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FISH DISTRIBUTION FOR WATERSHEDS IN LOUISIANA-PACIFIC'S COASTAL MENDOCINO/SONOMA MANAGEMENT UNIT, 1994- '96

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MENDOCINO REDWOOD COMPANY, LLC
FISH DISTRIBUTION REPORT

IMPORTANT INFORMATION

In response to inquiries from members of the community the Mendocino Redwood Company (MRC) is releasing a variety of previously collected data.

The Fish Distribution report presents data collected from 1994-1996. The purpose of the surveys presented in this report was to assess the presence and distribution of salmonids on forestlands formerly owned by Louisiana-Pacific.

Fish were counted during the time of the distribution survey and placed in abundance categories. The abundance categories have no correlation to actual numbers or fish populations. The fish distribution surveys were not designed to estimate fish populations, rather to simply ascertain the presence of species within our ownership.

To cover the largest geographical area, a hierarchical sampling framework as opposed to random sampling was used to select fish distribution survey sites. The sites were selected in stream reaches where salmonids were likely to be present; major systems were divided into upper, middle and lower segments for sampling. Smaller systems were divided into upper and lower segments for sampling. The number of survey sites increased annually.

The fish distribution surveys were conducted over a three-year period. The coho life cycle of adult migration, spawning, rearing and juvenile emigration is typically a three-year cycle. The design behind the three-year distribution surveys was to try and capture presence data for each of the three possible year classes of fish.

The conclusions that can be drawn from this study are qualitative and can be summarized as follows:

- Of the 20 basins surveyed within MRC's 350 square mile ownership, coho were present in 8 basins.
- Of the 20 basins surveyed within MRC's 350 square mile ownership, steelhead were present in 19 basins.
- The presence of steelhead throughout basins within MRC ownership indicate suitable stream conditions for steelhead, and the low presence of coho within these basins is supporting evidence for the recent listing of the coho as threatened species in the Central California ESU.

This fish distribution study represents a foundation on which additional studies can be built. While not a population study, it does provide qualitative baseline information on fish species distribution.

This report cannot be used to assess the current condition of salmonid stocks. It is a tool to help MRC to focus efforts so that a more quantitative effort can be made in watersheds with a high degree of biodiversity.

When the fish distribution surveys did not reveal the presence of fish it can not be said that they do not exist. A large geographic area was covered, and the survey design and goals were not meant to determine fish absence.

MRC believes that more surveys of aquatic species and their habitat conditions are warranted.

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BACKGROUND

Juvenile salmon and trout commonly segregate in streams along gradients of depth, velocity, substrate, and temperature (Chapman and Bjornn 1969; Everest and Chapman 1972; Reeves et al. 1987; Roper et al. 1994). Many abiotic and biotic parameters change from the headwaters to the lower stream reaches in a downstream direction (Vannote et al. 1981); thus, change in distribution and relative abundance of juvenile trout and salmon is expected (Platts 1979). The quantity and quality of instream habitat are factors that are important in maintaining resident and anadromous fish populations. Forest management practices and other anthropogenic influences can substantially alter instream habitat availability and may also influence the distribution of fishes in a drainage basin.

The most basic of fish distribution surveys involves determining the extent of fishes within a drainage basin through "spot" field sampling. After the general extent of fish species distribution is determined, area-specific intensive monitoring can elucidate positive or negative trends in populations of fishes.

Information on the distribution of fish species for watersheds within Louisiana-Pacific's lands will: (1) provide baseline resource condition data for forest planning and management, and (2) assist land managers in making informed decisions and prescribing management actions that are beneficial to a diverse assemblage of stream-dwelling species.

The primary objective of this three-year project (1994-'96) was to conduct basin-wide stream surveys to assess the existing fish distribution and species composition for watersheds in Louisiana-Pacific's coastal Mendocino/ Sonoma management unit. In addition, it is hoped that any major changes in the distribution of fish species can be detected from historical data or future watershed assessment efforts.

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Literature Cited

Chapman, DW., and TC. Bjornn. 1969. Distribution of salmonids in streams, with special reference to food and feeding. Pages 153-176 in TG. Northcote, editor. Symposium on salmon and trout in streams. HR. MacMillian Lectures in Fisheries, University of British Columbia, Institute of Fisheries, Vancouver, Canada.

Everest, FH., and DW. Chapman. 1972. Habitat selection and spatial interaction by juvenile chinook salmon and steelhead trout in two Idaho streams. Canadian Journal of Fisheries and Aquatic Sciences 29: 91-100.

