CALIFORNIA DIVISION OF FISH AND GAME **STREAM SURVEY** File form No_____

NAME: Redwood Creek COUNTY: Marin

STREAM SECTION: FROM: Mouth TO: l/2 mile upstream of upper boundary Muir Nat'l Woods Monument LENGTH: 4.8 miles

TRIBUTARY TO: Pacific Ocean TWP: 1S R: 6W SEC: 7

OTHER NAMES: ~~None known~~ Muir Woods Creek RIVER SYSTEM: None

SOURCES OF DATA: Calif. Dept. of Fish and Game Stream Survey, March 21, 1956. Some information from a Mr. Montague, resident of the area. Considerable information from Mr. Brainerd, Park Service Custodian of the National Monument. Interrogation of local residents.

EXTENT OF OBSERVATION: Approximately one-half of six-mile stream section walked out between 10 a.m. and 3:30 p.m. March 12, 1956 by C. K. Fisher, Associate Fisheries Biologist, Calif. Dept. of Fish & Game. The lower 3 miles of stream paralleled by a road was seen by general observation from the automobile. One-third of it was actually walked out. The upper 1.8 miles lying within and immediately above Muir Woods National Monument was seen by hiking along a paralleling trail, with occasional stations taken on the stream. A major tributary, Fern Creek, was walked out upstream about 2/3 of a mile above its mouth. Both streams were walked out to a point at which a steep descent and barrier falls which would have prevented upstream migration of salmon and steelhead was located.

LOCATION: Redwood Creek heads on the south slopes of Mt. Tamalpais and flows in a southeasterly and southerly direction for about six miles, where it enters the Pacific Ocean at Muir Beach. This point is about 10 miles north of San Francisco. *Fern Creek is the only named tributary and there are only three or four other permanent tributaries beside it in the drainage. No lakes exist in this drainage basin.

***RELATION TO OTHER WATERS:** See * in preceding paragraph. A separate drainage - unrelated to and of no importance to other water.

GENERAL DESCRIPTION:

Watershed: The stream heads on the south slopes of Mt. Tamalpais at about the 2200' elevation and flows in a southeast and southerly direction in a southward facing basin. The surrounding slopes in the upper half of the drainage are covered by a more or less thick covering of redwood, Douglas fir, tanbark oak, and on the drier slopes, chaparral. The lower half of the drainage is marked by bare south facing slopes and north facing slopes with scattered patches of vegetation in the form of redwood, Douglas fir and tanbark oak. The upper half of the drainage is through a V-shaped canyon; the lower half is over a narrow flood plain that attains a maximum width of about a quarter of a mile at its lower extremity. The soil of the basin is thin and contains scattered rock outcrops.

Immediate Drainage Basin – The upper half of the drainage basin is through a V-shaped canyon and heavily shaded by growths of redwood and Douglas fir. The shade is so heavy that streamside growth is at a minimum, only scattered clumps of alders. The lower half of the drainage breaks out onto the flood plain and therefore is much more open. Here alders border the stream quite thickly for the entire 3 miles. Occasionally there are open stretches of up to 100' or so that are exposed to the sun. The flood plain is mostly uncultivated and used for grazing. All these small lots of cultivation exist in the lowermost part of the plain.

