SCJ ALLIANCE
CONSULTING SERVICES

TECHNICAL MEMORANDUM

TO:	Ben Alworth, Wheeler Ridge Director of Support Operations
FROM:	Lisa Palazzi, CPSS, PWS, SCJ Alliance
DATE:	August 7, 2020
PROJECT #:	2512.01
SUBJECT:	Roads System Mitigation Assessment and Description

1.0 TECH MEMORANDUM OVERVIEW

Wheeler Ridge, LLC (WR-LLC) is proposing to develop a ~260-acre orchard within Section 17, Chelan County, Washington State (Figures 1 and 2). This proposal includes various proposed mitigation actions primarily related to preservation or enhancement of elk habitat. Because some of the proposed mitigation as well as orchard operations involve activity within existing and future roads, we provide this memorandum to describe the road system as it currently exists and will exist at various stages of the project.

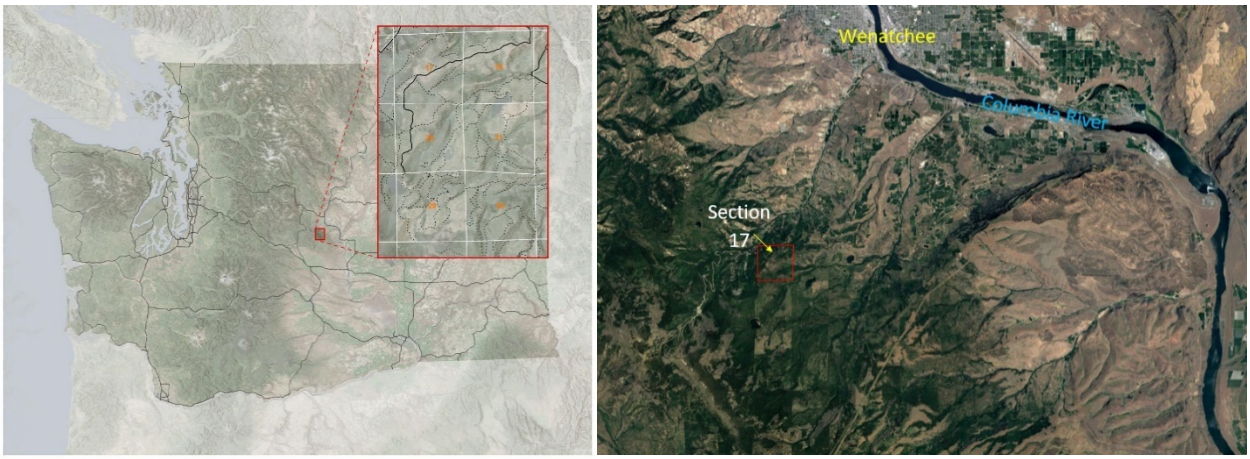

***Figure 1**. Location of the proposed project, Wheeler Ridge, Chelan County, Washington State; location of wetland delineation and riparian assessment.*

2.0 Road Systems Description

The purpose of this technical memorandum is to briefly describe the existing road system on Section 17 as well as the proposed road system at various stages of proposed site development. This memorandum describes current conditions; conditions during tree harvest in the orchard areas; conditions during site mitigation actions; and final road conditions when the orchards and Conservation Areas are being actively managed.

2.1 Existing Road Conditions

Figure 2 below shows existing roads in Sections 9, 16 and 17, including both paved and unpaved County roads (blue lines and red lines respectively) and DNR forest roads (orange lines). The paved County road is called Stemilt Loop Road; the unpaved County road is called Upper Wheeler Road and is named after Wheeler Ridge, which bisects Section 17 and continues offsite to the south.

Section 9 is already developed with orchards and an existing irrigation reservoir in the southeast corner of the section. The reservoir is located directly adjacent to Upper Wheeler Road (unpaved County road). The road section from Stemilt Loop Road to the reservoir is currently maintained by WR-LLC as needed to support the existing orchard operations on Section 9. Section 16 is owned by WDFW, and aside from the County Road and past tree harvest activities (and associated logging roads) is undeveloped.

