BIG THORNE PROJECT

SIR APPENDIX C

Legacy Forest Structure Standard and Guideline

Implementation Report

May, 2014

I have reviewed this report and found that the process used to identify legacy forest structure as required by the Forest Plan during the environmental analysis for the Big Thorne Project followed Forest Plan direction. Although there were changes to the Forest Plan LSTA used for the analysis of legacy, the process to determine the placement of legacy met the intent of the Legacy Forest Structure Standard and Guideline, and will provide clumps of old-growth forest throughout the VCUs identified in the Forest Plan that are at a higher risk of not providing the matrix functions of the Tongass Conservation Strategy.

/s/ Forrest Cole *May 23, 2014*

Forrest Cole Date
Forest Supervisor, Tongass National Forest

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Appendix C
Legacy Forest Structure Standard and Guideline Implementation Report

Purpose of this Report

This report documents the review by members of the Big Thorne Project Supplemental Information Report (SIR) Interdisciplinary Team (IDT) of how the Legacy Forest Structure Standard and Guideline (Forest Plan p. 4-90) was discussed in the Big Thorne Project Final Environmental Impact Statement (FEIS, Big Thorne Project record #736_2244) and Record of Decision (ROD, Big Thorne Project record #736_2248). This review was conducted in response to the Appeal Deciding Officer's letter for the Big Thorne Project (09/30/2013).

This paper provides additional information about the placement of legacy forest structure areas (hereafter referred to as legacy) in the Big Thorne units and how this meets the Forest Plan direction. Included in this report are the background, methods, and rationale used by the Big Thorne Project IDT for the design of legacy where required by the Forest Plan.

Summary of Process

The Big Thorne Project was the first project to evaluate the legacy requirements for a sizeable number of potential harvest units (113 units) on the Tongass National Forest since the 2008 Forest Plan was completed. The Baht Timber Sale (2008) and Logjam Timber Sale (2009, Big Thorne Project record #736_0082) implemented legacy for two units and one unit respectively. However, the size and complexity of the Big Thorne Project, combined with many adjustments to the unit pool occurring throughout the project, required the IDT to determine how legacy was to be applied in certain situations to meet the intent of the Standard and Guideline as outlined by the Forest Plan.

Several documents were developed by the IDT for the Big Thorne Project to document the legacy design process prior to signing of the ROD. The IDT developed an addendum to the harvest prescriptions, titled "Big Thorne Harvest Prescription Addendum; Legacy Requirements" and dated 6/3/2013 (see Big Thorne Project record #736_2192), to document and clarify resolution of particular issues associated with legacy planning and to further assist with project implementation. This document displays final legacy requirements, where applicable, of each unit included in the ROD. It includes a table, by unit, displaying acreage legacy was based on, final mapped opening size, mapped acres of legacy, adjoining units that were considered as one opening for the calculation of legacy requirements, and any additional legacy placement objectives. The introduction to the unit cards in the Big Thorne Project ROD, Appendix 1 (p. 5), provides a general explanation regarding how the IDT planned for legacy to be implemented in the project area. The Silviculture section of each unit card provides the required and currently mapped legacy acreage along with an explanation regarding legacy placement. Both the Timber and Silviculture Resource Report (Big Thorne Project record #736_2233) and the Wildlife and Subsistence Resource Report (Big Thorne Project record #736_0419) in the Big Thorne Project FEIS also discuss application of the legacy standard.

Appendix C

Forest Plan Direction for the Legacy Standard and Guideline

The intent of the Legacy Standard and Guideline is explained in the Forest Plan Record of Decision (p. 23 and p. 25) which states that this standard is used in in lieu of the goshawk foraging and marten habitat standard and guidelines included in the 1997 Forest Plan. This change was to provide a more comprehensive approach of retaining old-growth structural components in areas of timber harvest rather than the single-species approach of the 1997 Plan. However, the components for what legacy includes are based on the habitat needs of goshawk and marten by providing "some of the largest, oldest live trees, decadent or leaning trees, and hard snags occurring in the unit". Further information and background on the rationale of this standard and guideline is in the Forest Plan Amendment FEIS Appendix D (p. D-37 through D-44). The Legacy Standard is part of a set of the standards and guidelines designed to provide the matrix functions of the Tongass Conservation Strategy (see Forest Plan Amendment FEIS, p. 3-220 and Appendix D, pp. D-6 to D-12).

The Legacy Standard and Guideline (Forest Plan p. 4-90) explains the intent of the legacy forest structure:

> A. Objectives
> The intent of the Legacy Standard and Guideline is to ensure that sufficient residual trees, snags, and clumps of trees remain in timber harvest units within value comparison units (VCUs) that have had concentrated past timber harvest activity and are at risk for not providing the full range of matrix functions, in order to meet the intent of the conservation strategy while providing flexibility to address on-the-ground implementation issues.
>
> B. Legacy Standard
> In harvest units greater than 20 acres within VCUs identified in Section D [see below], leave 30 percent of the entire unit (based on area) in legacy forest structure. For the purpose of this standard, the unit is defined as the original Logging System/Transportation Analysis (LSTA) boundary prior to field verification. Legacy forest structure should remain indefinitely after harvest and shall be tracked through the life of the next stand. Salvage logging of legacy trees is generally prohibited unless the rationale is clearly documented and the effects are clearly neutral or an improvement.
>
> C. Distribution and Composition of legacy forest structure
> Legacy forest structure should be arranged primarily in clumps. The intent of leaving legacy forest structure is to provide structure within the opening; therefore, clumps should be left well inside the unit, compatible with logging system capabilities. Clumps may be placed along the external yarding boundaries within harvest units in situations where cable logging systems make leaving residual trees in other parts of the unit impractical due to operational or safety considerations. Structure left within units for other resources counts towards the 30 percent, provided it meets the old growth stand characteristics below. Mapped TTRA stream buffers do not count toward the 30 percent. Legacy forest structure shall be representative of the existing old-growth stand characteristics, including age, size class, species composition, and structural components. Clumps and dispersed retention trees should include some of the largest, oldest live trees, decadent or leaning trees, and hard snags occurring in the unit.

D. VCUs where the Legacy Standard Applies
This standard is to be applied in VCUs where 33 percent or more of the productive old growth has been harvested from 1954 to 2005, or VCUs where less than 33 percent has been harvested but more than 67 percent of the productive old growth is projected to be harvested by the end of the Forest Plan planning horizon (see [Forest Plan] glossary).

Units where the Legacy Standard Applies

The Legacy Standard and Guideline Section D (Forest Plan p. 4-90) lists the VCUs where legacy forest structure needs are to be evaluated. The VCUs on Thorne Bay Ranger District where the legacy standard applies are: 5320, 5350, 5371, 5380, 5390, 5440, 5450, 5460, 5500, 5542, 5550, 5560, 5570, 5580, 5590, 5600, 5610, 5620, 5700, 5710, 5720, 5790, 5810, 5830, 5840, 5850, 5860, 5871, 5872, 5880, 5900, and 5972.

In the Big Thorne Project area, VCUs 5790, 5810, 5830, 5840, 5850, 5860 and 5972 have a total of 113 proposed old-growth harvest units that are either fully or partially within these VCUs and required an evaluation of the Legacy Standard. Some of these units would be partially harvested leaving either 50 to 75 percent retention of the trees. This would not result in a created opening of more than 20 acres and would not require legacy to be retained. There are also 65 young-growth forest thinning units where legacy would not be applied since there is no old-growth forest structure to retain within these units.

Seven units spanned both a VCU where the Legacy Standard applies (legacy VCU) and a VCU where legacy does not need to be applied (non-legacy VCU). Based on direction in the Forest Plan, the Big Thorne IDT determined that the Legacy Standard intended the legacy to be applied in the legacy VCUs to meet objectives, even if a proposed harvest unit spanned both legacy and non-legacy VCUs. In these cases, and regardless of the size of the entire unit, legacy requirement was evaluated only for the portion of the unit within the legacy VCU. If legacy was required, the legacy was placed only within the portion of the unit that was in the legacy VCU. See Exhibit 1, attached, following this report.

Addressing Legacy in the Project Planning Process

Forest Plan Legacy Forest Structure, IV. Section B defines a unit, for the purpose of determining the legacy set-aside acreage, as the “original Logging System and Transportation Analysis boundary prior to field verification”. Because of some circumstances, following this direction and using the Forest Plan LSTA for the Big Thorne Project area may not have resulted in meeting the intent of the standard in some cases. However, modifications to the Forest Plan LSTA were expected during project implementation. This was anticipated during the development of the Forest Plan LSTA; see “Procedures for Conducting an Integrated Timber Operability Analysis for the Tongass National Forest Revised February 6, 2006” (Forest Plan record #603_0345 p. 8):

> “In addition, there is a potential for needing to adjust the LSTA to cover new areas that are currently inside Non-Development LUDs, in order to fully assess all alternatives. This could occur as a result of adjustments to Small OGR boundaries in Phase 2 of the Forest Plan Adjustment and Update process, or as a result of an alternative being developed that adjusts other LUD boundaries.”

This was reaffirmed by the Planning Staff Officer in 2008 when legacy was first applied for the Baht Timber Sale through an email (Big Thorne Project record #736_4206). During the analysis of the Big Thorne Project in 2012, several meetings between the IDT and the Responsible Official were held to discuss the LSTA to be used for legacy. The Responsible Official approved the use prior to legacy being allocated. Therefore, this issue was reconciled in a consistent manner while retaining the concept of the original LSTA unit, as described in the following section.

Big Thorne Logging Systems and Transportation Analysis

The Logging Systems and Transportation Analysis for the Tongass National Forest (Forest Plan LSTA) was created in 2006 during the environmental analysis for the Forest Plan Amendment FEIS. The Forest Plan LSTA included all suitable and available forested lands within development land use designations (LUD) where timber harvest is allowed (as identified in the 1997 Forest Plan, as amended), and thus did not contain any settings within Forest Plan Old Growth Reserves. No field reconnaissance was done for the Forest Plan LSTA; however, existing Geographical Information System (GIS) information and previously completed LSTAs were used.

The Forest Plan LSTA consists of GIS polygons that mostly represent settings rather than potential harvest units. A setting is a polygon delineated by timber type, topographical features, the logging system to be used, and the log landings. A setting delineates the area where the logs go to a specific landing by a specific logging system. Settings are normally too small to be efficiently analyzed as a single harvest unit in the planning process or administered as part of a contract. A unit is usually composed of a number of settings, while the unit pool for the project consists of all units that could be proposed for any alternative during the planning process. The unit pool usually does not consist of all the suitable and available forested land and is therefore a subset of the Forest Plan LSTA.

Initially, the Big Thorne unit pool layer consisted of all the harvest units that could be reasonably formulated from the settings in the Forest Plan LSTA. In most cases, a number of Forest Plan LSTA GIS layer polygons were combined based on similar stand characteristics and topographic features to form each proposed harvest unit within the Big Thorne Project Proposed Action. Once these units were created in GIS, the boundaries were verified against the most recent aerial photography available and adjustments made to best follow stand boundaries and exclude any areas of non-forest, non-merchantable timber, or past harvest. Field crews then began the process of reviewing these units. This included making adjustments to follow available commercial timber or existing managed stands. Additionally, some settings of suitable and available forest were identified that were not included in the Forest Plan LSTA. See Exhibits 4 and 5.

Tongass Timber Reform Act (TTRA) buffers on known Class I and II streams (fish streams) were excluded from the unit during the development of the Forest Plan LSTA. However, during field reconnaissance of the Big Thorne Project area, the mapped location of some of these streams varied from the GIS stream layer that forms the basis of the Forest Plan LSTA. This resulted in additional adjustments to the units and therefore also created substantial changes to the unit pool. See Exhibits 6 and 7.

As field reconnaissance was being completed in 2011, two modifications occurred to the unit pool. The first was the ruling on the lawsuit concerning the Tongass Exemption to the Roadless Rule[1]. This resulted in the removal of some potential units and portions of units within Inventoried Roadless Areas (IRA) from harvest consideration. At the same time, direction was given to the IDT to maximize potential harvest acreage outside IRAs to offset the areas removed from the project due to Roadless ruling. To respond to this, a review was done to see if it was possible to reposition the roaded portions of the Forest Plan Old-growth Reserves (OGRs), where timber harvest is not allowed, inside the boundaries of the IRAs, thus providing additional acres for potential harvest. This review generated 69 additional potential harvest units that were added to the unit pool for Big Thorne for field review in 2011.

