

A NEW ADDITION TO THE CAMP 20 RECREATION CENTER - THE RICHARD J. ERNEST MEMORIAL ARBORETUM

By Norm Henry 1/

The Camp 20 recreation /visitor center area halfway between Fort Bragg and Willits on Highway 20 is undergoing gradual change. In addition to the existing visitor informational kiosk, display signs, and recreation / picnic area, a new development is gradually taking shape. An arboretum dedicated to the memory of Richard J. Ernest, former Director of the Department of Forestry and Fire Protection (CDF) is being installed over a multi-year period on approximately 6 acres across the highway from the recreation center. Mr. Ernest had a long and dedicated career with CDF, rising from firefighter to Director, and his first hand experience in resource management both early in his career and later as the Region 1 Chief came primarily from the north coast. With his passing in 1990, Departmental staff decided to honor his career accomplishments by developing an arboretum which would reflect his vitality and at the same time be a significant public education addition to the recreation/visitor center.

The arboretum design was developed by Professor Randy Hester, UCB, and his landscape architecture design class. Randy had been one of the principal developers of the Jackson State Forest Master Recreation Plan and was thoroughly familiar with the state forest and the other recreational/demonstration facilities on the forest. Professor Joe McBride, forest ecologist at UC Berkeley, was also participant to the project, having a major input on the development of the species to be included for planting (Table 1). It was mutually agreed to plant some of the native hardwoods and shrubs associated with the conifer plant communities and to delete those conifer species that had little chance of surviving on this site.

ARBORETUM DESIGN GOALS

Three goals were selected as a framework in developing the design criteria: 1) to memorialize Dick Ernest; 2) to inform and educate users about the trees of California; and 3) to give the visitor a powerfully memorable experience. As part of the design process, the students guided by Professor's Hester and

McBride, had to answer questions regarding the best way to interest and educate visitors about plant communities, uses of trees, ecotypes, plant succession using displays or other type demonstrations as well as investigating those properties such as tree form and arrangement which would leave a memorable impression on the visitor. A considerable number of constraints also had to be considered in the final plan rendering. The approved plan had to integrate the history of the area, the site having been once part of a busy logging camp. Screening from the highway was desired and the plan had to be compatible with the Master Recreation Plan. The site imposed certain conditions such as wet soils, erosional features, historic logging camp house sites, dumps and domestic plantings which also had to be addressed in the plan.

After several meetings and trips to the site, three landscape architecture graduate students who had elected to take on this project each developed a site plan proposal. All three plans were presented to JDSF staff at UCB.

1/ Forester II, Demonstrations & Experiments Program, Jackson Demonstration State Forest

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION
Forest B. Tilley, State Forest Manager

Norm Henry, Editor

Richard Wilson, Director

Pete Wilson
Governor
State of California

Douglas P. Wheeler
Secretary of Resources
The Resources Agency

Although each design developed had excellent points, the best overall site design (fig. 1) was presented by Jennifer Madden. Her plan incorporated eight factors selected as the most important in designing the arboretum: 1) The memorial should be located in an existing grove of redwoods; 2) the conifers should be grouped by forest regions with each region occupying a site most closely approximating its natural site characteristics; 3) the regions should be divided by meadows allowing both close-up and distant views of each region; 4) the regions should be naturalistic and distinct from each other by locating the regions on the hillslope in a finger like arrangement; 5) there should be several viewpoints providing vistas to various distant and nearby features; 6) the majority of the access trail system should be accessible for people with mobility impairments; 7) each region should have at least one hands-on demonstration of a forest product from one or more species native to that region; and 8) the Arboretum should be a place to have fun by providing games that encourage visitor participation and enhance the learning experience.