Platts, WS. 1979. Relationships among stream order, fish populations, and aquatic geomorphology in an Idaho river drainage. Fisheries (Bethesda) 4(2): 5-9.

Power, ME., and eight co-authors. 1988. Biotic and abiotic controls in river and stream communities. Journal of the North American Benthological Society 7: 456-479.

Reeves, GH., FH. Everest, and JD. Hall. 1987. Interactions between redside shiner (Richardsonius balteatus) and the steelhead trout (Salmo gairdneri) in western Oregon: the influence of water temperature. Canadian Journal of Fisheries and Aquatic Sciences 44: 1603-1613.

Roper, BB., DL. Scarnecchia, and TJ. LaMarr. 1994. Summer distribution of and habitat use by chinook salmon and steelhead within a major basin of the south Umpqua River, Oregon. Transactions of the American Fisheries Society 123: 298-308.

Vannote, RL., GW. Minshall, KW. Cummins, JR. Sedell, and CE. Cushing. 1981. The river continuum concept. Canadian Journal of Fisheries and Aquatic Sciences 37: 130-137.

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METHODS

To cover the greatest geographical area, a hierarchical framework was used to select the locations of field survey areas in each river or stream. Major rivers or streams, anadromous reaches in particular, were segmented into lower, middle, and upper segments. Smaller systems were segmented into lower and upper segments. Each segment was then sampled in habitat units representative of the survey area. The basic survey unit, a site containing at least two consecutive habitat-types (pool-riffle) was selected within each stream segment. Survey time at each survey unit varied based on stream conditions. Stream segments were re-surveyed annually to obtain additional information on fish species not present in previous years because of ontogeny and stream access limitations (i.e., inadequate duration and intensity of discharge). Fish species distribution surveys were performed during low flows in late-summer to early-fall (June-October) of each year.

The primary survey method was electrofishing using a Smith-Root Model 12 (Smith-Root Inc., Vancouver, WA) backpack electrofisher. One person operated the backpack electrofisher while one or two other individual(s) used dip nets to capture the stunned fishes. The captured specimens were placed into a five-gallon bucket containing stream water. When the survey time ended, salmonid species were enumerated by age-class according to pre-determined size-age class categories. All other fish and vertebrate species were identified to lowest possible taxonomic level and enumerated. Upon concluding the survey effort at a site, when possible, specimens were returned to the instream habitat-types from which they were captured. Instream physical characteristics were recorded at each survey unit, including; flow estimation, habitat-type, water clarity, and air and water temperatures.

Snorkeling was used to assess fish presence at stream segments where the channel was large enough to preclude electrofishing. The basic survey unit for snorkeling contained a minimum of three pools. Depending on the channel width, one to four divers were used for the field surveys. The diver(s) would enter the survey unit from the downstream end, and wait approximately one-half to one-minute at the downstream end of the survey unit before proceeding upstream to observe fish. If the water velocity was excessive for diver(s) to proceed upstream, then the survey unit would be snorkeled by floating downstream. Dive slates were used to record data under water.

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Aquatic species such as salamanders, frogs, turtles, and snakes observed during the field surveys were recorded. These aquatic species were identified and enumerated.

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RESULTS

This report compiles and summarizes the fish species distribution data collected during 1994- '96 for watersheds in Louisiana-Pacific's coastal Mendocino/ Sonoma management unit. The results are organized based on Watershed and Wildlife Assessment Areas (WWAAs). A WWAA is an aggregate of planning watersheds (3,000-10,000 acres) to form larger hydrologic unit (25,000-50,000 acres) used to facilitate evaluation of cumulative watershed effects and management-by-watershed approach. The spatial distribution of fish species is linked to a geographical information system. No conclusions were drawn from the field survey results at this time.

Stream surveys using "spot" field sampling will provide information on presence of fish at the specific locations surveyed. Presence of anadromous fish downstream of survey areas can be inferred, but absence of fish cannot be established. More rigorous sampling protocols, such as probability sampling, would provide information on presence and the probability of absence of fish throughout a drainage basin.

Between 1994-'96 fish species distribution surveys were conducted in 27 WWAAs within Louisiana-Pacific's lands in coastal Mendocino and Sonoma County, California. During the three-year survey period, the number of survey sites increased annually; 206 survey sites in 114 streams during 1994, 292 survey sites in 157 streams during 1995, and 410 survey sites in 196 streams during 1996. A high percentage of the survey sites within various streams was sampled multiple years.