Altitude – The stream heads at around the 2200' mark on the south slopes of the uppermost peaks of Mt. Tamalpais and of course enters the ocean at sea level.
Gradient – Topographic maps show the following gradients: Upper 2 miles, 1,000 ft. drop per mile. Next mile 100 ft. drop per mile (in Muir Woods National Monument). lower 3 miles, 35 ft. drop per mile.
Width – The stream varied from around 6' to around 15' in width and averaged around 10' in width. It varied because of the alternation of pools and riffles.
Depth – From about 4" to about 2', with an average of about 8". The largest pools were found to be formed by impedances across the stream course which was altered in a small cascade which washed out the sand below. These pools will sometimes attain a depth of around 4'.
Flow – Flowing at estimated 8 second feet at the mouth this date. Gradually diminished in flow to about an estimated 3 second feet at the barrier falls 4.8 miles upstream. Heavy winter flood flows. No summer flows after July most yrs. below Nat'l Monument.
Velocity – Slow to torrential. Average could be considered rapid. The lower 2 miles of the stream vary between slow and rapid; the next mile was mostly rapid, and the upper 1.8 miles seen was mostly rapid and cascades.
Bottom – Predominantly sand and gravel in the lower 2 miles subject to some shifting during heavy flows. Gravel and rubble in the next mile, and boulders and rubble with some bedrock in the upper 1.8 miles; all but lower 2 mi. stable to effects of heavy flows.
Spawning Areas – Poor to good. Average fair in the lower 3 miles and from non-existent to fair in the upper 1.8 miles (for resident trout; fair for SH (larger gravel).
Pools – Pool development was quite limited. Although pools were quite abundant, they were of small size, alternating with shallow, fast riffles over gravel in the lower section and over bedrock and rubble in the upper section.
Shelter – Shelter development was fair from undercut banks and downed trees, but limited in size. This was especially true the lower 3 miles; in the upper 1.8 miles shelter improved to include not only occasional downed trees and stumps but also considerable numbers of head-sized boulders. Some scattering of larger boulders.
Barriers – A positive barrier in the form of cascades of small falls existed 4.8 miles up the main stream. This would block all upstream migrants at all water stages. Several partial barriers existed for about a mile below this permanent barrier. These were in the form of small falls that were barriers at low water but, as evidenced by small fish seen above them, they are passable at high water stages. On the major tributary, Fern Creek, the positive barrier was about 2/3 of a mile upstream. Here again there were several new barriers at about a quarter of a mile below this point, passable only in high water.
Diversions – Three pumps are located on the stream within the lower 2 miles. These pump for irrigation during the dry season, probably starting about April. Result in no flow and only standing pools in the lower 3 miles of stream after sometime in July during most years.

Temperatures – Temperature determinations meant very little because of the time of the year. As it was, the temperature taken at 10:50 a.m. on this clear, hazy overcast day, was 50°F.
Food – In general, food conditions were only fair. Latest maximum development in the lower 3 miles where there is more or less exposure because of the type of stream bed and overhead shade situation. In the upper 1.8 miles shade was so heavy and so much bottom consisted of bedrock and boulders that the food was rather poor in supply.
Aquatic Plants – None was seen either submergent or emergent. Only terrestrial plants such as alders along the creek could be considered aquatic.
Winter Conditions – Mild, about W of rain a year; considerable fog - in summer. Very infrequent snows in the upper part of the drainage. Heavy rains produce some flooding of adjoining plain in lower 2 miles; clears rapidly after rains cease.
Pollution – None at present but previously manure pollution from dairy barns. This condition has apparently been corrected.
Springs – Streamheads ~~and~~ in springs on the south slopes of Mt. Tamalpais. As described previously they are only sufficient to cause a permanent surface flow in the upper 3 miles of stream. Headwater springs, mostly from Fern Creek, are tapped by Marin Water District and consume an average of about 140,000 gallons of water per day. This could be a considerable part of the natural flow of Fern Creek during the summer since it would amount to about a continuous flow of l/4 ft. per second ft. Fern Creek was only flowing about 1 1/2 second feet at its mouth this date.
FISHES PRESENT AND SUCCESS – Steelhead and silver salmon regularly use this stream in upstream migrations for spawning purposes during the winter. Their offspring spend a more or less amount of time within the following year in the stream before descending to the ocean. What we thought to be steelhead could positively be identified in the stream, although probably some of these were silver salmon but were too small to distinguish. The maximum size seen was about 4" except for one individual steelhead of about 20" long. This date their abundance was considered no more than scarce or a little better than scarce in the form of fingerlings. This was undoubtedly due to the fact that this early in the season very few of the fish had hatched yet. Very few yearlings were seen. Because of the time of year observed it was impossible to determine the success of spawning in the stream. Condition of the fish was hard to determine because they were so small, although as near as could be ascertained they were in good condition. Again because of the time of year, natural propagation success was impossible to determine as few fish were out of the gravel yet. From observation there is apparently little, if any, resident trout population. Certainly none could be seen unless some of the larger fingerlings were yearling resident rainbows. This is improbable. Stranding of fish in lower 3 miles due to drying of streams in summer.
OTHER VERTEBRATES – The only other vertebrates seen were a few frogs and one salamander.
FISHING INTENSITY – Reported to be very light in the winter. Only about 5 steelhead are caught each year. Summer fishing intensity for yearling steelhead could be considered medium to heavy the lower 2 1/2 miles of stream during the first few weeks of the season. Fishing is generally allowed in this section and

no sign of posting was seen. Fishing is also allowed in the State Park upstream of the Muir Woods National Monument. No fishing is allowed in the National Monument.