INITIAL TASKS

Prior to starting actual work on the Arboretum, several tasks had to be completed. A soils survey was done to identify any planting problems for any of the regional vegetation types. In preparation for the planting to be done, we made arrangements for construction of a nursery area at Parlin Fork Conservation Camp where planting stock could be warehoused and maintained until the site was ready for planting. This was accomplished through the generous cooperation of the CDF and CDC personnel at the camp. The site's historical significance as an early logging camp was determined through an archeological site assessment by a state parks archeologist. A plot map showing all visible historical sites and remnants was made and procedures were agreed upon to protect its value as cultural resource reflecting local logging history. The initial site preparation activities included clearing the site of

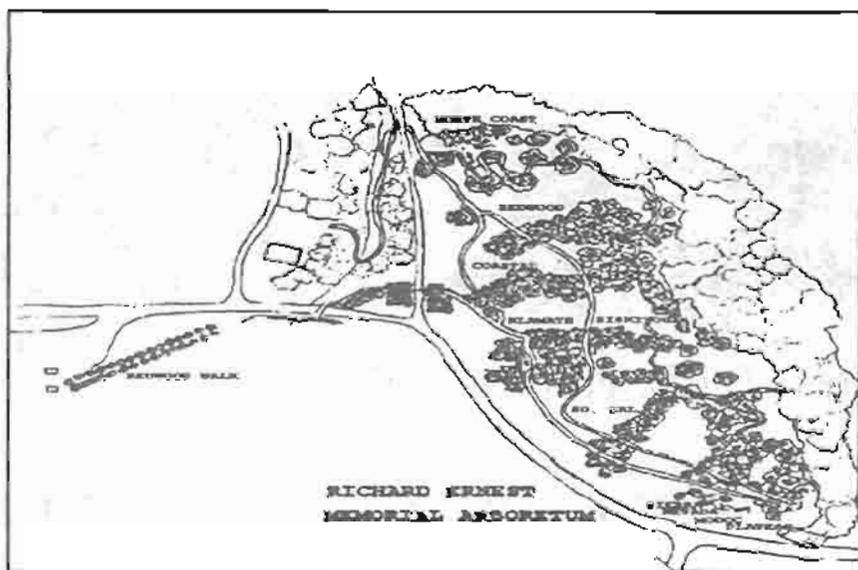


Figure 1. Arboretum planting/site plan

unwanted vegetation and generally cleaning the area of trash.

VEGETATION ZONES

Six climatic /vegetative regions have been identified for California and are represented in the Arboretum plan. These zones starting from the north are the North Coast, Coastal Strip, Redwood, Klamath-Siskiyou, Sierra Nevada/Modoc Plateau and Southern California.



Fig 2. State vegetation Regions

these regions. Each of these regions will be located in the Arboretum which best suits their climatic needs. There is some similarity in the relative position between the regions in the Arboretum sitings and where they are located in the state.

PROJECT PHASING

Part of the design work was to divide the project into phases, as careful staging of activities is critical to the successful completion and we want to make the Arboretum usable and enjoyable during the installation period. The project plan calls for the installation to be completed over six phases, each phase entailing among other things completing one or two regional plantings. The first phase is already well under way. Tasks completed on the Arboretum site for the dedication ceremony scheduled for this phase included construction of some of the main trails including the construction of a small foot bridge and bench; construction of a redwood deck inside the Memorial Grove; and design, purchase and installation of a bronze memorium plaque on a constructed rock base near the entrance to the grove. Under the guidance of state forest staff, Chamberlain Creek and Parlin Fork Conservation Camp fire crews did all of this work. The trail connecting the Camp 20 kiosk to the Arboretum was also partially completed

during this phase. This part is called the redwood walk and is a path with planted redwood seedlings along its length to illustrate the height of a red-

table 1. Arboretum conifer species

<u>North Coast Conifer Region</u>
Douglas-Fir
Grand Fir
Port Orford Cedar
Sitka Spruce
Western Hemlock
Western Red Cedar
<u>Redwood Region</u>
California Redwood
Pacific Yew
<u>Coastal Region</u>
Bishop Pine
Gowan Cypress
Monterey Cypress
Monterey Pine
Santa Cruz Cypress
Sargent Cypress
Santa Lucia Fir
Shore Pine
Torrey Pine
<u>Klamath Siskiyou Region</u>
Alaska Cedar
Brewer Spruce
Douglas-Fir
Engelmann Spruce
Noble Fir
Pacific Silver Fir
Shasta Red Fir
Siskiyou Cypress
Subalpine Fir
<u>Southern California Mountain Region</u>
Big Cone Douglas-Fir
Coulter Pine
Engelmann Oak
Limber Pine
Single Leaf Pinon Pine
Torrey Pine
<u>Sierra Nevada & Modoc Plateau Region</u>
Bristle Cone Pine
Digger Pine
Douglas-Fir
Foxtail Pine
Giant Sequoia
Incense Cedar
Jeffrey Pine
Knobcone Pine
Lodgepole Pine
Mountain Hemlock
Ponderosa Pine
Washoe Pine
Sierra Juniper
Sugar Pine
White Fir
Western White Pine
Ponderosa Pine

wood tree. To connect this trail to the Arboretum on the opposite side of Chamberlain Creek, an 85 foot steel footbridge will be sited parallel to and south of the existing highway bridge. The trail will then continue under the

highway bridge and up to the entrance via a wooden stairway already constructed.

