State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Northern Region/Timberland Conservation Planning
601 Locust Street
Redding, California 96001
(530) 225-2300
www.wildlife.ca.gov

EDMUND G. BROWN, Jr., Governor
CHARLTON H. BONHAM, Director

September 7, 2018

Mr. Phillip Battaglia
W.M. Beaty and Associates, Inc.
P.O. Box 990898
Redding, CA 96099

Subject: **Amendment of Master Timber Harvesting Operation Lake and Streambed Alteration Agreement No. R1-05-0497**

The California Department of Fish and Wildlife (CDFW) has received your request to amend Master Timber Harvesting Operation Lake and Streambed Alteration Agreement No. R1-05-0497 (Agreement) for a "major" amendment. Your request to amend the Agreement includes the addition of the Lassen Forest LLC parcels and the W.M. Beaty and Associates (WBA) parcels. These parcels are associated with the following existing Nonindustrial Timber Management Plans (NTMPs) respectively, 2-15NTMP-001-SHA and 2-16NTMP-001-SHA, and will be added to the Agreement. All parcels covered by this amendment are identified in Attachment D. In addition to the amended parcels, the Agreement will cover authorized activities on additional future parcels, in accordance with Section 4.12, on ownerships where WBA has permission to conduct operations and the parcels were previously reviewed by CDFW for timber harvesting activities.

Additional editorial revisions are included in the amended Agreement per discussions between WBA and CDFW intended to improve the usefulness and effectiveness of the Agreement. Revisions are shown with underline or strikeout text. The following Attachments are included as part of this amendment:

- **Amended Agreement**
- **Attachment A-** Measures Necessary to Protect Fish and Wildlife Resources
- **Attachment B-** Typical Diagrams for Stream Crossings and Facilities
- **Attachment C-** Fish, Wildlife and Botanical Resources
- **Attachment D-** WBA Owned and Managed Lands Covered by the MSAA

The subject Agreement came into effect on May 15, 2008. Section 8.7 of the Agreement states "If during the life of the Agreement, new information becomes available that indicates additional special status species are known or have a high potential of occurring on WBA managed lands and could be affected by operations conducted under this Agreement, protective measures shall be developed and amended into the Agreement in order to prevent or minimize any newly identified potential adverse impacts to these species." Attachment C includes a list of special status species potentially occurring on WBA owned or managed lands within stream channels or other

aquatic resources under the jurisdiction of CDFW per Fish and Game Code Section 1602. These species were analyzed in the applicable NTMPs identified above.

Since the original Agreement date, three species have received a change in status, the Sierra Nevada yellow-legged frog (*Rana sierrae*), foothill yellow-legged frog (*Rana boylii*), and the Cascades frog (*Rana cascadae*), with current state and federal status identified below. An analysis of these species and measures to minimize and avoid potential adverse impacts to them have also been included in Attachment C.

Species	Listing Status and Date	Counties in Range
Sierra Nevada yellow-legged frog (*Rana sierrae*)	State: Threatened (4-1-2013) Federal: Endangered (6-30-2014)	Lassen, Butte, Plumas
Foothill yellow-legged frog (*Rana boylii*)	State: Candidate (6-27-2017) Federal: none	Shasta, Tehama, Butte, Plumas
Cascades frog (*Rana cascadae*)	State: Candidate (10-17-2017) Federal: none	Shasta, Tehama, Butte, Plumas

CDFW hereby agrees to amend the Agreement to include the additional parcels and to include the Attachments that provide protection measures that minimize and avoid potential adverse impacts to fish and wildlife resources, including special status species. Please sign and return one copy of this letter to acknowledge the amended Agreement and Attachments. All other conditions in the Agreement remain in effect unless otherwise noted herein.

If you have any questions regarding this letter, please contact Jamie Galos, Senior Environmental Scientist (Specialist) at (530) 225-2062, or by email at john.galos@wildlife.ca.gov or Sandra Jacks, Senior Environmental Scientist (Specialist) at (916) 358-2916 or sandra.jacks@wildlife.ca.gov.

Sincerely,

Neil Manji
Regional Manager
Northern Region

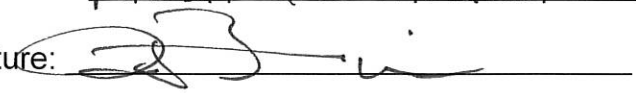
Jeff Drongesen
Environmental Program Manager
North Central Region

ec: See page 4

ACKNOWLEDGEMENT

I hereby agree to the above-referenced amendment.

Print Name: PHILLIP J BATTAGLIA Date: 9/11/18

Signature: 

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***EDMUND G. BROWN, Jr.**, Governor*
CHARLTON H. BONHAM, Director

MASTER STREAMBED ALTERATION AGREEMENT #R1-05-0497
BETWEEN
W. M. BEATY AND ASSOCIATES, INC.
AND
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
AMMENDED SEPTEMBER OF 2018

This Streambed Alteration Agreement ("Agreement") is entered into between the California Department of Fish and Wildlife ("Department") and W.M. Beaty and Associates, Inc. ("WBA").

WHEREAS, WBA manages lands in the State of California ("State") that are used primarily for timber production; and

WHEREAS, the Department, as trustee for the State's fish and wildlife resources, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species; and

WHEREAS, it is essential that WBA maintain and improve the road systems on the timber production lands it manages by installing, improving, removing, and/or maintaining watercourse crossings, controlling erosion, and stabilizing banks, among other activities associated with watercourse crossings, waterholes, temporary dams, diversion structures and bank stabilization structures authorized under this Agreement (collectively referred to hereinafter as "road maintenance activities" or "activities"); and

WHEREAS, Fish and Game Code § 1602 makes it unlawful for any person to substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, without first notifying the Department of that activity and, if that activity may substantially adversely affect an existing fish or wildlife resource, enter into a streambed alteration agreement with the Department; and

WHEREAS, the Department has determined that Fish and Game Code § 1602 applies to the road construction and maintenance activities covered by this Agreement; and

WHEREAS, it is mutually beneficial to the Department and WBA to establish procedures to conduct the activities covered by this Agreement and to incorporate

conditions into those activities to protect fish and wildlife resources that may be substantially adversely affected by them;

NOW, THEREFORE, the Department and WBA agree as follows:

1. PURPOSE

The purpose of this Agreement is to allow WBA and its employees, agents, or contractors and their subcontractors to conduct the activities identified in Section 4 below in accordance with the terms and conditions of this Agreement without the need to obtain any additional streambed alteration agreements from the Department while this Agreement is in effect.

2. LAND AREA AND FACILITIES COVERED

This Agreement shall cover authorized activities on existing facilities on or over those land areas owned or managed by WBA as described in ~~Appendix~~ Attachment D~~A~~, and on ownerships where WBA has permission to conduct operations and the facilities were reviewed by the Department for timber harvesting activities ~~of both the Red River Forests Sustained Yield Plan, No. 00-001, and the Shasta Forests Sustained Yield Plan, No. 00-002~~, and may cover new facilities on or over the same land areas only in accordance with Section 4.12.

3. DEFINITIONS

3.1. "Emergency" means a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. "Emergency" includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage (Public Resources Code, § 21060.3).

3.2. “Facility” means bridges, culverts, fords, vented fords, and temporary crossings and their associated road approaches, ditches, and adjacent channels (collectively referred to hereinafter as “watercourse crossings”), bank stabilization structures, temporary dams, diversion structures, boulder weirs, habitat restoration structures, and water holes.

3.3. “New facility” means a facility that does not exist on the date of this Agreement. For temporary crossings, this includes any watercourse crossing at a location that has not been used as a temporary crossing for more than 20 years. New facilities shall include existing watercourse crossings that are moved upstream or downstream so that the new road centerline is outside the existing watercourse crossing’s footprint.

3.4. "Operator" means WBA and its employees, agents, contractors and their subcontractors, and any other party authorized by WBA to complete one or more of the activities covered by this Agreement on behalf of WBA.

3.5. "Road surface maintenance" means any activity used to maintain and repair roads involving minor manipulation of the road prism to produce a stable operating surface and to ensure road drainage facilities, structures, cutbanks, and fillslopes are kept in a condition to protect the road, minimize erosion, and to prevent sediment discharge into a watercourse or lake.

3.6. "Special status species" means a species listed as threatened or endangered by the federal Endangered Species Act (ESA) (16 U.S.C. §§ 1531 *et seq.*) or a listed or candidate species by the California Endangered Species Act (CESA) (Fish & Game Code, § 2050 *et seq.*), listed as Sensitive by the Board of Forestry in the California Forest Practice Rules (Title 14, California Code of Regulations, § 895.1), or meeting the criteria contained in the CEQA Guidelines § 15380 (Title 14, California Code of Regulations).

3.7. "Substantial change in conditions" means one or more of the following: 1) the work described in this Agreement is substantially changed; 2) conditions affecting fish and wildlife resources substantially change and those resources are or will be significantly adversely affected by the work that is or will be conducted under this Agreement; and 3) the measures specified in Attachment A do not reflect advances in design and techniques that would significantly increase protection of fish and wildlife resources.

3.8. "Unstable area" is characterized by a slide area or unstable soils or some or all of the following: hummocky topography consisting of rolling bumpy ground, frequent benches, and depressions; short irregular surface drainages begin and end on the slope; tension cracks and head wall scarps indicating slumping are visible; slopes are irregular and may be slightly concave in upper half and convex in lower half as a result of previous slope failure; evidence of impaired ground water movement resulting in local zones of saturation within the soil mass which is indicated at the surface by sag ponds with standing water, springs, or patches of wet ground.

4. AUTHORIZED ACTIVITIES

The Operator may conduct the activities identified in this Section 4 without the need to obtain any additional streambed alteration agreements, provided the Operator conducts the activities in accordance with the terms and conditions of this Agreement, including "Measures Necessary to Protect Fish and Wildlife Resources," attached as Attachment A, and hereby incorporated as part of this Agreement. This Agreement and Fish and Game Code § 1602 do not apply to activities that will not substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or use any materials

from the streambeds, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. This Agreement does not apply to immediate emergency work necessary to protect life or property. The Operator may complete emergency work in accordance with Fish and Game Code § 1610.

4.1. Obstruction and Sediment Removal. The Operator may remove silt, sand, sediment, debris, trash, rubbish, flood-deposited woody and herbaceous vegetation, fallen trees, branches, and any other obstruction that reduces a facility's channel capacity and/or endangers a facility.

4.2. Vegetation Removal. The Operator may remove vegetation that directly reduces a facility's capacity and/or endangers a facility, including overhanging branches or tree limbs.

4.3. Bank Stabilization at Facilities. The Operator may construct, install, repair, improve, and maintain bank stabilization structures that are part of or immediately adjacent to a facility, such as rock rip-rap or gabions.

4.4. Bank Stabilization Structures. The Operator may repair, improve, and maintain existing bank stabilization structures, such as rock rip-rap or gabions.

4.5. Maintenance of Watercourse Crossings. The Operator may repair, replace, maintain, or upgrade, existing watercourse crossings.

4.6. Maintenance of Diversion Structures. The Operator may repair, replace, maintain, or upgrade, existing diversion structures.

4.7. New Facilities. New facilities may be constructed and installed, and thereafter maintained and repaired, under this Agreement only in accordance with Section 6.2.

4.8. Waterhole Maintenance. The Operator may maintain or improve existing waterholes. This includes stabilizing banks, improving approaches, and removing fill material to maintain or increase capacity.

4.9. Decommissioning. The Operator may decommission facilities.

4.10. Deposit and Disposal of Material. The Operator may deposit or dispose of soil fill, debris, waste, or other materials associated with work related to this Agreement only at stable locations where it is prevented from passing into waters of the state.

4.11. Habitat Restoration. The Operator may repair, replace, maintain, or upgrade, existing habitat restoration structures.

4.12. New Facilities. WBA may install or construct new facilities, and thereafter maintain and/or repair them in accordance with this Agreement, only as follows:

4.12.1. The new facility must be described in a timber harvesting plan (THP) as one that will be installed or constructed on or over those land areas covered by this Agreement.

4.12.2. WBA shall notify the Department in accordance with Section 6.2, and the Department shall process the notification in accordance with Section 6.3.

4.12.3. Installation or construction shall be in accordance with all provisions of this Agreement, including Attachment A.

4.12.4. The Department must review the new facility to ensure that the proposal is covered under the provisions of this Agreement, including Attachment A.

4.12.5. The Department will comply with the California Environmental Quality Act (CEQA) (Public Resources Code, § 21000 *et seq*.), if necessary before authorizing the installation or construction of the new facility.

5. UNAUTHORIZED ACTIVITIES

5.1. This Agreement does not authorize any activity that results in the take (as defined in Fish and Game Code § 86) of any species listed under CESA. If take cannot be avoided, WBA shall obtain take authorization from the Department before commencing the activity.

5.2. This Agreement does not authorize any work on a facility in immediate proximity of an unstable area unless WBA consults with a ~~registered~~ licensed geologist and risk of adverse environmental impacts has been minimized through development of site-specific mitigation measures. The THP process can be used to develop such measures and allow for expert review of proposed operations associated with unstable areas.

6. NOTIFICATION REQUIREMENTS

6.1. Except as otherwise specified herein, prior to conducting any activities this Agreement authorizes, WBA shall notify the Department by providing the information specified in Section 6.2 below in the form of a standard notification or THP for the proposed activity or activities. Any standard notification or THP WBA submits shall be subject to the notification procedure described in Section 6.3 below. For purposes of this section,

"notification" means either a standard notification or THP. Standard notifications are valid for two years. THP notifications are valid for ~~five~~ the life of the THP~~years~~. WBA shall limit ~~each~~ standard notifications to activities that can reasonably be completed in one year.

6.1.1. Notwithstanding Section 6.1., notification is not required for the following activities, provided the activities comply with Attachment A:

6.1.1.1. Minor clearing of culvert inlet debris and sediment within 8 feet of the inlet that can be accomplished with hand tools or a backhoe, as long as equipment used remains on existing road surfaces;
6.1.1.2. Water diversion into water trucks;
6.1.1.3. Minor vegetation control that can be accomplished with hand tools, limited to trees less than 12 inches diameter at breast height; and
6.1.1.4. Road surface maintenance.

6.2. Notification Information. The information described below shall be included in each notification.

6.2.1. The name and contact information of WBA's contact person for the activities described in the notification

6.2.2. The THP number, if applicable

6.2.3. The name of each major tributary watercourse the activity or activities could affect

6.2.4. A map that clearly shows all of the following:

6.2.4.1. The location of each activity, with a reference number or other appropriate identifying label

6.2.4.2. All roads, with a number or other appropriate identifying label

6.2.4.3. All watercourse classifications (i.e., Class I, II-L, II, or III)

6.2.4.4. A north arrow and scale

6.2.4.5. The township, range, and section numbers

6.2.5. A description of the proposed activities which clearly identifies the new facilities. If multiple lake or stream encroachments are proposed, WBA shall include a table that includes:

6.2.5.1. A map reference number for each facility

6.2.5.2. The new facilities identified separately

6.2.5.3. The existing facility type (e.g., permanent culvert, bridge, rock revetment)

6.2.5.4. The proposed facility

6.2.5.5. The watercourse classification

6.2.5.6. The culvert size

6.2.5.7. Proposed special measures

6.2.6. A description of the fish, wildlife, and botanical resources the activity or activities could adversely affect

6.2.7. Measures included to protect special status species

6.2.8. Any diagrams not included in Attachment B of this Agreement, including specific details, cross sections, and dimensions

6.2.9. Any photographs of the project location, particularly in areas with unique elements such as topography, sensitive species, or crossing structure. Photographs should be taken looking upstream and looking downstream including the project site with an object provided for scale.

6.2.10. The materials that will be used (e.g., soil, sand, gravel, ¼- to ½-ton rip-rap, or large wood)

6.2.11. The dimensions of the area and nature and volume of material to be excavated or filled

6.2.12. The type of equipment to be used

6.2.13. Calculations or other data used to size culverts on permanent crossings

6.2.14. For bridge installations only, indicate if the abutments or road approaches will encroach into the floodplain or channel; provide the calculations or data used to determine bridge height and flow capacity; describe the type of abutments and scour protections with dimensions; and provide any engineering reports or plans.

6.2.15. A description of any torrent, debris or landslide conditions.

6.3 Notification and Agreement Procedure

6.3.1 Within 14 days from the date the Department receives a notification, the Department shall respond in writing or email by doing one or more of the following: determine that the notification is complete; request additional information; propose site specific measures in addition to those listed in Attachment A or the notification if necessary to protect fish and wildlife resources; and/or contact WBA to schedule a site visit or to inform WBA that it will be visiting the site as part of a preharvest inspection in order to determine whether additional measures will be needed to protect fish and wildlife resources. Changes or new information submitted for and during review of a THP restart the 14-day response period. If WBA wants to proceed prior to the 14-day response period, it may contact the Department to seek expedited approval.

6.3.1.1 If the Department declares the notification complete, WBA may proceed with the activities described in the notification upon receiving the Department's written or emailed determination.

6.3.1.2 If the Department requests additional information, WBA shall submit the information. Upon receipt of the additional information, the Department will again process the notification in accordance with Section 6.3.1.

6.3.1.3 If the Department proposes additional measures, WBA shall either: 1) amend the notification by including the additional measures and submit the amended notification to the Department, or 2) notify the Department in writing or by email that it does not agree with the additional measures. If WBA amends the notification, within 14 days of receiving the amended notification, the Department shall determine whether to approve or deny the amended notification and notify WBA of its decision in writing or by email. If the Department fails to respond within the 14-day period, WBA may proceed with the activities described, provided it does so in accordance with the amended notification. If WBA does not agree to the additional measures, the Department and WBA shall resolve the disagreement in accordance with Fish and Game Code § 1603(b).

6.3.1.4 If the Department determines that a site visit is necessary, the Department shall make the site visit within 30 days of receipt of the notification, unless natural ground conditions prevent the Department from visiting the site within that time period or WBA agrees to extend the 30-day time period. Within 14 days of completing the site visit the Department shall approve the activities described in the notification, request additional information, or propose additional measures to protect fish and wildlife resources, after which Section 6.3.1.1., 6.3.1.2., or 6.3.1.3. shall apply, respectively.

6.3.1.5 If the Department fails to respond within the 14-day time period specified above in Section 6.3.1., WBA may proceed with the activities described in the notification, unless the notification is for a new facility, in which case Section 4.12 shall apply.

6.4. WBA may amend any notification after submitting the original notification to the Department, provided the amended notification references the original notification by number. Amendments to a notification are required to change the scope of operations identified in the original notification. The Department shall respond to an amended notification in the same manner as specified above for an original notification.

6.5. The notification requirements in this Section 6 do not apply to emergency repair work. Notification for emergency repair work on any facility shall be made in accordance with Fish and Game Code § 1610.

6.6 Emergency Timber Operations. For the purpose of constructing crossing facilities to access emergency timber operations, the standard notification process (see Sections 6.2 and 6.3) shall apply. WBA may contact the Department to seek an expedited response and approval time.

6.7 All notifications, ~~notification fees, and~~ correspondence, and reports~~, and other writings~~ shall be submitted in writing or by email to the addresses below, with reference to “Streambed Alteration Agreement #R1-05-0497.” In the event of CDFW staff changes, updated contact information will be provided to WBA by CDFW.

For activities in Shasta, Modoc, Siskiyou, and Lassen Counties:

Department of Fish and ~~Game~~ Wildlife
Northern Region
Attn: Interior Timberland Planning
601 Locust Street
Redding, CA 96001
Fax: (530) 225-3849
john.galos@wildlife.ca.gov

For activities in Plumas County:

Department of Fish and ~~Game~~ Wildlife
North Central Region
Attn: Forest Resources Conservation Planning
1701 Nimbus Road
Rancho Cordova, CA 95670
Fax: (916) 358-2912
R2timber@wildlife.ca.gov

7. MONITORING AND REPORTING

7.1. WBA shall inspect all permanent bridge, culvert crossings, and bank stabilization structures at least once every two years. In certain remote or low-precipitation situations, structures that were determined to be properly functioning during the initial two-year period of this Agreement may be inspected on a subsequent three-year cycle. All facilities that are associated with harvesting within the preceding 12 months and/or have been repaired or replaced shall be inspected after the subsequent winter periods for two years. Minor maintenance shall be conducted onsite at the time of monitoring. Major maintenance needs identified during monitoring shall be recorded and scheduled for completion prior to October 15 of that year.

7.2. Annual Report. WBA shall submit an annual report to the Department that summarizes the inspections of all facilities associated with harvesting within the preceding 12 months and/or have been repaired or replaced. Annual reporting of these facilities shall be provided for a period of two years. The annual report shall include for each facility: the date of the inspection; the name and location of the facility; the name and number of the associated THP; photographs, if available; and a summary of the functional status of each facility. The Annual Water Quality Waiver Monitoring Report submitted to the Central Valley or Lahontan Regional Water Quality Control Board may be submitted in lieu of a separate report to the Department.

7.3. Four Year Status Report. WBA shall provide a status report to the Department every four years. The status report shall be ~~delivered~~ submitted to the Department ~~no later than 90 days~~ prior to the end of each four-year period.

7.3.1. The status report shall include all of the following information: A copy of the original Agreement; the status of the activity covered by the Agreement; an evaluation of the success or failure of the measures

in the Agreement to protect the fish and wildlife resources that the activity may substantially adversely affect; and a discussion of any factors that could increase or reduce the predicted adverse impacts on fish and wildlife resources, and a description of the resources that may be adversely affected.

7.3.2. The Department shall review the four-year status report, and conduct an onsite inspection to confirm that WBA is in compliance with the Agreement and that the measures in the Agreement continue to protect the fish and wildlife resources, in accordance with Fish and Game Code § 1605(g)(3).

8. CONDITIONS

8.1. All authorized activities shall be conducted in accordance with this Agreement and the Operator shall otherwise use its best efforts to avoid or minimize adverse impacts to fish, ~~and~~ wildlife or botanical resources when conducting those activities.

8.2. For all THPs, an assessment of road surface and drainage conditions for all road segments within the plan area and appurtenant to proposed operations shall be included within the THP. The assessment shall contain a list of site-specific, field inventory information including proposed treatment of existing or potential sediment sources for all crossings, ditch relief culverts, road surfaces, road cuts, road fills, landings, turnouts and inboard ditches.

