thereby compensating for any perceived short term risks of managing with the RMZ
- reducing the inherent risks of meeting functions within the RMZ when doing light touch harvesting by limiting the regeneration/patch harvests within the RMZ to generally much less than 1 1/2 acres
- further minimizing overall risks to public resources through a combination of mitigating risk factors noted in the first section of this appendix

The "**equal** in overall effectiveness **to the protection provided by the act and rules**." portions are met by: (bold added)

- **RCW 76.13.005 (5)** In order to encourage and maintain nonindustrial forests and woodlands for their present and future benefit to all citizens, Washington's **nonindustrial forest and woodland owners'** long-term commitments to stewardship of forest resources **must be recognized and supported** by the citizens of Washington State.
- **RCW 76.13.100 (5)** "Stewardship" means managing by caring for, promoting, protecting, renewing, or reestablishing or both, forests and associated resources **for the benefit of the landowner**, the natural resources and the citizens of Washington state, **in accordance with each landowner's objectives**, best management practices, and legal requirements.
- **RCW 76.13.100 (2) partial -** The legislature further finds that small forest landowners should have the option of alternate management plans or **alternate harvest restrictions on smaller harvest units that may have a relatively low impact on aquatic resources.** The small forest landowner office should be responsible for assisting small landowners in the development and implementation of these plans or restrictions.
- **RCW 76.13.110 (3)** The small forest landowner office shall develop criteria to be adopted by the forest practices board in rules and a manual for alternate management plans or alternate harvest restrictions. These alternate plans or **alternate harvest restrictions shall meet riparian functions while requiring less costly regulatory prescriptions.** At the landowner's option, alternate plans or alternate harvest restrictions may be used to further meet riparian functions.
- **RCW 76.13.110 (4)** An advisory committee is established to assist the small forest landowner office in developing policy and **recommending rules to the forest practices board**.
- **RCW 77.85.180(4)** "The legislature recognizes that the adoption of forest practices rules consistent with the FFR as defined in RCW 76.09.020 will impose substantial financial burdens on forest landowners which **if not partially offset through other changes in the laws and rules governing forestry, could lead** to significantly reduce silvicultural investments on nonfederal land, deterioration in the quality, condition and amounts of forests on those lands, and **long-term adverse effects on fish and wildlife habitat and other environmental amenities associated with well managed forests** ……"
- **RCW 76.09.368 Intent –** "The legislature intends that small forest landowners have access to alternate plan processes or alternate harvest restrictions, **or both if necessary**, that meet the public resource protection standards set forth in RCW 76.09.370 (3), but **which also lowers the overall cost of regulation to small forest landowners including, but not limited to, timber value forgone, layout costs, and operating costs**. The forest practices board shall consult with the small forest landowner office advisory committee in developing these alternate approaches… etc"
- **RCW 76.09.370(3)** The rules adopted under this section should be as specific as reasonably possible while also allowing an applicant to propose alternate plans in response to site-specific physical features. Alternate plans **should** provide protection to public resources at least equal in overall effectiveness by alternate means. (Please note that this Legislative intent language "should" allows far more subjective

interpretation than the subsequent language "**will**" inserted in WAC 222-12-040(1) below and the "**must**" in WAC 222-12-0401(6) below.)

- **WAC 222-12-040(1)** The alternate plan process can be **used as a tool to deal with a variety of situations, including whe WAC 222-12-0403** The (Board **re the cumulative impacts of regulations disproportionately impact a landowner**. In some instances an alternate plan may be used to make minor on-the-ground modifications, which result in significant operation efficiencies. The alternate plan process may be used to address circumstances where a landowner has an economically inaccessible unit. The alternate plan process **may also be used to facilitate voluntary landscape, riparian or stream restoration.** In all cases, the alternate planning process **will** result in a plan that provides protection to public resources at least equal in **overall effectiveness** as provided by the act and rules **while seeking to minimize constraints to the management of the affected lands.**
- **WAC 222-12-0401 (6)** Approval standard. An alternate plan **must** provide protection for public resources at least equal in overall effectiveness to the protection provided in the act and rules.
- **WAC 222-12-040 (2)** The legislature has found in RCW 76.13.100(2) that small forest landowners should also have the option of alternate management plans or **alternate harvest restrictions on smaller harvest units that may have a relatively low impact on aquatic resources.** These alternate plans are **intended to provide flexibility** to small forest landowners that will still provide protection of riparian functions based on specific field conditions or stream conditions on the landowner's property.
- **WAC 222-12-0403** The (Board) manual should include: . . . . (4) Appropriate **recognition or credit for improving the condition of public resources;** and (5) **Criteria** to assist the department in determining whether a small forest landowner **alternate plan qualifies as a low impact** alternate plan.
- **WAC 222-30-010 Timber harvesting. (3) (partial)** The rules provide for the conversion and/or **treatment of riparian forest** which may be understocked, overstocked or uncharacteristically hardwood dominated **while maintaining minimum acceptable levels of function on a landscape scale**.