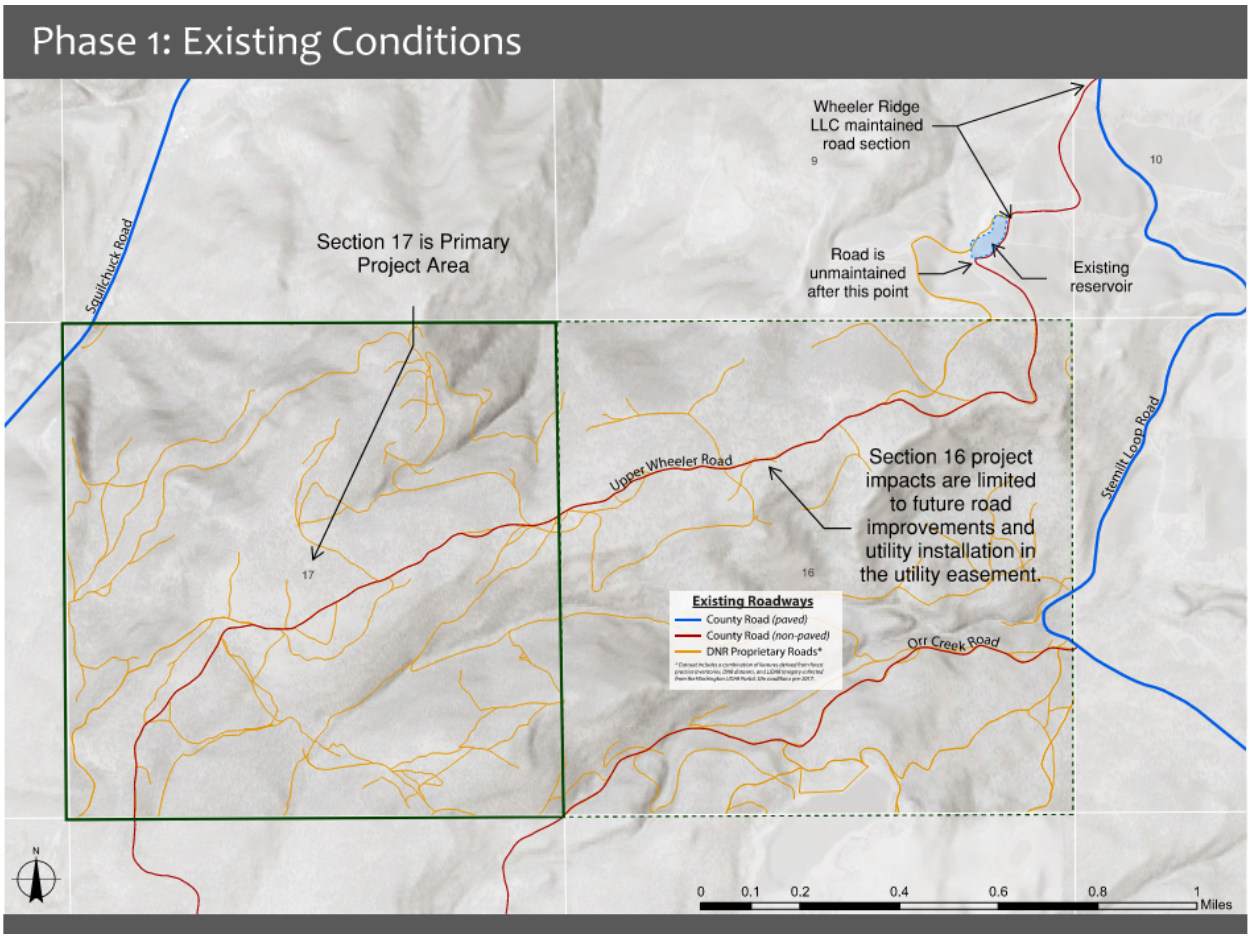

Figure 2. Current road conditions on Sections 16 and 17.

Upper Wheeler Road in the area beyond the reservoir in Section 9, currently unmaintained and only accessible by bike, foot or 4WD vehicles. The DNR roads feeding from Upper Wheeler Road on Section 17 are old logging roads built during various past forest harvests. Many of these roads have continued to be used over time by hunters, hikers, bikers (motorized and non-motorized) and ATVs.

2.2 Existing Roads with Hydrology Buffers

As was described in the primary wetland report, stream mapping by DNR was assessed in the field at Section 17. From that work, DNR Stream Type Mapping has been corrected and updated following standard DNR protocols to define the onsite extent of seasonal stream flow (Ns streams), and in one case, perennial stream flow (Np stream). The stream buffers and wetland buffers per County regulations are overlaid on the Existing Road map in Figure 3.