Determination of the Appropriate Amount of Legacy Acreage

Section B of the Standard (Forest Plan p. 4-90) states that harvest units greater than 20 acres within VCUs identified in Section D should leave 30 percent of the entire unit (based on area) in legacy forest structure. The original Logging System/Transportation Analysis (LSTA) boundary in the Forest Plan is the basis for determining the 30 percent; thus areas deferred or dropped from harvest consideration after field reconnaissance could be considered as legacy areas (Forest Plan p. 4-90 and 4-91). The Plan goes on to state in Section C that legacy forest structure should be arranged primarily in clumps and that the intent of leaving legacy forest is to provide this structure within the harvest unit. However, legacy can be left along the edges of the opening for the consideration of safety or operational considerations.

As with most projects, the unit pool evolved as the project progressed, creating questions when applying the Legacy Standard. Specifically, if legacy calculations were based solely on the original Forest Plan LSTA unit size prior to field verification, the Big Thorne Project might not meet the intent of the Forest Plan if:

- the unit boundary increased beyond 20 acres (triggering the Legacy Standard in the Forest Plan) after field reconnaissance, or
- a number of adjoining small units would combine to form an opening larger than 20 acres after harvest, or
- the unit had areas prescribed for uneven-aged management, or
- a planned unit of 20 or more acres was found to adjoin a recent harvest area still considered a created opening by NFMA standards.

With these changes that occurred to the unit pool from the outset of the project, and throughout the project timeline there was no “original LSTA” that would be suitable as a base for calculating legacy.

Therefore, to best meet the intent of the Forest Plan, the IDT calculated required legacy acreage based on the potential opening that might be created rather than only by the unit identified prior to field review. The size of a potential opening is the sum of all adjacent proposed even-aged units or existing even-aged harvest openings that have not met NFMA standards. Using the potential opening size resolved issues with adjoining even-aged units or acreage adjustments that occurred during field review as a result of following timber type boundaries, stream locations, or other topographical features. It also addressed

[1] The Tongass Exemption was vacated and the application of the 2001 Roadless Rule was reinstated for the Tongass National Forest in 2011 due to the decision on litigation [OVK et al.v, USDA, et al. (1:09-cv-00023 JWS.)].

uneven-aged management prescriptions and units with multiple separate polygons. See Exhibits 9, 10, 11, and 13.

Created Openings

Extensive past harvest in the project area resulted in some planned units adjoining areas previously harvested. The IDT utilized direction from NFMA regarding what constitutes a created opening[2] to determine under what conditions an adjacent previously harvested unit should be considered part of the potential opening in order to calculate the amount of legacy needed. During field review of the unit pool, the IDT identified situations where planned units shared boundaries with past harvest areas that had not yet met NFMA requirements and were still considered to be a created opening. In these cases, the combined area of the past harvest along with the area of the proposed unit was used as the potential opening size to determine the amount of legacy required. Any adjoining past harvest areas that have met NFMA requirements were not considered in the legacy calculation for Big Thorne units. See Exhibit 12.

Uneven-aged Management Prescriptions

The IDT determined that harvest unit prescriptions would greatly influence harvest opening sizes and therefore the legacy requirements. The silvicultural prescriptions for Big Thorne harvest units were part of both even-aged and uneven-aged regeneration systems and some units would utilize both systems. The Forest Plan does not state that legacy is to be applied only under even-aged regeneration systems; however, it does state that the intent is to provide old growth structure within openings larger than 20 acres. A review of the Forest Plan and the Forest Plan Amendment FEIS, Appendix D p. D-38, regarding stand structural requirements, also indicated that legacy objectives would be met in uneven-aged management units, without requiring specific legacy set-aside areas since no opening greater than 20 acres would be created. Based on this, the IDT determined that legacy was not required where uneven-aged management was prescribed. See Exhibit 2.

Units Containing Both Even-aged and Uneven-aged Management Prescriptions

The Big Thorne Project includes a number of units that have both uneven-aged management prescribed for helicopter yarding areas and even-aged management prescribed for cable or shovel yarding areas. Uneven-aged management areas within units are prescribed either 50 percent or 75 percent basal area retention. No legacy set-aside acreage is required in these areas because openings of 20 or more acres will not be created; therefore, they are not included in the legacy set-aside requirement calculation for the unit as a whole. Even though the IDT determined that the uneven-aged management prescriptions (50 percent and 75 percent retention prescriptions) would meet the requirements for legacy based on the discussion from the Forest Plan Amendment FEIS page D-38, the intent of the Legacy Standard was to set aside intact old-growth forest (representative of the existing old-growth stand characteristics) rather than to rely on any adjacent partially cut areas as legacy even if they were within the original LSTA unit. Therefore, legacy was only calculated for and placed within the even-aged portion of these units. See Exhibit 3.

[2] Forest Plan p. 4-72 III.E, Created Opening: Created openings will be adequately stocked with desirable tree species, which are approximately 5 feet in height, before the area will no longer be considered an opening for the purposes of determining limitations on the scheduling, locating, and calculating the size of additional created openings. Small inclusions within openings do not constitute division to the openings for purposes of reducing size.

Big Thorne Project Legacy Application

The following direction was used by the IDT for the determining the required legacy acres in the Big Thorne Project, documented in the prescription addendum (Big Thorne Project record #736_2192) titled "Big Thorne Project Harvest Prescription Addendum - Legacy Requirements" dated 6/3/2013.

- Base the number of acres of required legacy on the acreage of even-aged management openings within a unit or any combinations of units that create a contiguous even-aged opening greater than 20 acres. Unsuitable areas removed from harvest consideration may be used for legacy so long as the area is included in the calculation. For example a proposed 100 acre opening would require 30 acres of legacy to fall within the 100 acre opening. If legacy is to be placed in an adjoining unsuitable soil area of 50 acres[, T]the required legacy would be 150 x 30% or 45 acres. The entire legacy area could be placed in the unsuitable soil area at that time so long as it meets the requirements for distribution and composition stated in the Forest Plan. [See exhibits 10, 11, and 13.]
- Some units or portions of units were originally planned within inventoried roadless areas (IRA). All IRAs have since been removed from harvest consideration. Parts of units removed that are in IRAs may however be utilized as legacy as long as the overall [acreage for the] unit area legacy is figured on includes the roadless [acres] being used as legacy. For example a proposed 34 acre unit was originally planned with 10 acres falling within an adjacent IRA. The final unit harvest area is now 24 acres of clearcut. The legacy requirements can be met in the 10 acres of IRA already removed if it meets all other requirements. The legacy acreage requirement would be 34 x .30 or 10 acres. [See Exhibit 8.]
- Units with multiple independent openings less than 20 acres do not require legacy even if the combined acreage of all the openings exceeds 20 acres. [See Exhibit 9.]
- Many units have sections with both even-aged clearcutting and uneven-aged partial harvest. These units should have the legacy acres calculated based on the even-aged opening only. If the legacy acreage that is required needs to be designated in the portion of the unit planned for partial harvest. Those areas must be set aside. Areas determined for legacy may not be partially harvested. [See Exhibit 3.]
- If an even-aged opening is expanded during implementation the increased acreage must be accounted for in legacy. For example a 21 acre opening is enlarged to 30 acres. Legacy would need to be increased from 6.3 acres (21 x .30) to 9 acres (30 x .30). [See Exhibit 14.]
- Changes during implementation that expand an opening to beyond 20 acres will need to have legacy applied. In some case this could result in a net loss of harvestable acres. Consider the following: A 19 acre opening is expanded to 22 acres during layout. The opening would go from not requiring legacy to requiring 6.6 acres. Resulting in a final harvest of 15.4 acres and legacy polygons that must be tracked for the life of the stand. In this situation presale should however consider the location of unsuitable areas if they exist adjacent to the opening being expanded. In the case above the opening could be expanded and newly required legacy placed in a previously identified unsuitable soil area should one exist that meets the legacy distribution and composition requirements. [See Exhibit 14.]

Appendix C

Determining the Location of Legacy Forest Structure within the Potential Opening

The Forest Plan legacy direction (Section C, p. 4-90) states that legacy should be arranged primarily in clumps to provide structure within the harvest opening. The plan states that legacy clumps should be well inside the harvest opening but makes concessions for them to be located along opening edges for operational and safety concerns.

Review of the Forest Plan FEIS Amendment FEIS (Appendix D, p. D-42) indicated that the primary reason for the reference to the original LSTA boundary was to allow for legacy to be placed in forested areas identified during field reconnaissance as unsuitable for harvest. In other words, where resource concerns such as scenery, soils, riparian buffers on Class III streams, or sensitive plants exclude part of a unit from being harvested, those areas may be considered as legacy if they meet the requirement of being representative of the existing old-growth characteristics. Appendix D, pp. D-39 and D-42 discusses that increasing the efficiency of logging to reduce costs was considered to allow legacy placement in unsuitable forested areas and in clumps. Therefore, to help address economic concerns, the IDT made it a priority to designate legacy within portions of units that are representative of the existing old-growth characteristics, where possible, but classified as unsuitable for other resource concerns.

Placing legacy in clumps is the second principal design consideration of the Legacy Standard and Guideline. Appendix D of the Forest Plan Amendment FEIS (p. D-39) discusses research that indicates retention of clumps of 2.5 acres has ecological advantages over dispersed retention (individual trees). Experience from previous projects on Prince of Wales Island shows that low dispersed retention levels are prone to windthrow and therefore do not meet objectives of retaining legacy characteristics in the stand over time. The IDT also was aware that dispersed trees within units planned for conventional yarding systems would be generally unfavorable for economics and would contribute to unsafe logging operations. To positively influence the operational efficiency and economics of the sale and the potential ecological benefits of legacy, the IDT designed clumps of legacy exclusively.

The IDT also considered the surrounding landscape when determining the location of legacy; particularly, how legacy placed along the edge of a unit would function. If muskeg, non-forested land, or young-growth forest abutted the unit, the IDT determined legacy placed between the harvest opening and these areas would be appropriate and meet the intent of the Forest Plan of providing structure within openings.

Big Thorne Project Legacy A and Legacy D

The IDT designated legacy for the project in two ways, referred to as Legacy A and Legacy D areas. In both, the same old growth structural requirements must be met for the area to be used as legacy regardless of other objectives. These requirements are described in the Forest Plan, which states that areas left for legacy should be representative of the existing stand characteristics including age, size class, species composition, and structural components. It goes on to state that legacy should include some of the largest, oldest, decadent or leaning trees and hard snags in the unit. During the planning process, enough information about stand structure was available from field notes to determine if the areas proposed for legacy have forest structure similar to the overall unit.

Legacy A areas are legacy acres that have been added from within the suitable forested portion of the unit that would otherwise be planned for harvest, in order to meet the acreage or other requirements. Legacy D is located within unsuitable forested portions of a unit, which are areas with merchantable timber where application of standards and guidelines preclude timber harvest because of other resource concerns.

These areas tend to naturally be along the edges of harvest openings, which therefore also define the exterior of suitable harvest areas. Seldom are unsuitable soils, over-steepened slopes, karst areas, nest and den buffers, or non-TTRA stream buffers found in an arrangement of small clumps, nor do they typically occur centrally within the unit. The IDT determined that legacy designed to protrude into the unit, even if it adjoined the edge of the unit, will meet the objective of the Forest Plan as well as or better than smaller clumps surrounded by openings. Additionally, the IDT determined that consolidating legacy areas as large as possible will be positive for wildlife, lower the risk of blowdown, and make operations more practical and safe.

Legacy configurations for both Legacy A and D within units were often designed to achieve multiple beneficial resource objectives; mitigate effects to wildlife, soils, and other resources; and also positively influence the timber harvest economics of the project, all while meeting the intent of the Forest Plan. In accordance with the Forest Plan, the IDT determined additional legacy placement may include:

- areas along streams where legacy is used to expand the buffer and/or function as a Reasonable Assurance of Windfirmness (RAW) buffer (Forest Plan p. 4-24);
- important wildlife habitat including bear den buffers and high value deer winter range;
- areas with rare or sensitive plants;
- difficult to access areas, or areas where road construction cost recovery is marginal or uneconomic; and
- planned divisions between units that avoid the creation of an even-aged opening larger than 100 acres.