8.3. WBA agrees to allow Department employees access to any property it owns and/or manages for the purpose of inspecting and/or monitoring the activities covered by this Agreement, provided the Department: 1) provides WBA 48 hours advance notice; and 2) allows WBA representatives to participate in the inspection and/or monitoring, if WBA requests such participation. This condition does not apply to Department wardens.

8.4. Prior to the Operator commencing any activities covered by this Agreement, WBA shall communicate to the Operator the relevant terms and conditions of this Agreement by: 1) providing the applicable notification described in Section 6, and 2) verbally communicating the site-specific measures to protect fish, ~~and~~ wildlife or botanical resources applicable to the work involved. A copy of Attachment A and the notification shall be readily available at all work sites at all times during any active work period and shall be presented to any Department employee or employee of another public agency upon request.

8.5. WBA and the Department agree to meet annually if requested by either party to discuss this Agreement. Topics for discussion may include implementation problems, new information regarding special status

species, the protective measures in Attachment A, proposed amendments, or any other topic that affects implementation of this Agreement.

8.6. Prior to conducting an activity covered by this Agreement, WBA shall query a current version of the California Natural Diversity Database and WBA environmental/wildlife files to determine whether the special status species as described in Section 3.6 or Attachment C are present at or near the activity site. The mitigation measures for aquatic, wildlife or botanical species ~~s~~ contained in the notification(s) ~~or outlined within the Red River Forests Sustained Yield Plan, No. 00-001, and the Shasta Forests Sustained Yield Plan, No. 00-002,~~ shall be implemented for any covered activities that involve the use of heavy equipment.

8.7. If during the life of the Agreement, new information becomes available that indicates additional special status species are known or have a high potential of occurring on WBA managed lands and could be affected by operations conducted under this Agreement, protective measures shall be developed and amended into the Agreement in order to prevent or minimize any newly identified potential adverse impacts to these species.

~~**9. FEES**~~

~~9.1. Initial Fee. An initial fee of $2,500.00 shall be submitted to the Department prior to the Department's execution of this Agreement in order to reimburse the Department for the costs of preparing this Agreement.~~

~~9.2. Notification Fee. A Notification fee of $100.00 per facility shall be submitted to the Department at the Redding or Rancho Cordova address listed in Section 6.6 with submittal of any notification. A Notification fee is not required for the activities listed in Section 6.1.1. All facilities on Class III watercourses for each notification will be considered one facility for the purpose of calculating fees (i.e., the fee for all Class III facilities for a notification is $100.00).~~

~~9.3. Amendment Fee. The fee to amend this Agreement shall be that specified in section 699.5 in title 14 of the California Code of Regulations. Amendments proposed by the Department are not subject to an amendment fee.~~

10. AMENDMENTS

This Agreement may be amended at any time, provided that: 1) the Department and WBA mutually agree on the amendment; 2) the amendment is duly executed by the Department and WBA; 3) the amendment is made part of the Agreement~~; and 4) WBA includes any applicable amendment fee(s)~~. Any proposal to amend this Agreement shall be in writing and submitted to the other party for its review

and concurrence. The Department shall not execute any amendment until it has complied with all applicable CEQA requirements.

11. LIABILITY

WBA shall be solely liable for any violation of this Agreement, whether committed by WBA, its employees, agents, contractors or their subcontractors, or any party authorized by WBA to complete one or more of the activities this Agreement covers on behalf of WBA.

12. SUSPENSION

12.1. The Department may suspend the entire Agreement or any activity authorized by this Agreement and being conducted under a notification if the Department determines that circumstances warrant suspension. The circumstances that might warrant suspension include, but are not limited to, the following:

12.1.1. The Operator fails to comply with any of the terms and conditions of this Agreement.

12.1.2. The Department determines that the information provided by WBA to develop this Agreement or the information contained in any notification is inaccurate or misleading.

12.1.3. The Department obtains new information that shows the activities this Agreement authorizes could substantially adversely affect fish and wildlife resources.

12.1.4. The Department determines that measures to protect fish and wildlife resources different from those included in this Agreement and/or added to a notification are necessary to reduce potentially substantial adverse effects on fish and wildlife resources and those measures have not been amended into the Agreement.

12.1.5. There is a substantial change in conditions.

12.2. Scope of Suspension. At the discretion of the Department, any action to suspend may be limited in scope to address the specific problem(s) resulting in the suspension. Hence, the Department may limit the suspension to specified activities or specified areas covered in a notification. The entire Agreement may also be suspended. The Department shall notify WBA of any suspension in writing. Any suspension shall take effect immediately upon receipt of such notice by WBA, or in accordance with the instructions contained in the notice. Such notice will

identify the reason or reasons for the suspension, the actions necessary to correct the problem, and the scope of the suspension.

12.3. Reinstatement Following Suspension. The Department may lift any suspension when it has determined that WBA has adequately addressed the problem resulting in the suspension and that reinstatement will not cause harm to fish and wildlife resources.

13. TERMINATION

This Agreement may be terminated at any time by the Department or WBA by written notice sent by certified mail. The conditions that warrant Department termination include, and are limited to, failure to comply with any of the terms and conditions of this Agreement. Termination shall become effective 30 days after receipt of the termination notice by the other party. In the event this Agreement is terminated, WBA shall be responsible for notifying the Department and, if necessary, obtaining a streambed alteration agreement in accordance with Fish and Game Code section 1602 or 1611 before commencing any activity that would otherwise be covered by this Agreement. In the event that this Agreement is terminated, any existing approved notification shall remain valid for the calendar year approved.

14. TERM

The term of this Agreement shall be 12 years from the date of execution by the Department. The term shall apply only to work for which WBA was required to notify the Department pursuant to Fish and Game Code § 1603(a). WBA may not perform any work authorized by this Agreement beyond the term unless WBA notifies the Department and obtains a new agreement. For work covered in a notification approved prior to the Agreement's expiration, the Agreement shall not expire until WBA has completed the work described in the notification and met each and every mitigation measure set forth in this Agreement. Notwithstanding this Section 14, WBA shall be responsible for all conditions in this Agreement intended to protect fish and wildlife resources that might require WBA to take some action beyond the term of the Agreement.

15. EXTENSION

This Agreement may be extended at the end the term for up to five years, as determined by the Department, provided that: 1) the Department receives a written request for extension from WBA prior to the Agreement's expiration; 2) the Department determines that there has not been a substantial change in conditions; and 3) there has been full compliance with the terms and conditions of this Agreement. If the Department determines that there has been a substantial change in conditions or that there has not been full compliance with the terms and conditions of this Agreement, the Department, at its sole discretion, may decide

not to extend the Agreement. The Department shall not extend this Agreement until it has complied with all applicable CEQA requirements.

16. TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned without the prior written consent of the Department.

17. COMPLIANCE WITH OTHER LAWS

The Operator shall be responsible for complying with all local, state, and federal laws or regulations that may apply to the activities covered by this Agreement. This Agreement does not supersede the authority of CAL FIRE to administer and approve timber operations pursuant to the California Forest Practice Rules (Title 14, California Code of Regulations, § 895 *et seq*.) and the Z'Berg-Nejedly Forest Practice Act (Public Resources Code, § 4511 *et seq*.).

18. ENTIRE AGREEMENT

This Agreement and the ~~appendices~~ attachments attached hereto constitute the entire Agreement and understanding between the Department and WBA as to the activities covered by this Agreement.

19. CONCURRENCE AND EFFECTIVE DATE

This Agreement becomes effective on the date of the Department's signature, which shall be after WBA's signature~~, the Department's receipt of the initial fee,~~ and the Department's compliance with CEQA.

W.M. BEATY & ASSOCIATES, INC.

Donald J. Beaty
General Manager

Date: 05/12/08

CALIFORNIA DEPARTMENT OF FISH AND GAME

Gary Stacey
Regional Manager
Northern Region

Date: 5/14/08

Kent Smith
~~Supervising Biologist~~ Environmental Program Manager
North-Central Region

Date: 5/15/08

ATTACHMENT A

Measures Necessary to Protect Fish and Wildlife Resources

Definitions

For the purpose of this Agreement only, the definitions below apply below.

“Average active channel width” means the channel width obtained from measuring at least five widths of different habitat units outside the influence of the crossing. The active channel margin is that area that is normally scoured by flows every year, as evidenced by scoured substrate or predominantly terrestrial vegetation.

“Bankfull stage or zone” means the area where the stream fills the entire channel cross section without significant inundation of the adjacent floodplain, and generally has a recurrence interval of 1.5 to 2 years.

“Chance of rain” means U. S. Weather Service forecast of 30% or more probability of precipitation within the next 24 hours.

“Class I, II-L, II and III” means the same as defined in the ~~2007~~ California Forest Practice Rules Title 14, California Code of Regulations § 895 *et seq*.).

“Corduroy crossing” means de-limbed logs laid parallel to support the tractor or skidder on wet and soft ground.

“Edge of the facility” means the culvert inlet or outlet, the edge of the traveled road surface on a ford or bridge, or the end of the logs or culvert in a temporary crossing, whichever is further from the crossing centerline.

“Spittler crossing” means a temporary watercourse crossing that uses logs (often chokered to facilitate placement and removal) for fill (with or without a culvert), a 4 to 8 inches minimum straw layer or geotextile layer, and local topfill or rock for the running surface.

“Stream” means a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation, including but not limited to, streams as defined in Public Resources Code section 4528(f).

“Temporary crossing” means a watercourse crossing used during timber operations, removed subject to the timeframes specified below or described in a THP, and designed to pass the expected flows during the period of use (i.e., activated and deactivated seasonally).

"Vented ford" means a permanent ford armored to withstand 100-year flows with a culvert sized to pass summer low flows. Vented fords include heavy armoring over the crossing surface and outfall or predominantly rock fill, and may include a grate on the culvert inlet for ease of clearing (see Attachment B diagram).

Time of Operation

1. The Operator shall conduct activities during the periods specified below. The Operator shall conduct the activities at such time that adverse impacts to fish and wildlife resources are avoided or minimized.

2. Class I Watercourses. The Operator shall conduct the following activities only during periods of low or no water flow between June 15 and October 15: vegetation removal, bank stabilization, and maintenance, waterhole maintenance, replacement and installation of watercourse crossings. Activities may be conducted during the periods of May 1 to June 14 and October 15 to November 15 if weather and stream conditions do not pose and imminent threat to the crossing structures and the Department has been notified and approved of the activities to occur. Temporary crossings installed during this time may be removed after October 15, but in such event shall be removed prior to the first chance of rain (i.e., 30% or more) within the next 24 hours as forecast by the U.S. Weather Service, but in no case past November 15.

3. Class II and III Watercourses. The Operator shall conduct the following activities only during periods of low or no water flow between May 1 and October 15: vegetation removal, bank stabilization, and maintenance, waterhole maintenance, replacement and installation of watercourse crossings. Activities may be conducted during the period of October 15 to November 15 if weather and stream conditions do not pose and imminent threat to the crossing structures and the Department has been notified and approved of the activities to occur. Temporary crossings installed during this time may be removed after October 15, but in such event shall be removed prior to the first chance of rain (i.e., 30% or more) within the next 24 hours as forecast by the U.S. Weather Service, but in no case past November 15.

4. Water Drafting. The Operator may draft water into water trucks at any time, subject to the practices specified below.

Crossing Type

5. The type of crossing shall be appropriate for the season, watercourse class, and type of use as described below:

- Fords are generally used in intermittent or ephemeral streams that are dry during use. Fords shall not be used where listed species are present and could be impacted or substantial sedimentation or turbidity would result from use. A temporary culvert shall generally be installed in the ford when flows are present.
- Temporary crossings with soil fill (Spittler, dipped, Humboldts, culvert with soil fill, etc.) shall be installed and used in such a way as to minimize soil entering the channel. ~~and shall not~~Rock may be used as fill in watercourses that support fish or where sediment may be transported downstream and impact fisheries resources.
- Spittler crossings are appropriate for incised channels that support aquatic life and/or streams that are flowing during use.
- A temporary culvert with rock fill crossing is appropriate in shallow channels that need minimal fill.
- Vented fords are appropriate for watercourses that are perennial. Channels tend to be broad and shallow and tend to carry a large amount of debris.
- Humboldts are temporary crossings typically comprised of logs placed in the channel for fill with a dirt cap running surface. Humboldts are generally used on dry Class II or Class III watercourses.
- Corduroys are temporary crossings and are generally used to skid across a wet area.

PERMANENT CROSSINGS

Bridges

6. Bridges are the preferred crossing type for fish-bearing streams. Where bridges are used, they shall be constructed as clear span bridges without abutment fills below the ordinary bankfull stage. Bridges shall be set high enough to pass the entire 100-year peak flow and floating debris. Log stringer bridges may be used, but all surfacing material shall be clean rock if the surface material is not otherwise planked, plated, or paved.

7. During bridge installation, an excavator or winch-tractor shall be used to winch or suspend the flat cars or other bridge structure across the watercourse. Both the leading and trailing ends of any structures shall be lifted to prevent the gouging of the stream bed.

8. All bridge locations will be evaluated for the presence of a floodplain. At bridge locations with a floodplain, site specific plans will be developed to ensure that either the floodplain function is maintained by providing water passage or that no significant effects will occur from the placement of road approaches and bridge abutments.

Culverts

9. Any permanent structure or culvert on fish bearing streams shall be designed, constructed, and maintained such that it does not constitute a barrier to upstream or downstream movements of all life stages of fish. Any watercourse crossing on a Class I watercourse shall not prevent or impede or tend to prevent or impede upstream or downstream movements of all life stages of fish.

10. Plate arch culverts (bottomless) shall have the footings placed below the channel grade down to bedrock or hardpan to prevent undermining of the structure from scour. If the presence or depth of bedrock or hardpan cannot be determined, a geotechnical drilling/boring and engineer's examination and report shall be conducted or another crossing type shall be used.

11. Culverts on Class I watercourses shall be installed using the diagram in Attachment B "Typical Diagrams for Stream Crossings and Facilities" as a guideline. To the extent practicable, all culverts on Class I watercourses shall comply with the Department's "Culvert Criteria for Fish Passage 2002." Other criteria that is generally accepted by the professional fisheries/engineering community, or supported by peer-reviewed research, may also be used with approval by the Department.

12. Culverts on Class I watercourses shall be installed to provide fish passage using methods supported by the best available current research.[1] Methods used shall be acceptable to both WBA and the Department. In the event mutual agreement cannot be reached regarding the crossing design, then the following measures shall be used:

    a) The culvert diameter shall generally be at least 1.5 times the average active channel width.
    b) The culvert inlet shall be installed/embedded below stream grade less than 40% of the culvert diameter and the outlet between 20 and 40% of the culvert diameter.
    c) The culvert shall be set as close to 0% slope as feasible and not more than 1.5%.
    d) The following equation shall be used as a test prior to installation:

    minimum culvert diameter = S x L / 0.2,
    where S = channel slope and L = culvert length[2]

[1]Some examples include, but not limited to: California Salmonid Stream Habitat Restoration Manual – 1998 (3rd Ed); Oregon Road/Stream Crossing Restoration Guide – Spring 1999.

[2]Example - If the average channel width is 10 feet and gradient 5%, then the first cut culvert diameter is 15 feet (1.5 times the channel width), and the upstream end embedded 6 ft. maximum (40% x 15 ft.) and downstream end 3 feet minimum (20% x 15 feet). But if you multiply the channel gradient by the

13. Permanent culvert crossings shall be sized to accommodate 100-year peak flows, plus debris and sediment loads, with a diameter equal to or greater than the average active channel width. The appropriate size shall be calculated by using at least two acceptable methods (one calculated/desk method and one field method). These may be methods identified in Cafferata et al., 2004.

14. Culvert inlets shall be bevel-cut at 45 degrees, or have a winged inlet structure to increase capacity. WBA may provide justification in the notification as to why a culvert inlet will not be beveled or have a winged inlet.

15. Trash racks shall not be used.

16. Armoring of culvert crossings shall be commensurate with the risk of overtopping and guided by the following table:

Risk	**Indicators**	**Armoring**
Low	Culvert size => active channel width; receives yearly maintenance	Inlet and outlet to top of culvert.
Medium	culvert size 70-100% of active channel width, does not receive yearly maintenance	Armor critical/overflow dip over entire fill.
High	Debris-flow channel; culvert size <70% active channel width; > 6 feet of fill at inlet; not aligned; not accessible in winter; steep gradient stream	Armor all fill.

17. Armoring shall consist of rock rip-rap or other non-erodible material (e.g., concrete head wall). Rock rip-rap shall be of sufficient size to remain in place during 100-year peak flows (generally 12 inch or greater diameter or larger than the largest size that exists in the channel).

18. Culverts shall be aligned with the stream channel.

19. Culverts ends shall extend beyond the toe of the road fill.

20. Culvert inlets shall be flush with the rock armoring of the fill face and shall not protrude.

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culvert length (0.05 x 80) = 4 feet of channel elevation drop in the culvert - So this does not meet the embedded criteria - i.e., 3 feet at the bottom plus 4 feet rise in channel = 7 feet at the inlet is greater than the 6 foot maximum at the inlet!

Solution 1 - Using the equation in bold - 0.05 x 80/0.2 = 20 foot CMP;
Solution 2 - Add headwalls and shorten CMP to 60 feet, retain 15 foot diameter (0.05 x 60/0.2 = 15).

21. Culverts shall not be perched (suspended). On Class II and III watercourses culverts shall be installed at stream gradient. If setting to grade is physically limited by bedrock or large boulders, culverts shall have down-flumes or culverts extended down the entire fill. If half-round down-flumes are used, they shall be of sufficient size to accommodate the entire anticipated flow from the culvert. Down-flumes shall be securely attached to the culvert, and durably anchored to the fill slope using methods or materials designed to operate through the life of the crossing (i.e., using deadman posts or cable-anchor assemblies).

22. Road surfaces that drain towards watercourses shall feature drainage facilities or waterbars that direct runoff onto stable or stabilized areas that resist erosion and the transport of sediment into the watercourse. Rock, slash or other energy dissipation methods shall be provided where natural ground cover is insufficient to prevent erosion or filter sediment.

23. Road approaches to new or re-constructed permanent crossings on Class I and II watercourses, or those that will be used during wet weather, shall be treated to minimize erosion and prevent the deformation of the road surface, as well as sediment delivery to the stream. Road approaches shall be armored with durable rock for a minimum of 25 feet in both directions from the crossing, or to the nearest effective water bar or point where road drainage does not drain to the crossing. Rocking beyond 25 feet will occur where factors such as road gradient, soil types, time, duration, and frequency of use dictate the need.

24. All culvert crossings shall include an overflow dip/critical dip (low point in the road near the crossing to carry overflows) or other feature designed to minimize stream diversion potential.

25. Basins shall not be constructed and channels shall not be widened at culvert inlets or lowered in gradient from the upstream channel, unless designed and approved as part of a waterhole facility.

26. Multiple-pipe crossings shall generally not be constructed or reconstructed within the bankfull channel, unless as part of a vented ford.

27. Large rocks and woody debris shall be removed from the crossing fill area. Both the culvert foundation and the trench walls shall be free of logs, stumps, limbs, and rocks that could damage the pipe, or subsequently cause seepage of flow around the outside of the culvert pipe.

28. The culvert bed shall consist of compacted, rock-free soil or gravel. If gravel is used for the bed, geo-textile filter fabric should be placed to separate the gravel from the soil, to minimize the potential for soil piping. A slight hump

(camber) in the center of the culvert alignment is recommended (1.5 to 3 inches per 10 feet of culvert pipe length) to compensate for settling of the culvert bed. Backfill soil material shall be layer-placed and machine compacted in one-foot lifts.

29. Backfill material shall be free of large rocks, limbs, or other debris that could damage the pipe or allow water to seep around the pipe. Culvert ends should be covered first. Backfill material shall be compacted in layers at frequent intervals. Finer material shall be placed along the pipe on permanent culverts to create a better seal.

30. Fill placed in the channel shall not exceed the minimum necessary to construct the crossing. Soil fill within the channel above the top of the culvert shall be constructed to a stable slope (generally 1.5 run: 1 rise) and shall be stabilized with mulch or other appropriate material.

Vented Fords

31. Vented fords shall be installed using the diagram in Attachment B “Typical Diagrams for Stream Crossings and Facilities” as a guideline.

32. Vented fords shall not be constructed on Class I watercourses.

33. Vented fords shall be adequately armored on the inlet and outlet with competent, angular rock to withstand scour. Geotextile fabric shall be used to protect the entire dirt fill face beneath the rock armoring on the outlet in order to protect the fill from scour.

Fords

34. Fords shall be the preferred crossing type on shallow, poorly incised, smooth bottom channels that do not require substantial excavation of the bank and that are usually dry during the normal use period. If using the ford would result in substantial downstream turbidity or sedimentation, another crossing type shall be utilized or a temporary crossing shall be installed over the ford for hauling.

35. Fords shall be constructed in a manner that does not create a dam. The inlet/upstream end of the ford shall be at the same elevation as the upstream channel bed in order to minimize scour at the head of the crossing or deposition on the crossing.

36. Any ford of Class I watercourses shall allow unimpeded upstream and downstream movement of adult and juvenile fish where natural flows enable fish movement. Fords shall not be used on Class I watercourses if the

crossing gradient will be substantially different from the natural stream gradient so that the downstream buttress would create a fish passage barrier at the outlet. Fords shall be constructed to maintain surface flow and prevent stream flows from sieving through the crossing.

37. Fords shall be constructed using rock that will withstand erosion by expected flow velocities, placed in a U-shaped channel to create a drivable crossing. Fords shall be buttressed on the downstream side as necessary to maintain the crossing grade.
38. Fords shall be installed using the diagram in Attachment B "Typical Diagrams for Stream Crossings and Facilities" as a guideline.

39. Boulder weirs may be installed downstream of the ford to maintain grade. Weirs shall be constructed in a U-shape with the bottom of the U facing upstream per the Department's California Salmonid Stream Habitat Restoration Manual (Flosi, et. al. 2003). Footer boulders may be used to increase stability in medium to large streams. These shall be placed in a footing trench slightly downstream of the surface boulders. Boulder weirs shall be constructed to create a maximum water elevation change of one foot.

40. Concrete fords shall not be constructed or reconstructed on fish bearing streams.

41. No native soil may be pushed into the stream bankfull channel. If grading of road surfaces is required, all material shall be graded away from watercourses.

42. Constructed or re-constructed fords on Class I watercourses shall have road approaches treated to minimize sediment production and prevent tracking of soil into the crossing. Road approaches shall be armored from the edge of the stream for a minimum of 25 feet, or to the nearest water bar or point where road drainage does not drain toward the crossing, with durable compacted rock. Rocking beyond 25 feet will occur where factors such as road gradient, soil types, time, duration, and frequency of use dictate the need.