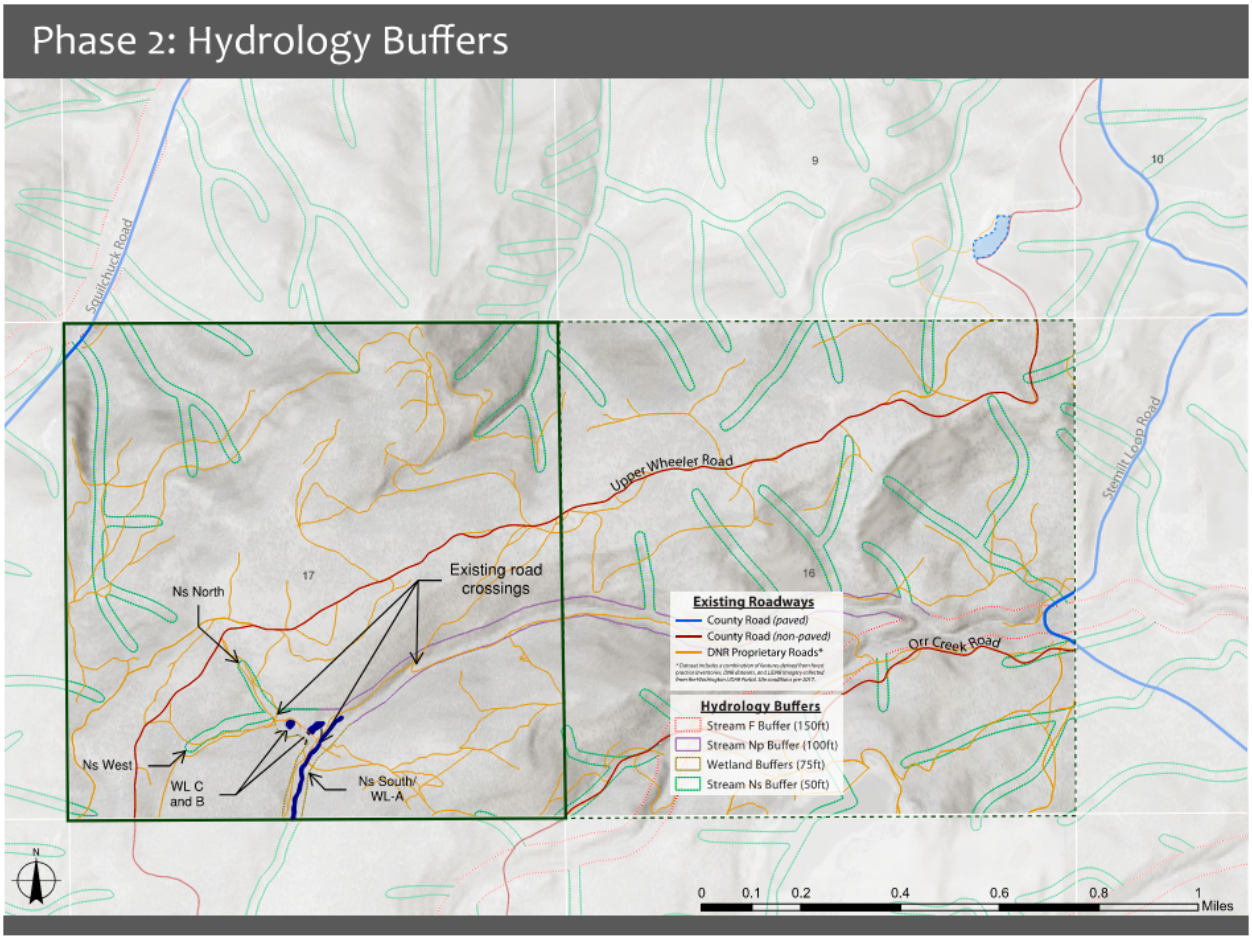

Figure 3. Onsite stream and wetland buffers in relation to existing roads.

Several of the existing primitive roads cross streams or wetlands, and some of the roads were built in or directly adjacent to seasonally dry stream beds (Ns streams). The Ns streams typically have no flow by late April to early May in most years. The Np stream sometimes has flow until mid to late June. There are existing crossings at Wetland A; near the confluence of streams Ns West and Ns North; and at the Np stream farther to the east.