The dedication ceremony took place on May 8, 1992 with Director Ernest's family in attendance as well as many active and retired CDF employees who had known Dick. The current Director,

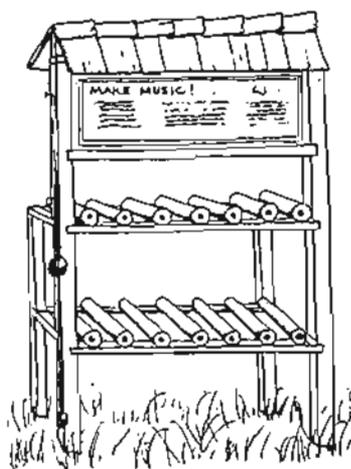


Fig 3. Wood musical instrument demonstration illustrating different species wood tonal qualities .

Richard Wilson and Region I Chief, Lloyd Keefer made presentations honoring the former Director. The group then had a delicious lunch cooked and served by the Parlin Fork kitchen crew. With the site dedicated, the vast majority of the work still lies ahead.

The next step in the first phase is completing the Redwood region site preparation and planting. Most of the existing redwoods in this region will remain with some additional plantings of those species which have been selected for this region but are not present at this site. The scattered clumps of conifers on other areas of the Arboretum site will have to be removed as part of the site conversion phase in preparation for planting the other vegetation zones. Table 1 shows the conifer species that are to be planted. The other important part of this phase is a search for some financial support for construction of the wood products demonstrations. It was felt important to have some interactive type exhibits to have a truly memorable educational experi-

ence. Each region will have at least one hands on demonstration. A wood weights demonstration located in the Klamath Siskiyou will teach people about the comparative weights and densities of wood. The North Coast region will have several product demonstrations which use Sitka Spruce as the primary material. Examples would be a propeller, crew seat, and ladder. A porch swing illustrates the use of this species with Western Red Cedar and Port Orford Cedar. An Incense Cedar pencil and Giant Sequoia girth demonstration will be the featured exhibits in the Sierra/Modoc region and the Coastal region will feature a wood production exhibit. A California Rainfall demonstration will be situated in the Southern California region and near the entrance kiosk across the highway, a wood musical instrument demonstration (fig. 3) will be installed. So if you would like to contribute to a specific demonstration that will be on the site either in materials or funding, please contact the author at the State Forest headquarters.

The current plan is to develop the northern part of the Arboretum, working south, to allow a phased elimination of an existing road system while using it to remove the existing vegetation as required to implement the planting design. Specifically, in phase two, the North Coast region will be planted and in phase three, the lower Klamath Siskiyou region and the Coastal Strip region will be covered. In phase four and five, the Sierra Nevada region and the Southern California Mountain region will be completed. Phase six activities will be completing demonstrations, benches, planting iris to mark old logging camp house sites and developing the game materials for the Arboretum.

With completion of the installation comes the responsibility to maintain the planted stock through the growing development phase of the trees. During this period the Arboretum will continually be changing in appearance as each year the trees become larger and each area more closely represents the mature stage of the vegetation for that particular region.

FOREST INVENTORY-MANAGING THE NUMERIC MONSTER FOR FOREST PLANNING

Paul Ederer, Forestry Aide, IFF Tech.