While the various RCW's and WAC's can be very confusing and appear contradictory at times it is very clear that the Legislature intended small landowners to have alternate harvest prescriptions similar to this template and that the approval standards were intended to be based on DNR's professional foresters subjective expert judgment from a silviculture standpoint that could also use reasonable judgment about equal in overall effectiveness in conjunction with economics, simplicity, and credit for improving the RMZ's over time.

Appendix B RMZ Thinning Options

Western Washington:

The table below represents the minimum, after thinning, trees per acre (TPA) for the ending Diameter Breast Height (DBH) of your remaining stand. This Table represents an after thinning Relative Density of 30 - 45 as the average DBH increases. This is considered to be heavy, but designed to release the remaining tree's to maximize their growth/tree and speed their pathway towards Desired Future Condition.

Process:
There are more detailed processes to reach the same relative density outcomes but a rule of thumb process to determine the appropriate after thinning trees/acre and spacing is:

1. Take plots/determine actual average DBH of the stand outward from Bank Full Width before thinning, then
2. Use the Before Thinning DBH answer above to look up the After Thinning DBH; the minimum Trees Per Acre; and the maximum Spacing (all shown in the table below).

For example: if your before thinning DBH average of all RMZ trees is 10.0", the look-up table indicates you need to end up, after thinning, with a minimum 11.0" DBH; a minimum of 170 TPA; and a well distributed average spacing of 16.0'.

Priority of Trees to Harvest:
To ensure that the formula above works; to help ensure optimum RMZ functions; and to facilitate the best pathway towards DFC the following harvest priority must be followed:

1. Thin no closer than 20' to BFW, except in situations where topography, stream orientation, brush, and hardwood trees will provide sufficient riparian function, then commercial thinning can occur within the 20 feet *but only* when approved by the DNR forest practices forester in collaboration with any ID team members.
2. Thin out the smallest diameter trees.
3. Thin out hardwoods, except those retained for spacing, LWD, &/or diversity.

It is ok to harvest **some** of the larger trees for economic, access, or clump reduction reasons, but the metrics in the outcome based table below must be met **without fail**. In other words, leave most of the largest Conifers needed to get the after thinning DBH, the TPA, and the Well Distributed Spacing. Also to further ensure the stream ultimately gets and maintains appropriate levels of Large Woody Debris leave at least 15 of the larger trees/1,000' of stream reach that are clearly leaning towards and most apt to eventually fall into the stream naturally.

Outcome Based Westside RMZ Thinning Table

(Assumes after thinning DBH is 1.11 of before thinning DBH)

---BEFORE-- ----------AFTER HARVEST----------

Before Thinning Dia. Breast Ht.	After Thinning Dia. Breast Ht.	Relative Density	Basal Area per acre	Trees per Acre Minimum	Average Well Distributed Spacing Maximum
7.2”	**8”**	30.0	85	**243**	**13.4’**
8.1”	**9”**	31.3	94	**212**	**14.3’**
9.0”	**10”**	32.5	103	**188**	**15.2’**
9.9”	**11”**	33.8	112	**170**	**16.0’**
10.8”	**12”**	35.0	121	**154**	**16.8’**
11.7”	**13”**	36.3	131	**142**	**17.5’**
12.6”	**14”**	37.5	140	**131**	**18.2’**
13.5”	**15”**	38.8	150	**122**	**18.9’**
14.4”	**16”**	40.0	160	**115**	**19.5’**
15.3”	**17”**	41.3	170	**108**	**20.1’**
16.2”	**18”**	42.5	180	**102**	**20.7’**
17.1”	**19”**	43.8	191	**97**	**21.2’**
18.0”	**20”**	45.0	201	**92**	**21.7’**
18.9”	**21”**	45.0	206	**86**	**22.5’**
19.8”	**22”**	45.0	211	**80**	**23.3’**
20.7”	**23”**	45.0	216	**75**	**24.1’**
21.8”	**24”**	45.0	220	**70**	**24.9’**
22.5”	**25”**	45.0	225	**66**	**25.7’**