Where the primitive roads intersect or bisect streams or wetlands, there is damage. Evidence of past impacts from logging decks and related heavy equipment traffic typically include compacted and/or layered soils with buried organic debris. Where logging roads and Ns streams converge around Wetlands B and C and the northern end of Wetland A, impacts from ongoing recreational ATV use has resulted in deep ruts and erosion that has severely damaged soil and drainage systems, creating a "mud bog." This area will be restored and revegetated during future mitigation actions (described more below).

2.3 Road Impacts and Use During Orchard Site Preparation

To prepare for orchard tree planting, all three orchard areas will be cleared of forest vegetation. Grading and road work will be carried out in compliance with County regulations. During logging activities, the existing DNR forest roads and County road will be used to haul away logs and related debris. A section of existing road west of Upper Wheeler Road near the reservoir in Section 9 and Section 16 will be improved to provide orchard haul trucks direct access to the west side of the reservoir. Once logging is complete, existing primitive roads within the orchards will be removed or realigned to serve orchard activities. When the area is ready for orchard layout and planting, orchard roads will be placed between rows of fruit trees, spaced about 620 feet apart on average. The orchard roads will be contained within a protective fence with a typical orchard perimeter road / tractor turning radius just inside the fence. The current alignment of Upper Wheeler Road will be moved to the outer edge of the Orchard #1 and #2 boundaries. The new road location has been evaluated by geotechnical consultants to ensure that the