OTHER RECREATIONAL USES – The stream within Muir Woods National Monument is #only heavily used during the winter months and probably all year long. Records of January and February of the two previous winters were taken. During both seasons there were 17,000 in January and 24,000 in February. Chance to observe spawning fish is major attraction. Muir Beach available to public for small fee.

ACCESSIBILITY – Good access to lower 3 mi. of stream + to mouth at Muir Beach. A good surfaced road parallels the lower 3 miles of stream. Above this point a good trail is adjacent to the stream upstream 1.8 miles within #the# and beyond Muir Wood National Monument. The trail was only followed this distance; however, it appeared to continue some distance beyond this point and this was shown to be true on various maps seen within the National Monument.

OWNERSHIP – The lower 3 miles of stream apparently was all in private ownership , including Muir Beach. , The next 1 1/2 miles of stream lay within Muir Woods National Monument, an area under the jurisdiction of the U.S. National Park Service. Beyond this point all of the stream is believed to lie within Tamalpais State Park for the remaining 1 1/2 miles of stream. As far as could be ascertained, the entire stream is unposted. Use of the National Monument is free to the public.

IMPROVEMENTS – ~~It is believed that considerable improvement to the fish carrying capacity of the stream could be made by the installation of simple stream improvement devices, namely, V — notch dams and deflection devices. In a few instances, natural dams in the form of logs that had fallen across the stream were seen to have made the best pools seen in the entire stream. Some beautiful pools were seen that were comparable to some of the nicest stretches of streams of this size in the Sierras.~~ No existing improvements were seen, on the stream except that banks within the National Monument have been rip-rapped, apparently by CCC boys to prevent erosion during floods.

PAST STOCKING – There is no evidence on file anywhere to indicate that there ever has been any stocking of this stream by the Calif. Dept. of Fish & Game.

GENERAL ESTIMATE – This is a small, rather poor trout stream as it presently exists. It contributes only to small runs of steelhead and silver salmon. Development is rather poor and pools are small with limited shelter in the form of boulders, undercut banks, logs and stumps. The flow is normally small and could never even with good stream improvement devices support a very large trout population. Potential is limited ~~to~~ due to small amounts of food and shelter that could only be increased to a certain extent by stream improvement. Permanent limitations are in the form of the V-shaped canyon and the heavy overcovering of shade which limit admission of sunlight and thereby limit development of stream organisms. In addition, the soil of the basin itself appears to be rather unproductive. Because of these reasons, food production is believed to be very limited in its ultimate potential, even with the best of stream improvement devices. Primary value of stream at present is aesthetic - supplying considerable enjoyment to visitors who are provided opportunity to observe spawning fish.

RECOMMENDED MANAGEMENT – ~~For the present it is recommended that angler use both present and potential is studied to determine whether it is advisable to make a small planting of catchable trout during the spring and early summer. Reports are that there is sufficient angler interest even now with small juvenile steelhead the only harvest to indicate that a small planting of catchable rainbow trout would be advisable. It is not recommended that stream improvement devices be installed at present although they would undoubtedly do considerable good to the carrying capacity of the stream. The stream is too isolated and off the beaten path to warrant such improvement at this time, it is felt. It is very probable that with the great demands being made on water that eventually streams such as this one will warrant improvement and development of trout carrying capacity to their ultimate. Such is not believed to be in the scheme of things at present.~~ Do all possible to encourage stable steelhead and silver salmon runs to provide for aesthetic enjoyment of visitors to National Monument.

SKETCH MAP – See attached.

REFERENCES AND MAPS – Muir Woods National Monument map revised 1954. U. S. Coast and Geodetic Survey Map San Francisco entrance Chart #5532 1943. Corps of Engineers U. S. Army Tamalpais Quadrangle 1938-41. Marin County-map published by the Mescar Map Company. S. Balboa Building
593 Market St. San Francisco.