Appendix C RMZ Thinning Options

Eastern Washington:

Overview –
This RMZ forest management alternative is applicable to overstocked stands that can be restored without starting over. Commercial thinning can further be defined as the traditional "thin from below" prescription or "variable density thinning" prescription. Stand structure may be complex but with cohorts of the historic species best adapted to the site. Pest complexes, including root disease may be present but resilience can be achieved with the correct species composition with >30% crown ratios and stocking control. Thinning marketable trees will improve SFLO economic viability and encourage ownership tenure and stewardship.

There is vast amount of research related to historical and current stand structure and the correct stocking levels for growth and health in Eastern Washington: J. K. Agee, P.H. Cochran, R.D. Everett, R. Schellhaas, S.F. Arno, F. Hall, T.R. Lillybridge, D.C. Powell, just to name a few. These scientists basically all support similar conclusions as summarized in Appendix A "Returning our eastside Riparian Zones to more historical and sustainable conditions."
(Note to reviewers: Contact Phil Hess if you would like to have the relevant published and unpublished references above forwarded to you. The Rural Technology Institute (U of W) Fact Sheet #25 provides background for the issues this template attempts to address.)

The objective is to develop a thinning table with the intention of simplifying the leave tree specs in WAC 222-30-222 and at the same time design them to fit within the range of habitat types occurring on the majority of SFLO forests in Eastern Washington.

For simplification the classification of PAG's (plant association groups) can be grouped into the following Site Classes:

- HDSG (hot/dry/shrub/grass) = low Site Class V
- WFSH (warm/dry/shrub/herb) = medium Site Class IV
- WDTS (warm/dry/tall shrub) = medium Site Class IV
- WMSH (warm/mesic/shrub/herb) = high Site Class III
- CDG (cool/dry/grass) = high Site Class III

(Note to reviewers: Assuming this draft template get's legs, the Eastside SFLO's really need help from other knowledgeable and practical stakeholders drafting appropriate user friendly thinning prescriptions or tables. *The goal is to provide an opportunity for the E. WA. SFLO's to manage their RMZ forests in order to create and maintain healthy, firesafe stands of trees – and do so in an economically viable "low impact" way. The concept is to restore our RMZ forests to within a range of their historic species composition and stocking levels and do so with a simpler set of instructions than available to SFLO's in Board Manual Sec. 7 – and still meet "minimum acceptable levels of function on the landscape scale" [WAC 222-30-010 (3)].*

How much simplification can be achieved? As we see it, as a minimum an applicant will still need to:

1) *Identify the RMZ (as defined on p. 2, eligible stands)*
2) *Identify the 20 foot no entry (or modified entry when approved by DNR FP forester)*
3) *Inventory by species of TPA and Ave DBH from BFW to the outer edge of the RMZ, and*
4) *Identify the leave trees, including those intended to be part of our targeted LWD strategy.*

Following are the key differences we envision for the template thinning vs the existing Sec. 7, E. WA:

1) *The inventory is outward from BFW to the RMZ upland boundary.*
2) *There are currently (in Sec 7, E. WA) four scenarios each with a different BA and density leave tree spec. Can this level of complexity be modified to something more readily understood and implemented by SFLO's? For example: A specification for site classes > site class III and another specification for site classes IV and V. There are very few if any site classes I & II. Site classes can be grouped by PAG's as illustrated above.*
3) *It is economically imperative that SFLO's have enough flexibility to harvest high value trees in order to conduct an economically feasible operation even when associated with the adjacent upland harvest; our harvest MBF/acre is usually low (marginal) and in many situations there will be need for a follow-up PCT, and possibly LWD placement.*
4) *Full Alternate Plans simply are not practical for eastside SFLO's. To work for the benefit of landowners and resources a template format/process is needed to provide a reasonable expectation of a successful application without the need for the expertise required to navigate exhaustive and intimidating alternate plan guidance/processes.*

Do reviewers see any possibilities to achieve the goal? SFLO's are open to a dialog on practical eastside thinning rules appropriate for a template which is still subject to review on site specific basis!)