Implementation of the Planned Legacy

The IDT recognized that the areas planned for legacy during the environmental analysis process may not be the optimum solution for meeting the intent of the standard and guideline. During field layout of the units and roads for the timber harvest contracts, implementation personnel have the latitude to modify planned legacy areas to best meet Forest Plan requirements, as long as the appropriate set-aside acreage and original goals of placement are achieved including the stand structure elements. There were 143 units laid out and offered under the Big Thorne Stewardship Contract in 2013. All modifications to unit designs and legacy placement were documented in a change analysis (August 17, 2013) that was prepared following the direction of TNF-Supplement FSH 1909.15-2009-1, section 18. As other contracts are offered, change analyses will be completed for all units, whether legacy is required or not. Maps that compare the ROD planned unit and the as-laid-out unit will continue to be prepared to track changes. A map of the entire project area has been prepared to show what effects these units have on connectivity and will be updated as needed to visually track these changes. At the project-area scale using the orthophoto maps created, effects to connectivity can be determined. After harvest, legacy areas will be entered into the Forest Activity System (FACTS) GIS layer as a subunit of the harvest unit (see direction in FSH-TNF Supplement to FSH 2409.26d-2012-2) to ensure tracking and that these areas are perpetually maintained as forested areas if future harvest is planned within the Big Thorne Project area.

Conclusion

The process used to identify legacy forest structure as required by the Forest Plan during the environmental analysis for the Big Thorne Project process followed Forest Plan direction. Although there

were changes to the LSTA used for the analysis of legacy from the Forest Plan LSTA, the process to determine the placement of legacy met the intent of the Legacy Forest Structure Standard and will provide clumps of old-growth forest throughout the identified VCUs in the Forest Plan that are at a higher risk to not providing the matrix functions of the Tongass Conservation Strategy.

Attachments

In addition to this *Appendix C Legacy Forest Structure Standard and Guideline Report* are three attachments that follow. First, Exhibits 1 through 14 are example maps displaying common scenarios described in this Appendix. Exhibit numbers throughout this report refer the reader to which map helps depict that particular unit design situation. Note that these maps do not display actual timber sale units. Following that is a Legacy Implementation Review for the Big Thorne Stewardship Integrated Resource Timber Contract. Members of the Big Thorne SIR IDT reviewed each unit included in the aforementioned Stewardship Contract that required legacy to ensure the intent of the standard and guideline was met in each case. Lastly, a series of maps that correspond to the Legacy Implementation Review is included, each labeled by its Big Thorne Project unit number. These maps show the difference between how the units and their required legacy were designed in the Big Thorne Project ROD versus how they were implemented in the Stewardship Contract.

References

Note that the number preceding each reference is the corresponding Big Thorne Project record number.

#736_0082 – June 2009 Logjam Timber Sale Final Environmental Impact Statement

#736_0419 – June 2013 Big Thorne Project Wildlife and Subsistence Resource Report

#736_2192 - June 3, 2013 Big Thorne Project Harvest Prescription Addendum; Legacy Requirements

#736_2233 – April 2013 Big Thorne Project Timber and Silviculture Resource Report

#736_2244 – June 2013 Big Thorne Project Final Environmental Impact Statement

#736_2248 – June 2013 Big Thorne Project Record of Decision

Forest Plan record #603_0345 – February 6, 2006 Procedures for Conducting an Integrated Timber Operability Analysis for the Tongass National Forest Revised

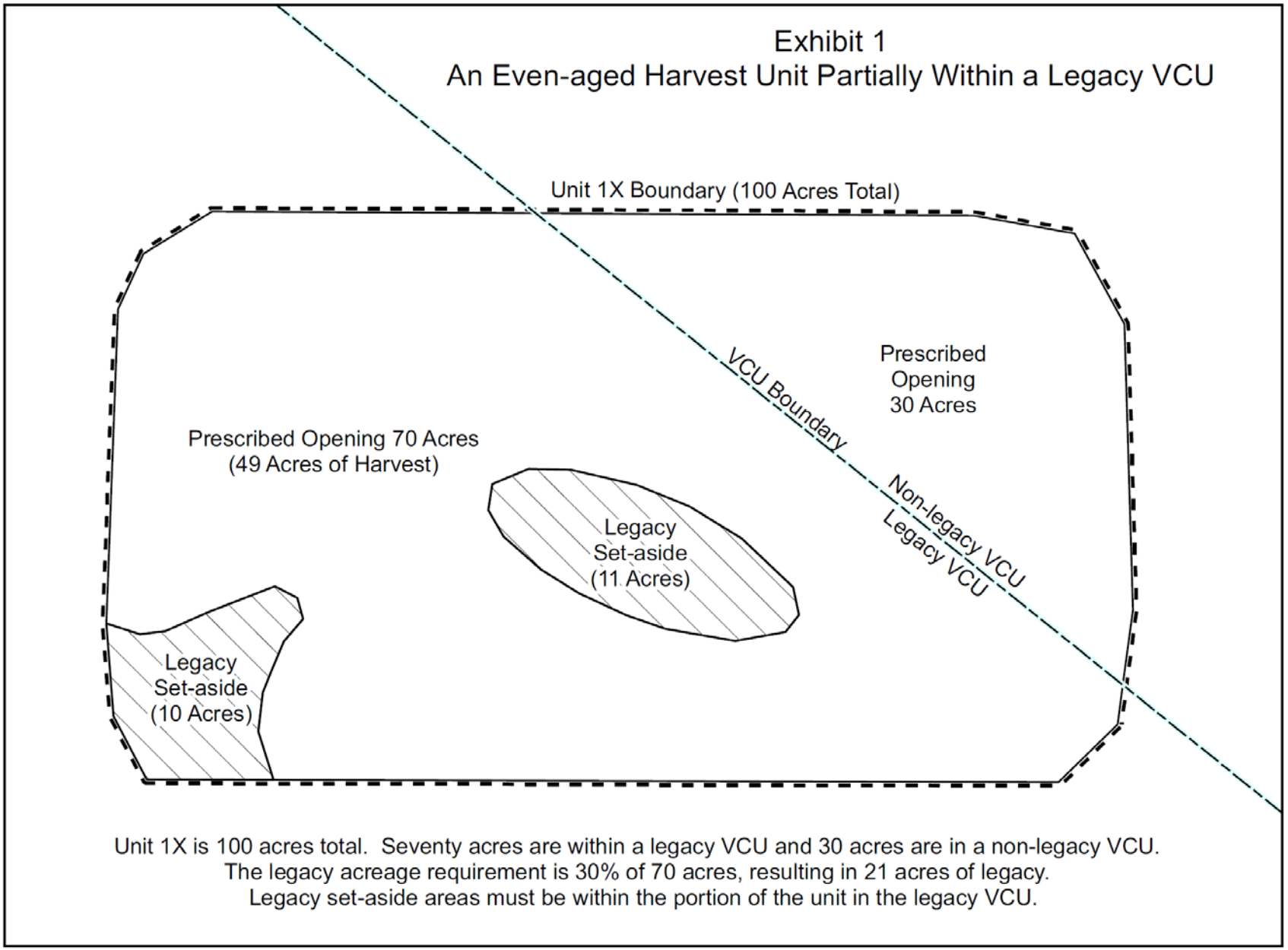
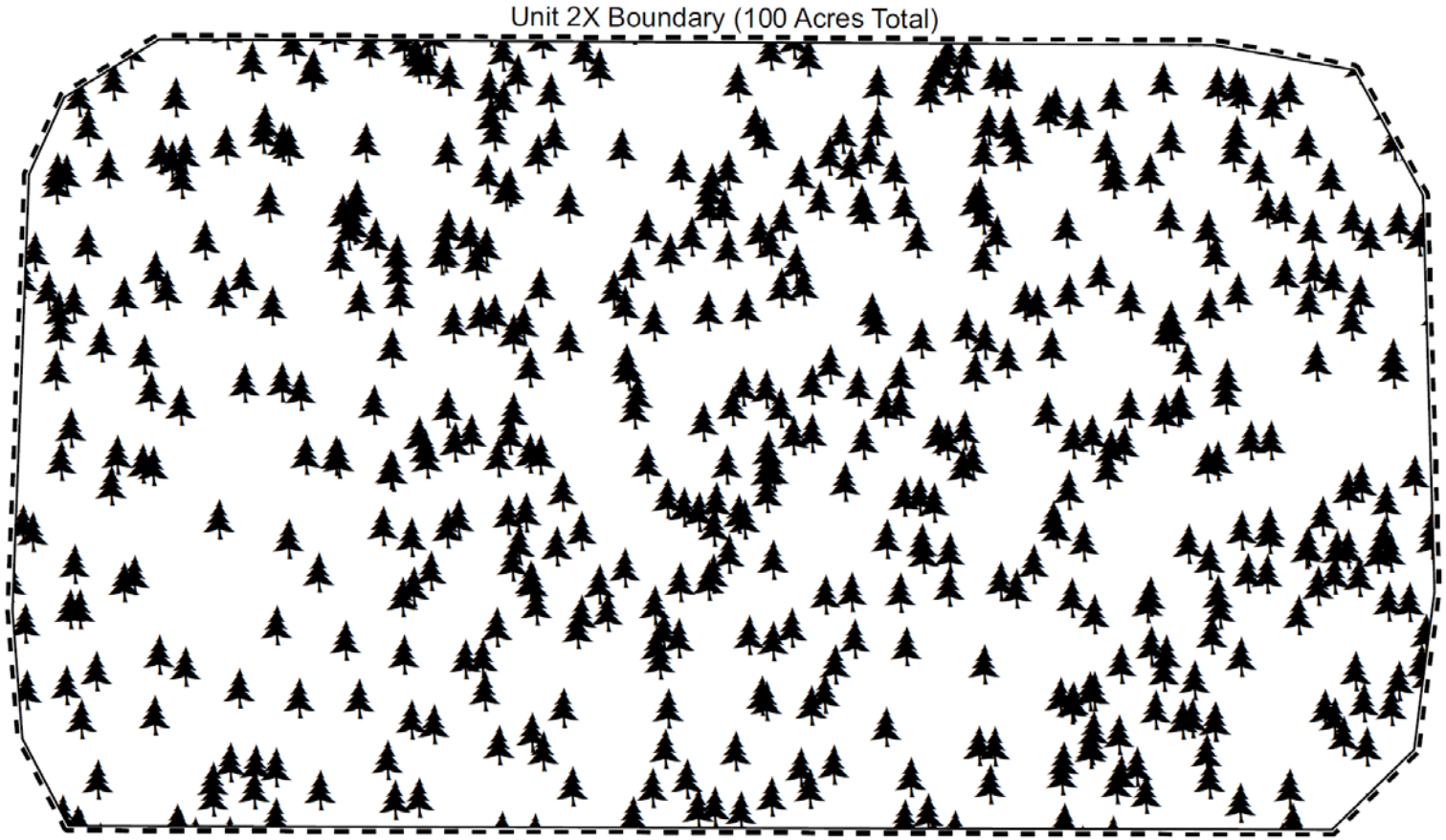


Exhibit 1
An Even-aged Harvest Unit Partially Within a Legacy VCU
Unit 1X Boundary (100 Acres Total)
VCU Boundary
Prescribed
Opening
30 Acres
Prescribed Opening 70 Acres
(49 Acres of Harvest)
Legacy
Set-aside
(11 Acres)
Non-legacy VCU
Legacy VCU
Legacy
Set-aside
(10 Acres)
Unit 1X is 100 acres total. Seventy acres are within a legacy VCU and 30 acres are in a non-legacy VCU.
The legacy acreage requirement is 30% of 70 acres, resulting in 21 acres of legacy.
Legacy set-aside areas must be within the portion of the unit in the legacy VCU.

Appendix C

Exhibit 2
Uneven-aged Management Prescriptions



Unit 2X is 100 acres all within a legacy VCU and is prescribed for all uneven-aged management with 50% or greater retention. No openings were created that are greater than 20 acres. No legacy set-aside areas are required.

