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JDSF's RECREATION MASTER PLAN

Thomas Sutfin

Regular readers of this Newsletter are aware that we on Jackson Demonstration State Forest (JDSF) have been actively studying and planning recreation use on the Forest for the last three years. Faced with increasing visitor use and accompanying conflicts, the California Department of Forestry and Fire Protection (CDF) commissioned a thorough study of recreational use on the Forest in 1987. It was conducted by Community Development by Design (CDbyD), a consulting firm located in Berkeley. Background on the JDSF recreation program and the results of this study are found in JDSF Newsletters No. 25 (March 1987), and No. 31 (October 1988), respectively. In 1989, CDF contracted once again with CDbyD to complete a Recreation Master Plan for the Forest. This Plan has just been completed and this article summarizes the results.

Plan Goals and Guiding Principles

From the beginning, the Department has had four primary goals for the Recreation Master Plan. These goals are to: 1) reduce visitor conflicts, 2) increase forestry education opportunities, 3) improve campgrounds, and 4) create an action plan for implementation. The overall intent has been to clearly define the types and levels of recreation opportunity the Forest will provide.

During the planning process, CDF worked closely with CDbyD to provide input and guidance, and to ensure that the final product was consistent with CDF policies. JDSF staff and CDbyD exchanged information and refined the proposed guidelines. This interaction produced several guiding principles

early in the process which directed the planning effort. They are as follows:

The Board of Forestry's primary goal for JDSF is the long-term demonstration of timber management, with recreation a secondary mandate. Recreational use on JDSF is unique and it is important to maintain the Forest's special, informal atmosphere. The guiding intent should be to enhance and control existing uses, rather than to expand recreation use. New facilities should only be developed to solve some conflict or replace a facility that has been removed. Improvements to facilities should meet users' needs but remain rustic. Recreational development should be concentrated in a specific recreation corridor, corresponding roughly to the rivers already being used by recreationists and Highway 20. And finally, forest education should be

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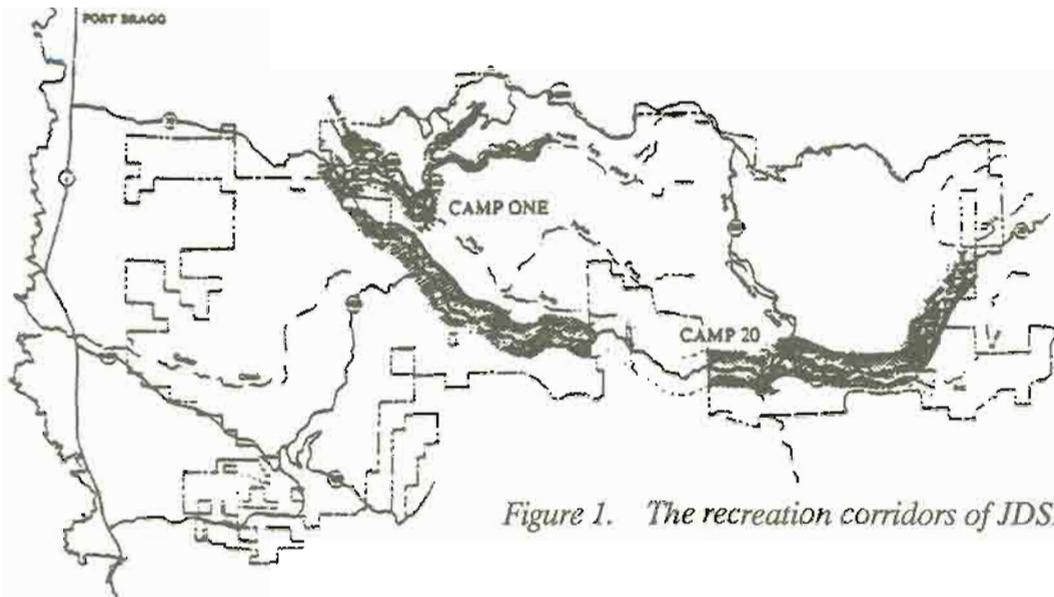


Figure 1. The recreation corridors of JDSF.

an integral part of the recreation experience, with public educational activities concentrated in the corridor where the most visitors will be reached.

Conflict Reduction

There are conflicts on JDSF between different recreational user groups (e.g., equestrians and hunters) and between recreation use and timber management. The

Recreation Master Plan addresses both of these types of conflicts with specific recommendations.