In 1988, a thirty years old continuous forest inventory (CFI) system was radically changed as Jackson Demonstration State Forest (JDSF) joined the high tech information age by implementing a new state of the art forest inventory system. The original system of 141 rectangular 1/2 acre plots established in 1958-60 on a regular 3/4-mile grid was laid to rest, replaced by a new system of 2350 circular 1/5 acre plots (fig. 1) randomly located according to forest cover types. A more detailed description of the new

IFI is equipped to supply most of the information required by pending rule changes. Increasing concern over how timber harvesting affects other forest resources both immediately and over time has resulted in more and more information being demanded of forest managers. CFI was limited in the amount and detail of information that could be obtained, especially with regard to timber stand distribution information at the management compartment and watershed level. It also lacked the capacity to link with a growth projection model.

hired to start clicking on the computer. Most of the data entry was completed by the contractor but inserting site index and hand checking for suspicious values was left to JDSF.

The IFI system has the capability to interact with any statistical and data managing program. Inventory data is read into our statistical program where it is manipulated and transformed before being written to IFI for final processing. Two important pieces of information were required before that could be done: 1) a height/diameter relationship had to be developed since

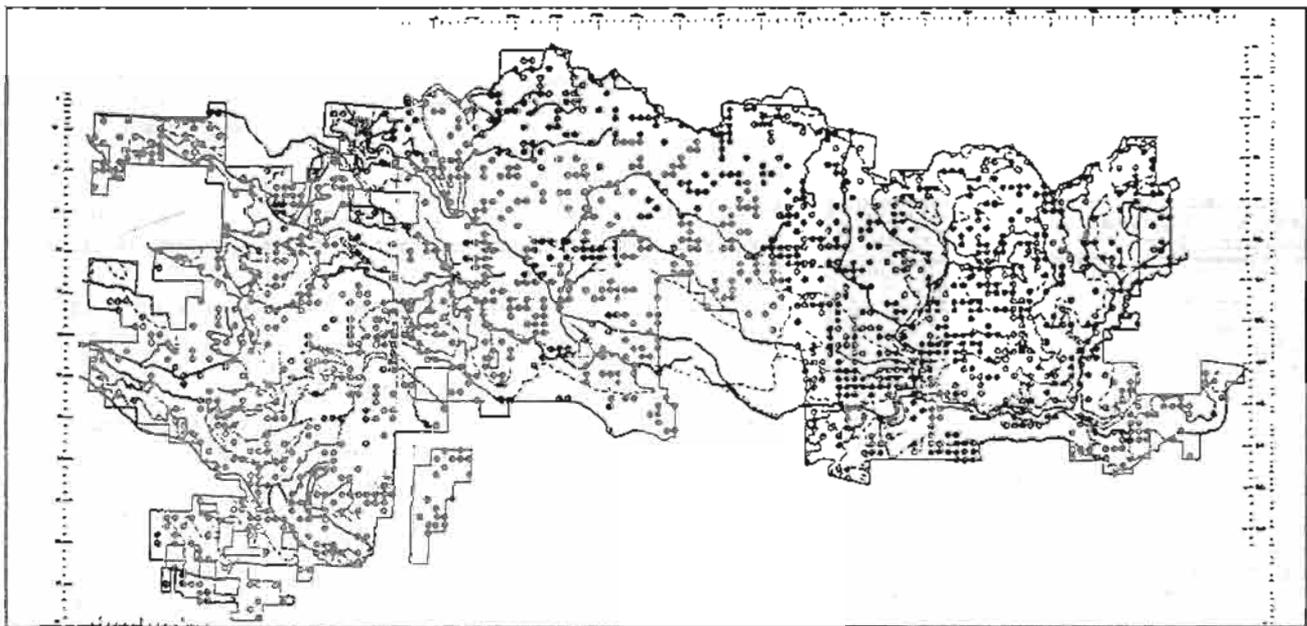


Figure 1. Overlay of permanent and temporary plots which are part of new inventory system

system is available in newsletter No. 28, January 1988. Data collection for this new system began in the summer of 1988 and was completed in the spring of 1990. The analysis phase started just as forestry in California began to experience sweeping changes that are still shaking the dust out of the old forest practice rules. With the anticipated changes in rules and their focus towards a regional outlook and a even timber flow, the new intensive forest inventory (IFI) data has assumed a highly significant role in forest wide planning.

Of course all this new information has costs attached to it. The increased number of plots to be measured and subsequent additional data analysis burden mean less time for other staff duties. The lack of staff time necessitated bringing in outside contractors which can distance the managers from the reality of the source of the numbers generated. In balancing these trade-offs, it was decided to contract the data gathering and do the analysis in-house. With field work finished by spring of 1990, a temporary forestry aide was

heights were only taken for a small sample of the total trees; and 2) a radial growth model had to be developed from a subsample of cored trees for IFI to project diameters to a common year.