French Drain

43. French drains are generally used for road crossings of seeps and springs. These structures shall consist of a layer of geotextile fabric covered with a 12-inch layer of 4-inch fractured (or similar) rock. This rock layer is covered with geotextile fabric and a layer of 4-inch fractured (or similar) rock. These structures may be constructed in a layered fashion such as a sandwich or in an excavated "U" shape channel such as a burrito.

TEMPORARY CROSSINGS

44. Temporary crossings on Class I watercourses shall allow unimpeded upstream and downstream movement of adult and juvenile fish where natural flows enable fish movement. Exceptions may be made by ~~DFG~~ CDFW on a ~~site-specific~~site-specific basis where impacts to fish present would be minimal or passage is not biologically justified. Measures to minimize impacts of the ford barrier may include: duration of use, seasonal timing, or relief culvert.

Bridges

45. Temporary bridges can be flatcars, log stringers, plate, or other clear-span designs, which shall be removed by the end of the work period in each year. Bridge abutments below the high water mark shall be rock, pre-cast concrete or logs. Log stringer bridges shall be surfaced with planking or straw under a road surface layer of rock, to prevent surface material from entering channel during use.

Spittlers

46. Spittler crossings generally include logs to fill the channel that may be chokered to facilitate removal, a culvert if necessary to carry excess flows, a 4-8 inch straw or geotextile layer capping the logs, and covered by a temporary running surface of local topfill or rock. Culverts shall be of sufficient size to accommodate the expected flow during the use period. Spittler road crossings used on fish-bearing streams shall utilize rock for the running surface. Rock fill used for a running surface on road crossings shall be free of soil but should contain enough fines to functionally bind the material. Spittler crossings shall be constructed by laying choker cables or similar cables across stream channel, then placing pipe and/or sound logs in the channel bottom, or lowering pre-chokered logs into the channel. The choker cables are not necessary if a log loader will be used to place and remove the logs. The logs are then covered with the straw layer, and rock or a local topfill for road surfacing. For removal, the topfill is scraped off without sidecasting, the logs removed as a unit by pulling the chokers or

using a log loader, and any excess loose soil removed from the crossing using mechanized equipment and/or hand tools, as necessary. Channel rocks and debris may be moved for installation if needed.

47. Spittlers shall be installed using the diagram in Attachment B "Typical Diagrams for Stream Crossings and Facilities" as a guideline.

Fords

48. Temporary skid crossings on dry Class II and III watercourses that have poorly incised, shallow, or smooth channels that require little or no bank excavation shall usually be fords.

Corduroy

49. Corduroy crossings are generally used to skid across a wet area.

Crossing Removal

50. Upon completion of use and removal, temporary crossings on "temporary roads" as defined in the California Forest Practice Rules shall be isolated from potential subsequent traffic by strategic placement and construction of effective barriers.

51. When fill material is removed from the crossing, the channel shape and gradient shall be wider than the natural channel, and any adjacent bare soil shall be stabilized by mulching or other effective method. Excavated fill material shall be placed outside of the WLPZ to the extent feasible.

OTHER BEST MANAGEMENT PRACTICES

Channel Dewatering - Flow Bypass

52. During instream work, if surface flow is present and prolonged turbidity may be transported downstream, the flow shall be diverted around the work area by temporary pipe, diversion channel, or pumping. Flow shall be bypassed for the entire time that instream work is conducted (i.e., 24 hrs a day for multiple day projects). Bypass is not required for installation of temporary crossings or culverts that do not need channel preparation prior to installation, and assuming low flows.

53. Any temporary dam, berm, road, or other obstruction that is required shall be built only from materials such as sandbags, gabions, clean gravel, plastic impervious barrier, natural channel gravels, or other materials or means that cause minimal turbidity or siltation. Water routed around the work site shall re-enter the channel below the annual high-water mark.

54. Construction of the diversion shall normally begin in the downstream area and continue in an upstream direction, and the flow shall be diverted only when construction of the diversion is completed. Channel bank or barrier construction shall be adequate to prevent seepage into or from the work area. Channel banks or barriers shall not be made of earth or other erodible supportive materials unless first enclosed by sheet piling, rock rip-rap, geo-textile filter fabric, or other protective materials. The enclosure and supportive material shall be removed when the work is completed and removal shall normally proceed from downstream in an upstream direction.

55. Temporary channels shall be constructed in the following manner:

a) Begin excavation for the temporary channel at the downstream end of the diversion but do not connect with flowing stream at this time. Leave three- to five-foot "plug" between flowing stream and beginning of excavation.
b) Build the temporary channel with new banks approximately 3 to 1 slope from top of bank to streambed to avoid collapse. Stop the diversion channel approximately three to five feet from upstream edge of flowing stream where channel will connect with the live stream.
c) Place and maintain a sediment barrier in the stream at a location within 150 feet below the downstream end of the temporary channel. The sediment barrier shall be in place prior to opening the temporary channel. The sediment barrier shall be maintained until all flows are clear of sediment after the opening of the new low flow channel. When the water is clear of sediment, remove the sediment barrier.
d) Open plugs downstream-end first. This should be done by hand or small equipment to cause the least disturbance.
e) Place a diversion barrier of gravel across the stream on an angle to divert flow into the new channel. Upon project completion, notch the gravel barrier down to stream grade and allow heavy winter flows to wash out the remaining gravel barrier.

Erosion and Sediment Control

56. Discharge of sediment shall be prevented to the maximum feasible extent practicable.

57. Erosion control measures shall be utilized throughout all phases of operations to prevent the degradation of water quality where sediment runoff from exposed slopes may discharge into a stream.

58. At least 90% of disturbed, bare mineral soil that is exposed in conjunction with crossing construction, maintenance, repair, or removal that may be

delivered to a stream shall be treated for erosion control immediately upon completion of work on the crossing or prior if the U. S. Weather Service forecast is a “chance” of rain (i.e., 30% or more). For projects that require more than one day to complete, all materials shall be protected from erosion at the end of each workday if the U. S. Weather Service forecast is a “chance” of rain (i.e., 30% or more).

59. Erosion control treatment shall consist of straw mulch or its equivalent (e.g. compacted slash) to a minimum of 90% coverage. Application of a suitable native seed mixture is also recommended where appropriate. Road running surfaces are excluded.

60. Sediment discharge from exposed, unstable or eroding cutbanks, fillslopes and landing fills shall be stabilized and prevented by pulling, buttressing, rock armoring or other means and by installing and maintaining effective erosion control materials.

61. Silty or turbid water shall not be discharged into streams or downstream of an instream worksite. Such water shall be settled, filtered, or otherwise treated prior to discharge back into the stream channel using straw bales, silt filter fabric fencing, settling pond, catch basin or other effective method. Settling basins may be constructed out of the stream using a straw bale ring covered with impermeable plastic sheeting. Instream settling basins may be constructed by excavating a pool/basin at the lower end of the worksite with settled fines removed from the stream channel prior to rewatering, and reforming the channel.

62. Sediment barriers shall be constructed across the channel at the proper locations immediately downstream of the work area prior to the beginning of any work that could result in substantial ~~down stream~~downstream siltation/turbidity. The barriers shall consist of a silt filter constructed of only clean, screened, un-crushed stream gravel, native stream gravel, properly installed filter fabric fencing, properly installed straw bales, or other effective means. Native stream gravel may be obtained from dry, exposed bars in the vicinity of the project.

63. Straw bale barriers shall consist of whole bales set on a cut end in a four-inch deep trench. Bales shall be butted together and staked in place with metal stakes, rebar, or other effective means.

64. Silt filter fabric fencing deployed in streams shall be limited to use in streams during low flows. Where necessary to resist collapsing, such filter fabric fencing shall be supported by metal t-posts and rabbit wire or other effective means. Filter fabric shall be placed with the entire bottom in a minimum two-inch deep trench.

65. Sediment barriers shall be maintained in good operating condition throughout the period of construction of the project. This includes, but is not limited to, removal of accumulated silt and/or replacement of damaged bales and fabric fencing.

66. Sediment barriers and the entrained fine sediment shall be completely removed upon completion of work.

Bank Stabilization

67. Eroded or eroding banks that are contiguous with and within 20 feet of a stream crossing may be stabilized with rock rip-rap or sloped to a stable angle and stabilized. Operations for such repair and maintenance shall be confined to the minimum area necessary.

68. Bank stabilization methods may utilize those presented in Flosi, et al. 2003 or other generally accepted methods.

69. Rock rip-rap shall be sized to provide stable channel bank protection. Rock rip-rap and energy dissipater materials shall consist of clean rock, competent for the application, sized and properly installed to resist washout. Rock rip-rap slopes shall be supported with competent boulders keyed into a footing trench with a depth sufficient to properly seat the footing course boulders and prevent instability (typically at least 1/3 diameter of footing course boulders). Rock rip-rap slopes and footing trenches shall feature an underlayment of appropriate grade geo-textile filter fabric to protect fill from erosion. Smaller rocks may be used to fill voids after placement of the bearing rocks.

70. Rocks may come from the stream channel provided they can be plucked from the bed surface without excavation into the streambed.

71. Placing of rock rip-rap shall be done with an excavator or backhoe. Placing by dumping shall not occur.

Decommissioning

72. Roads that are decommissioned shall have all crossings excavated and all road surfaces treated and configured so as not to require maintenance. Such treatment and configuration shall minimize erosion and sediment delivery to watercourses.

73. During crossing removal, all fill material shall be excavated to recreate the natural channel grade and orientation, with a channel bed that is slightly wider than the original stream.

74. During crossing removal the natural channel grade shall be determined by approximating a straight line through the crossing between the natural channel bottom upstream and downstream of the crossing.

75. During crossing removal the banks of the channel shall be laid back to a stable repose, generally at an angle less than that of adjacent banks that are not affected by the roadbed. Such slopes shall not be steeper than 1.5 horizontal to 1 vertical (67%) unless armored with rip-rap or other effective means.

76. Large woody debris resulting from the crossing abandonment (e.g., log stringers) may be left within the floodplain or channel but should be evaluated for the potential to move during high flows and block downstream culverts or damage downstream facilities.

77. Decommissioned road approaches associated with crossing abandonment shall be treated to minimize erosion and sediment delivery to the stream, generally with cross drain waterbars and mulching.

78. Decommissioned road surfaces shall be hydrologically disconnected from watercourses. Treatment may include the installation of waterbars, mulching, or ripping the road surfaces.

79. Decommissioned road segments with inside ditches hydrologically connected to a stream shall either have the ditch eliminated and the road outsloped or large cross drain waterbars installed. Cross drain waterbars should be deeper than standard waterbars and extend from the cutbank to the outside edge of the road. On road segments with slopes >10%, cross drain waterbars should be skewed at approximately 45 degrees to the road alignment.

80. Barricades shall be placed or constructed to effectively prevent access by standard-production four-wheel-drive passenger vehicles (excluding all-terrain vehicles) at all points of access to the abandoned road. These may include excavated pits, large slash piles, large waterbars, or other means.

Water Drafting

81. Operators may divert and use water for road dust control and maintenance, provided that WBA has the legal right to do so. This applies to the diversion of water at existing facilities and the drafting of water into water trucks.

82. For Class I waters with CESA- or ESA-listed anadromous fish species present, all water drafting shall be conducted in accordance with the following:

a) Bypass flows in the source stream during drafting shall be at least 2 cubic feet per second (cfs).
b) The diversion rate shall not exceed 10% of the surface flow and pool volume shall not be reduced by >10%.
c) Intake hoses used for drafting shall be screened. Openings in screens (perforated plate or woven wire mesh) shall not exceed 2.38 millimeters (3/32 inches). Slot openings in wedge wire screens shall not exceed 1.75 millimeters (roughly 1/16 inch).
d) The intake velocity (water moving through the screen) shall not exceed 0.33 feet/second.
e) The screen surface shall have at least 2.33 square feet of openings and the diversion rate shall not exceed 350 gallons per minute (gpm).
f) If diverting at less than 350 gpm, a smaller screen surface area may be used. To calculate the screen surface area needed: diversion rate (gpm) X 0.00676 = square feet of screen surface area. The diversion rate can be calculated by dividing the tank capacity by the fastest filling time (i.e., 3000 gallons/15 minutes = 200 gpm).
g) The drafting operator shall actively observe the drafting operation. Pumping shall cease and the screen cleaned if it becomes more than 10% obstructed with debris.

83. Class I watercourses temporarily dammed to create a drafting pool shall provide passage for all life stages of fish, generally by allowing water flow through rocks and limiting the dam height to one foot. Temporary dams shall be removed when operations are complete.

84. When diverting water from any Class I or II watercourse, bypass flows shall be maintained that ensure continuous surface flow in downstream reaches, and keep fish and amphibians in downstream reaches in good condition.

85. Minimum water depth at the deepest part of the pool tail crest for Class I watercourses shall be at least 0.2 foot deep.

86. Small dams may be installed at Class II diversion sites by using sandbags or river run gravel and sheet plastic (cofferdam) barriers. The sandbags shall be filled with clean sand or river gravel and then placed into the stream by hand. Once dammed, bypass water shall be routed downstream of the diversion via gravity in order to maintain flow downstream of the diversion site. Upon completion, or prior to the winter operating period, the sandbags shall be removed entirely from the channel by hand and sand shall not be deposited into the channel. River gravel may remain in the channel.

87. All water drafting vehicles should be checked daily and shall be repaired as necessary to prevent leaks of deleterious materials from entering the stream and Watercourse and Lake Protection Zone (WLPZ).

88. Where overflow run-off from water trucks or storage tanks may enter the stream; effective erosion control devices shall be installed such as water bars, gravel berms, or hay bales.

89. Road approaches and truck pads connected to a stream shall be treated as necessary to prevent sediment production and delivery to a stream or waterhole. Where feasible and beneficial truck pads shall be sloped to facilitate drainage away from the waterhole or stream. Road approaches shall be armored as necessary from the end of the road approach nearest the stream for a minimum of 25 feet, or to the nearest water bar or point where road drainage does not drain toward the stream, with durable compacted rock, compacted grindings, pavement, or chip-seal. Treating approaches beyond 25 feet will occur where factors such as road gradient, soil types, time, duration, and frequency of use dictate the need. Brow logs or large rocks shall be placed at the end of the truck pad where needed to prevent overland flow into the water source and to limit truck access.

90. Drafting from gravity fed storage tanks shall conform to the following:

    a) Water storage tanks shall be fitted with properly sized pipes designed to cleanly return the tank overflow to the source stream.
    b) Outflow pipes shall be sized to fully contain the tank overflow and prevent it from overflowing onto the drafting pad or road surface.
    c) Water storage tank return pipes at the water outfall area shall be armored or designed to prevent erosion of the streambed, bank or channel and sediment delivery to the stream.
    d) Intakes shall be screened with openings <1/8 inch diameter (horizontal for slotted or square openings) for Class II gravity intakes or 3/32 inch for round openings or 1/16 inch diameter (horizontal for slotted or square openings) for Class I gravity intakes.
    e) Water storage tanks shall be screened or closed to effectively prevent wildlife entrapment.

91. At the end of drafting operations, intake pipes shall be plugged, capped, or otherwise blocked (i.e., with a valve shut-off) or removed from the active channel to terminate water drafting during the winter period.

Waterhole Maintenance

92. Waterhole maintenance includes stabilizing banks and removing fill material to maintain or increase capacity. Fill removed shall be placed in a stable location that will not erode and deposit in a stream.

93. During waterhole maintenance, silty/turbid water shall not be discharged into the stream. Silty/turbid water shall be settled in a settling basin, filtered

with instream sediment traps, or otherwise treated prior to discharge back into the stream channel.

Obstruction and Sediment Removal

94. Obstruction or sediment removal shall be generally limited to within 30 feet upstream and downstream from the edge of natural channel grade shall be maintained. Basins shall not be constructed and channels shall not be widened at culvert inlets, unless designed and approved as part of a waterhole facility.

Vegetation Removal

95. The disturbance or removal of vegetation shall not exceed the minimum necessary. Vegetation removal shall be generally limited to within 30 feet upstream and downstream from the edge of the facility.

96. All cleared vegetation and debris shall be removed from the stream corridor and placed or secured where it cannot re-enter a stream.

Deposit and Disposal of Material

97. Fill, debris, soil, silt, sand, bark, slash, rubbish, spoils, cement or concrete or washings thereof, or other organic or earthen material shall not be deposited in an unstable location and shall be treated to prevent erosion and delivery to a stream.

Equipment Use, Petroleum and other Pollution Control

98. Staging, storage, maintenance and re-fueling areas for machinery and equipment, as well as other hazardous materials shall be located outside of the stream riparian areas, WLPZs or ELZs designed to protect water quality.

99. Stationary pumps, motors, generators and welders placed within the bankfull zone shall have drip pans placed beneath them. Drip pans shall be sufficient in size to capture at least 2 to 3 gallons of leaking fluids. Absorbent blankets, sheet barriers and/or thick straw beds shall be placed on gravel bars and beneath parked equipment that have several small but chronic leaks. In the event of a petroleum and/or chemical spill, clean-up shall begin immediately. The Department shall be notified immediately of any spills and shall be consulted regarding clean-up procedures.

100. Any equipment or vehicles driven or operated within or adjacent to the stream shall be checked and maintained to prevent leaks. Equipment shall only operate in flowing streams or standing water if the equipment is completely clean of petroleum residue that could drip or be submerged and

water levels are below the gear boxes of the equipment.

101. Heavy equipment operation within wetted channels shall be minimized. If operations require moving equipment across a flowing stream, equipment crossing shall be minimized and restricted to armored locations that cause a minimum amount of channel disturbance and without causing a prolonged visible increase in turbidity. If heavy equipment must be operated within the wetted channel, operations shall only occur at low flows. For repeated crossings, a bridge, culvert, or rock-lined crossing shall be installed.

Road Maintenance

102. Road surfaces shall be graded only when necessary for maintenance of a smooth, stable, and well-drained operating surface. Inboard ditches shall be graded only when they are blocked or lack adequate hydraulic capacity, or driver safety is a concern. Where feasible, blading the segment of ditch between the stream and first upslope drainage facility shall be avoided.

103. All road segments shall be hydrologically disconnected, to the extent feasible, from watercourses through the use of: outsloping, rocking, installation of rolling dips, cross drains, and/or waterbars. All of these features shall drain to stable sediment filter strips.

104. Each road approach to a watercourse crossing shall be treated to create and maintain a stable operating surface, and to avoid the generation of fine sediment.

105. Side casting of soils shall not occur on road approaches to crossings where an adequate filter strip is not present.

106. Road segments with inside ditches hydrologically connected to a stream shall either have the ditch eliminated and the road outsloped or large cross drain waterbars installed. Cross drain waterbars should be deeper than standard waterbars and extend from the cutbank to the outside edge of the road. On road segments with slopes >10%, cross drain waterbars should be skewed at 45% to the road alignment.

References

Cafferata, P., T. Spittler, M. Wopat, G. Bundros and S. Flanagan. 2004. Designing Stream Crossings for Passage of 100-Year Flood Flows, Wood, and Sediment. California Department of Forestry and Fire Protection, the Resources Agency, Sacramento, California. California Forestry Report No. 1.

CDFG. 2003. Culvert Criteria for fish passage. In: Flosi et al. 2003. Salmonid Stream Habitat Restoration Manual, Third Edition. California Department of Fish & Game, Sacramento.

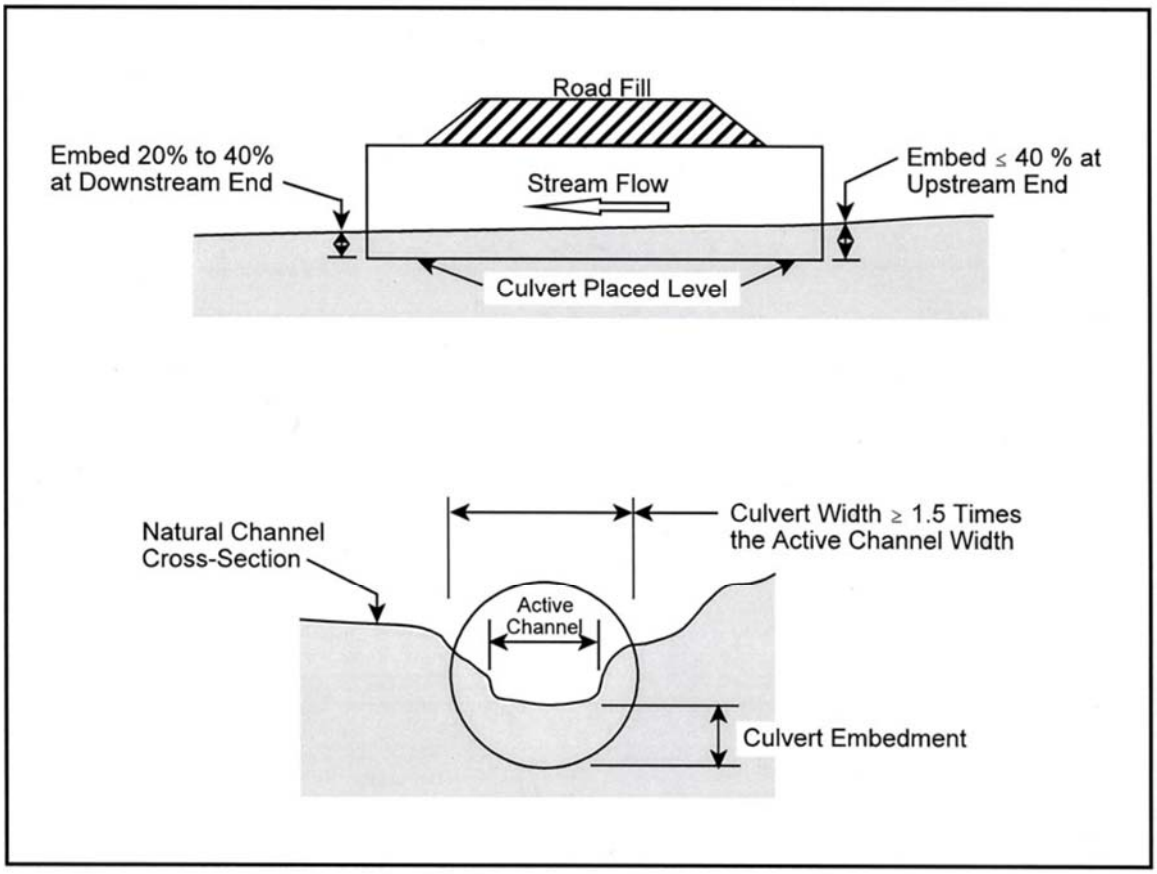
Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Coey, and B. Collins. 2003. Salmonid Stream Habitat Restoration Manual, Third Edition. California Department of Fish & Game, Sacramento.