For example, the conflict between recreation use and timber management will be reduced by establishing a recreation corridor along Highway 20 and the South Fork of the Noyo River (see Figure 1). Recreation use currently occurs primarily in this area and future development will be concentrated here. Recreation and silviculture will be given equal con-

sideration within the corridor, and it will be managed as an aesthetic, historical and educational resource.

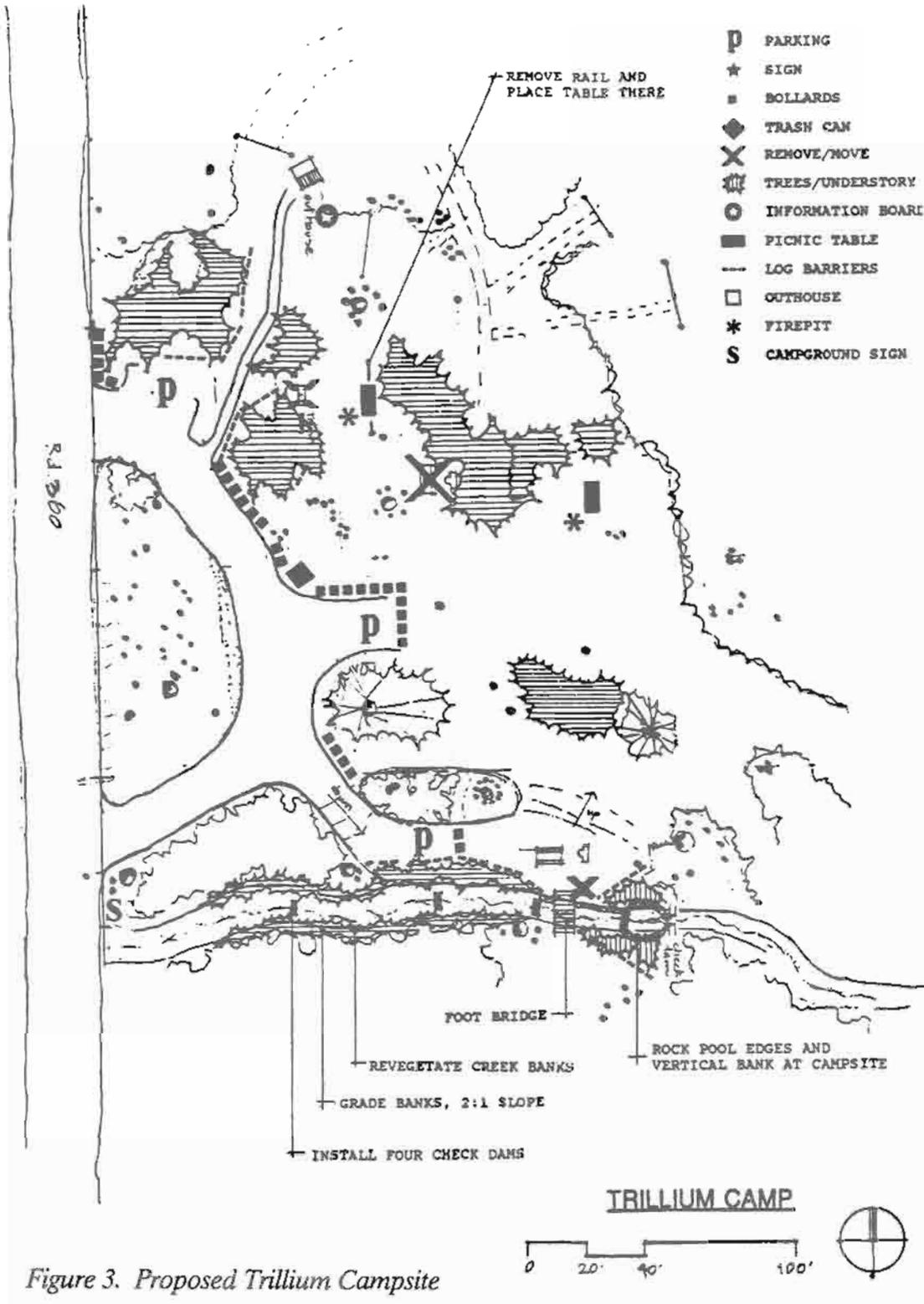
The Plan also attempts to resolve several on-going problems in campgrounds with improved or new facilities. Wagon Camp will be developed as a group camp that will be used by large groups on a reservation basis. Additionally, a new horse camp will be developed on the west end of the Forest to relieve pressure on the existing east end Horse Camp. It will accommodate equestrians who want to camp in the general Camp One area.