Steelhead trout (Oncorhynchus mykiss) and coho salmon (Oncorhynchus kisutch) were the primary salmonid species found within streams draining Louisiana-Pacific's lands in coastal Mendocino and Sonoma County, California. Chinook salmon (Oncorhynchus tshawytscha) have been historically documented within the study area, but due to timing of the annual survey effort we did not observe this species. The overall focus of this multiple year survey effort was to locate summer rearing salmonids; thus, our field surveys detected juvenile coho salmon or steelhead trout (young of the year or yearlings), with a few exceptions where adult salmonids were observed.

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Coho salmon juveniles were found in eight watersheds over the three-year survey period. In the eight watersheds, coho salmon were present in 56 individual streams (10 out of 23 streams surveyed in South Fk. Eel River, 5 out of 10 streams surveyed in Cottaneva Creek, 8 out of 24 streams surveyed in Noyo River, 9 out of 26 streams surveyed in Big River, 11 out of 18 streams surveyed in Albion River, 11 out of 48 streams surveyed in Navarro River, 1 out of 8 streams surveyed in Elk Creek, and 1 out of 7 streams surveyed in Garcia River).

Steelhead trout juveniles were observed in 18 watersheds over the three-year survey period. Steelhead were present in 181 individual streams (16 out of 23 streams surveyed in South Fork Eel River, 8 out of 10 streams surveyed in Cottaneva Creek, 4 out of 5 streams surveyed in Hardy Creek, 2 out of 2 streams surveyed in Juan Creek, 2 out of 2 streams surveyed in Howard Creek, 22 out of 24 streams surveyed in Noyo River, 1 out of 1 stream surveyed in Doyle Creek, 20 out of 26 streams surveyed in Big River, 15 out of 18 streams surveyed in Albion River, 7 out of 8 streams surveyed in Russian River, 45 out of 48 streams surveyed in Navarro River, 6 out of 6 streams surveyed in Greenwood Creek, 7 out of 8 streams surveyed in Elk Creek, 1 out of 1 stream surveyed in Mallo Creek, 6 out of 8 streams surveyed in Alder Creek, 2 out of 4 streams surveyed in Schooner Gulch, 6 out of 7 streams surveyed in Garcia River, and 11 out of 11 streams surveyed in Garcia River).

Steelhead trout were the most widely distributed and abundant species observed during the three-year study period. Young of the year, yearling, and two-year or older steelhead were found throughout the study area streams. Some of the survey sites may have had resident rainbow trout present, but they were identified as steelhead trout due to the difficulties in distinguishing resident and anadromous forms of rainbow trout.

Non-salmonid fish species present within the study area included sculpin (Cottus spp.), three-spine stickleback (Gasterosteus aculeatus), California roach (Hesperoleucus symmetricus), Sacramento sucker (Catostomus occidentalis), Pacific lamprey (Lampetra tridentata), and Pacific brook lamprey (Lampetra pacifica).

Non-native fish species were also found during stream surveys. During 1994 fish distribution surveys in the South Fork Albion River, sunfish (Centrarchus spp.) was located. In 1995, catfish (Ictalurus spp.) was observed in the mainstem of Navarro River. These non-native fish species most likely were introduced from farm ponds located within the watersheds.

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Miscellaneous aquatic species observed during stream surveys included Pacific giant salamanders (Dicamptadon ensatus), California newt (Taricha torosa), rough-skinned newt (Taricha granulosa), red-bellied newt (Taricha rivularis), yellow-legged frogs (Rana boylei), red-legged frogs (Rana aurora), and tailed frogs (Ascaphus truei).

Survey effort, method of survey, habitat-types, stream flow estimate, water clarity, air and water temperatures, and miscellaneous instream physical parameters for the fish species distribution survey sites are reported in the appendix section. The results of the fish distribution surveys during 1994-'96 for Louisiana-Pacific's coastal Mendocino/ Sonoma management unit are organized as follows:

WATERSHED-NAMES	WWAA NO.	TABLE	APPENDIX	MAP
S. Fk. Eel River & Rockport Area	41, 47, & 55	1- 11	1- 11	1- 5
Noyo River & Doyle Cr.	70, 71, & 72	12- 18	12- 18	6- 8
Big River	74, 75, 76, & 79	19- 26	19- 26	9- 13
Albion River	78	27- 29	27- 29	14 & 15
Upper Russian River	77 & 83	30 & 31	30 & 31	16 & 17
Navarro River	81, 82, 85, 86, & 88	32- 43	32- 43	18- 24
Greenwood Cr., Elk Cr., & Alder Cr.	84, 87, & 89	44- 48	44- 48	25- 29
Garcia River & Schooner Gulch	92, 93, & 94	49- 52	49- 52	30- 32
Gualala River & Lower Russian River	97 & 98	53- 55	53- 55	33 & 34