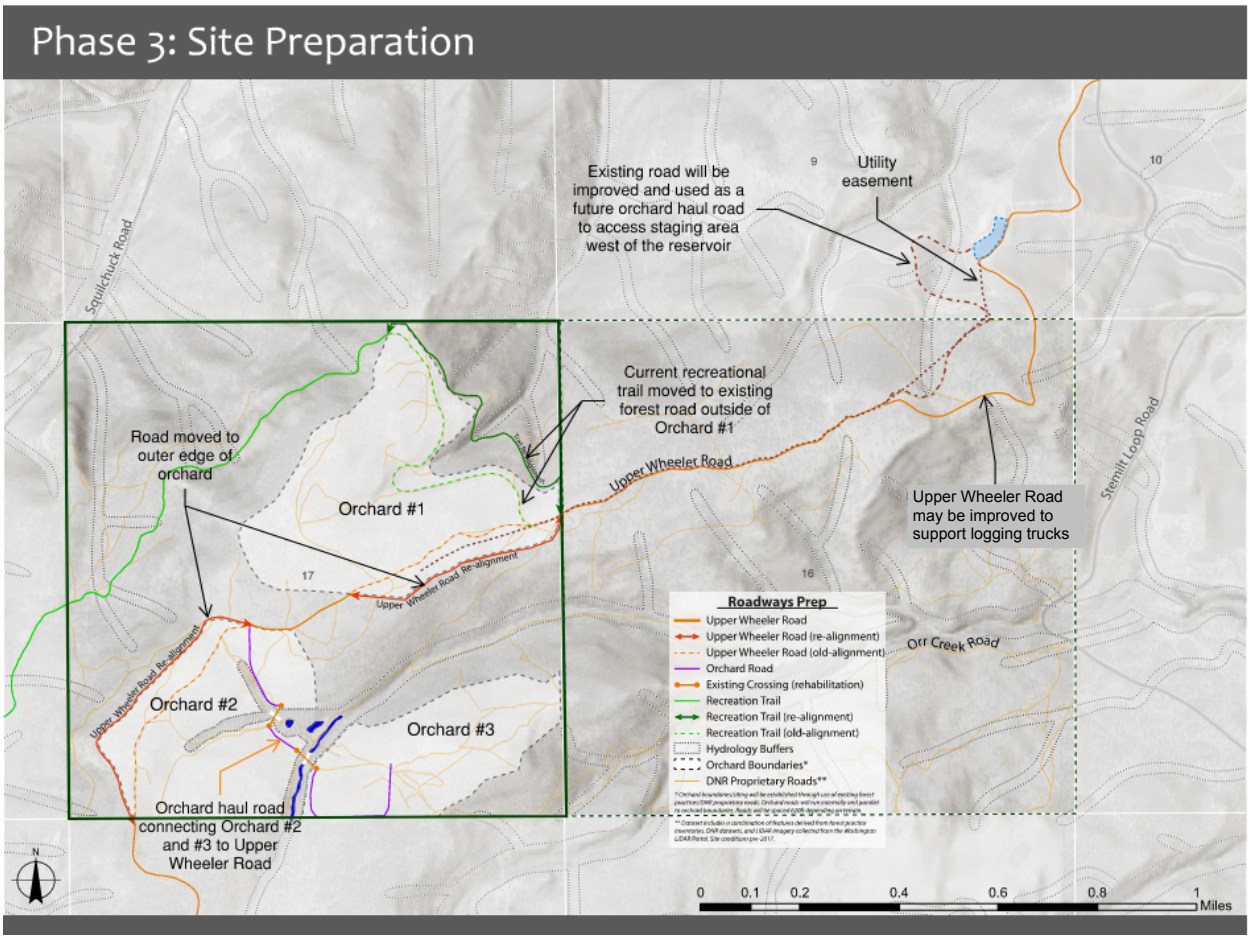

Figure 4. Road impacts during orchard site preparation; existing road on Section 16 may be used to support timber harvest.

new road will meet County standards (see Aspect Consulting Report dated 7/24/2020). An existing recreational trail that currently follows a primitive road in the northeast quadrant of Section 17 will be moved to a different existing road farther northeast, outside of the Orchard #1 boundary. (Figure 4)

2.4 Road Removal or Restoration In Conservation Area

Once logging is complete and the orchard areas are ready for planting, the focus will turn to restoration and mitigation actions in the Conservation Area. Existing roads used by ATV enthusiasts to access the mud bog area near Wetlands B and C will be abandoned, blocked, tilled and revegetated to enhance habitat and eliminate future impacts from motorized vehicles. Impacted wetland areas will be regraded and replanted. The Ns West stream (see Figure 5 below) – whose natural flow has been impacted and diverted due to its proximity to a severely eroded logging road – will be restored to its natural channel, and the eroded road will be tilled and revegetated. Eroded areas in the Ns North channel will be stabilized and replanted. Degraded wetland and stream buffer areas will be replanted with native vegetation comparable to nearby natural areas.

To retain a single haul road connection between the three orchard areas, two existing stream crossings between Orchards 2 and 3 will be preserved, but the current associated roads will be realigned to move them outside of the stream channels and wetland and stream buffers. The approximate haul road realignment is shown in Figure 5 (purple line) below. The retained crossings are at the least impactful locations and preserving them in place avoids impacts to other areas. The crossings will also be