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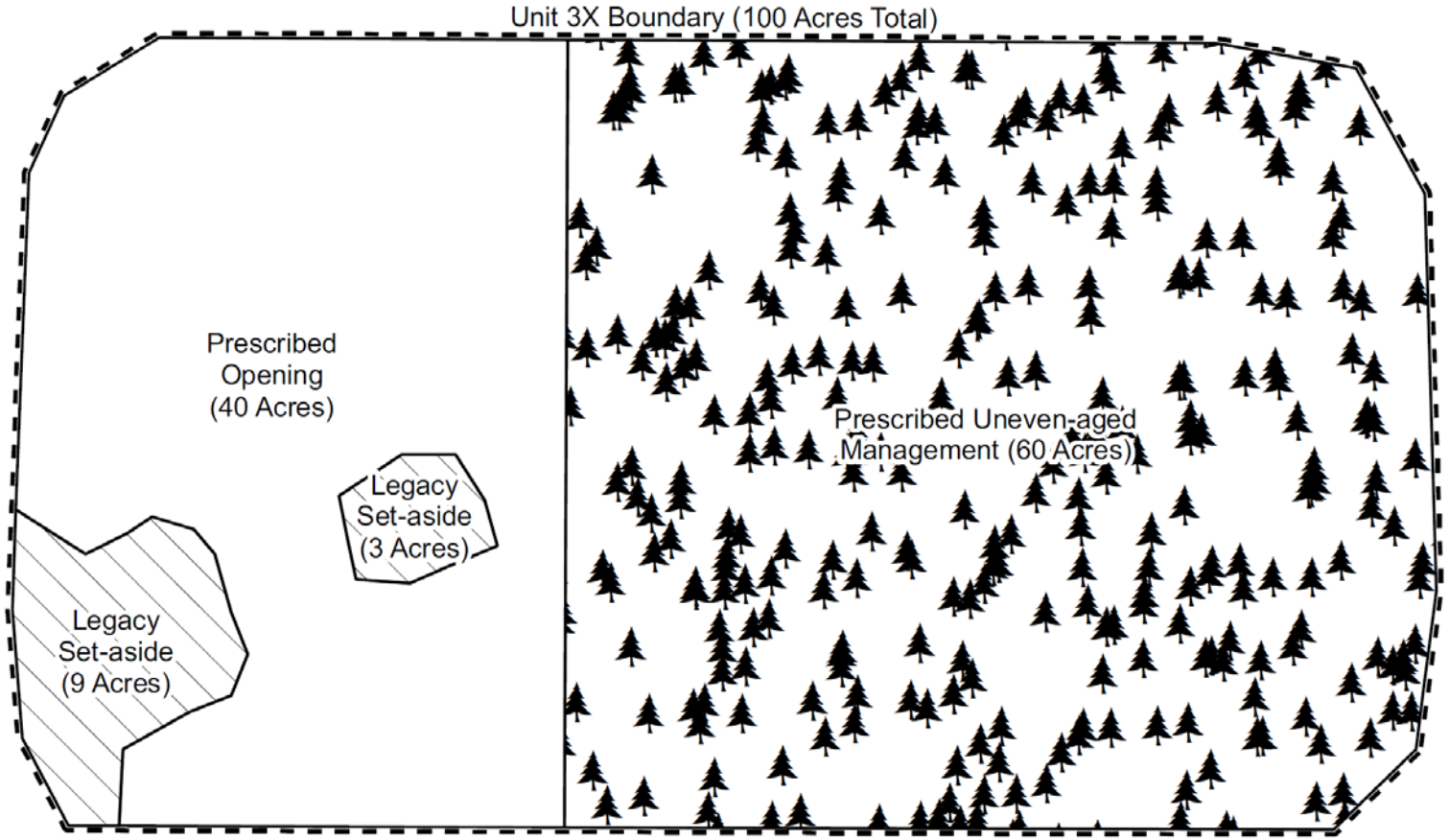
Exhibit 3
A Unit Split Between Uneven-aged Management and Even-aged Management



Unit 3X is 100 acres with 60 acres prescribed for uneven-aged management and 40 acres prescribed for even-aged management. The entire unit is within a legacy VCU. The legacy acreage is based only on the 40 acres of prescribed opening and is 30% of 40 acres, resulting in 12 acres of Legacy. Legacy set-aside areas must be within the even-aged portion of the unit.

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Appendix C

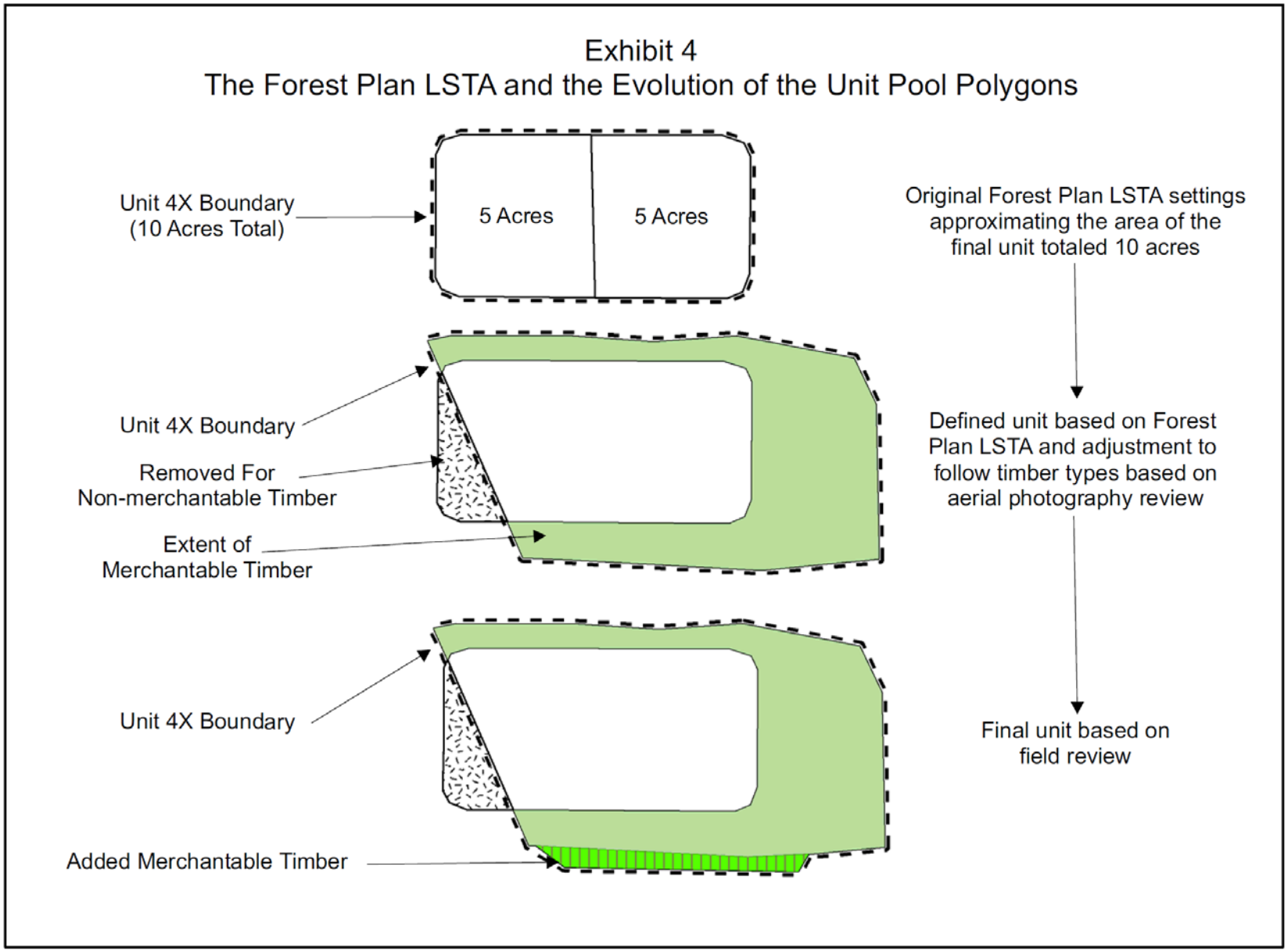

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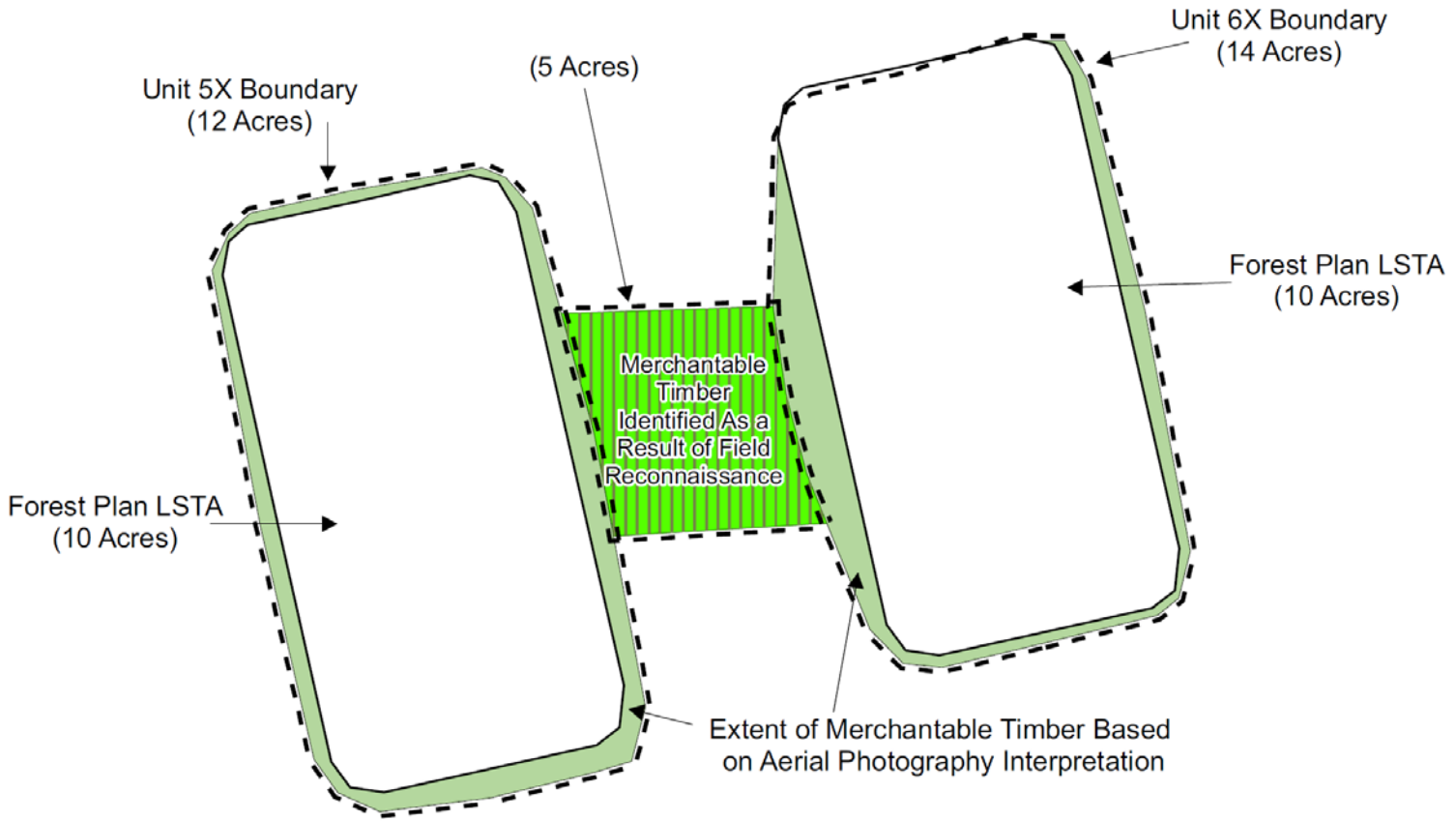
Exhibit 5
An Additional Unit Identified As a Result of Field Reconnaissance



Initial Forest Plan LSTA settings were not adjacent and individual opening acreages were less than 20 acres.
During field reconnaissance, an additional five acre area was identified that was adjacent to both Unit 5X and 6X.
In addition, an aerial photograghy review expanded the original units by six acres.
The new Potential Opening is now 12 + 5 + 14 acres or 31 total acres, resulting in a legacy requirement.