Weaver, W.E. and D.K. Hagans. 1994. Handbook for Forest and Ranch Roads, A Guide for Planning Designing, Constructing, Reconstructing, Maintaining and Closing Wildland Roads. Pacific Watershed Associates, for the Mendocino County Resource Conservation District, in cooperation with the California Department of Forestry and Fire Protection and the U.S.D.A. Soil Conservation.

ATTACHMENT B

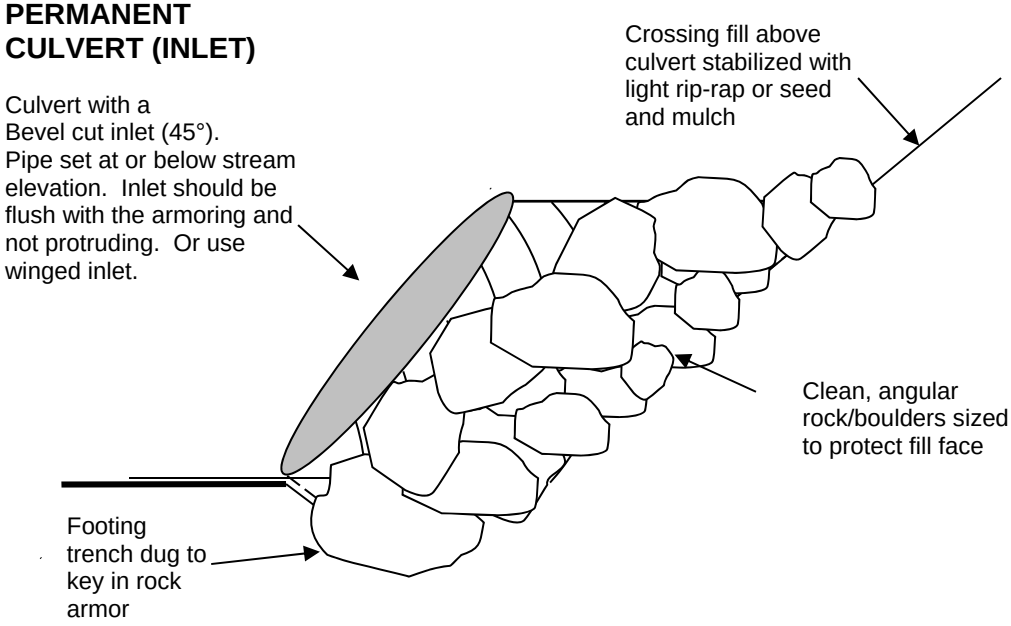
Typical Diagrams for Stream Crossings and Facilities

PERMANENT CULVERT PIPE INSTALLATION
FOR CLASS I WATERCOURSES
(LONGITUDINAL AND CROSS-SECTIONAL VIEW)

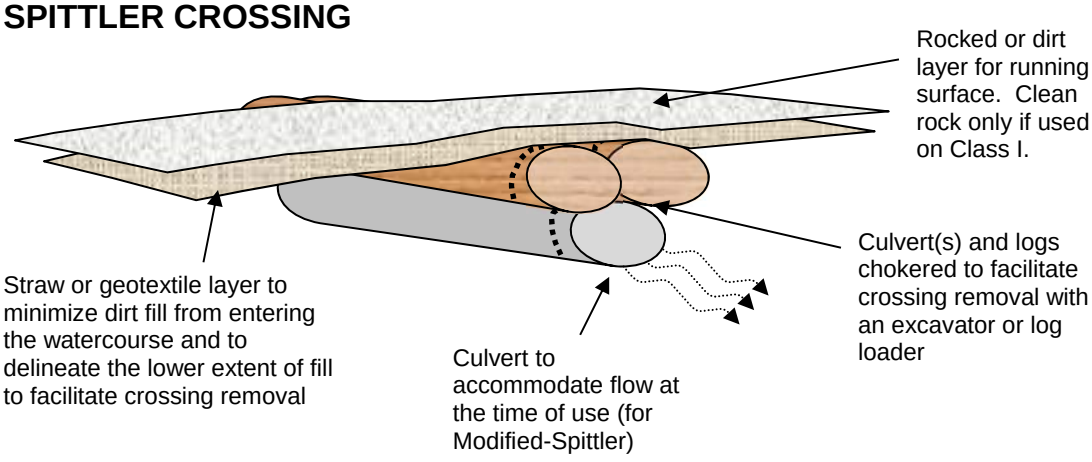


From the California Salmonid Stream Habitat Restoration Manual (CDFG 2003)

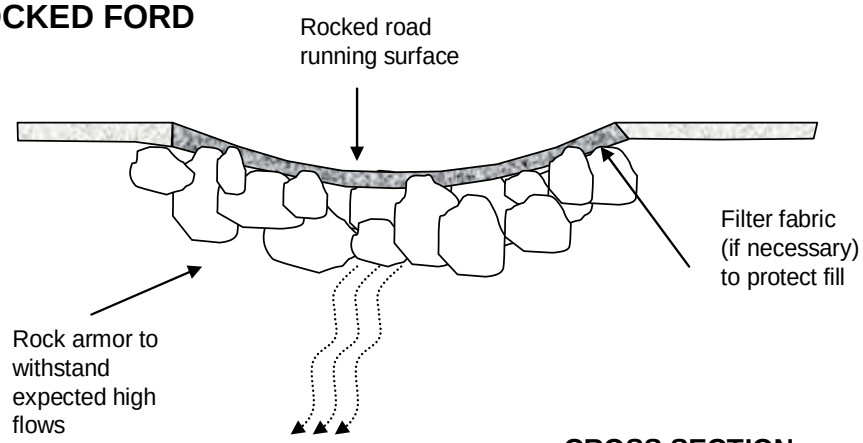
PERMANENT CULVERT (INLET)



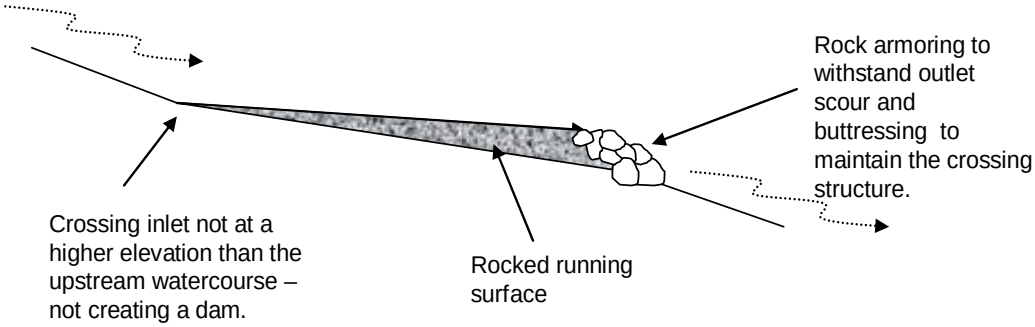
SPITTLER CROSSING



ROCKED FORD



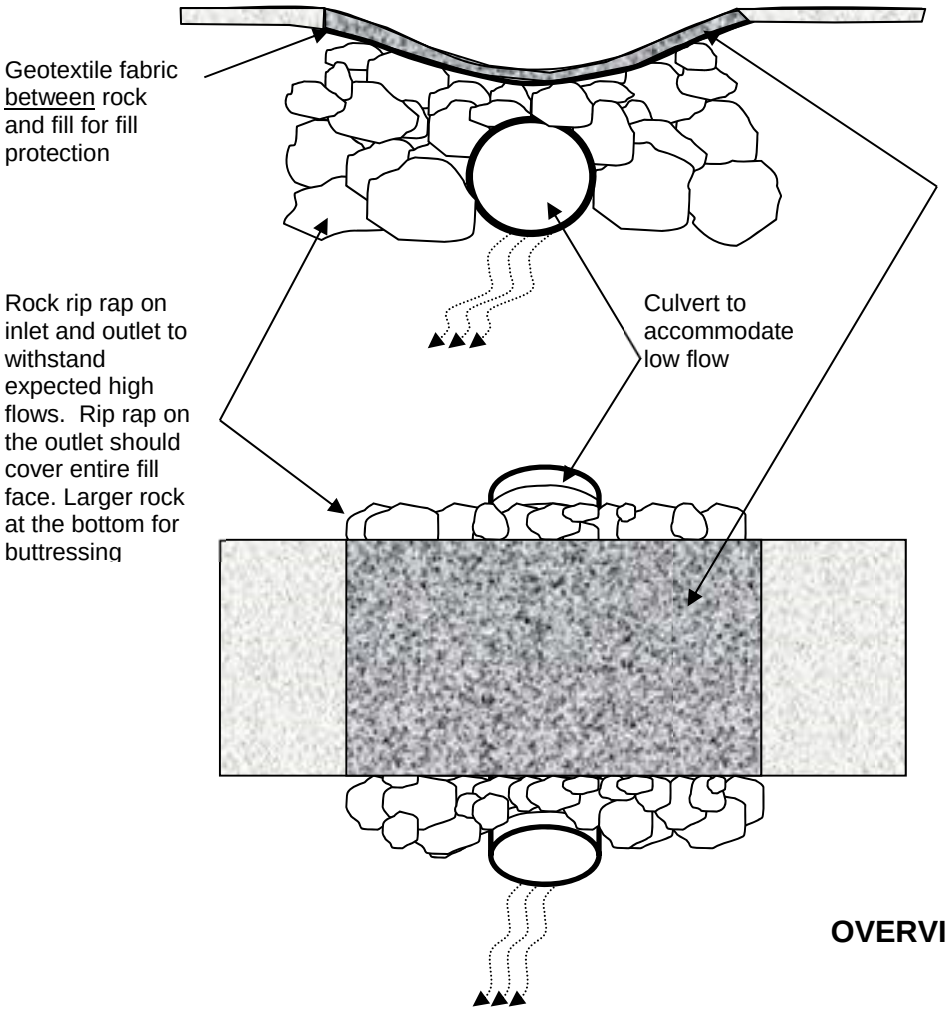
CROSS SECTION



LONGITUDINAL VIEW

VENTED FORD

CROSS SECTION



OVERVIEW

Attachment C

Fish, Wildlife and Botanical Resources

I. Birds

I.1 Bank swallow (*Riparia riparia*) State Threatened

This species is not known to occur on land covered (See Section 2, Land and Area and Facilities Covered, herein referred to as land covered), however it does occur adjacent to land covered. The species migrates through California in the spring and fall, with peak numbers occurring in May and most birds having left the state by September (Zeiner et al. 1988). During the summer breeding season (May through July), bank swallows are mainly found along open riparian corridors where habitat associations usually include open areas near water, such as fields, marshes, streams, and lakes.

Potential Threats: Potential noise disturbance from forest management operations and loss of nesting habitat because of stream bank stabilization efforts that eliminate down cut banks along stream channels.

Mitigations: For proposed operations occurring adjacent to watercourses, during THP preparation watercourses will be carefully field reviewed and any potential nesting colonies shall be reviewed and, if necessary, site-specific measures shall be developed with CDFW and proposed in the THP.

I.2 Greater sandhill crane (*Grus canadensis tabida*) State Threatened

This species is known to occur on and adjacent to land covered. The Central Valley population numbers approximately 6,000-7,000 birds, with 200-250 pairs nesting in northeastern California including Lassen, Modoc, Plumas, and Siskiyou Counties (Littlefield 1989). This population winters in the Central Valley of California. Greater sandhill cranes inhabit wet prairies, treeless marshes, grain fields, and other open, wet areas (Zeiner et al. 1988). In California, greater sandhill cranes typically arrive on their territories in February or early March. Pairs are generally established by March 25, and nesting usually commences by April 15. Most pairs are finished incubating by June 15 (Littlefield 1989) although some pairs may still be nesting in August (Zeiner et al. 1988).

Potential Threats: Most sandhill cranes do not reproduce until they are 5 to 8 years old and coupled with low nest success and colt survival, this species has a very low biotic potential. Some sandhill cranes are very sensitive to disturbance and may abandon nests if encroached upon within 0.5 miles. Other pairs seem to tolerate activity near the nest fairly well and nests have been found near highways and other major roads. Terrestrial predators such as skunks, coyotes, mink, and others can take significant portions of eggs and colts. Potential noise disturbance from forest management activities occurring adjacent to a nesting pair is a potential threat to the species from operations.

Mitigations: For proposed operations occurring adjacent to potential suitable habitat, during THP preparation potential suitable habitat will be carefully field reviewed and any potential nesting sites shall be reviewed, surveyed and monitored, if necessary, to ensure nest sites are not disturbed. Following the methods of Littlefield (1989) the surveyor uses binoculars or a spotting scope to search for cranes along designated transects, if cranes are observed on multiple occasions in a given area then particular attention is focused there to ensure against missing a nesting pair. If the species is found nesting, and

operations could cause adverse impacts, site-specific measures shall be developed with CDFW and proposed in the THP.

I.3 Willow flycatcher (*Empidonax traillii*) State Endangered

This species is known to occur on and adjacent to land covered. Willow flycatchers are summer residents in California's Sierra Nevada and Cascade ranges. They are more common as migrants during the spring and fall at lower elevations. Males arrive on their territories in early June. Breeding takes place from mid-June through July and nearly all young have fledged by mid-August (Sanders and Flett 1989). Willow flycatchers nest in riparian areas and also upland mesic mountain meadows (2,000-8,000 feet in elevation) with a well-developed deciduous shrub component. Nesting areas consist of patches of dense willows that occur in wet meadows, but usually require interspersed openings or breaks in vegetative cover as well. Water may be running, standing or forming areas of saturated soil.

Potential Threats: Willow flycatcher nest parasitism occurs by brown headed cowbirds (*Molothrus ater*). Grazing can also result in habitat loss if grazing defoliates the lower portions of deciduous shrubs along riparian zones. Since forest management activities do not remove potential suitable willow habitat, potential noise disturbance from forest management activities occurring adjacent to a nesting pair is a potential threat to the species from operations.

Mitigations: For proposed operations occurring adjacent to potential suitable habitat, during THP preparation potential suitable habitat will be carefully field reviewed. Prior to operations, potential suitable habitat shall be surveyed to determine if nesting is taking place. When surveys detect territorial male willow flycatchers during the year of operations, a seasonal operating restriction shall be proposed in the THP, and if necessary, site-specific measures shall be developed with CDFW and proposed in the THP.

II. Fish

II.1 Steelhead *(Oncorhynchus mykiss) (*Central Valley ESU*)* Federal Threatened

The species is known to occur on and adjacent to land covered. The listed steelhead are part of the Central Valley Evolutionarily Significant Unit (ESU) as defined by the National Marine Fisheries Service (NMFS) (FR 61:155, 41541-41561). The only portions of land covered that support steelhead are those watersheds in the Shasta Tract tributary to the Sacramento River below Shasta Dam. The Central Valley ESU population is considered distinct because geographic separation in spawning areas limits the amount of genetic exchange that can occur with other population segments. Also, steelhead inhabiting these waters have adapted to the conditions specific to this geographic area. Of the fish that migrate upstream past the Red Bluff Diversion Dam, the majority are hatchery fish produced at the Coleman National Fish Hatchery (CNFH). A limited number of naturally spawning fish enter Paynes Creek, spawn below the CNFH on Battle Creek, stay in the mainstem Sacramento River, or could possibly enter Bear or Cow Creeks.

In general, migratory steelhead spend their first 2 years rearing in freshwater and then begin a downstream migration to the sea when they are between 5 and 10 inches long (McGinnis 1984). Steelhead typically spend the next 2 to 3 years in the ocean before returning to their natal streams to spawn as 4 to 5 year olds. Steelhead in the Central

Valley ESU enter freshwater between July and May and are considered “fall run” fish. Peak upstream movement past the Red Bluff Diversion Dam occurs between September and October. Within the Central Valley ESU spawning occurs between late December and early April. After spawning, eggs incubate for 1.5 to 4 months depending on water temperature. After hatching the larval fish (alevins) receive nutrition from an attached yolk sac. Once yolk sacs are absorbed, juvenile “fry” emerge from the gravel substrate and begin actively feeding. Juveniles rear in fresh water for 1 to 4 years and then migrate to the ocean as “smolts”.

The only potential habitat for steelhead on land covered lies within the South Cow Creek, Old Cow Creek, the North Fork of Battle Creek, and Bear Creek. Surveys conducted by Thomas Payne & Associates in 1986 located juvenile fish that were assumed to be steelhead that had emerged from spawning gravels in the upper reaches of South Cow Creek or Atkins Creek (CDFW Northern California-North Coast Region files). However, the diversion dam on Atkins Creek in Section 13, T32N, R1E that supplies water to the Worden Ditch for use on the Rough Diamond Ranch would prevent any movement of fish upstream from that point (T. Healy, CDFW fisheries biologist pers. comm. with B. Carey).

According to CDFW files, Bear Creek is assumed to potentially support steelhead upstream from the Highway 44 Bridge; diversion of water below the bridge limits habitat suitability for steelhead. Naturally low water flows in this small creek limit its ability to support steelhead in all but the wettest years. The only available data concerning the occurrence of steelhead in Bear Creek is from 1965 (CDFW files). According to this report, approximately 200 adult steelhead were seen in the North Fork of Bear Creek (Section 3, T31N, R1E) approximately 1 mile downstream from the nearest land covered. There is a waterfall (Bear Creek Falls) in Section 23, T31N, R1W, just above the confluence of the North and South Forks of Bear Creek that prevents further upstream fish migration into the South Fork of Bear Creek.

Potential Threats: Many variables have been attributed to declines in steelhead population throughout their range. These variables can be broken down into natural and anthropogenic causes. Habitat loss from the construction of dams, diversion of water, and development within river basins has purportedly led to population declines. Over exploitation in marine and freshwater environments may also result in low spawner returns. Hatchery practices have led to a diffused genetic pool and have increased susceptibility to disease and lowered survival rates. Other factors such as climate, increased predation by marine mammals, and cyclic or degraded oceanic conditions have been implicated as causing declines in steelhead populations.

Habitat loss or modification is the primary potential threats to the species from forest management activities. General threats would include timber harvest which reduces streamside shade thereby leading to elevated water temperatures which are detrimental to steelhead. Excess removal of trees along streams can lead to a lack of large woody debris (LWD) that form an integral part of the pool habitat in some places where steelhead occur. Large woody debris can also influence the hydrology of some streams. Operating heavy equipment adjacent to watercourses can lead to unstable banks and increased sediment delivery. Soil disturbance from upslope activities or sediment transport associated with roads, landings, and skid trails can lead to adverse impacts to salmonids if sediment actually reaches the stream.

Mitigations: Adherence to the Forest Practice Rules will reduce to insignificance potential impacts that could result from timber harvest within planning watersheds containing potential suitable habitat. The proper use of WLPZs during timber operations will ensure

that canopy closure is maintained to provide shade, LWD is recruited, and sediment input is minimized. Roads are constructed and maintained so that in most cases sediment is not delivered to the watercourses existing on land covered. If sediment is transported to watercourses on land covered, corrective measures are undertaken as soon as the problems are detected. For proposed operations occurring adjacent to watercourses, during THP preparation watercourses will be carefully field reviewed and any potential suitable habitat and known locations shall be reviewed and, if necessary, site-specific measures shall be developed with CDFW and proposed in the THP.

II.2 Chinook salmon (*Oncorhynchus tshawytscha*)

Winter run: Federally endangered, State endangered
Spring run: Federally proposed endangered, State threatened
Fall/Late Fall run (Central Valley ESU): Federally proposed threatened

All of these anadromous Chinook salmon share life histories, however the timing of migratory movements and spawning differs such that they are separated into distinct "runs". Like steelhead they begin their lives in freshwater, migrate downstream to spend a portion of their lives in saltwater, and then return to freshwater to spawn. All of these runs occur in the Sacramento River but only fall run Chinook are known to migrate up into watersheds that are potentially impacted by operations on land covered. Chinook salmon do not migrate as far upstream as steelhead and are more restricted by steep gradients and shallow water.

In 1999, a Memorandum of Understanding was signed by various state and federal stakeholders to begin restoration of Battle Creek, tributary to the Sacramento River. The Battle Creek Salmon and Steelhead Restoration Project is now a cooperative program that includes state and federal agencies and local watershed groups in an effort to restore spawning access for Central Valley steelhead and spring-run Chinook salmon to Battle Creek and its tributaries. As restoration activities are completed, threats to the Central Valley steelhead and spring-run Chinook salmon should be reduced, and improved habitats should contribute significantly towards CDFW, U.S. Fish and Wildlife and N.O.A.A. Fisheries population recovery goals.

Potential Threats: The same potential threats apply to Chinook salmon as to steelhead.

Mitigations: The same measure apply to Chinook salmon as to steelhead.

II.3 Rough sculpin *(Cottus asperrimus)* — State Threatened

Freshwater sculpins occupy a narrow feeding niche where they forage along stream bottoms for invertebrates. The rough sculpin is limited in distribution and only occurs in isolated populations near the falls in the Pit River near Burney, in Hat Creek, and in the Fall River (McGinnis 1984).

Potential Threats: Increased sediment delivery could directly affect this species by aggrading areas of habitat. Indirect effects could result from changes in benthic stream invertebrate communities in response to increased water temperatures, sedimentation, or otherwise altered hydrology.

Mitigations: Adherence to the Forest Practice Rules will alleviate most potential impacts that could result from timber harvest within watersheds containing potential suitable habitat. The proper use of WLPZs during timber operations will ensure that canopy closure is maintained to provide shade, LWD is recruited, and sediment input is minimized.

For proposed operations occurring adjacent to watercourses, during THP preparation watercourses will be carefully field reviewed and any potential suitable habitat or known locations of the species shall be reviewed and, if necessary, site-specific measures shall be developed with CDFW and proposed in the THP.

II.4 Modoc sucker (*Catostomus microps*) Federally Endangered, State Endangered

The species is not known to occur on land covered, however it is known to occur adjacent to lands covered. Modoc suckers are small (adults reach about 7 inches) narrowly distributed fish. During the dry summer months, fish are limited to isolated permanent pools. Spawning takes place between April and June and may be spread over 3-4 weeks. Permanent pools with some form of cover and suitable substrate are probably the most limiting aspect of Modoc sucker habitat. Cover can be in the form of boulders or cobbles, aquatic vegetation, under cut banks, or other debris. Barriers have been constructed to prevent fish from passing upstream of Highway 299 on both Johnson and Rush Creeks in Modoc County.