Figure 2. Tin Can II Campsite (to be renamed Trillium).

Forest Education

Guidelines are included in the plan to integrate public education with recreational activities. The intent is to provide the public with information on progressive forest management, logging history, redwood ecology, and current research projects. These guidelines present general direction for an educational program in the recreation corridor. They include specific recommendations for areas of special interest, such as Camp 20 and Camp One. Self-guided trails, interpretive signs,



and a camp host program are also addressed.

Camp 20 will be one of the main areas for the forest education program. It was Caspar Lumber Company's last logging camp prior to the sale of their land to the State in 1947. A visitor to the Forest will be able to see much of Jackson's history here by taking a series of self-guided loop walks. They will feature such remnants as the school house, the steam donkey, the "Cat Barn," the old Camp 20 swimming hole, and the railroad grade.

Facilities and Orientation

Specific site plans were developed for the Forest's seven primary recreation sites: Camp 20, Camp One, Wagon Camp, Horse Camp, Dunlap Camp, and Camps Tin Can I and II. Each site plan includes a narrative description of the objectives of the site, proposed changes, and a detailed map showing the location of each feature. Many of the

proposed campground changes are intended to increase privacy, reduce user impact, and better delineate camping sites. Additional tables and outhouses are planned. This section of the Plan also includes guidelines for general campground and day-use area development, and the design and placement of maps and signs for visitor orientation.

For example, Trillum Camp (formerly known as Tin Can II) will be slightly rearranged to accommodate an additional campsite (see Figures 2 & 3). The plan proposes that a series of check dams be installed along the small creek that flows through the camp to prevent further down-cutting from occurring.

Action Plan

Finally, the Recreation Master Plan groups all the specific tasks that are to be accomplished into one-year phases. It ranks them in order of importance by individual project, as

well as for the entire Forest. For example, the highest priority projects for the Forest are to improve Wagon Camp, build a new west-end Horse Camp, and develop a new trailhead for the Forest History Trail. Detailed cost estimates are provided for each project and phase. Thus, the Plan assists in annual budgeting and directs daily recreation management activity.

It's an exciting time for recreation management on JDSF. The Plan further integrates the recreation, timber, and research and demonstration programs on JDSF. Hopefully, it will promote a positive interaction between Forest visitors and silviculture.

TANOAK HARVESTING WITH THE ZIG-ZAG YARDER SYSTEM

Norman D. Henry, Forester II

Currently, large areas of North Coast forests are heavily stocked with various types of hardwoods. Tanoak (*Lithocarpus densiflorus*) is the dominant species, while madrone (*Arbutus menziesii*), chinquapin (*Castanopsis chrysophylla*), and big-leaf maple (*Acer macrophyllum*) are less common. The aggressive development of the



Figure 1. Zig-Zag Yarder.

hardwood component on the dryer interior sites has occurred primarily through timber harvesting activities during the last century. Tanoak is a prolific seeder and produces many stump sprouts when cut or burned. It can dominate a site for decades, inhibiting conifer regeneration and growth.

At the present time, one commercial use for tanoak is as a source of wood chips. There is also a strong demand for tanoak firewood by both commercial cutters and home users. Ongoing research in drying tanoak lumber may lead to a valuable new hardwood lumber market. Hardwood biomass material as an energy source for electrical generation plants has been researched as well.

This article describes a small cable yarding system which allows the removal of tanoak or other hardwoods from sites that currently would be economically unfeasible with conventional yarding systems.

Development of the Zig-Zag Yarding System

The zig-zag yarder system evolved in Japan and is used operationally there. The system technology is now available in the United States, due to research efforts in developing small log harvesting systems. The U.S. Forest Service's Pacific Northwest Forest and Range Experiment Station in Seattle, Washington imported this technology and has conducted production and related engineering tests on it over the last several years.

The system uses an endless 3/8"-5/16" wire cable loop which is powered by a 8-10 horsepower gasoline engine and some form of capstan winch unit (see Figure 1). The cable is suspended 4-6 feet above ground using open sided

blocks strapped and hung from trees. The only blocks currently manufactured which meet the necessary specifications are made in Japan by Iwafugi Industrial Inc. The zig-zag name comes from the necessary layout design of the cable blocks (see Figure 2). The line should have an interior angle at each block of about 90-140 degrees (Miyata et al 1986). Twine is used to attach the logs to the wire cable. The log is preferably suspended when yarded to the landing. Once there, it is automatically cut from the cable using a suspended cut-off blade to sever the twine choker.