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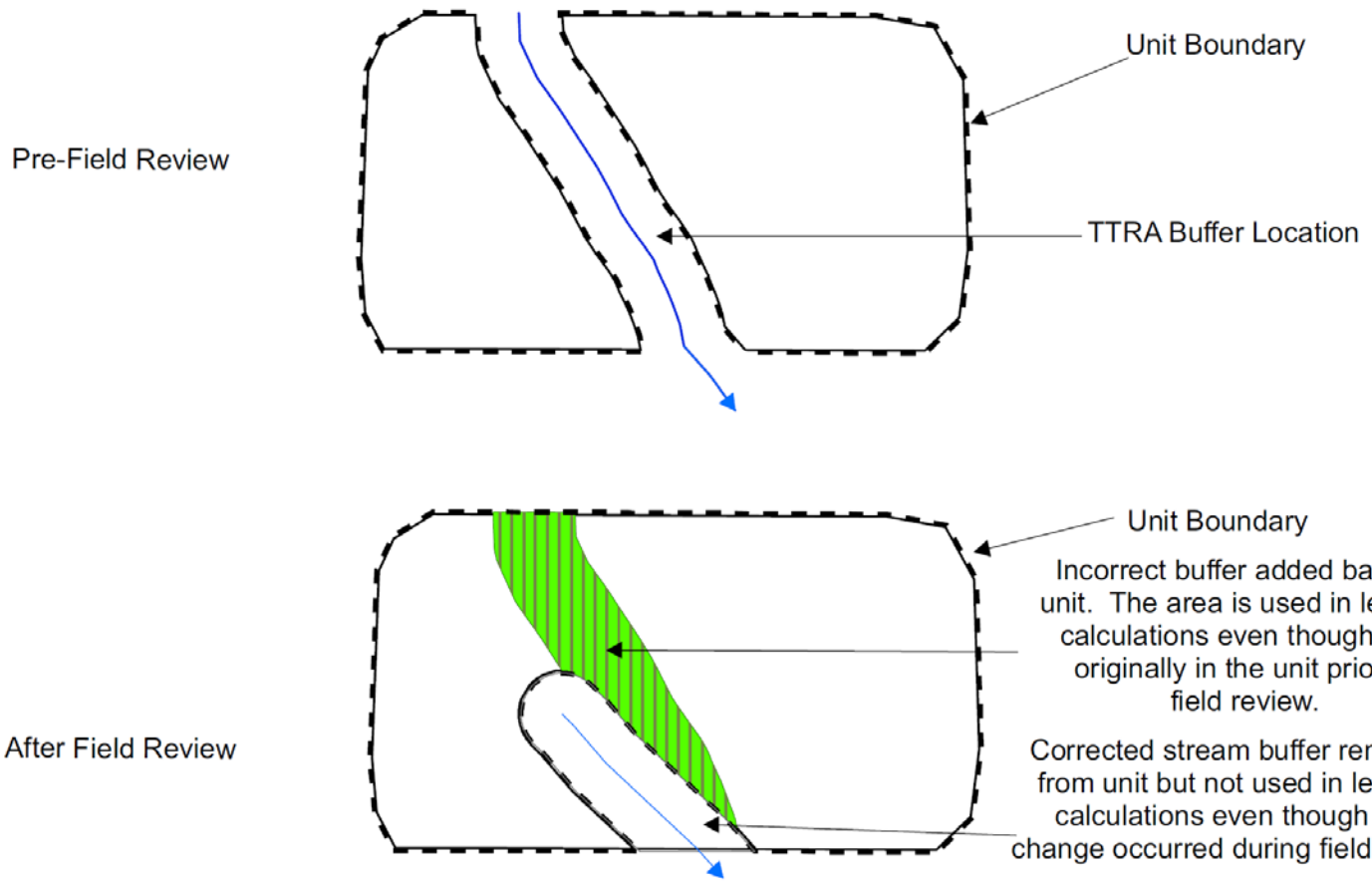
Appendix C

Exhibit 6
Adjustment of TTRA Buffers



Prior to field review, the unit consisted of two polygons separated by a TTRA buffer exclusion. After field review, the stream length and alignment were adjusted, with a smaller TTRA buffer exclusion, which no longer split the unit. The legacy requirement is based on this single polygon size.

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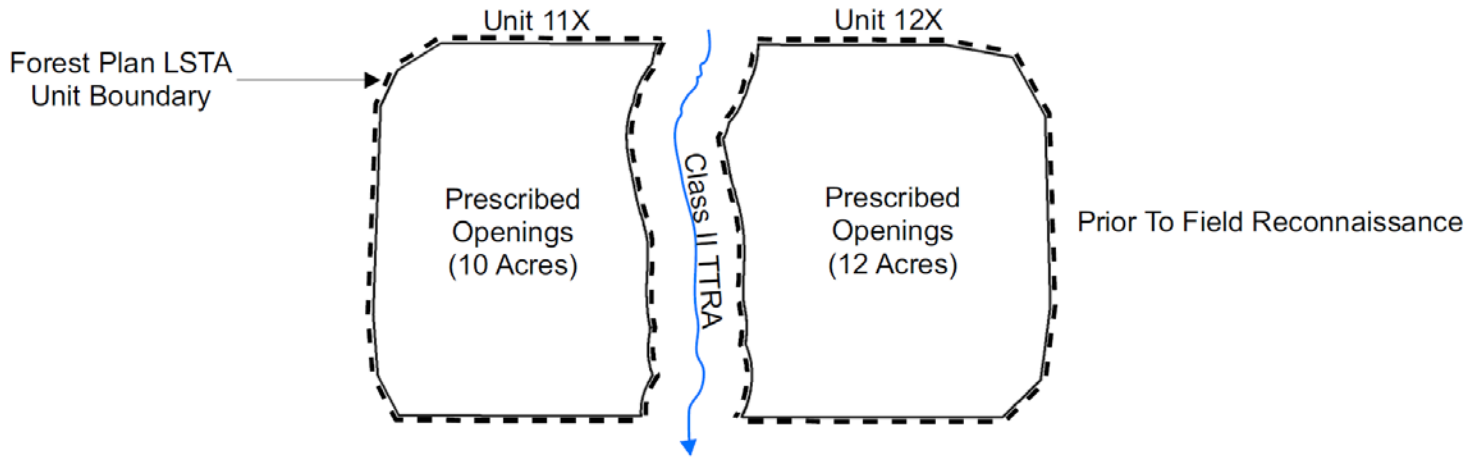
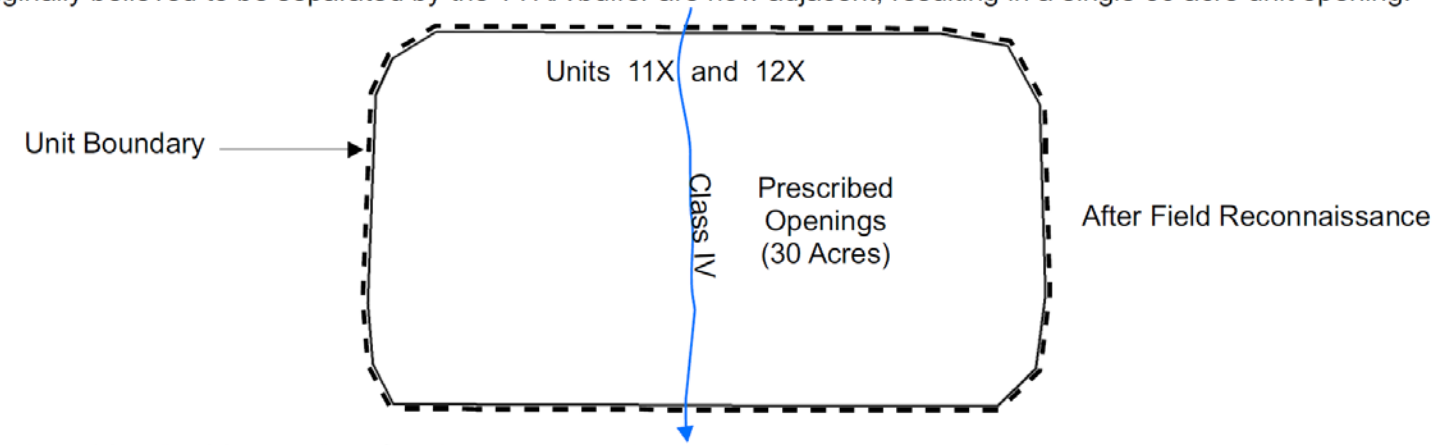
Exhibit 7

Stream Clarification Changes After Field Reconnaissance Affecting Unit Size and Adjacency



A stream originally believed to be Class II requiring a TTRA buffer is found to be Class IV after field reconnaissance.
Units originally believed to be separated by the TTRA buffer are now adjacent, resulting in a single 30 acre unit opening.



Units 11X and 12X now adjoin forming an opening larger than 20 acres, resulting in a legacy requirement.

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Appendix C

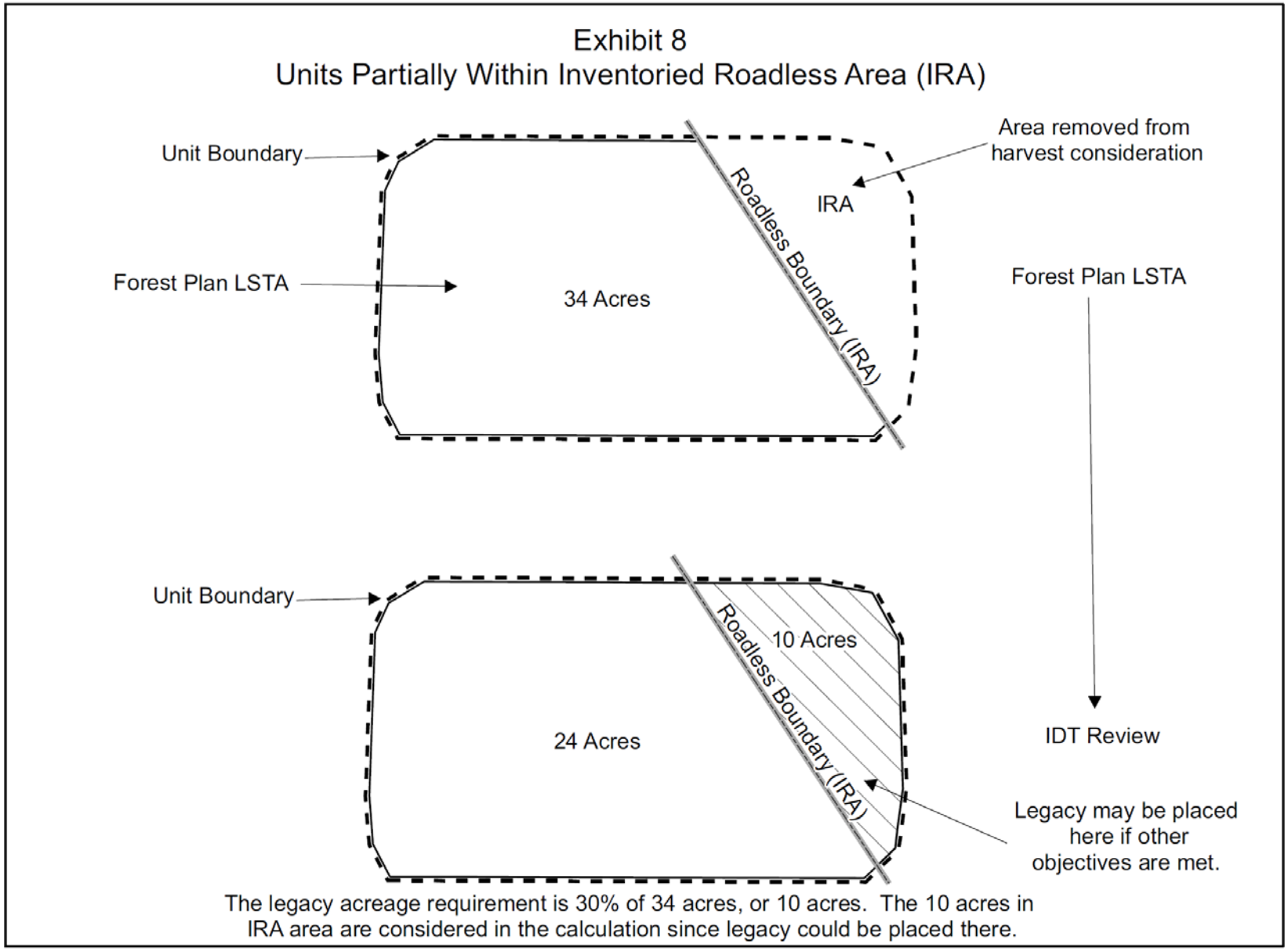

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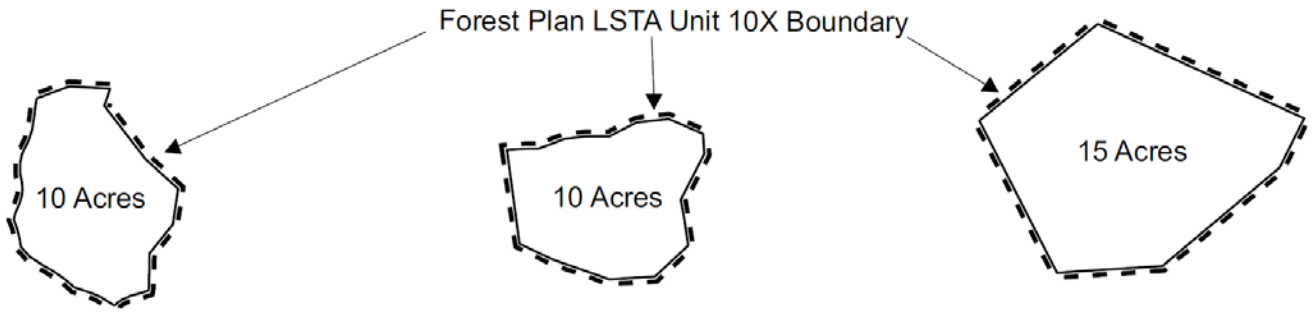
Exhibit 9
A Single Unit With Multiple Polygons



In some cases the numbering of the unit pool created situations where multiple well separated polygons were numbered as one unit. Even though the sum of all the polygons exceeds 20 acres, legacy was not applied because the harvest openings are well separated and each individual opening is less than 20 acres.