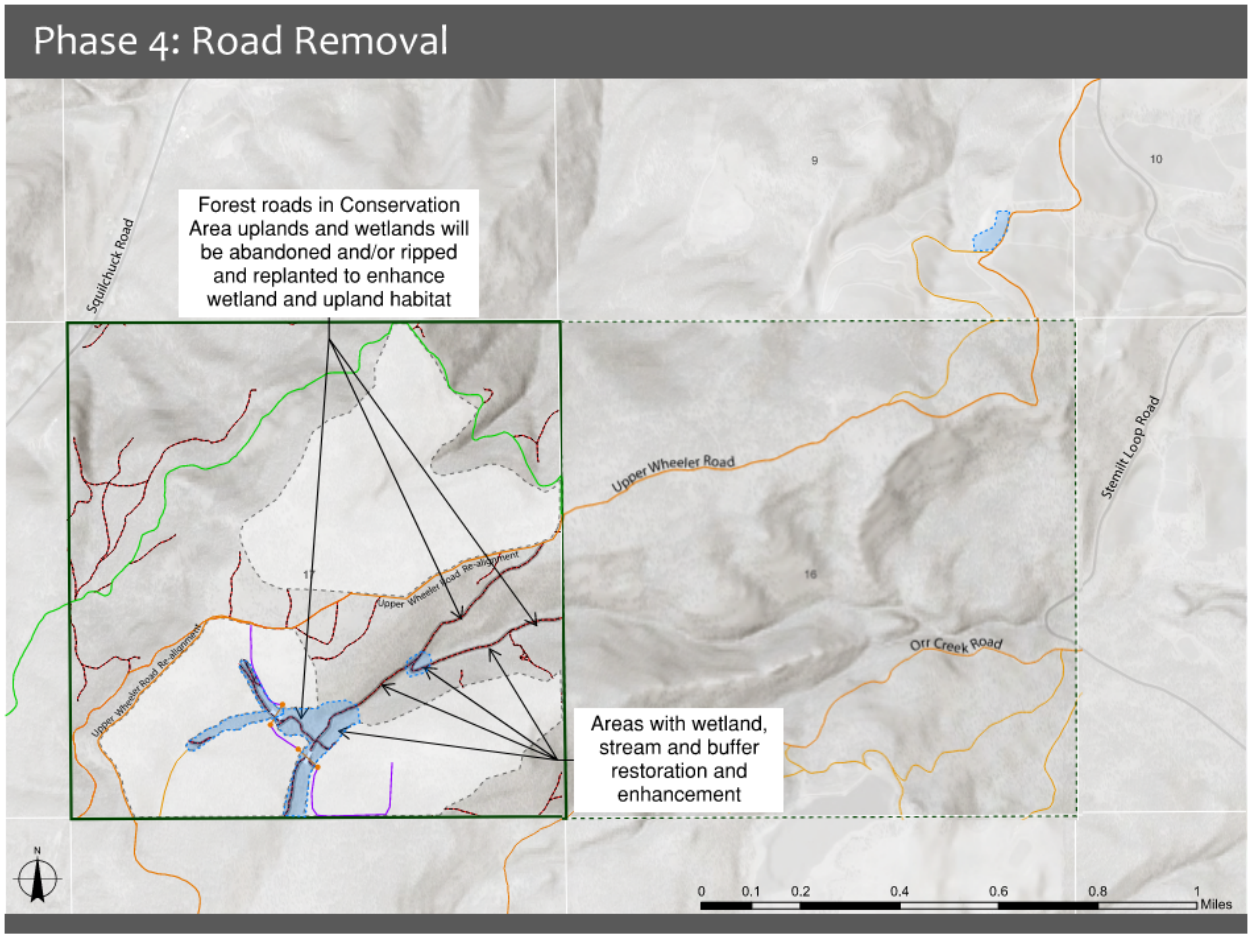

Figure 5. Conservation Area road, stream and wetland restoration and mitigation

enhanced and improved to reduce erosion and protect nearby wetland and stream enhancement and restoration mitigation efforts.

2.5 Final Orchard Development Conditions.

The final orchard development will include three orchards, with Orchard #1 being approximately 120 acres, Orchard #2 being about 80 acres, and Orchard #3 being about 60 acres. Exact acreage will be defined in these same areas as the perimeter is adjusted slightly dependent on site specific conditions. A new reservoir (filled from the existing reservoir on Section 9) will be located along the southern edge of Orchard #1, near an orchard operations structure described in other reports and shown below in Figure 6. The wetland and stream restoration areas as well as the rest of the Conservation Area acreage outside of the orchards will continue to be maintained and managed as habitat.

Illegal recreational trails previously used to access sensitive wetland and stream areas will be blocked off and, where possible, restored to native vegetation. Other privative, illegal roads throughout the Conservation Area will be blocked with wood or rocks to reduce potential for use by motoized vehicles. Recreational trail use will be re-directed toward the northern trail system or toward Upper Wheeler Road, which will be improved as part of the project / mitigation and will have minimal orchard traffic most of the year, except during cherry harvest season in late-summer.