The system demonstrated is of the continuous operation type. Logs are attached with the twine choker using a clove hitch while the line is moving. The typical line speed is 100 feet per minute and can be adjusted by installing the proper size capstan and using the appropriate engine and winch gear reducers to keep the engine at the rpm for optimum power. One person can stop the system quickly through a clutch mechanism or kill switch on the power unit if the need arises. Line tension can be adjusted in a variety of ways. Since the

demonstration unit was mounted onto a small trailer, it was a simple matter to drive forward or backward to adjust the tension. Line tension and position can also be adjusted through the use of snatch blocks and hand powered winches at various locations along the loop.

The loop has to be cut and spliced together for each setup. This can take one-half hour for an experienced person with the proper tools. Allowing more flexibility in loop configuration using the various tension adjustment devices minimizes the line splicing downtime.

The Forest Manager and I observed the zig-zag yarder operating on a State Lands parcel near Shingletown, California in 1987 and requested a demonstration of the system on JDSF. A cooperative effort between Edwin Miyata, Industrial Engineer with the USFS Pacific Northwest Forest and Range Experiment Station; Dale Etter, Fuels Management Specialist on the Shasta-Trinity National Forest, and ourselves resulted in a successful demonstration of the system here on April 24 to 27, 1990.

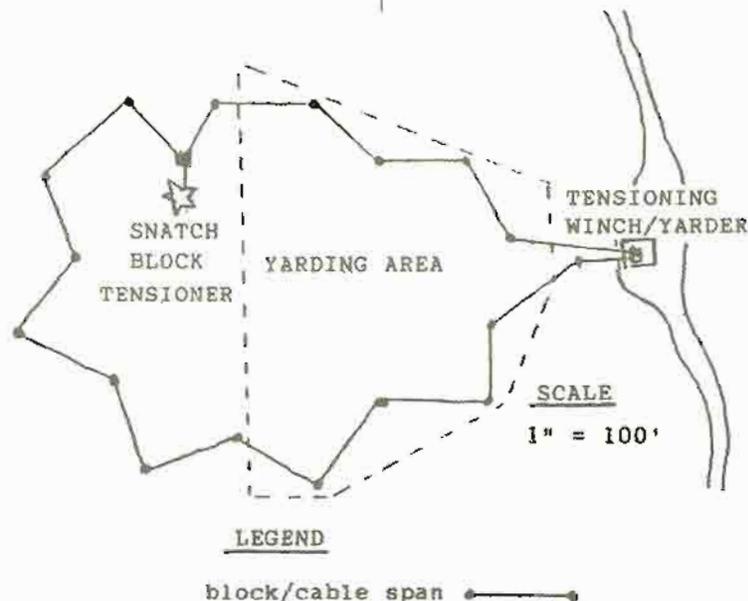


Figure 2. Diagram of the zig-zag yarder system set-up on JDSF.

Dale, with initial technical assistance from Ed, has put together two systems. They were developed piecemeal from military surplus equipment parts, USFS equipment, and purchase of special blocks from Japan. The primary reason for building the yarders was for residue removal from precommercial thinnings and other sites on the Shasta-Trinity N.F. where fuel loading reduction is necessary. Wood cutters enjoy the new supply of firewood which is generated as a roadside by-product of these operations.

Testing the System on JDSF

The site chosen for our demonstration consisted of scattered 50-60 year-old redwood clumps and a dense understory of tanoak. The hardwood stem size ranged from 1 to 15 inches d.b.h., with almost half of the stems between 5 and 7 inches. This size is optimal for handling with the zig-zag system, since all pieces have to be manually connected to the yarding cable (see Figure 3). A cruise of the 2-acre unit showed the hardwood volume was 2800 cubic feet per acre. The slope of the area yarded ranged from flat to 60 percent. The steep ground was not a limitation for the system, even though most of the logs dragged almost full length due to the number of pieces attached.

Attempts to have a private contractor do the felling, bucking, limbing, and logging failed on this project. One contractor started and found that the costs of doing all the required work for the firewood value in the tanoak logs was prohibitively high. The main concern was the dense stocking and difficulty of felling individual trees without causing substantial tree hangups. Once down, a significant amount of work was left in limbing and slashing to 24 inches above the ground. The



Figure 3. The zig-zag system operating on JDSF.

other job elements included moving the pieces near the cable, assisting in the cable setup, yarding the logs, rebucking, splitting, and hauling.