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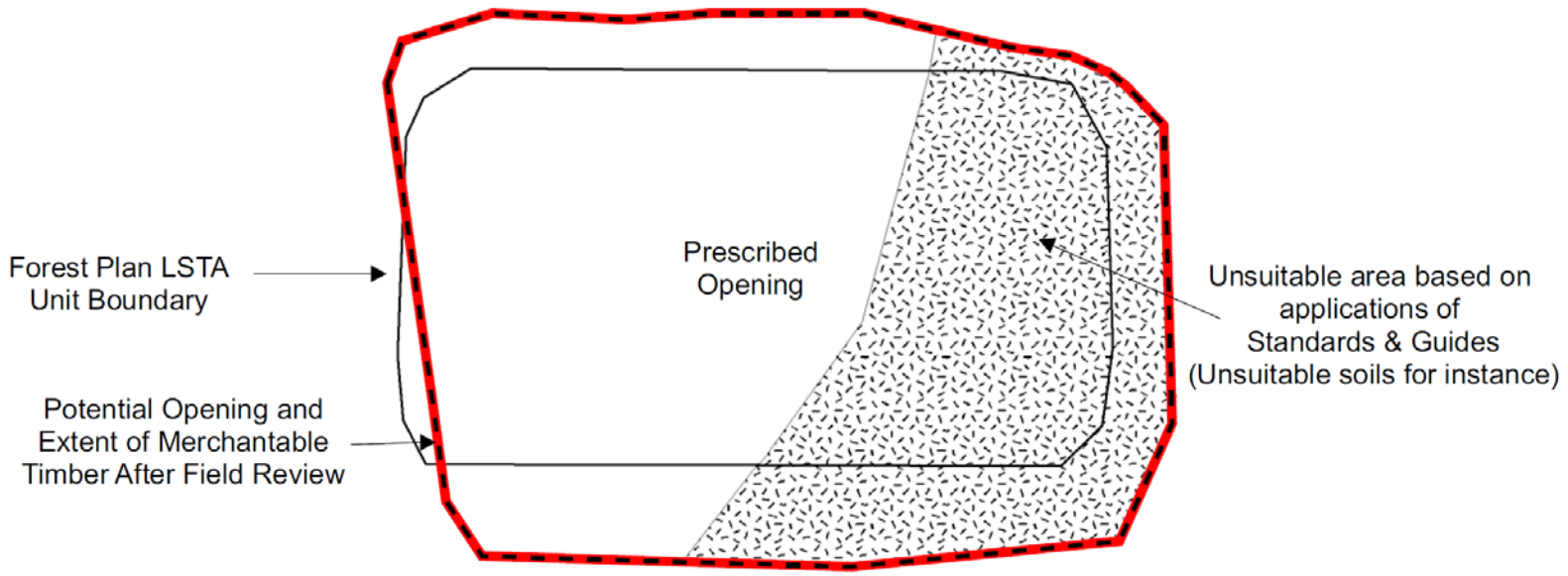
Exhibit 10
The Potential Opening Concept



The concept of the Potential Opening was developed to simplify and standardize the application of legacy in the project because many units had multiple situations that complicated the application of legacy. The Potential Opening is the hypothetical opening that might be created based on the sum of all adjacent prescribed harvest openings and any areas removed from harvest consideration for other resource concerns except any final TTRA buffers.

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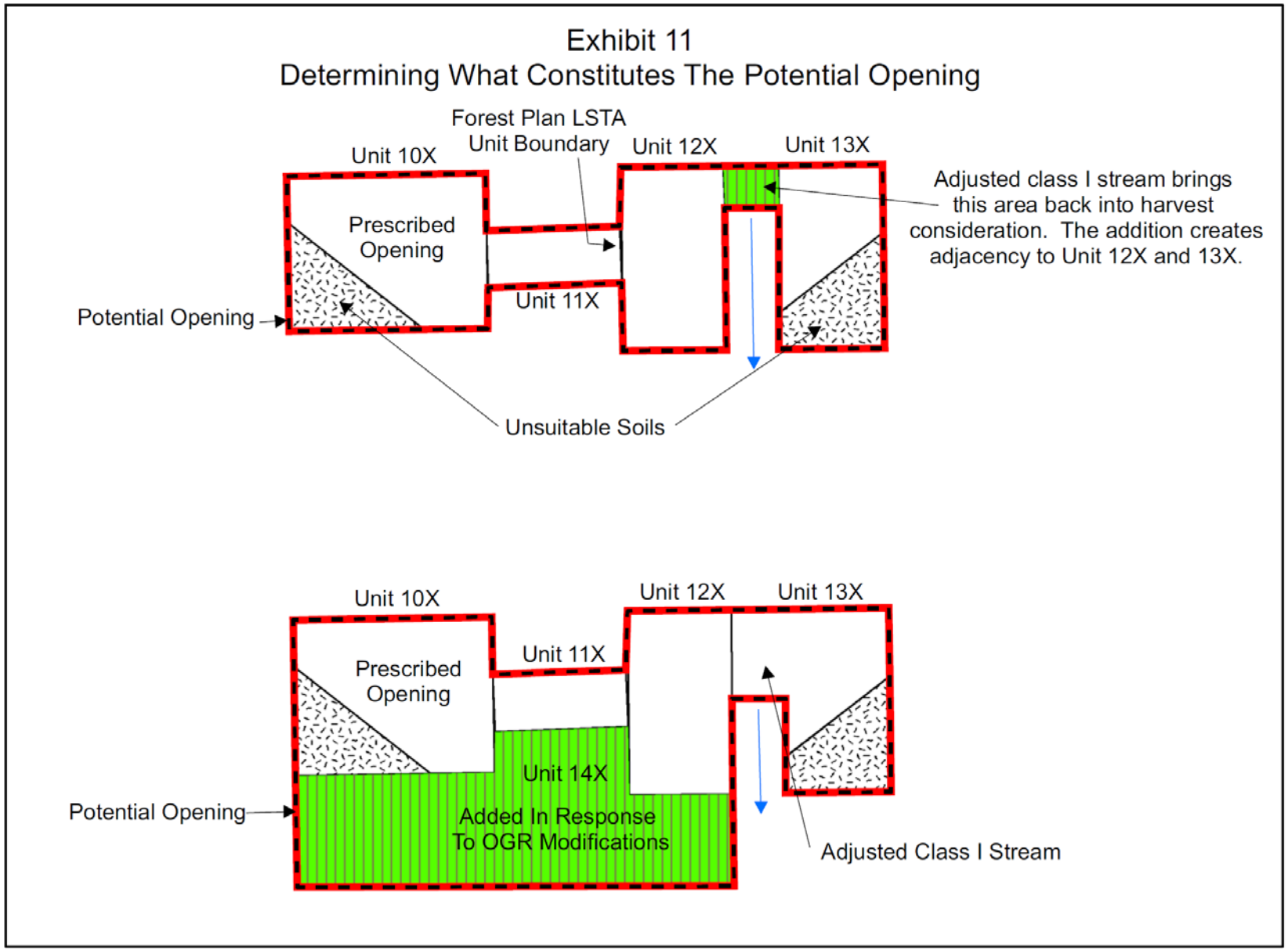