Potential Threats: Potential threats to this species include limited water flows and loss of genetic integrity through hybridization with Sacramento suckers. Increased sediment delivery could directly affect this species by aggrading areas of habitat. Indirect effects could result from changes in benthic (stream bottom) stream invertebrate communities in response to increased water temperatures, sedimentation, or otherwise altered hydrology. Activities that result in stream incision, excess siltation, and decreased bank stability can also contribute to habitat degradation. Impoundment and diversions that limit water availability can likewise negatively affect habitat quality.

Mitigations: Adherence with Forest Practice Rules will alleviate most potential impacts that could result from timber harvest within watersheds containing Modoc sucker habitat. The proper use of WLPZs during timber operations will ensure that canopy closure is maintained to provide shade, LWD is recruited, and sediment input is minimized. For proposed operations occurring adjacent to watercourses, during THP preparation watercourses will be carefully field reviewed and any potential suitable habitat or known locations of the species shall be reviewed and, if necessary, site-specific measures shall be developed with CDFW and proposed in the THP.

III. Plants

III.1 Alisma gramineum - Grass alisma CNPS List 2.2

This rhizomatous aquatic herb occurs in marshes and swamps at elevations between 1,250 to 6,000 feet. The blooming period of this species is June to August.

Potential Threats: CNPS lists a potential threat to this species as road construction.

Mitigations: Timber harvesting does not generally affect aquatic species. The construction, reconstruction or use of watercourse crossings and water drafting for dust abatement pose a slight risk to this species. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where channel margins could be impacted. Should any plants of this species be detected they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology,

shade canopy, or soil conditions).

III.2 Arnica fulgens - Hillside arnica — CNPS List 2.2

This rhizomatous herb occurs in Great Basin scrub, lower montane coniferous forests, meadows, and seeps at elevation ranges of 4,900. The blooming period for this species is May through July.

Potential Threats: CNPS lists a potential threat to this species as wetland modification.

Mitigations: Surveys for this species are most appropriate near areas near riparian deciduous shrubs along stream channels or meadow margins. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian deciduous shrubs could be impacted. Any plants of this species which are detected will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Additionally, no slash piling or pile burning in the immediate vicinity of known locations of this species will occur.

III.3 Betula glandulosa - Resin birch — CNPS List 2.2

This deciduous shrub occurs in a variety of habitats including bogs, fens, meadows, seeps, marshes, swamps, lower montane coniferous forests, and subalpine coniferous forests at elevation ranges of 4,200 to 7,600 feet. The blooming period is May through June but identification is possible in any season.

Potential Threats: CNPS lists a potential threat to this species is grazing.

Mitigations: In general, timber operations do not occur in areas of habitat for this species. Surveys for this species are most appropriate near areas of riparian deciduous shrubs along stream channels or meadow margins. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian deciduous shrubs could be impacted. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.4 Botrychium ascendens - Upswept moonwort — CNPS List 2.3

This perennial rhizomatous herb (fern) of the adder's-tongue family grows in mesic lower montane coniferous forests between 4,921 and 6,004 feet in elevation. The blooming period is July through August.

Potential Threats: CNPS lists logging and foot traffic as potential threats to this species.

Mitigations: Timber operations do not typically occur in habitat types supporting this species. Surveys for this species are most appropriate near riparian zones along stream channels or meadow margins. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian zones could be impacted. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in

such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain riparian function and limit encroachment by conifers may be beneficial (Plumas National Forest, 2007). Additionally, no slash piling or pile burning in the immediate vicinity of known locations of this species will occur.

III.5 Botrychium crenulatum - Scalloped moonwort CNPS List 2.2

This annual rhizomatous herb (fern) of the adder's-tongue family grows in marshes and meadows at elevation ranges of 4,921 to 8,202 feet. The blooming period for this species is June through September.

Potential Threats: CNPS lists grazing, logging, traffic, and road construction as potential threats to this species.

Mitigations: In general, timber operations do not occur in areas of habitat for this species. Surveys for this species are most appropriate near riparian zones along stream channels or meadow margins. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian zones could be impacted. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain riparian function and limit encroachment by conifers may be beneficial (Plumas National Forest, 2007). Additionally, no slash piling or pile burning in the immediate vicinity of known locations of this species will occur.

III.6 Botrychium minganense - Mingan moonwort CNPS List 2.2

This rhizomatous herb (fern ally) occurs in bogs, fens and moist areas in upper and lower montane coniferous forests at elevations ranges of 4,700 to 6,700 feet. The blooming period for this species is July through September.

Potential Threats: CNPS lists potential threats to this species as logging, grazing, trampling, fire, and habitat alteration.

Mitigations: Timber operations do not typically occur in habitat types supporting this species. Surveys for this species are most appropriate near riparian zones along stream channels or meadow margins. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian zones could be impacted. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain riparian function and limit encroachment by conifers may be beneficial (Plumas National Forest, 2007). Additionally, no slash piling or pile burning in the immediate vicinity of known locations of this species

will occur.

III.7 Botrychium montanum - Western goblin CNPS List 2.1

This rhizomatous herb (fern ally) occurs in lower and upper montane coniferous forests near meadows and seeps at elevation ranges of 4,800 to 7,000 feet. The blooming period for this species is July through September.

Potential Threats: CNPS lists a potential threat to this species as road deconstruction.

Mitigations: Timber operations do not typically occur in habitat types supporting this species. Surveys for this species are most appropriate near riparian zones along stream channels or meadow margins. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian zones could be impacted. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain riparian function and limit encroachment by conifers may be beneficial (Plumas National Forest, 2007). Additionally, no slash piling or pile burning in the immediate vicinity of known locations of this species will occur.

III.8 Botrychium pinnatum - Northwestern moonwort CNPS List 2.3

This rhizomatous herb of the grape-fern family occurs in meadows, seeps and lower and upper montane coniferous forests at elevation ranges of 5,800 to 6,700 feet. The blooming period for this species is July through October. This species is only known from 5 occurrences.

Potential Threats: CNPS lists trampling and grazing as potential threats to this species.

Mitigations: Timber operations do not typically occur in habitat types supporting this species. Surveys for this species are most appropriate near riparian zones along stream channels or meadow margins. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian zones could be impacted. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.9 Botrychium virginianum - Rattlesnake fern CNPS List 2.2

This perennial herb (fern ally) occurs in a variety of habitats including bogs, fens, meadows, seeps, riparian forests, and lower montane coniferous forests at elevation ranges of 2,300 to 4,300 feet. The blooming period for this species is June through September.

Potential Threats: CNPS lists logging as a potential threat to this species.

Mitigations: Timber operations do not typically occur in habitat types supporting this species. However, this species is known to occur near the Shasta Forests Big Bend Tract. Surveys for this species are most appropriate near riparian zones along stream channels or meadow margins. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian zones could be impacted. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.10 Bruchia bolanderi - Bolander's bruchia CNPS List 2.2

This moss grows in both lower and upper montane coniferous forests as well as meadows and seeps at elevations between 5,600 and 9,200 feet.

Potential Threats: CNPS lists potential threats to this species such as agricultural development, urbanization, grazing, trampling, and vehicles.

Mitigations: Timber operations do not typically occur in habitat types supporting this species. Surveys for this species are most appropriate near riparian zones along stream channels or meadow margins. Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian zones could be impacted. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.11 Calochortus longebarbatus var. *longebarbatus* - Long-haired star-tulip
CNPS List 1B.2

This bulbiferous herb occurs in vernal pools, meadows, seeps, Great Basin scrub and near openings and drainages in lower montane coniferous forests at elevation ranges of 3,200 to 6,200 feet. The blooming period for this species is June to August.

Potential Threats: CNPS lists potential threats to this species as logging and vehicles.

Mitigations: Surveys for this species would be limited to areas along meadow edges in areas where significant ground disturbance may occur (i.e. skid trail, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial. Additionally, no slash piling or pile burning

in the immediate vicinity of known locations of this species will occur.

III.12 Carex petasata - Liddon's sedge — CNPS List 2.3

This perennial herb occurs in broadleaved upland forests, upper and lower montane coniferous forests, pinyon juniper woodlands, meadows and seeps at elevation ranges of 1,900 to 10,800 feet. The blooming period for this species is May to July.

Potential Threats: CNPS lists potential threats to this species as logging and fire.

Mitigations: Surveys for this species would be limited to areas along meadow edges in areas where significant ground disturbance may occur (i.e. skid trail, landings, new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial. Additionally, no slash piling or pile burning in the immediate vicinity of known locations of this species will occur.

III.13 Carex sheldonii – Sheldon's sedge — CNPS List 2.2

This rhizomatous herb occurs in lower montane coniferous forests, marshes, swamps and riparian scrub habitats at elevation ranges of 3,900 to 6,600 feet. The blooming period for this species is May to August.

Potential Threats: CNPS lists the primary threat to this species as road maintenance.

Mitigations: Surveys for this species would be limited to areas along meadow edges in areas where significant ground disturbance may occur (i.e. skid trail, landings, new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial. Additionally, no slash piling or pile burning in the immediate vicinity of known locations of this species will occur.

III.14 Carex vulpinoidea - Brown fox sedge — CNPS List 2.2

This perennial herb occurs in marshes, swamps and riparian woodland habitats at elevation ranges of sea level to 4,000 feet. The blooming period for this species is May to June.

Potential Threats: CNPS lists the a potential threats to this species as habitat loss.

Mitigations: Surveys for this species would be limited to areas along riparian edges in areas where significant ground disturbance may occur (i.e. skid trail, landings, new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this

species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.15 Drosera anglica - English sundew — CNPS List 2.3

This perennial carnivorous herb occurs in bogs, fens, meadows and swamps at elevation ranges of 4,200 to 6,200 feet. The blooming period of this species is June through September.

Potential Threats: CNPS does not list threats to this species but potential a threat from timber operations could include alteration of hydrologic conditions.

Mitigations: Surveys for this species would be limited to areas along meadow edges in areas where significant ground disturbance may occur (i.e. skid trail, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial.

III.16 Hierochloe odorata - Nodding vanilla grass — CNPS List 2.3

This perennial rhizomatous herb of the sweetgrass family occurs in meadows and seeps at elevations of 4,900 to 6,200 feet. The blooming period is April through July.

Potential Threats: CNPS lists the primary threat to this species as grazing.

Mitigations: Surveys for this species would be limited to areas along meadow edges in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial to this species.

III.17 Juncus dudleyi – Dudley's rush — CNPS List 2.3

This perennial graminoid occurs in wet areas within lower montane coniferous forests at elevation ranges of 1,500 to 6,500 feet. The blooming period is July through August.

Potential Threats: CNPS does not list threats for this species.

Mitigations: Surveys for this species would be limited to areas along riparian edges in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference

of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.18 Juncus luciensis – Santa Lucia dwarf rush CNPS 1B.2

This annual herb occurs in a variety of habitats including chaparral, Great Basin scrub, lower montane coniferous forest, meadows, seeps, and vernal pools at elevation ranges of 985 to 6,700 feet.

Potential Threats: CNPS lists the primary threat to this species as development.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trail, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial to this species.

III.19 Lysimachia thyrsiflora - Tufted loosestrife CNPS List 2.3

This perennial herb occurs in meadows, seeps, marshes, and swamps in upper montane coniferous forest at elevation ranges of 3,100 to 5,500 feet. The blooming period for this species is May through August.

Potential Threats: No threats are listed by CNPS but potential threats could include hydrological alteration and vehicles.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial to this species.

III.20 Meesia uliginosa – Broad-nerved hump moss CNPS List 2.3

This moss is associated with damp soils in a variety of habitats including bogs, fens, meadows, seeps generally within subalpine and montane coniferous forests at elevation ranges of 4,200 to 9,200 feet. This species blooms in October.

Potential Threats: CNPS lists the primary threat to this species as altered hydrology.

Mitigations: Surveys for this species would be limited to areas with moist soil and along wet meadow edges and drainages in areas where significant ground disturbance may

occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.21 Mimulus evanescens - Ephemeral monkeyflower CNPS List 1B.2

This species is an annual herb that occurs in seasonally wet areas and lake and channel margins with gravelly or rocky soils within Great Basin scrub, lower montane coniferous forest and pinyon and juniper woodland habitats at elevation ranges between 4,100 and 5,700 feet. The blooming period for this species is May to August.

Potential Threats: CNPS lists potential threats to this species as trampling and hydrological alterations.

Mitigations: Surveys for this species would be limited to areas along riparian edges in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.23 Nemophila breviflora - Great Basin nemophila CNPS List 2.3

This annual herb occurs in mesic meadows, seeps, and thickets in Great Basin scrub and upper montane coniferous forest. The blooming period for this species is between May and July and it is found at elevations ranging from 4,000 to 7,900 feet.

Potential Threats: CNPS lists no threats related to timber harvesting.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trail, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial to this species.

III.24 Orcuttia tenuis - Slender Orcutt grass CNPS List 1B.1
Federal Threatened, State Endangered,

This endemic annual grass (herb) occurs in wetlands, vernal pools, seasonally flooded flats and along lake margins at elevations between 100 to 5,800 feet.

Potential Threats: CNPS lists potential threats to this species as vehicles, logging, trampling, and fire.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial to this species.

III.25 Oreostemma elatum - Tall alpine aster CNPS List 1B.2

This perennial herb occurs in moist soils within bogs, fens, meadows, seeps and upper montane coniferous forest between 3,200 and 6,900 feet in elevation. The blooming period for this species is June to August.

Potential Threats: CNPS lists the primary threat to this species as hydrological alteration.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial to this species.

III.26 Packera indecora - Rayless mountain ragwort CNPS List 2.2

This perennial herb occurs along channel margins and in wet meadows and seeps at elevation ranges of 5,200 to 6,600 feet. The blooming period for this species is July through August.

Potential Threats: CNPS lists potential threats to this species as hydrological alterations.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain meadow conditions and limit encroachment by conifers may be beneficial to this species.

III.27 Polygonum polygaloides ssp. *esotericum* - Modoc County knotweed CNPS List 1B.1

This annual herb occurs in seasonally flooded flats and wet areas, seeps, and vernal pools in Great Basin scrub and lower montane coniferous forests usually between 2,900 and 5,600 feet in elevation. The blooming period for this species is May through September.

Potential Threats: CNPS lists threats to this species as non-native plants and trampling.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.28 Potamogeton epihydrus ssp.*nuttallii* - Nuttall's ribbon-leaved *pondweed* CNPS List 2.2

This rhizomatous aquatic herb occurs in ponds, marshes and swamps at elevations between 1,200 and 7,200 feet. The blooming period for this species is July through September.

Potential Threats: CNPS lists threats to this species as recreational activities and water contamination.

Mitigations: Surveys for this species would be limited to watercourse crossing locations and water drafting sites where channel margins could be impacted. Should any plants of this species be detected they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.29 Potamogeton filiformis - Slender-leaved pondweed CNPS List 2.2

This rhizomatous aquatic herb occurs in marshes and swamps at elevation ranges of 900 to 7,000 feet. The blooming period for this species is May to July.

Potential Threats: CNPS does not list any threats to this species.

Mitigations: Surveys for this species would be limited to watercourse crossing locations and water drafting sites where channel margins could be impacted. Should any plants of this species be detected they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.30 Potamogeton praelongus – White-stemmed pondweed CNPS List 2.3

This rhizomatous aquatic herb occurs in marshes, swamps, and deep water lakes at elevation ranges of 5,900 to 9,840. The blooming period for this species is July through August.

Potential Threats: CNPS does not list any threats to this species.

Mitigations: Surveys for this species would be limited to watercourse crossing locations and water drafting sites where channel margins could be impacted. Should any plants of this species be detected they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not

change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.31 Potamogeton zosteriformis – Eel-grass pondweed CNPS List 2.3

This rhizomatous aquatic herb occurs in marshes, swamps, and deep water lakes at up to an elevation of 6,100 feet (5,900 to 9,840 feet). The blooming period for this species is June through July.

Potential Threats: CNPS does not list any threats to this species.

Mitigations: Surveys for this species would be limited to watercourse crossing locations and water drafting sites where channel margins could be impacted. Should any plants of this species be detected they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.32 *Rhamnus alnifolia* - Alder buckthorn CNPS List 2.2

This native deciduous shrub occurs in mesic areas and riparian habitats often in lodgepole pine and red fir stands at elevations ranging from 4,500 to 7,000 feet. The blooming period for this species is May to July although the flowers are inconspicuous. This brush species has been known to cause mild dermatitis if handled.

Potential Threats: CNPS does not list potential threats associated with forest management activities.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.33 Rhynchospora alba - White beaked-rush CNPS list 2.2

This rhizomatous perennial herb of the sedge family (*Cyperaceae*) occurs in bogs, seeps, marshes, and swamps at elevation ranges of 100 to 6,600 feet. The blooming period for this species is July through August.

Potential Threats: CNPS lists threats to this species as grazing, trampling, and hydrological alterations.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes

to hydrology, shade canopy, or soil conditions).

III.34 Rhynchospora capitellata - Brownish beaked-rush CNPS List 2.2

This perennial herb of the sedge family (*Cyperaceae*) occurs in meadows, seeps, marshes, swamps sometimes within lower and upper montane coniferous forests at elevation ranges of 150 to 6,600 feet. The blooming period for this species is July through August.

Potential Threats: CNPS lists threats to this species as grazing and development.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.35 Schoenoplectus subterminalis - Water bulrush CNPS List 2.3

This perennial rhizomatous aquatic herb occurs along lake margins and in bogs, fens, marshes and swamps at elevations of between 2,400 and 7,400 feet. The blooming period for this species is June through August.

Potential Threats: CNPS does not list threats to this species related to forest management activities.

Mitigations: Surveys for this species would be limited to watercourse crossing locations and water drafting sites where channel margins could be impacted. Should any plants of this species be detected they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.36 Scutellaria galericulata - Marsh skullcap CNPS List 2.2

This hearty perennial rhizomatous herb of the mint family occurs in meadows, seeps, marshes, and swamps within lower montane coniferous forests at elevations from sea level to 6,900 feet. The blooming period for this species is June through September.

Potential Threats: CNPS does not list threats to this species related to timber harvesting.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes

to hydrology, shade canopy, or soil conditions).

III.37 Smilax jamesii - English peak greenbriar CNPS List 4.2

This endemic rhizomatous herb occurs along channel margins and other mesic areas within broadleaved upland and upper and lower montane coniferous forests at elevation ranges of 1,900 to 8,200 feet. The blooming period for this species is May through July.

Potential Threats: CNPS does not list threats to this species but potential threats resulting from timber operations could include ground disturbance and alteration of hydrologic conditions.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.38 Solidago gigantea - Giant goldenrod CNPS List 2.2

This perennial herb occurs on moist stream banks and lakesides at elevations of 3,200 to 5,000 feet.

Potential Threats: CNPS does not list threats to this species to timber harvesting.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trail, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.39 Stachys palustris ssp. pilosa - Hairy marsh hedge-nettle CNPS List 2.3

This rhizomatous herb of the mint family (Lamiaceae) occurs in wet meadows and mesic areas in Great Basin scrub, at elevation ranges between 3,900 and 5,800 feet. The blooming period for this species is June to August.

Potential Threats: CNPS does not list threats to this species to timber harvesting.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trail, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.40 Stellaria longifolia - Long-leaved starwort CNPS List 2.2

This rhizomatous herb occurs in meadows, seeps, and mesic areas within woodlands and upper and lower montane coniferous forests at elevation ranges of 2,900 to 6,000 feet. The blooming period for this species is May through August.

Potential Threats: CNPS lists threats to this species as road maintenance, logging, and altered hydrology.

Mitigations: Surveys for this species would be limited to areas along meadow edges and drainages in areas where significant ground disturbance may occur (i.e. skid trails, landings, and new roads). Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

III.41 Trichodon cylindricus - Cylindrical trichodon CNPS List 2.2

This bryophytic moss occurs in broadleaved upland forest, meadows, seeps and on exposed soil or road banks within upper montane coniferous at elevation ranges of around sea level to 6,600 feet.

Potential Threats: CNPS lists threats to this species as logging and road maintenance.

Mitigations: Surveys for this species would be limited to watercourse crossing locations and water drafting sites where areas of riparian zones could be impacted. Care will be taken to identify areas where this plant is growing via inspection of suitable areas and comparisons to other known populations or a photographic reference of this species. If individual plants are discovered, they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions). Operations that maintain riparian function and limit encroachment by conifers may be beneficial (Plumas National Forest, 2007). Additionally, no slash piling or pile burning in the immediate vicinity of known locations of this species will occur.

III.42 Utricularia intermedia - Flat-leaved bladderwort CNPS List 2.2

This species is a unique stoloniferous carnivorous aquatic herb that occurs in a variety of wetted habitats including bogs, fens, meadows, seeps, marshes and swamps at elevation ranges of 3,900 to 8,600 feet. The blooming period for this species is July to August.

Potential Threats: CNPS lists a potential threat to this species is hydrological alteration.

Mitigations: Surveys for this species would be limited to watercourse crossing locations and water drafting sites where channel margins could be impacted. Should any plants of this species be detected they will be flagged and avoided in such a way that direct impacts to individual plants do not occur and immediately surrounding habitat conditions do not change (i.e. no significant changes to hydrology, shade canopy, or soil conditions).

IV. Other Species

IV.1 Shasta Crayfish (Pasifastacus fortis) **Federal and State Endangered**

The species is not known to occur within or immediately adjacent to lands covered. The species and its habitat occur downstream of lands covered only within the Pondosa Tract that are tributary to the Fall River from Bear Creek and Dry Creek. Shasta crayfish are generally found in the clear cold headwaters of the mid Pit River drainage in the vicinity of Fall River Mills. They are usually associated with clean substrates of lava cobbles and boulders on gravel or sand. Shasta crayfish habitat is also limited by water quality and food resources, but these parameters can be quite variable (USFWS 1988).

Potential Threats: The species limited distribution and low abundance within subpopulations makes the species vulnerable to isolated incidents and cumulative impacts within watersheds where they occur. Potential threats to the species from forest management activities and operations are changes in stream water temperature, delivery of sediment to watercourses and loss of LWD recruitment.