The preparation and logging was eventually done by a two Parlin Fork Conservation Camp inmate fire crews. The crews worked 7 days (with a productive 6 hour workday) felling and bucking the trees into approximately 4 foot lengths. The limitation of piece size is primarily a function of manually moving the log to the yarding cable and holding it while tying it on with the twine. The tanoak weighed about 60 pounds per cubic foot, based on a small sample measured after cutting.

A zig-zag loop which traversed approximately 1200 feet was installed in 4-5 hours by three people. The required tasks were: 1) determining appropriate block trees by estimating span lengths and interior angles created, 2) packing the blocks out to the trees and hanging them by strapping, 3) pulling the cable through the blocks, and 4) splicing the cable together to create the endless loop.

The cut-off blade block was installed on a cable strung between two trees near the yarding machine. This blade can be positioned at different locations to allow the logs to be dropped into separate piles.

One crew worked the line during the yarding process. One crewperson handled the logs as they were cut off the line. Two other crew members stacked the logs for further processing, or in this case eventual sale. During the three days of yarding, two sides of the loop were worked on. About 285 feet of the south side of the loop was yarded uphill. Over half this distance was on a 45-50 percent slope with the remainder over 25 percent. Log pieces were tied onto the cable with a spacing averaging 5 feet. The logs in one pile from this part of the loop averaged 6.7 inches in diameter and 34 inches long. As this log size equates to about 43 pounds, we estimate the yarder was dragging up 2300 pounds of partially suspended wood when the crew was at the lowest yarding area. The preferred method is to keep most of the logs

suspended during operation. The winch unit never slowed down under any loading condition we imposed on it in this demonstration.

Some safety precautions when operating the system are as follows:

1. Straps used for anchoring pulleys to the trees should be as strong as the running line.
2. No person should stand or remain within the bight of any running line.
3. A tension gauge should be installed to monitor running line stress.
4. Line splices must be tucked a minimum of two times.

5. Minimum crew size is 2 persons and one should hold a valid first aid certificate and have it on site.

6. If the crew works apart from each other, provide an emergency warning device.

A formal production study was not done, as we did not have a private contractor on the project. At one point we estimated that 1.5 cords per hour were being yarded in. Logs were hauled near the cable by part of the crew, while other one or two person teams tied the pieces onto the line. Miyata et al (1986) reported similar production by two persons, where material had already been laid near the line. Production will be influenced by the average

piece size, terrain conditions, line speed, and the distance pieces have to hauled to the line. The zig-zag system shows promise for low-impact recovery of small wood. The economics of the operation will depend on the type of product produced, local markets, transportation and labor costs.

Reference:

Miyata, E. S., E. Aulerich and G. Bergstrom. 1986. A monocabable system for handling small trees on steep, difficult sites. Paper presented at 9th Annual Council on Forest Engineering Meeting, Mobile, AL. September 29-October 2. pp. 94-98.

STAFF NOTES :

Thom Sutfin left JDSF in June to become State Forest Manager of the newly created Sequel Demonstration State Forest, located near Santa Cruz. Thom came to Fort Bragg in 1982, after graduate school at Oregon State University. He was a Timber Sale Officer until 1985, when he promoted to Assistant Forest Manager. In that position, he was in charge of the budget and accounting, as well as the law enforcement and recreation programs. His intelligence, integrity, and hard work will be missed on JDSF. We wish him the best of luck in his new job as Forest Manager.

Several other changes have occurred on our staff in the last year. **Ernie Rohl** left the State Forest to become a Forest Practice Officer in Fortuna. **Mike Risso** was hired to fill Ernie's Forester I slot in January. Mike holds a forestry degree from Humboldt State University, and formerly worked for Simpson Timber Co. and Coos County, in Oregon. **Mike DeLasaux** left JDSF to be a research associate at Cal Poly-San Luis Obispo. **Hugh Scanlon** was hired in November to fill the Forestry Assistant I position. Hugh also has a forestry degree from HSU. His background includes work with

Dr. Rich Barber of HSU on harvest scheduling and Dr. Doug Brodie of OSU on economic optimization.

Our summer Forestry Aides are all busy on JDSF. Returning to Fort Bragg is **Wayne Walker**, who just finished his forestry degree at HSU. Also, we have **Paul Ederer**, who is a recent graduate of Oregon State and **Al Rodriguez**, who holds an A.A. degree from Kings River Community College. Also returning is **Troy Garrison** who is getting on the job experience. Have an enjoyable summer, gentlemen!

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