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Appendix C

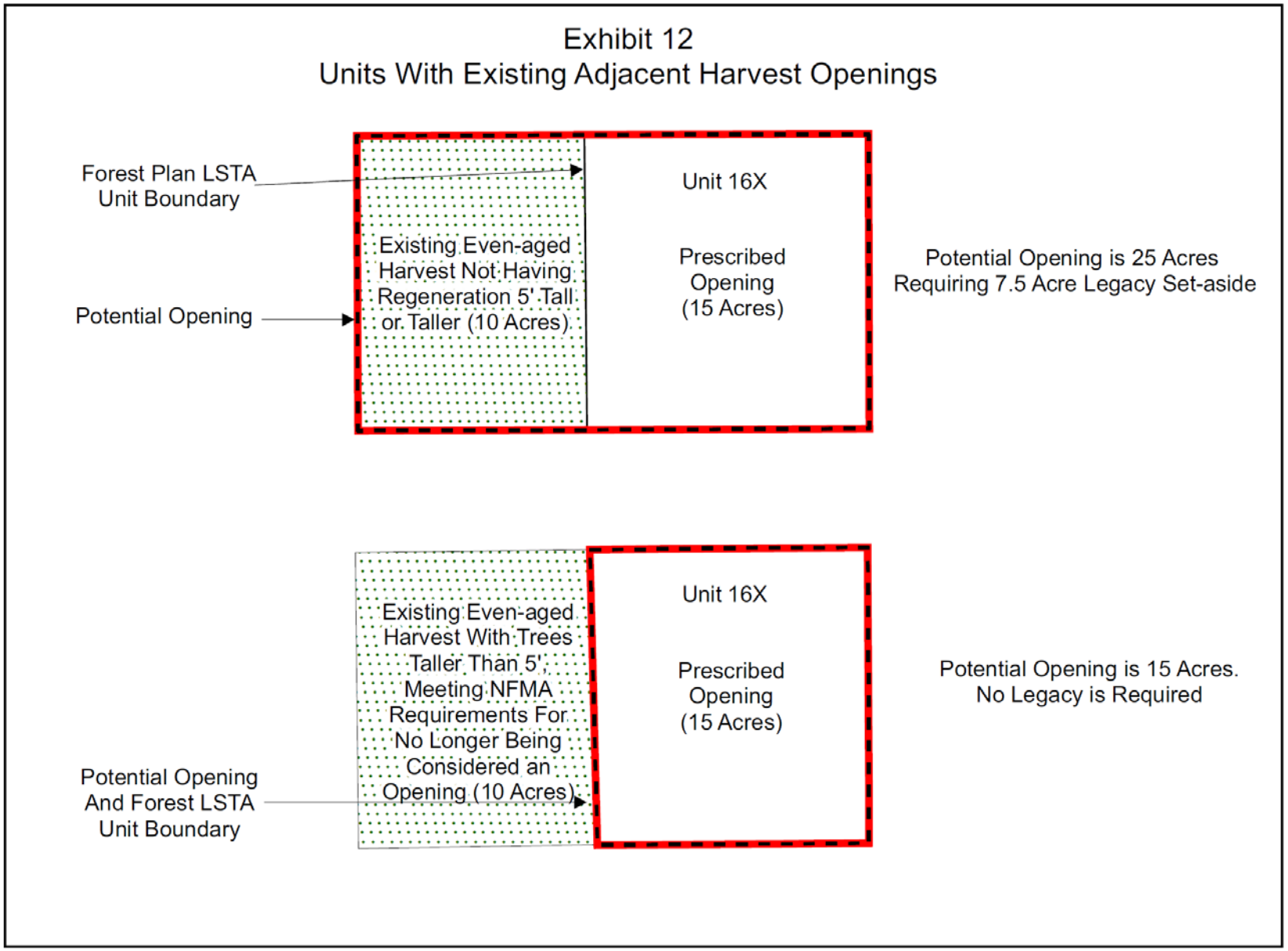

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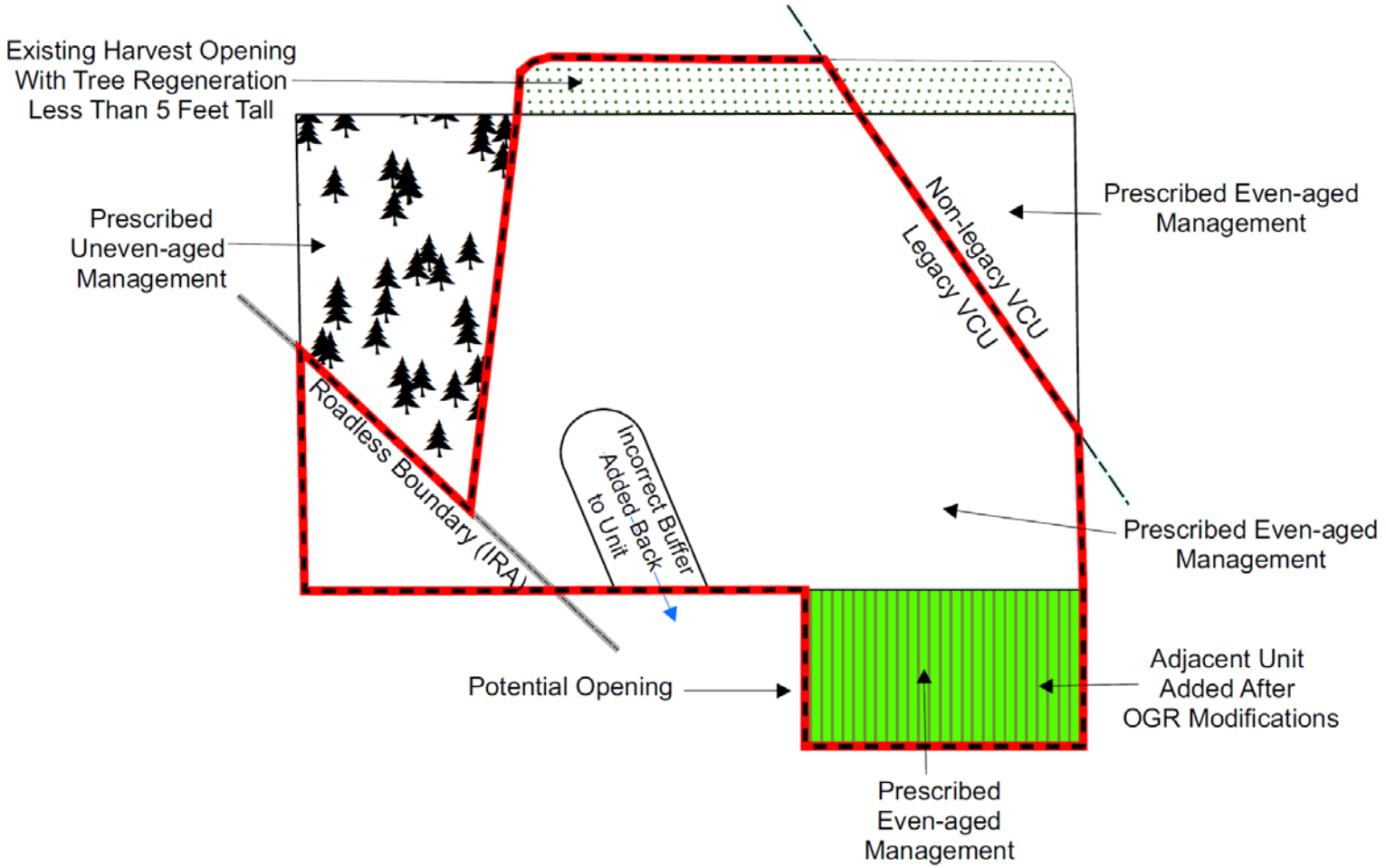
Exhibit 13
Unit Potential Opening After Office and Field Reviews



Final unit configuration. This is the result of office and field review. This review could address streams and other resources, OGR modifications, and Inventoried Roadless Area (IRA) boundaries.

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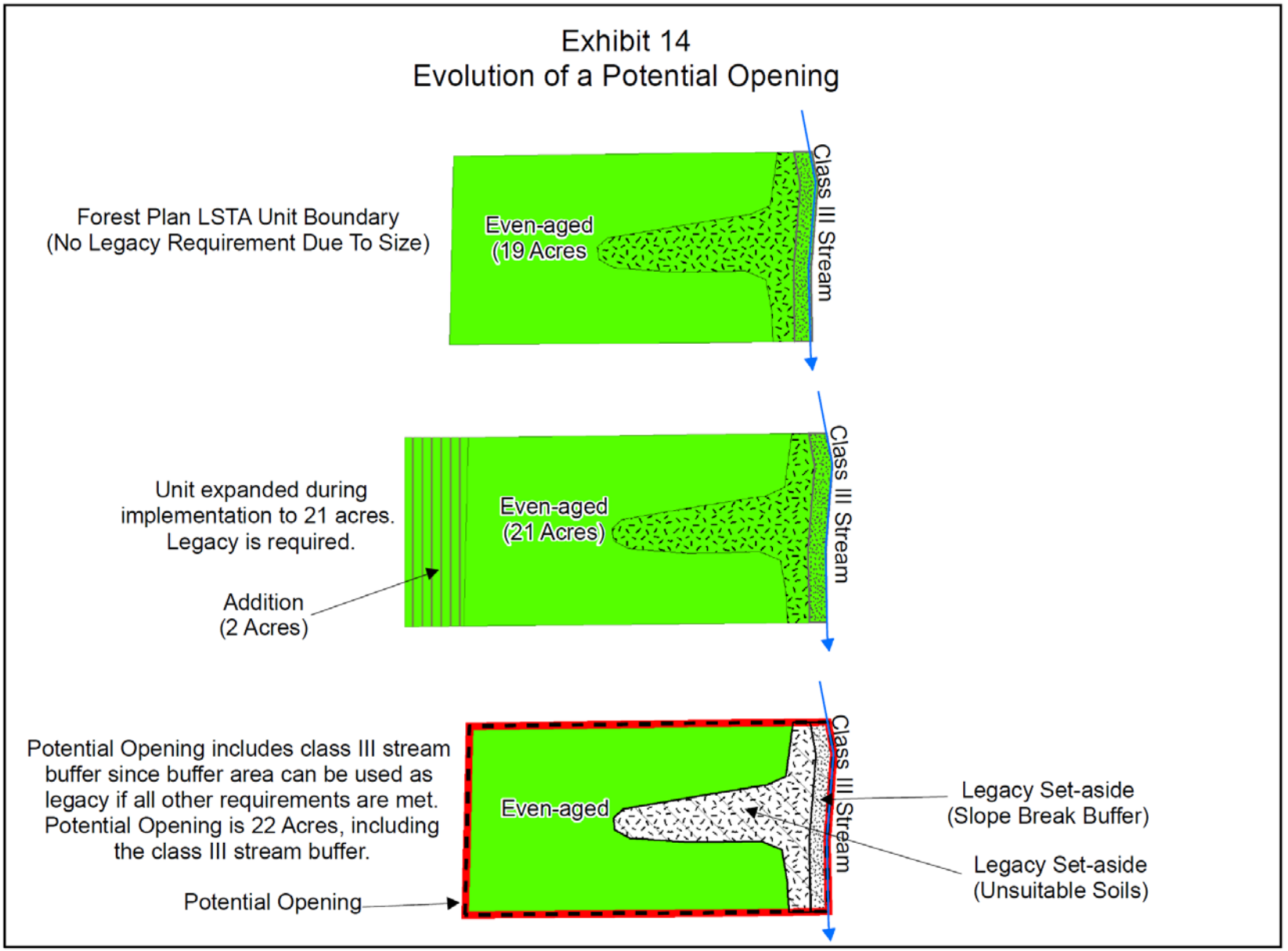
Appendix C



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Big Thorne Stewardship Integrated Resource Timber Contract

Interdisciplinary Team Legacy Implementation Review

May, 2014

This attachment provides a unit-by-unit review of how legacy retention areas planned within the Big Thorne Project ROD were implemented under the Big Thorne Stewardship Integrated Resource Timber Contract (IRTC, stewardship contract). The interdisciplinary team (IDT) recognized that the areas planned for legacy during the environmental analysis process may not end up being the optimum location on the ground during implementation for meeting the intent of the Legacy Standard and Guideline. During field layout of the units and roads for the IRTC, implementation personnel were given the latitude to modify planned legacy areas to best meet Forest Plan requirements, as long as the appropriate set-aside acreage and original planned goals of placement are achieved, including the stand structure elements. The following text highlights modifications made between planned legacy locations, objectives, and acreages, and what has been implemented as part of the stewardship contract. Maps following this review display what was planned and what was implemented for each of the units discussed below. As explained in the Big Thorne Supplemental Information Report under Item 2, three units are redesigned as a direct result of this review. The original planned design in the Big Thorne Project ROD will be used for units 52 and 132, with no legacy requirement due to unit size, and they are consequently not discussed further in this review. Unit 195 was redesigned only to adjust the location of the legacy within the unit and is still included within this review.

Unit 36

Legacy forest structure (legacy) placement is in areas of unsuitable soils in combination with an expanded area of uneven-aged (UEA) management to the west consolidates productive old growth (POG) and promotes/maintains an east–west wildlife travel way in the southern half of the planned unit.

The even-aged (EA) opening was reduced from a planned 42 acres to 38 acres. 45 acres are now retained for legacy. The required legacy based on the Big Thorne Project Record of Decision (ROD) was 26.4 acres with 46 acres located for legacy retention.

Maintaining additional legacy acreage over the minimum requirement enhances the function of the legacy area as a wildlife travel way. It is our determination that the unit as prepared for the Big Thorne Stewardship Integrated Resource Timber Contract meets or exceeds the objectives of the ROD.

Unit 37

The ROD potential opening is 26 acres with 8 acres retained for legacy. The implemented EA harvest opening is 18 acres and 15 acres of legacy are retained approximately as located in the ROD.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

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Units 42 and 43

Units 42 and 43 are considered as one potential opening to determine the legacy requirement for the ROD.

The ROD unit designs result in a potential opening of 77 acres, requiring 23 acres of legacy retained. There are 26.7 acres of legacy mapped in the ROD. Legacy in the ROD plans to expand on RMAs and coincide with costly yarding areas.

Implemented legacy is 25.5 acres. The implemented legacy covers approximately the same areas as was planned in the ROD with the exception of one area in the northern lobe of Unit 42. This area has legacy placed adjacent to the southeastern edge of a Class II stream complex to expand on the riparian management area (RMA) and provide reasonable assurance of windfirmness (RAW). This area was not implemented for legacy.

The clearcut (even-aged) boundary was implemented adjacent to the Class II stream buffer and as a result the buffer may now need to be reviewed for RAW.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 44

A large portion of Unit 44 planned for EA management was changed to UEA management with 50 percent retention. Legacy was implemented approximately as planned in the ROD except for legacy areas that fell within the area changed to UEA which were no longer necessary. The remaining EA management area is 11 acres. The implemented legacy design retained 14.7 acres which is in excess of what is now required due to the prescription change. Legacy in the ROD is 14.7 acres with 18 acres mapped. The unit as implemented requires a minimum of 8 acres of legacy.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Units 46 and 47

Units 46 and 47 have an adjacent boundary in the original Logging Systems and Transportation Analysis (LSTA). The units are considered one potential opening to determine the legacy requirement for the ROD. The ROD legacy placement was primarily planned to coincide with unsuitable soils in the east and western sections of the combined units. Implemented legacy encompasses all of the ROD legacy area and also includes an area of low productivity timber in the center of Unit 47 originally planned for even-aged management. Implemented legacy also includes some lower productivity suitable areas planned for uneven-aged management within Unit 47.

The combined ROD units 46 and 47 require 19.2 acres of legacy retained and has 29 acres mapped.

The implemented legacy in the stewardship contract is 37.3 acres as located in the ROD. It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 54

Unit 54 was analyzed in the ROD as a 29 acre EA harvest unit. The potential opening was 45 acres. This required 14 acres of legacy retained. In the ROD approximately 6 acres of legacy are retained for unsuitable soils and an additional 12 acres of legacy is mapped. The required legacy structure is planned in conjunction with areas of unsuitable soils plus areas of higher value wildlife habitat that are consolidated with unstable soil areas and TTRA buffers to provide functional connectivity across the unit. Approximately 21 acres of legacy is implemented.

The unit was implemented approximately as planned, utilizing approximately the same legacy areas with the exception that some upper elevations of the planned harvest openings were utilized as legacy and an area of legacy in the lower elevations adjacent to the eastern Class II TTRA stream buffer was changed from legacy to harvest. This area is approximately 2.5 acres and is not high-value deer winter range. The relatively small acreage change and the availability of habitat adjacent to the unit to the east make the effects of this change minor.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Units 56 and 57

The potential opening for units 56 and 57 in the ROD is 78 acres. This requires 24 acres of legacy retained. Legacy and harvest areas in Unit 56 are implemented approximately as planned, providing RAW and expanding on stream buffers, coinciding with costly yarding areas and consolidating POG along stream corridors. Legacy is located approximately as in the ROD. Additional legacy is placed in areas planned for harvest but not included in the implemented harvest areas.

When Unit 57 is implemented, personnel will need to consider the acreage retained for legacy in Unit 56 to ensure appropriate legacy retained for the whole potential opening of units 56 and 57.

It is our determination that Unit 56 as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 59

Unit 59 is in the ROD for both EA and UEA management. The potential opening is 37 acres, requiring 11 acres of legacy retained. (Note that the ROD unit card states a potential opening of 51 acres requiring 15 acres of legacy. The unit card is in error). 13 acres of legacy are mapped on the unit card. The unit as implemented has 11 acres of legacy located in association with the EA opening of 21.9 acres.