Mitigations: Implementation of the FPRs will alleviate most potential impacts that could result from forest management activities upstream of watersheds containing the species. The proper implementation of the FPR's and WLPZs during operations will ensure that canopy closure is maintained to provide shade, LWD is recruited, and sediment delivery to watercourses is minimized. For THPs occurring within or adjacent to watercourses within the current known range, during THP preparation, watercourses will be carefully field reviewed and any potential suitable habitat shall be reviewed and, if necessary, surveys and monitoring of watercourses shall be conducted. If the species is detected within or adjacent to lands covered. site-specific measures shall be developed with CDFW and proposed in the THP.

IV.2 California Red Legged Frog (Rana draytonii) **Federal threatened**

The species is no known to occur within or adjacent to lands covered. The Humbug tract in Plumas County are the only lands covered within the current known range of the species. Historically distributed throughout the Sierra Nevada foothills and Coast Range Mountains in California, the species is now nearly extirpated in both the Sierra Nevada foothills and in the southern regions of its range. The Sierra Nevada populations consist of a very few scattered sites in El Dorado, Yuba, and Butte Counties. Non-breeding habitat includes sites that stay moist and cool through the summer including brushy areas along creeks, springs, and seeps, as well as under rootwads and other debris that retains moisture.

Potential Threats: A very small portion of Plumas County is within the current range of the California red-legged frog as depicted in Figure 4 of the 2002 USFWS California red-legged frog Recovery Plan (http://ecos.fws.gov/docs/recovery_plan/020528.pdf). On pages 22 and 23 of the recovery plan, under the section titled *Timber Harvesting* it states "Timber harvest activities occur in many areas within the California red-legged frog's historic range, but outside the current range. These areas include Glenn, Shasta, Lassen, and Plumas Counties, and counties on the west slope of the Sierra Nevada south of Tulare County." The recovery plan directs individuals to consult the CNDDB for specific location information where red-legged frogs have been detected. The closest recorded detection of California red-legged frogs is in Pinkard Creek in Butte County (>20 miles from the closest lands covered). This record is from 1991 according to the Recovery Plan (page 7) but intensive subsequent surveys have not detected this species. Accordingly, it is unlikely that forest management activities or operations on lands covered would result in any adverse impacts to this species.

Mitigations: Due to the species life history and apparent absence of the species from within or adjacent to lands covered, potential impacts or disturbance of the species or its habitats is very unlikely. However, for THPs occurring within or adjacent to watercourses within the current known range, during THP preparation, watercourses will be carefully field reviewed and any potential suitable habitat shall be reviewed and, if necessary, surveys and monitoring of watercourses shall be conducted (USFWS 2005). If the species is detected within or adjacent to lands covered. site-specific measures shall be developed with CDFW and proposed in the THP.

IV.3 Sierra Nevada yellow-legged frog (Rana sierrae)

State Threatened
Federal Endangered

The species is known to occur within and adjacent to land covered in Plumas County. In 2012, the California Fish and Game Commission listed the species as threatened (McCammon 2010, CDFW 2011). In 2014, the U.S. Fish and Wildlife Service listed the species as endangered under the federal Endangered Species Act. Also, in 2014, the U.S. Fish and Wildlife Service designated critical habitat for the species and occurs on land covered in Plumas County.

The northern most extent of known occurrences of the species occurs in Plumas County, however the CDFW also recognizes portions of Lassen County as within the known range. Sierra Nevada yellow-legged frog (*Rana sierrae*) are native to the northern and central sierra. The distribution is generally restricted to mid to high elevations in the Sierra Nevada range. The species is found in mid to high elevation streams, ponds and lakes. The species is usually found within one meter from water which is its habitat for shelter, foraging and reproduction and overwintering.

The species typically occupies low-gradient watercourses, ponds, lakes, marshes and wet meadows (CDFW 2011). While the species may be found in small, shallower watercourses the species may occur at lower densities or not at all in small, shallower watercourses (Jennings and Hayes 1994). Since the species transformation from tadpoles to frogs often occurs over 2 to 4 years (Knapp and Matthews 2000), breeding habitat is thought to require deeper habitats greater than 1.5 meter (> 5.0 feet). However, breeding may occur in habitats between 0.2 to 1.5 meter (0.7 to 5.0 feet) that do not freeze over during winter and do not dry out during summer (Matthews and Pope 1999).

The species is highly aquatic and are generally not found more than 1 meter from water (USFWS 2014). In high elevation 3470 meter (11,555 feet) landscapes with a combination of occupied ponds, lakes, wet meadows and low-gradient watercourses, Pope and Matthews (2001) found that 17% of pit-tagged mountain yellow-legged frogs (Rana muscosa) overland movements were greater than 66 meter (220 feet) from water. In lower elevation (3,900 to 4,800 feet) watercourses dominated habitats with few off-channel habitats, Wengert (2008) reported that 86% of the species locations were within 0.2 meter (0.67 feet) of the watercourse. However, during winter periods the species were found up to 22 meter (73 feet) from watercourses (Wengert 2008).

Potential Threats: Potential threats to the species, as stated by CDFW and U.S. Fish and Wildlife Service include predation of eggs by introduced fish species, chytrid fungus, fire management, livestock grazing, overexploitation by scientific collectors and researchers

and recreation. In addition, potential threats from forest management activities may include changes in watercourse temperatures, changes in large woody debris that can influence watercourse hydrology, soil disturbance from upslope activities or sediment transport associated with roads, landings, and skid trails, and operation of equipment in watercourse channels within occupied suitable habitat.

Mitigations: For THPs occurring within or adjacent to watercourses within the current known range, during THP preparation, watercourses will be carefully field reviewed and any potential suitable habitat shall be reviewed and, if necessary, surveys and monitoring of watercourses shall be conducted. To determine whether potential suitable habitat occurs within the THP area, a suitable habitat and watercourse assessment shall be conducted and the objectives of this assessment included: (1) Suitable habitat and watercourse assessment process and protocols, (2) Results of the assessment, and (3) Based on the results of the assessment, the operation measures proposed for the species.

Visual encounter surveys shall be conducted by a qualified individual (knowledgeable with all life stages of Sierra Nevada yellow-legged frog and similar species). Specific parameters shall be utilized to ensure a thorough survey. An example of suitable parameters includes a survey 100 feet above and below a watercourse crossing, and no more than two weeks prior to crossing construction/reconstruction work at such site. If the species is detected within or adjacent to lands covered, site-specific measures shall be developed with CDFW and proposed in the THP. The site-species measures shall include, but are not limited to: (1) WLPZ operational measures specific to the dry season of April 16th to October 15th, (2) WLPZ operational measures specific to the winter season of October 16th to April 15th. (3) Timing and location of pile burning, (4) Water drafting measures related to timing, duration and screening, and (5) Watercourse crossing installation measures.

IV.4 Foothill yellow-legged frog (Rana boylii) **State Candidate**

This species is not known to occur within the land covered, however the species occurs adjacent to land covered. The species is not listed under the state or federal Endangered Species Acts. In 2016, the California Fish and Game Commission received a petition to list the foothill yellow-legged frog as threatened, and in 2017, the Commission listed the species a candidate under CESA.

The species is widely distributed in California and occurs at elevations from sea level to approximately 5,800 feet. Breeding occurs in the spring following winter runoff and tadpoles metamorphose in late summer to fall. Metamorphosed and adult frogs generally use watercourses for movement, rarely going beyond ten feet from the channel during any time of the year. Adults have been documented as far as 120 feet from the stream.

Potential Threats: Potential threats to the species, as stated by CDFW and U.S. Fish and Wildlife Service include predation of eggs by introduced fish species, chytrid fungus, fire management, livestock grazing, overexploitation by scientific collectors and researchers and recreation. In addition, potential threats from forest management activities may include changes in watercourse temperatures, changes in large woody debris that can influence watercourse hydrology, soil disturbance from upslope activities or sediment transport associated with roads, landings, and skid trails, and operation of equipment in

watercourse channels within occupied suitable habitat.

Mitigations: For THPs occurring within or adjacent to watercourses within the current known range, during THP preparation, watercourses will be carefully field reviewed and any potential suitable habitat shall be reviewed and, if necessary, surveys and monitoring of watercourses shall be conducted (Seltenrich and Pool 2002).

Visual encounter surveys shall be conducted by a qualified individual (knowledgeable with all life stages of foothill yellow-legged frog and similar species). Specific parameters shall be utilized to ensure a thorough survey. An example of suitable parameters includes a survey 100 feet above and below a watercourse crossing, and no more than two weeks prior to crossing construction/reconstruction work at such site. If the species is detected within or adjacent to lands covered, site-specific measures shall be developed with CDFW and proposed in the THP. The site-species measures shall include, but are not limited to: (1) WLPZ operational measures specific to the dry season of April 16th to October 15th, (2) WLPZ operational measures specific to the winter season of October 16th to April 15th. (3) Timing and location of pile burning, (4) Water drafting measures related to timing, duration and screening, and (5) Watercourse crossing installation measures.

IV.5 Cascades frog (Rana sierrae) State Candidate

This species is known to occur on and adjacent to land covered. The species is not listed under the state or federal Endangered Species Acts. In 2017, the California Fish and Game Commission received a petition to list the Cascades frog as threatened, and the Commission listed the species a candidate under CESA.

Metamorphosed and adult frogs generally use low-gradient, slow moving watercourses, lakes, ponds and wet meadows for breeding and movement, and typically are found close to water (Pope et al. 2014).

Potential Threats: Potential threats to the species include airborne contaminants, climate change, disease, fire suppression, introduced fish, livestock grazing and recreational activities (Pope et al. 2014). Forest management activities that may potentially conserve the species include restoration of breeding habitat and thinning and fuels treatments adjacent to breeding habitat

Mitigations: For THPs occurring within or adjacent to watercourses within the current known range, during THP preparation, watercourses will be carefully field reviewed and any potential suitable habitat shall be reviewed and, if necessary, surveys and monitoring of watercourses shall be conducted.

Visual encounter surveys shall be conducted by a qualified individual (knowledgeable with all life stages of Cascades frog and similar species). Specific parameters shall be utilized to ensure a thorough survey. An example of suitable parameters includes a survey 100 feet above and below a watercourse crossing, and no more than two weeks prior to crossing construction/reconstruction work at such site. If the species is detected within or adjacent to lands covered, site-specific measures shall be developed with CDFW and proposed in the THP. The site-species measures shall include, but are not limited to: (1) WLPZ operational measures specific to the dry season of April 16th to October 15th, (2) WLPZ operational measures specific to the winter season of October 16th to April 15th. (3) Timing and location of pile burning, (4) Water drafting measures related to timing, duration and screening, and (5) Watercourse crossing installation measures.

V. REFERENCES

AmphibiaWeb: Information on amphibian biology and conservation. [web application]. 2010. Berkeley, California: AmphibiaWeb. Available: http://amphibiaweb.org/. (Accessed: Apr 30, 2010).

Calflora 2010. 1700 Shattuck Av #198, Berkeley, CA 94709. www.calflora.org. (510) 528-5426

California Department of Fish and Wildlife. 2011. A Status Review of the Mountain Yellow-Legged Frog (Rana sierra, Rana muscosa). Report to the Fish and Game Commission. November 28, 2011. p. 52

California Native Plant Society (CNPS). 2010. Inventory of Rare and Endangered Plants (online edition, v7-10b). California Native Plant Society. Sacramento, CA. Accessed on Mon, May 10, 2010 from http://www.cnps.org/inventory.

California red-legged frog recovery plan. USFWS California red-legged frog Recovery Plan (http://ecos.fws.gov/docs/recovery_plan/020528.pdf).

Fowler, C., B. Valentine, S. Sanders, and M. Stafford. 1991. Habitat capability model. Willow flycatcher. U.S. Forest Service, Tahoe National Forest.

Knapp, R.A. and K.R. Matthews 2000. Non-native fish introductions and the decline of the mountain yellow-legged frog (Rana muscosa) from within protected areas. Conservation Biology 14:428-438.

Littlefield, C. D. 1989. Status of greater sandhill crane breeding populations in California, 1988. Report prepared for the Department of Fish and Game, Wildlife Management Division, Nongame Bird and Mammal Section.

Matthews, K.R. and Pope K.L. 1999. A telemetric study of the movement patterns and habitat use of (Rana muscosa), the mountain yellow-legged frog, in a high-elevation basin in the Kings Canyon National Park, California. Journal of Herpetology, Vol. 33, No. 4: 614-624.

Mayer, K. E., and W. F. Laudenslayer Jr. editors. 1988. A guide to the wildlife habitats of California. California Department of Forestry and Fire Protection. Sacramento, California, USA.

McCammon, J. 2010. Evaluation of petition from the Center of Biological Diversity to list all populations of Mountain Yellow-legged frog as endangered. California Department of Fish and Game. June 2010. 18 p.

Pope, K. L., and K. R. Matthews. 2001. Movement ecology and seasonal distribution of mountain yellow-legged frogs, Rana muscosa, in a high-elevation Sierra Nevada basin.
Copeia 101:787–793.

Pope, K., and C. Brown, M. Hayes, G. Green and D. Macfarlane. 2014. Cascades frog conservation assessment: General Technical Report. PSW-GTR-244. Albany, CA., USDA Forest Service, Pacific Southwest Research Station. 116 p.

Sanders, S. D., and M. A. Flett. 1989. Ecology of a Sierra Nevada population of willow flycatchers (*Empidonax traillii*), 1986-87. California Department of Fish and Game. Nongame bird and mammal section report.

Seltenrich, C.P. and A.C. Pool. 2002. A standardized approach for habitat assessments and visual encounter surveys for the foothill yellow-legged frog (Rana boylii). Pacific Gas and Electric Company, Technical and Ecological Services, 3400 Crow Canyon Road, San Ramon, CA 94583. May 2002.

U.S. Fish and Wildlife Service. 1998. Recovery plan for the Shasta crayfish (*Pasifastacus fortis*). U.S. Fish and Wildlife Service, Portland, Oregon. 153 pp.

U.S. Fish and Wildlife Service. 2005. Revised guidance on site assessments and field surveys for the California red-legged frog. August 2005. p.26

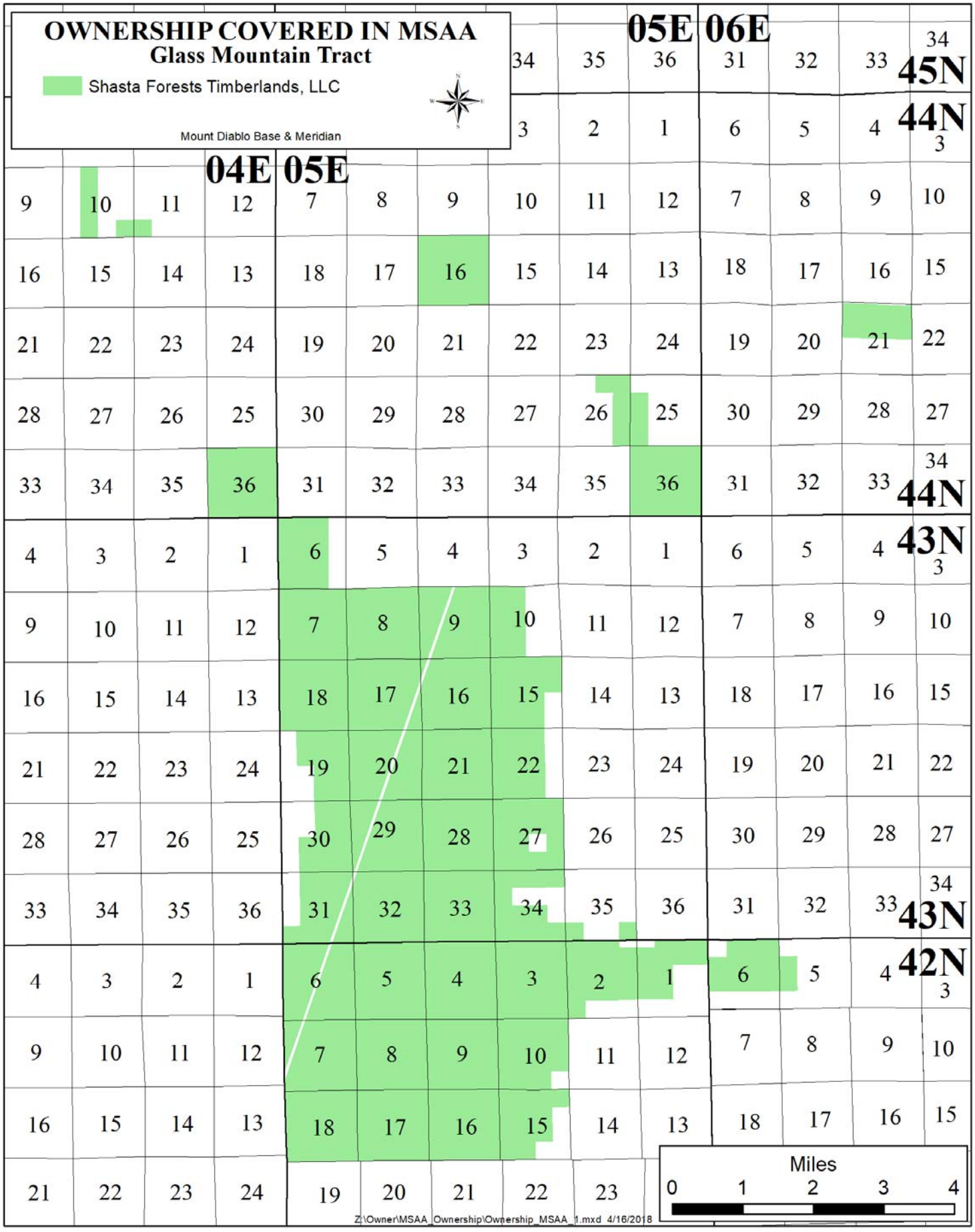
U.S. Fish and Wildlife Service. 2014. Endangered species status for Sierra Nevada Yellow-Legged Frog and Northern Distinct Population Segment of the Mountain Yellow-Legged Frog and Threatened species status for Yosemite Toad. U.S. Department of Interior, U.S. Fish and Wildlife Service. Federal Register Volume 79, No. 82.

Wengert G. 2008. Habitat Use, Home Range, and Movements of Mountain Yellow-legged Frogs (*Rana muscosa*) in Bean and Spanish Creeks on the Plumas National Forest. Final Report to the Sacramento Fish and Wildlife Office, U.S. Fish and Wildlife Service. Sacramento, CA 32 pp.

Zeiner, D. C., W. F. Laudenslayer, Jr., and K. E. Mayer, editors. 1988. California's wildlife, volumes I, II, and III.

ATTACHMENT D

WBA Owned & Managed Lands Covered In by the MSAA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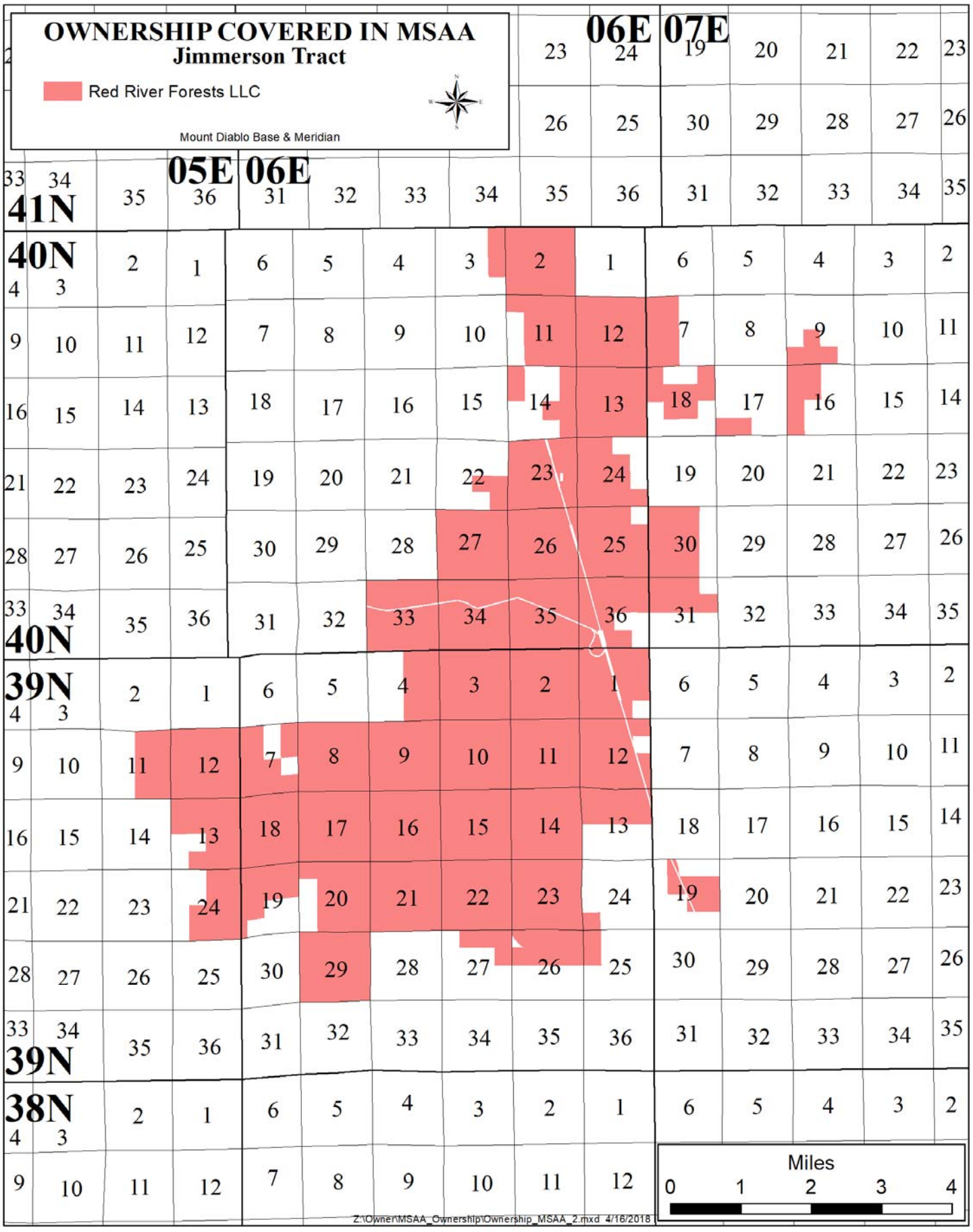