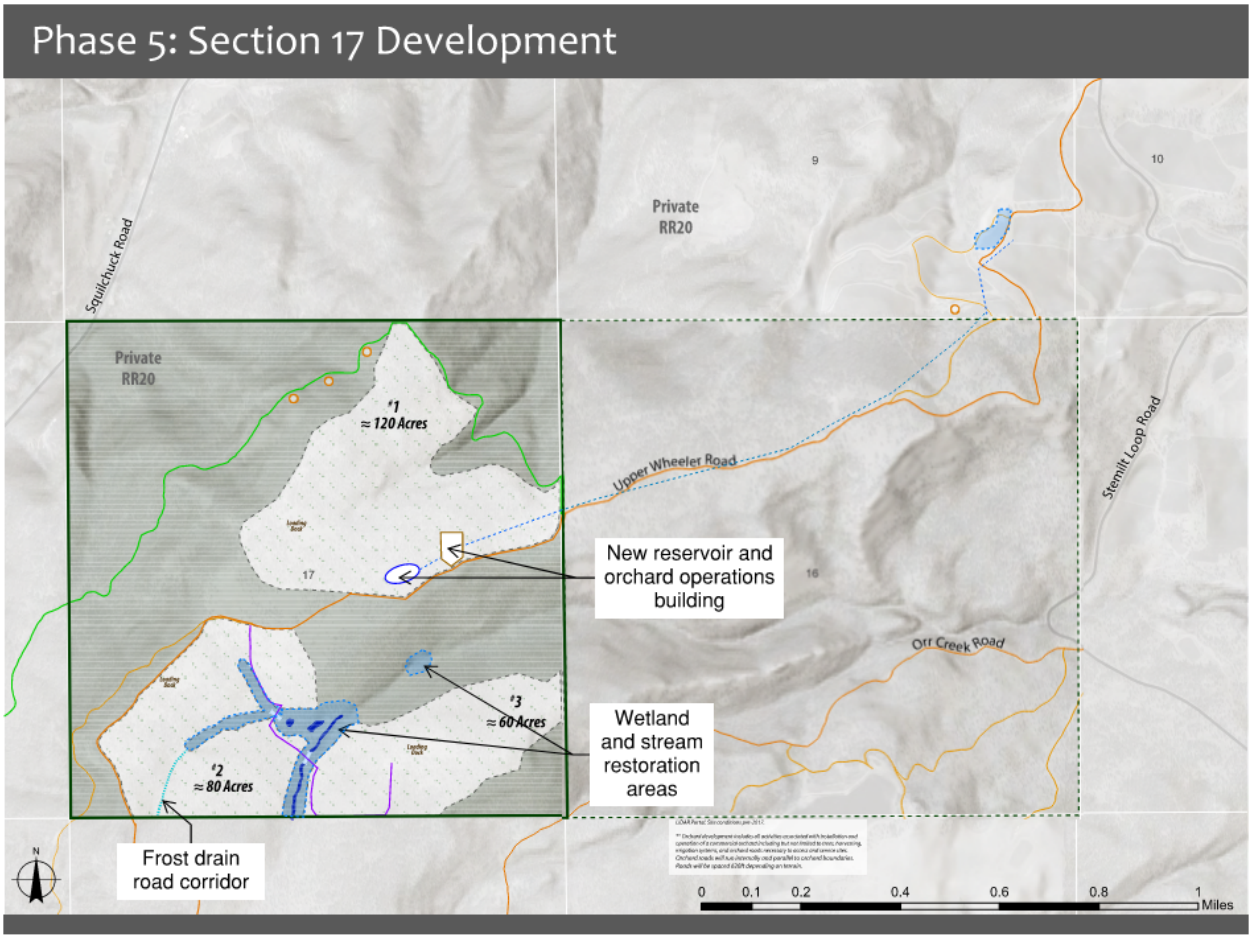

Figure 6. Site plan with wetland and stream restoration areas.

3.0 SUMMARY

There are many existing primitive roads on and around Section 17 from past logging and recreational uses. Most of these primitive roads are unmaintained and not accessible to standard motorized vehicles. The main County Road that crosses Section 17 (Upper Wheeler Road) will be retained, improved and slightly realigned to move outside of the orchard areas. Existing primitive logging roads in the orchard areas will be removed after tree harvest is complete. Existing roads in the orchard areas may be used for logging prior to planting the orchard, depending on soil moisture conditions at the time of logging and so as to protect soil structure and support future orchard growth conditions. There will be perimeter orchard roads around each orchard unit, just inside the orchard fence. An internal grid of orchard roads will be placed between rows of fruit trees, spaced about 620 feet apart on average.

An existing recreational trail on an old primitive logging road that runs around the northeast and north side of Section 17 and continues offsite to the west will be retained, but eastern trail sections will be slightly realigned outside the orchard fence.

Other existing primitive logging roads in the Conservation Area will be tilled and replanted or blocked off and abandoned to provide mitigation for nearby critical areas and to reduce potential for motorized vehicle access. The roads that currently run down the base of Ns streams, or within wetland or stream buffers will be removed and restored to a natural condition, including replanting with native vegetation. The net effect of the activities referenced in this memorandum will be the restoration and enhancement of significant portions of the site located closest to or with wetlands, streams and associated buffers.