It is our determination that this unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 120

The potential opening of this unit in the ROD is 26 acres requiring 8 acres of legacy retained. Legacy was to be placed so that it coincided with RMAs, provided RAW and covered costly yarding areas. The EA opening in the ROD is 18 acres.

The unit is implemented as a 19 acre opening with 8 acres of legacy retained.

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The unit as implemented maintains legacy approximately as planned in the ROD.

It is our determination that this unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 121

The potential opening of this unit in the ROD is 57 acres with 38 acres planned for EA management. 17 acres are required for legacy retained.

The unit is implemented as a 30 acre EA harvest opening with most of the remainder of the planned EA area changed to UEA management. Legacy is implemented as planned in the ROD except that areas of ROD planned UEA management in the eastern tip of the unit were not implemented for harvest but used as legacy instead.

The implemented legacy is 24 acres which is in excess of the requirement; however, the excess areas are well situated to provide a significant contribution as legacy so it is recommended that these areas are maintained in legacy as implemented.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 123

The potential opening of this unit in the ROD is 27 acres with 19 acres EA management and 8 acres of legacy retained. The unit was implemented as a 14.5 acre EA harvest opening with the majority of the remainder of the planned EA opening implemented as legacy retained.

Implemented legacy retained approximates the ROD design.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 127

The potential opening of this unit in the ROD is 124 acres with 86 acres of EA management and 37 acres of legacy retained. Legacy is designed in the ROD to divide the potential opening to reduce visual effects, coincide with unsuitable soils, and expand on RMAs. The unit is implemented as 82 acres of EA harvest openings with most of the remainder of the planned EA opening implemented as legacy retained.

Implemented legacy retained is 41 acres and approximates the ROD design except for a corridor in the ROD for the northeastern corner of the unit was changed to EA harvest. This corridor originally was along a Class III stream. The stream was changed from Class III to Class IV during implementation. This eliminates the need to apply legacy in that area as it was designed to expand on the RMA of that stream and provide RAW.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 130

The potential opening of this unit in the ROD is 27 acres, with an 18 acre EA management opening in the western half of the unit and UEA management in the eastern half of the unit. Legacy retained in the ROD is planned to coincide with RMAs, and areas on the east end of the unit to expand RMAs and consolidate POG. About 8 acres of legacy were required and 9 acres are mapped on the unit card.

The unit was implemented as a 16 acre EA opening with 11 acres of legacy retained approximately as planned in the ROD. Legacy areas adjacent to the western lake were expanded slightly. The UEA harvest areas in the east were not completely implemented with the remainder used as legacy. A small corner of the southern-most planned legacy adjacent to a Class II stream was implemented as part of the adjacent UEA harvest and the approximate acreage swapped for ROD UEA areas planned just to the northeast.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Units 131

Unit 131 consists of two EA harvest openings split by legacy areas. The potential opening is 42 acres and the combined EA harvest is 29 acres with 13 acres of legacy retained. The legacy is located to consolidate POG, while reducing required road length, avoiding areas with longer yarding distances, dividing the unit opening into two openings, and incorporating RMAs.

Unit 131 was implemented as a single EA harvest opening of 15 acres that primarily encompassed the ROD eastern harvest area. The western half of the harvest area was not implemented as harvest but instead as legacy. This resulted in approximately 13 acres of implemented legacy.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 133

The potential opening for this unit in the ROD is 61 acres with 43 acres of EA management and 18 acres legacy retained. Legacy is located to consolidate POG and reduce new road construction. The unit is implemented as a 44-acre EA harvest opening with 19 acres of legacy retained. Implemented legacy approximates the ROD.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 135

The potential opening for this unit is 27 acres with 19 acres EA management and 8 acres of legacy retained. Legacy is located to reduce road costs, facilitate yarding, and consolidate POG. The unit was implemented using UEA management on 17 acres of the potential opening and deferring the remainder.

As implemented, no legacy is required due to UEA management.

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Units 138 and 139

The potential opening for units 138 and 139 is 147 acres. This requires 44 acres of legacy retained. Legacy was located to reduce the size of the openings and to include sensitive plant populations. Legacy on the east side of unit was placed to reduce road construction and reduce visibility of harvesting from Sandy Beach and the Sandy Beach Road. Legacy is also used to consolidate POG adjacent to Slide Creek RMA.

Legacy is implemented in these units approximately as located in the ROD. The primary change was in the western lobe of Unit 139 where a portion of the area planned for UEA management was changed to EA harvest and the remaining area used as legacy. It is reasonable to utilize these former UEA areas since the prescription was changed in the adjacent polygon. The units as implemented include 48 acres of legacy. The recalculated potential opening is 153 acres which requires 46 acres of legacy.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Units 140, 141, 142, and 143

The potential opening for units 140, 141, 142, and 143 is 256 acres. This requires 77 acres of legacy retained. In the ROD, legacy was located to split the harvest opening by building off of and providing RAW to the RMA that partially separates units 140 and 141. Legacy is also located to reduce visibility of the opening from Sandy Beach and Sandy Beach Road, and build off the southern RMA, consolidating POG. Units 140, 141, 142, and 143 have a mapped legacy of 81 acres.

The units have 80 acres of legacy implemented approximately as located in the ROD except the area planned as the harvest division and RAW expansion between units 140 and 141 was changed from legacy to UEA management. Windthrow is likely in the upper section of the implemented UEA area depending on the level of harvest. A harvest design that returns the portion of this area that can be yarded from the road to EA and utilizes 75 percent retention in the remaining section would be preferable. The unit 140/141/142 harvest opening could then be split by implementing legacy just to the south of where units 140 and 142 join just to the west of the muskeg exclusion. This configuration would be more wind resistant than what is currently implemented. The northwest portion of Unit 142 was not implemented for the stewardship contract, but there should be enough acreage available during implementation to account for the legacy needed to meet the standard and guide.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD; however, the items above could be addressed to create a more windfirm stand post-harvest.

Unit 153

The potential opening for this unit is 68 acres, with a 47 acre EA opening. This requires 20 acres of legacy retained. Upper legacy is located to consolidate POG, reduce visibility of higher slopes, and improve economics. Lower legacy is located to reduce visibility, build off the Class II RMA complex, and consolidate POG.

The unit was implemented as a 46 acre opening with about 20 acres of legacy. Legacy is placed approximately as located in the ROD.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 160

The potential opening for this unit is 38 acres, with 26.5 acres of EA harvest openings. This requires 11 acres of legacy. Legacy is located to compliment RMAs, divide the opening, and incorporate unsuitable soils. A total of about 13 acres of legacy are mapped in the ROD.

The unit has legacy implemented approximately as planned. The central EA harvest opening expanded slightly into the UEA management to its north. The implemented design retained about 14 acres of legacy. This amount is adequate and approximates the ROD legacy locations.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 184

This unit is in the ROD as both EA and UEA management. The EA harvest opening was 27 acres within a potential opening of 54 acres. This potential opening size is in error in the ROD as it accounts for the UEA management area. The majority of the unit in the north encompassed unsuitable soils. 16 acres of legacy was planned to primarily coincide with areas of unsuitable soils. The prescription addendum potential opening includes all the unsuitable soil area. The unit card map does not appear to have consideration of all the unsuitable when determining the legacy requirement. There is a note in the prescription addendum to see the FEIS unit design so this discrepancy had been realized prior. As implemented, this error is corrected. The actual potential opening for this unit is 25 acres, requiring approximately 8 acres of legacy retained. The other 29 acres of the unit are either UEA management or adjacent to the UEA management area only. The implemented EA harvest area is 14 acres and there are 11 acres of legacy implemented.

The unit had legacy implemented in excess of the ROD plan as well as having a somewhat smaller EA opening laid out. There is 11.5 acres of legacy implemented adjacent to the EA area. It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 185

The potential opening for this unit is 30 acres with 9 acres of legacy retained. 10 acres of legacy are in the ROD. The EA harvest opening is 20 acres. The unit is implemented about as planned except for a section of the ROD harvest opening in the southwest is implemented as legacy. There is a 17-acre EA opening and improved legacy composition.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 190

This unit is in the ROD as both EA and UEA management. The potential opening was 31 acres which encompassed a 19-acre EA opening and 12 acres of legacy retained to coincide with karst and RMA areas. The unit is implemented as a 17-acre EA opening with the remaining UEA and EA ROD acres

implemented as legacy. The implemented legacy is in excess of required; however, the design is an improvement over the ROD because the UEA area being set aside as legacy is adjacent to an area of past partial harvest and affords additional protection to a Class III stream.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 191, 192, 193, 469, and 470

These units combine to form a potential opening of 217 acres. The EA harvest openings total about 138 acres in the ROD. This requires 65 acres of legacy retained within units 191, 192, 193, 469, and 470 potential opening. Legacy is located to divide the combined opening, include sensitive plants, provide RAW and coincide with steep slopes, unsuitable soils and reduce visual impacts.

These units have a combined legacy retained of approximately 70 acres in the ROD. Most of the legacy is within units 469 and 470.

These units have about 68 acres of implemented legacy in three main central polygons that well approximated the planned legacy locations.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 194

This unit is in the ROD as both EA and UEA management. The potential opening is 75 acres, with 52 acres of EA harvest openings. About 23 acres of legacy is required. Legacy is located to cover RMA and consolidate POG. There are 23 acres of UAE management in the ROD.

The unit is implemented using about 24 acres of legacy located generally as planned in the ROD. Additional legacy is located within a narrow portion of the unit along the southeastern edge that is UEA management in the ROD. Legacy located here expands on the RMA in that area and is adjacent to both implemented and past harvest. This adjustment is therefore appropriate and makes a general improvement over the ROD design.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 195

This unit has areas of both EA and UEA management in the ROD. The potential opening is 41 acres and includes a 27 acre EA opening. 12 acres of legacy retained are required based on the potential opening size. About 14 acres of legacy are mapped in the ROD. Legacy is located to coincide with areas dropped due to unsuitable soils and RMA. In the ROD, legacy is located almost entirely on the areas of unsuitable soils which are along the southern edge of the unit. In the FEIS this area had been planned for EA management. The prescription for this area was changed to UEA in the ROD. No adjustment to the legacy location was made for the ROD.

As implemented, this problem was fixed as the legacy retention is all adjacent the EA harvest area. The EA opening is 25.7 acres and the legacy implemented is 12 acres. It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 368

This unit is in the ROD for both EA and UEA management. The potential opening is 24 acres with an 18-acre EA opening prescribed. The ROD calls for 7 acres of legacy retained within the central portion of the unit.

8 acres of legacy is implemented approximately as in the ROD.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Unit 369

Unit 369 is in the ROD as two EA harvest openings split by legacy. The potential opening is about 25 acres with 18 acres of harvest and 7.5 acres retained for legacy.

This unit is implemented as three separate polygons separated by small openings. 9.6 acres of legacy is implemented approximately as in the ROD.

It is our determination that the unit as prepared for the stewardship contract meets or exceeds the objectives of the ROD.

Overview of Units

Units partially or fully implemented for Big Thorne Stewardship IRTC and included in this document as requiring legacy:

36, 37, 42, 43, 44, 46, 47, 54, 56, 57, 59, 120, 123, 127, 130, 131, 140, 141, 142, 143, 153, 160, 184, 185, 191, 192, 193, 194, 368, 369, 469, and 470.

Unit fully implemented for Big Thorne Stewardship IRTC and included in this document as not requiring legacy due to prescription change:

135.

Units partially or fully implemented for Big Thorne Stewardship IRTC but not included in this review because they are not in legacy VCUs:

1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 24, 25, 26, 62, 63, 89, 90, 91, 92, 93, 94, 95, 96, 98, 100, 104, 105, 106, 107, 108, 109, 110, 111, 112, 114, 207, 360, 361, 363, 395, 404, 405, 407, 440, 444, and 447.

Units partially or fully implemented for Big Thorne Stewardship IRTC but not included in this review because they did not require legacy:

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33, 34, 35, 38, 48, 50, 52, 55, 58, 59, 124, 125, 126, 129, 132, 136, 148, 149, 154, 158, 159, 161, 162, 167, 168, 169, 171, 175, 177, 178, 179, 180, 181, 183, 186, 187, 189, 197, 200, 201, 202, 203, 204, 206, 365, 438, and 471.

Units not implemented for Big Thorne Stewardship IRTC:

27, 40, 41, 49, 53, 57, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 77, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 115, 116, 117, 118, 119, 128, 145, 146, 147, 148, 172, 174, 176, 182, 370, 371, 372, 380, 381, 382, 383, 384, 386, 387, 388, 392, 394, and all young-growth units (500s).