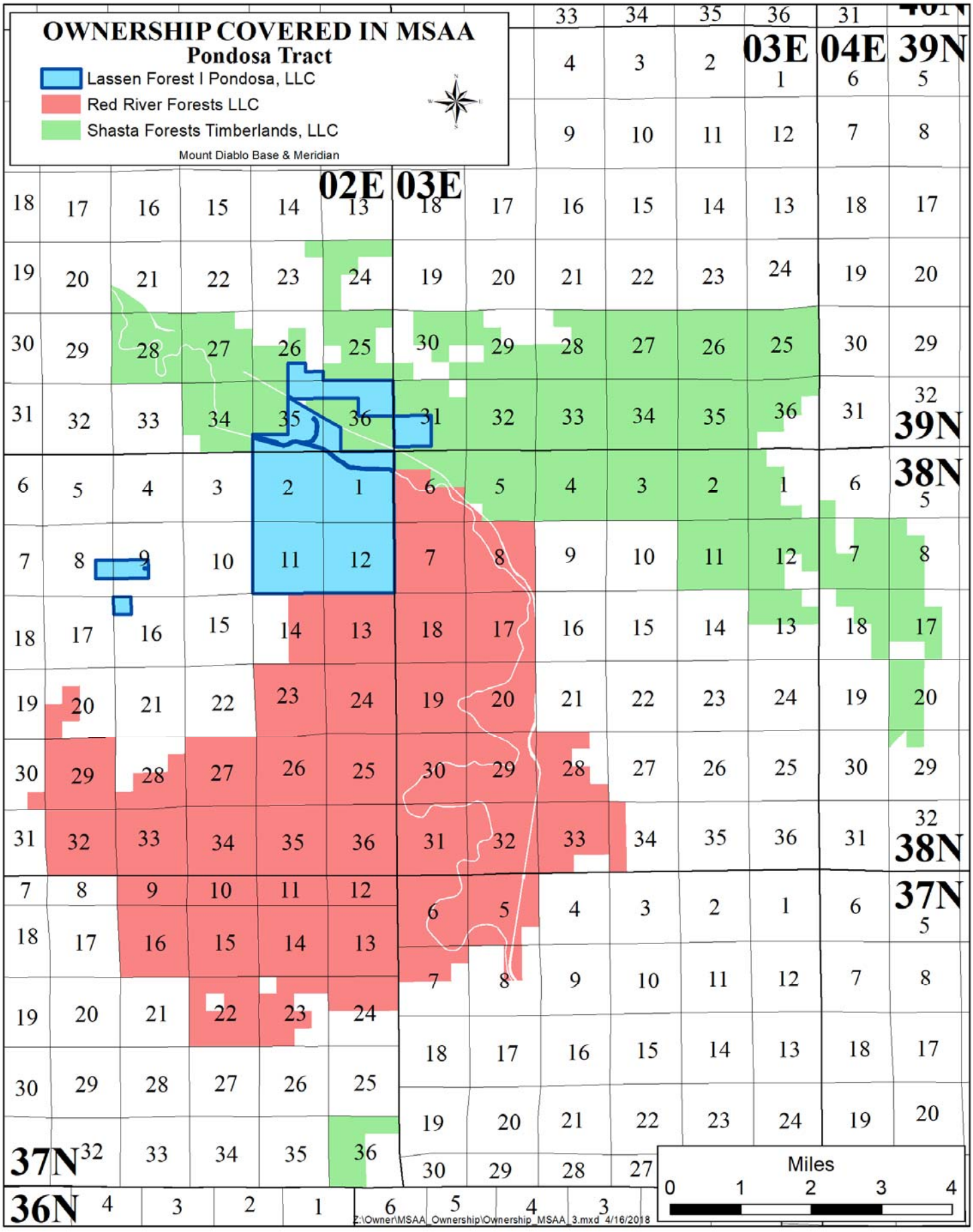
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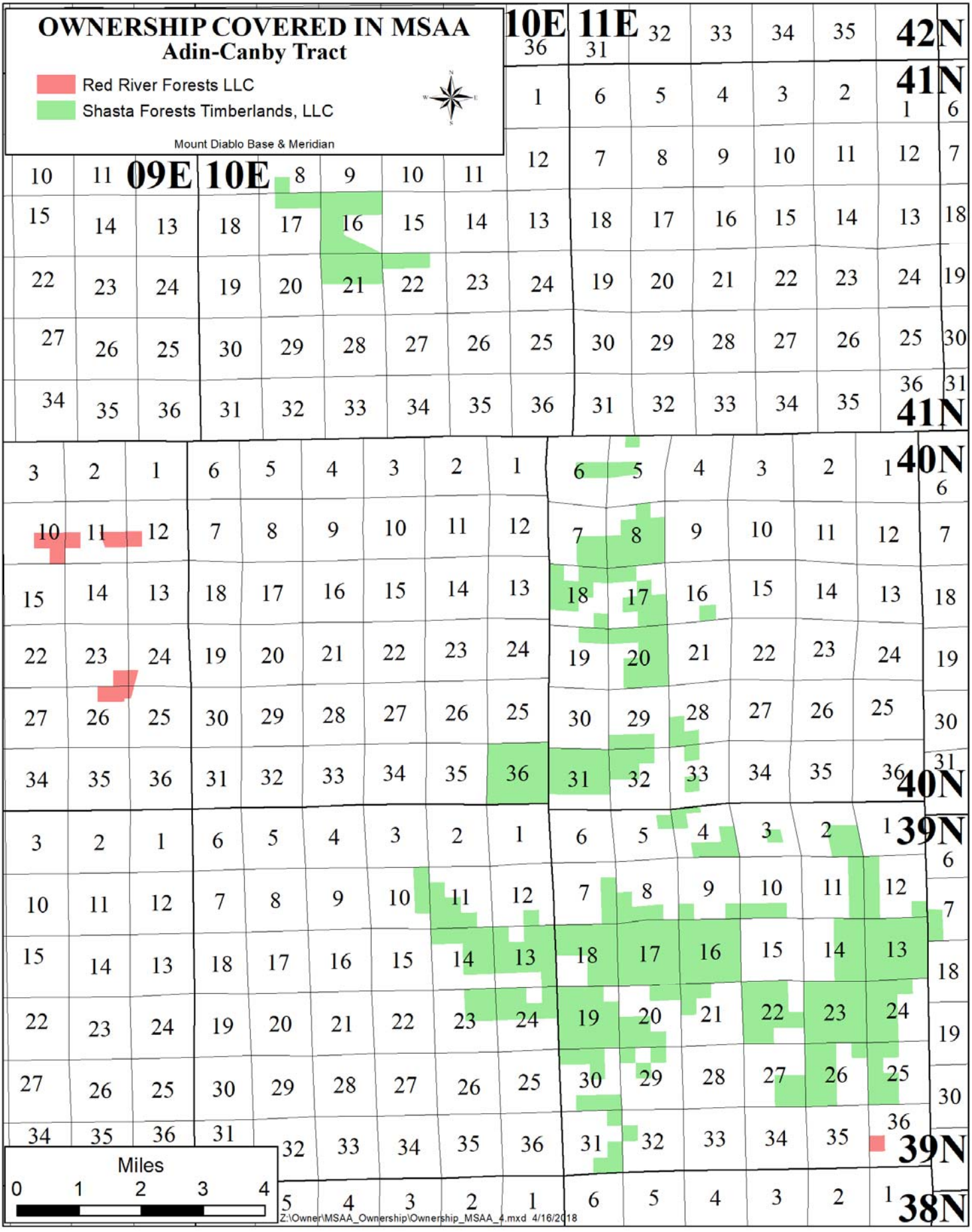
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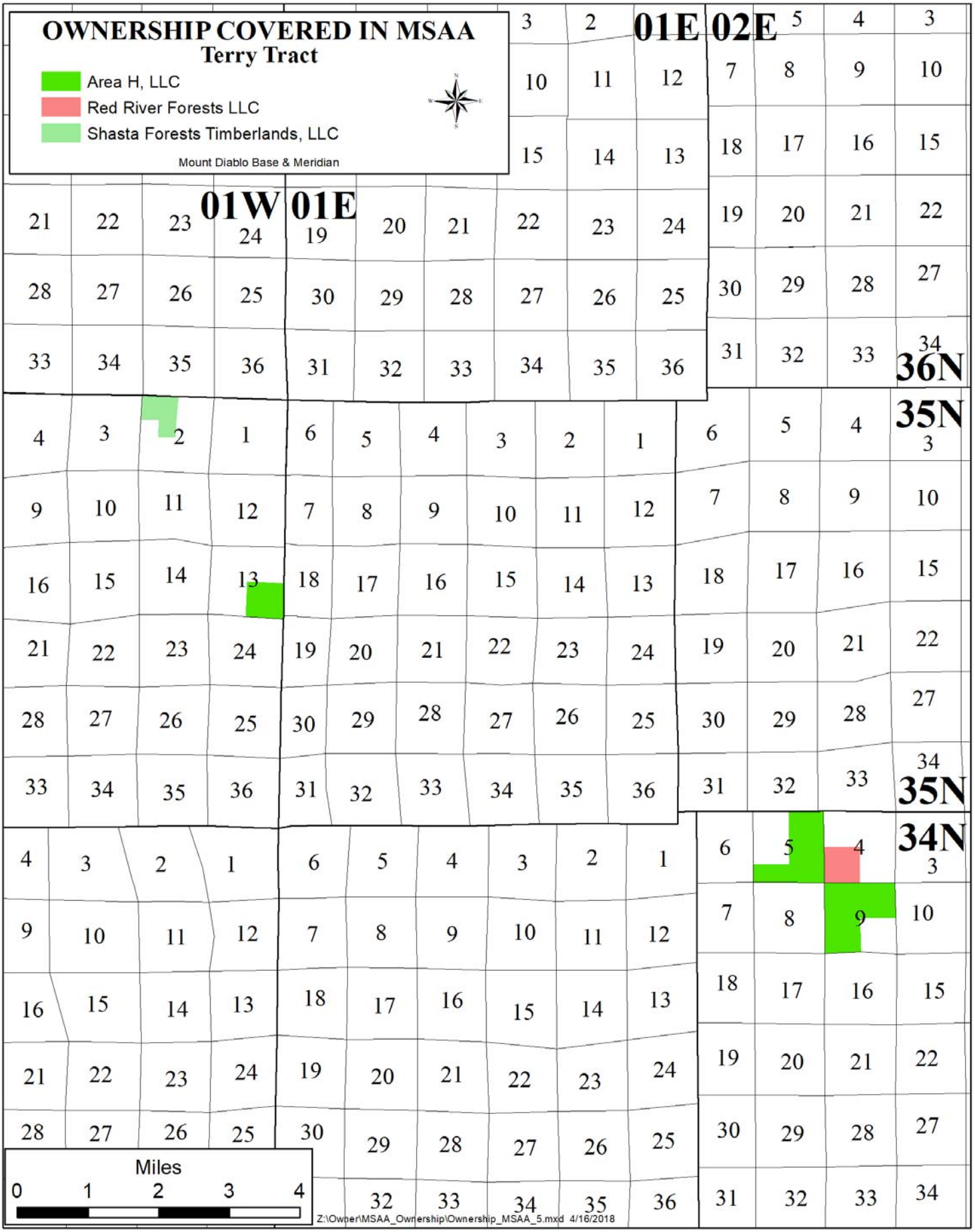
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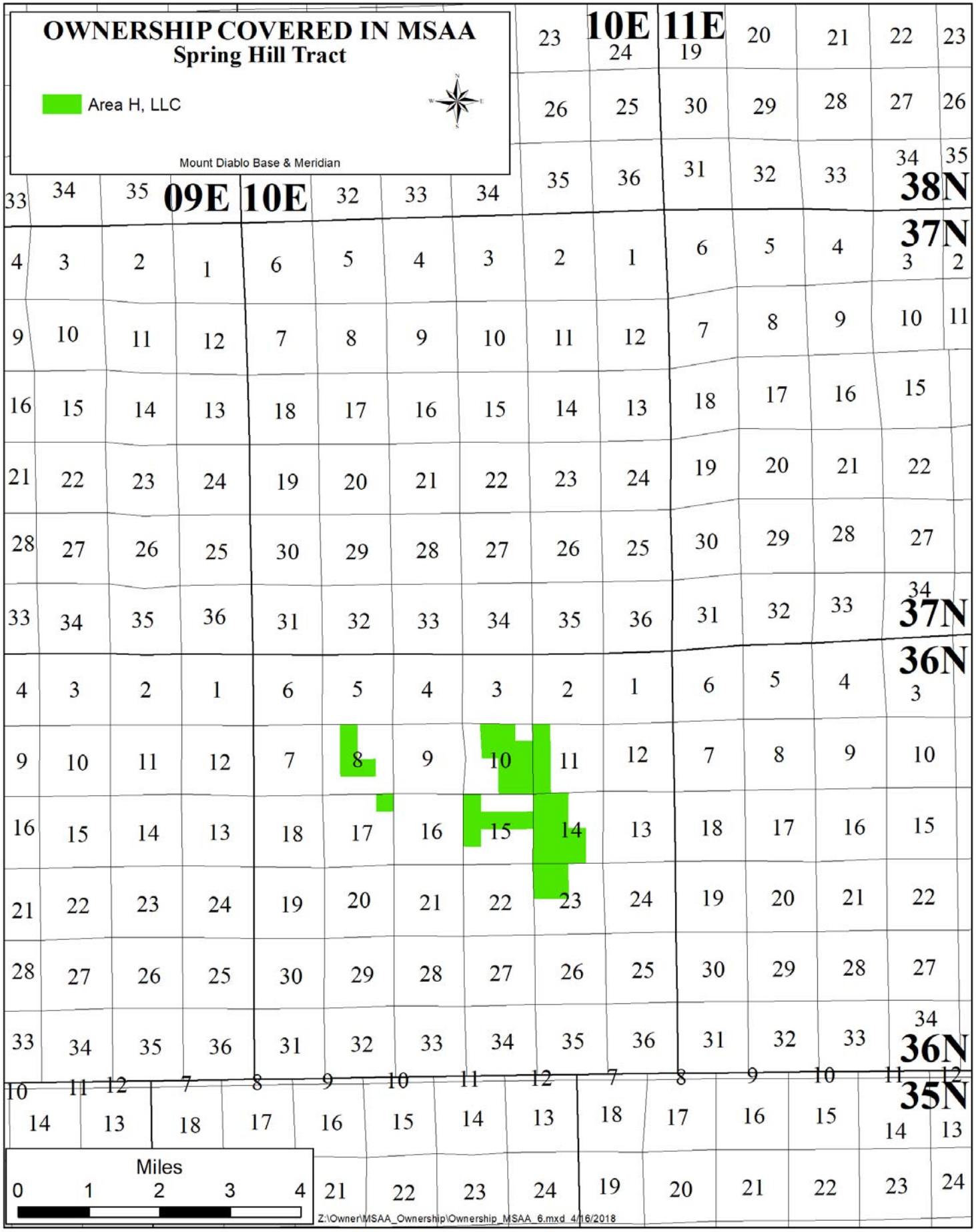
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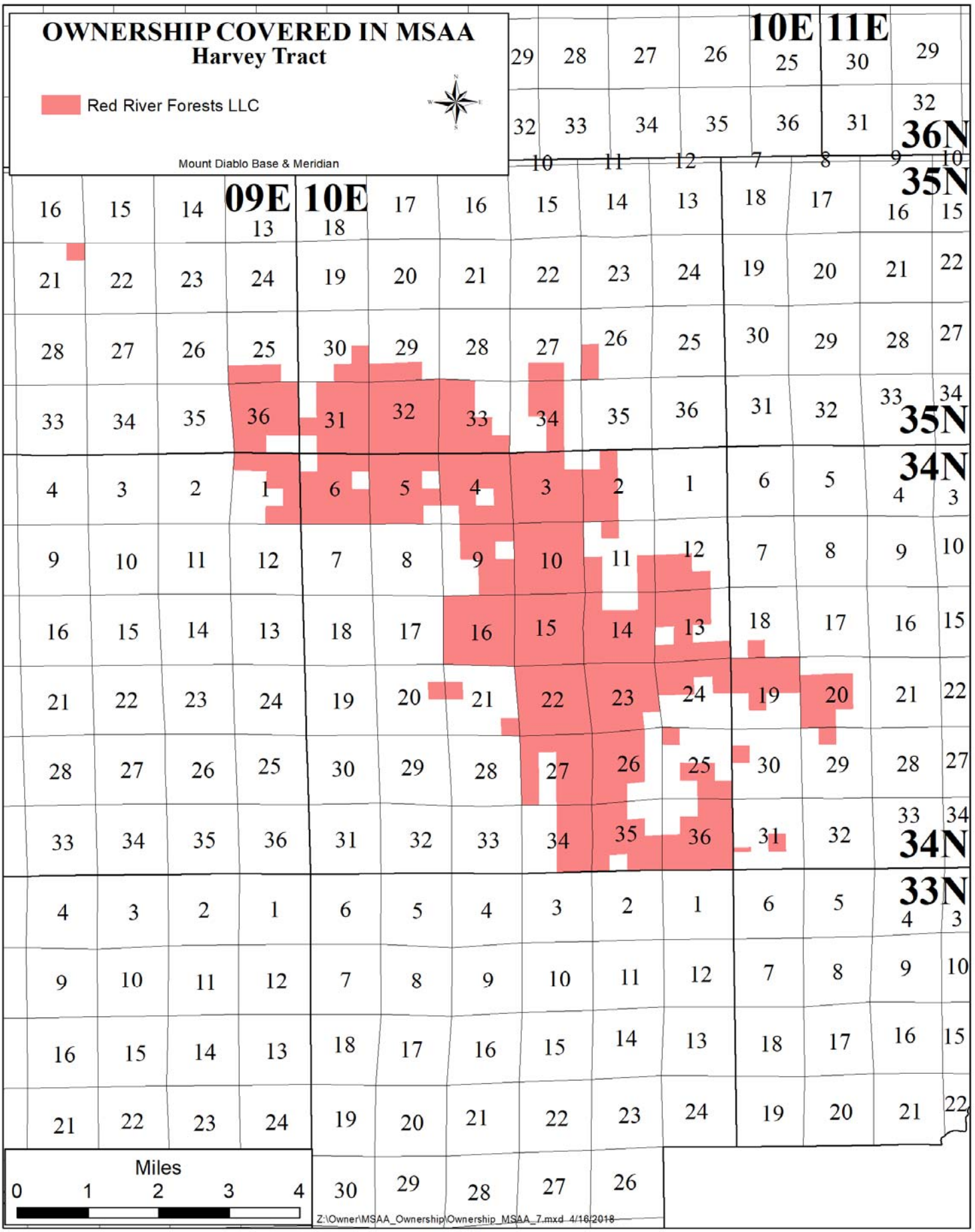
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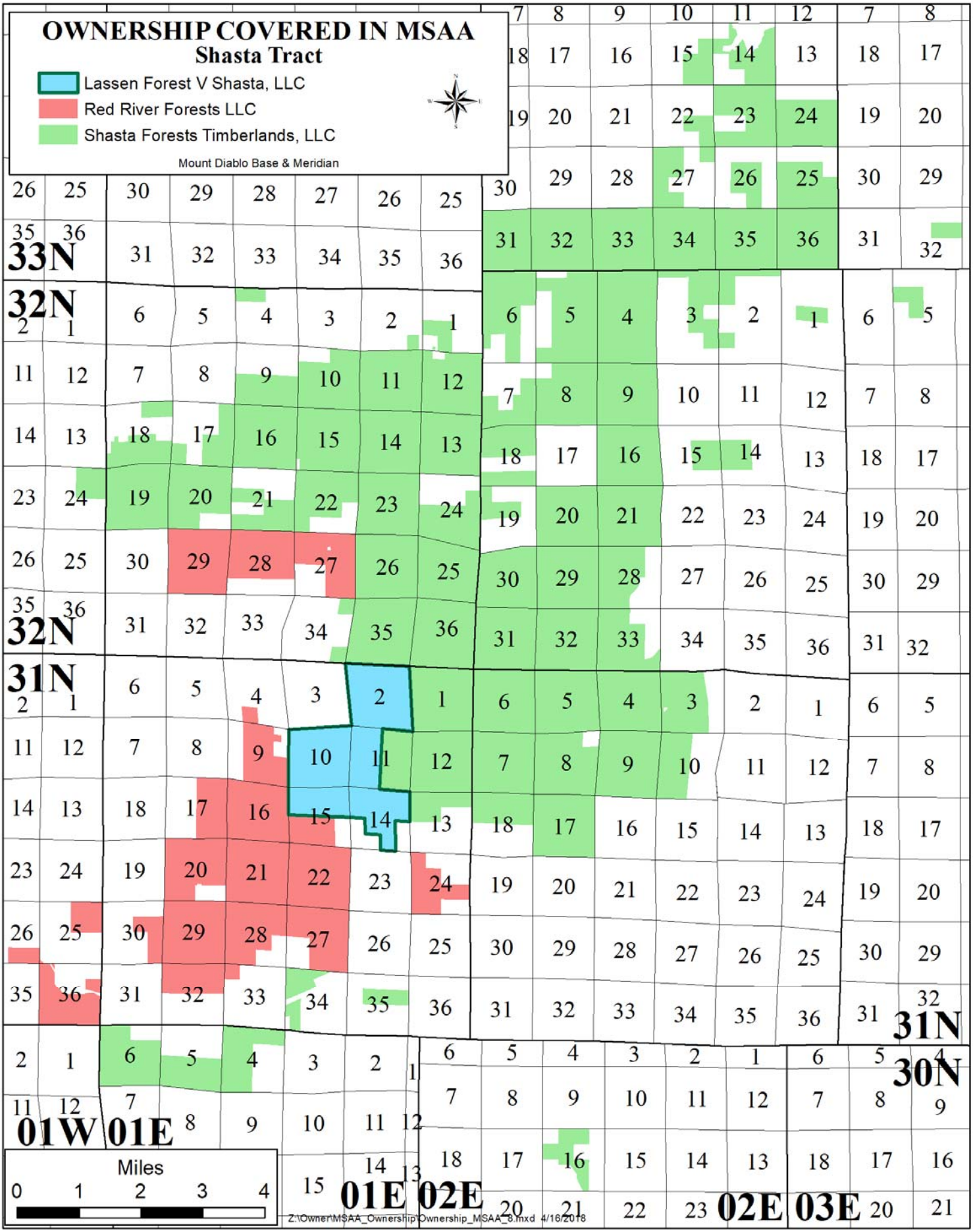
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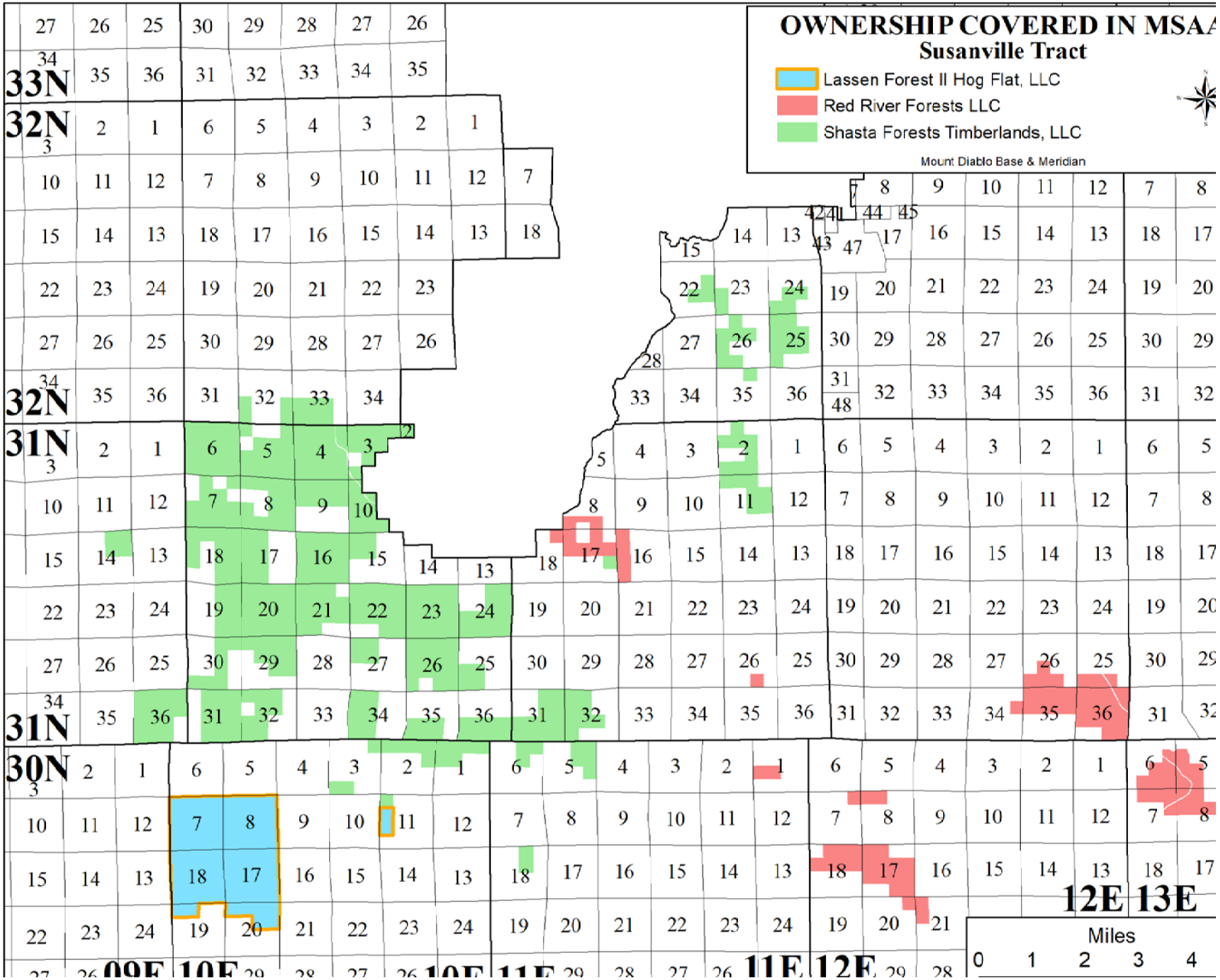