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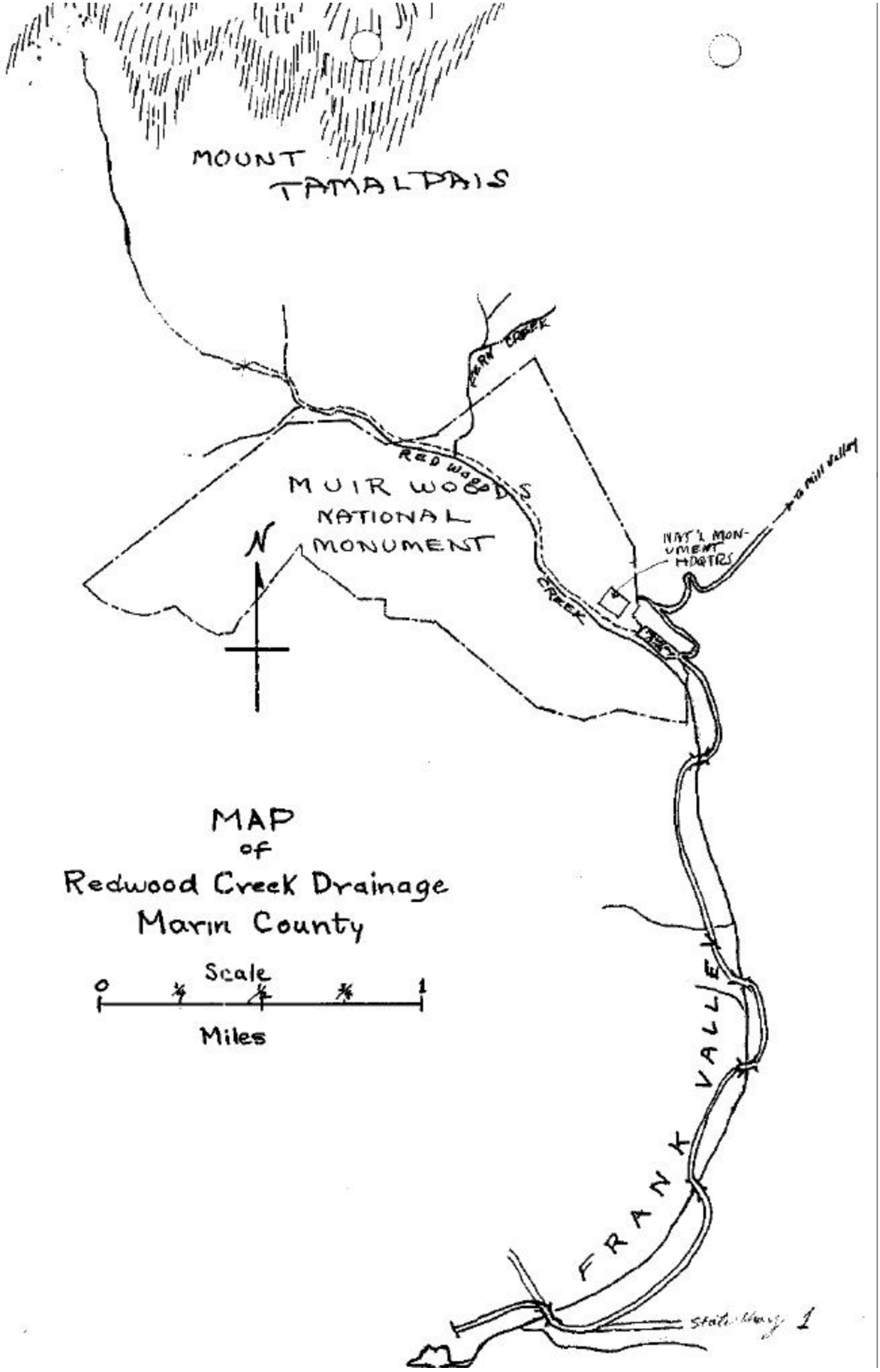
MOUNT TAMALPAIS
MUIR WOODS NATIONAL MONUMENT
N
NAT'L MONUMENT HDQTRS
FRANK VALLEY
MAP
of
Redwood Creek Drainage
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Scale
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