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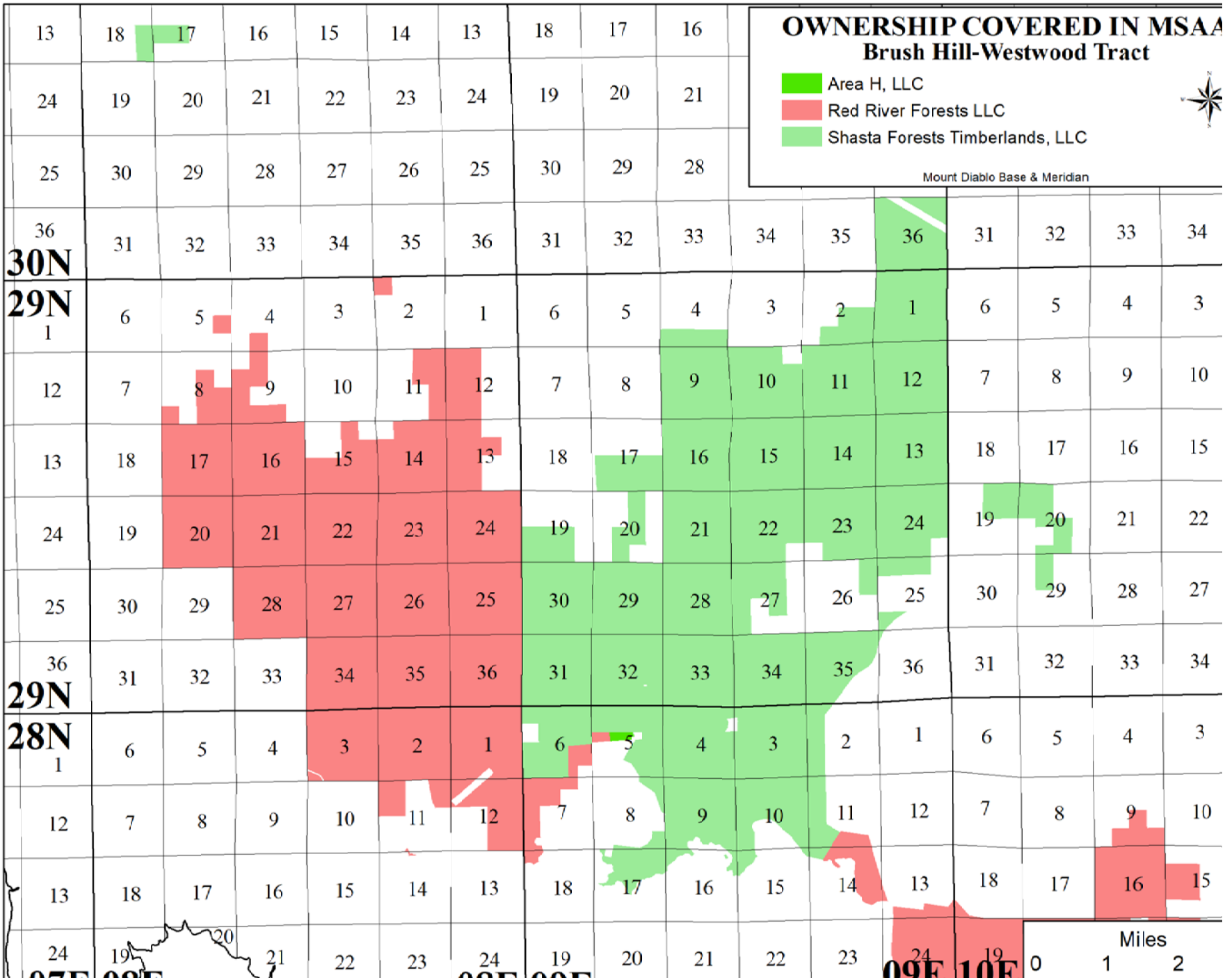

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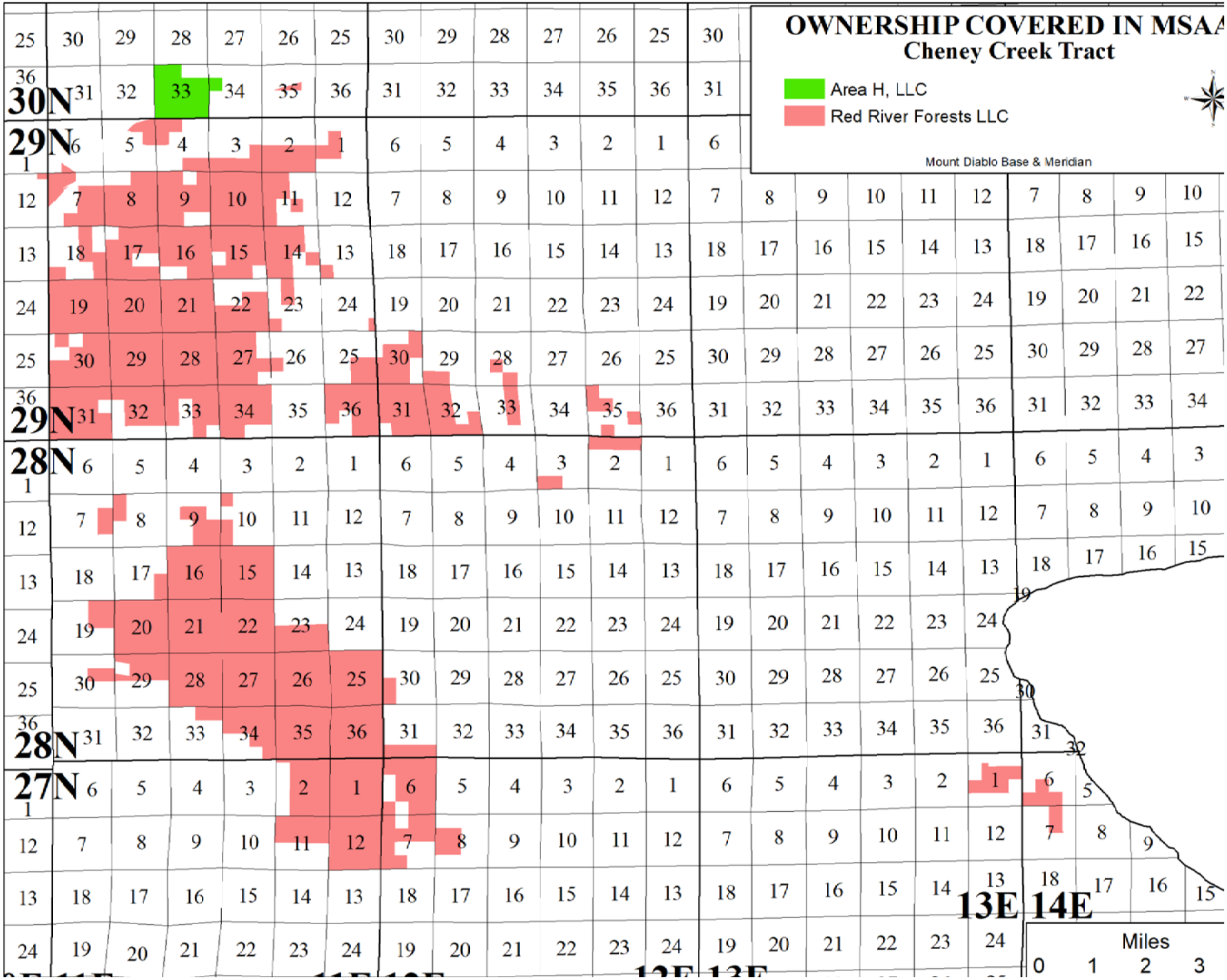

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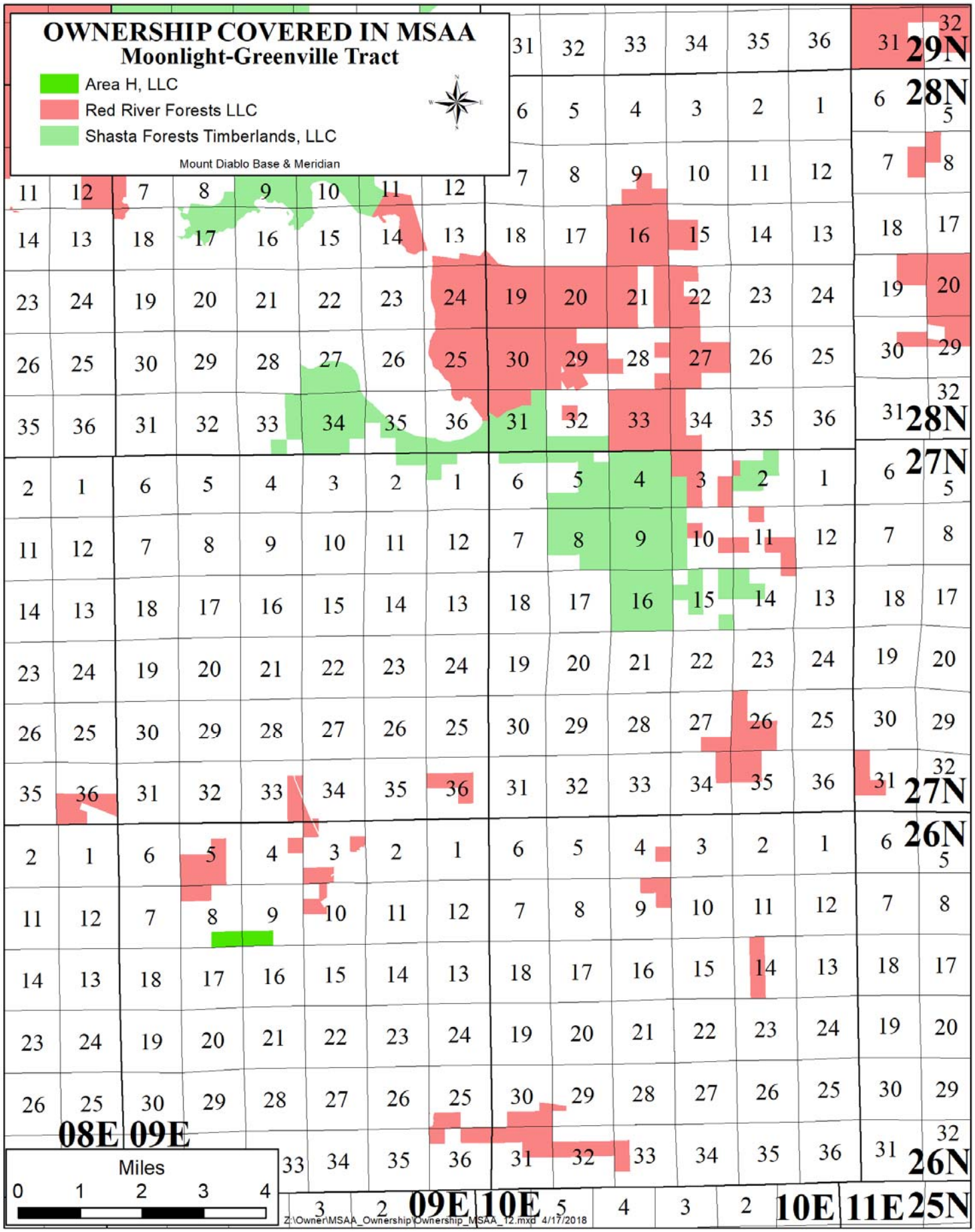
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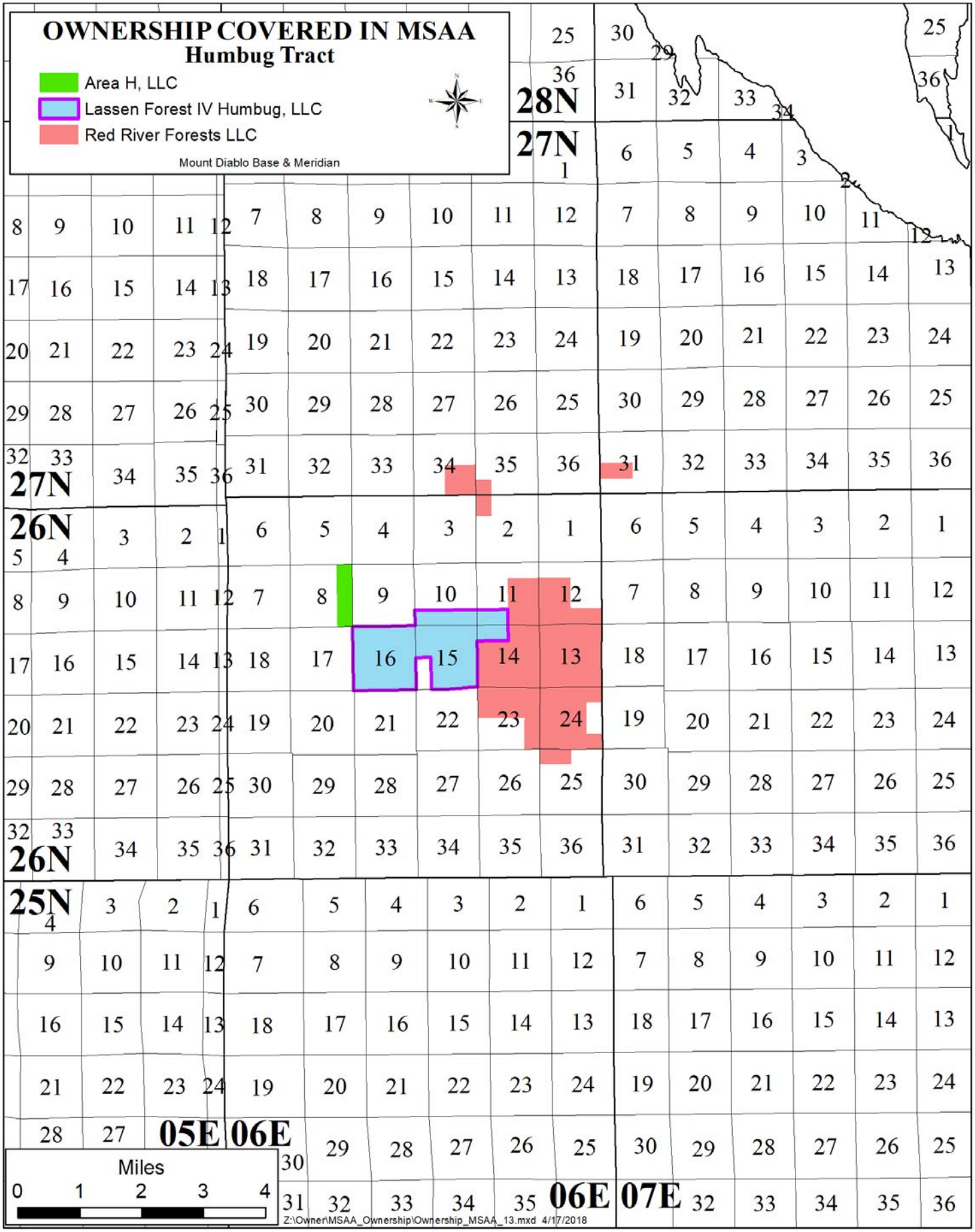
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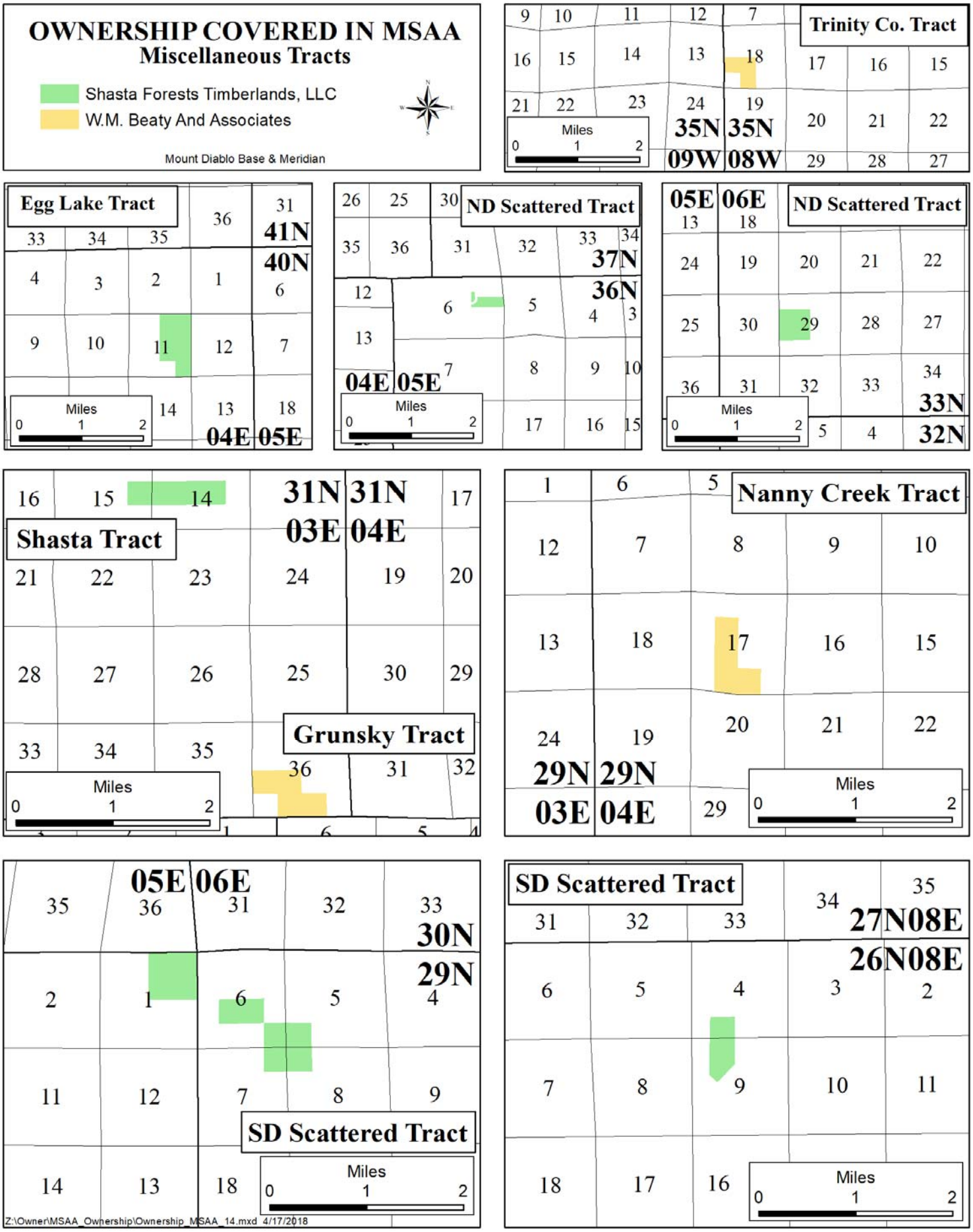
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