The height/diameter relationship was assumed to be non-linear and modeled using the following non-weighted equation:

$HEIGHT = 4.5 + EXP(b_1 + b_2 * (DBH^{b_3}))$
as suggested by Forest Service Research Note PSW-408. Both equations

mentioned in the report were tried but the one shown here produced a consistently better fit with our data. Separate coefficients were developed for old and young redwood, whitewoods (Douglas-fir, grand fir) and minor conifers. Hardwood heights were not taken so coefficients from the minor conifers were used instead. Each species group was further stratified by five aggregations of 69 different stand/density codes and 3 aggregations of 12 soil/site index codes.

Ten year radial growth data was collected as it was anticipated that not all 2350 plots would be measured in a single year requiring some growth factor to adjust dbh to a common year for estimating total forest growth. Since there was no equation to directly predict radial growth, a basal area growth (BAG) variable was created. An equation taken from Research Bulletin 51 published in 1985 by the Oregon State University Research Lab was used to predict BAG. A simpler version of the equation was used as some of the information needed for the full equation was not available. BAG was envisioned as the "doughnut" of new growth formed by the difference in basal area in a 10 year period. A conversion equation was used to change the BAG variable to a radial growth value usable by the IFI. Again the data was stratified by the same species groups and stand/density, soil/site codes as were the height data. Where there were not enough data to be confident in predictions, each species group was combined by soil/site codes and then stand/density codes.

All this data manipulation exposed several problems with both the computer and programs. Most of the initial work was done using a 80286 (AT) computer, frequently pushing it to the limit of its capacity. The major problem was the size of the data file. Having input data on over 50,000 individual trees, the "monster" file created occupied 12 megabytes (mb) worth of space on the hard drive. After performing a few data transformation operations in which backup files are automatically written, the hard disk

would be filled. The computer was then unable to complete the assigned task or old files would have to be deleted to make room for the new. Even with a data compression program the file could not be squeezed onto one floppy disk, requiring an hour long multi-step procedure to save a file. The file size was also a hindrance to data checking; no reasonable way was found to check it manually so a technique had to be developed for the computer to do it. The problem arises in the difficulty of having the computer program error check certain items and how to anticipate every possible error condition. The data management program used was usually up to the task, but it was not always obvious how to get it done, necessitating many calls to the company.

A frustrating time ensued as errors like plot data being triplicated or deleted from the file crept in during the processing phase before being noticed. The causes for the errors then had to be determined and eliminated. A program upgrade process was also endured as it required switching between two versions of the statistical program for certain analyses. The new version was significantly better visually and procedurally than the old, so we used it as much as possible. The newer version lacked some vital routines however, resulting in extra time spent converting the data between versions with the risk of errors or the program crashing.

The system was upgraded to a 80386 model computer with the newest disk operating system (DOS 5.0) installed which lessened data storage problems and significantly increased the file processing speed. At this point in the inventory cycle, the data management program is completely operable in its new version. A future addition of a tape backup system for the hard drive will provide easy data storage and mitigate the fear of a major data loss.

As reported by the old inventory system, gross softwood volume on the forest has fluctuated around 1.36 billion board feet (standard error of 8.4%). The new inventory system indicates the

Forest contains 1.87 billion board feet (standard error of 1.9%). The gain is every forest managers dream but at this time we view the new number with a cautious eye. One probable cause for the difference is the volume equations that were developed for the new system. As a check we did a comparison of the 141 old CFI plots in 1984 and 1989. Using tagged tree numbers, we were able to reconstruct the 1989 circular plots in the old 1984 rectangular plots and then process the two data sets identically. The results were not what were expected, with the '89 data suggesting 2.2 billion b.f. and the '84 data indicating 1.6 billion b.f. Some increase would be anticipated but a 37 percent increase is suspicious.

During the time this article is being written the California State Board of Forestry is considering monumental changes to the regulations that govern how timber is managed in the State. Several versions of different rules are being considered, but one main focus is on sustained yield and long term timber management. Emphasis on forest wide planning will require managers to have information at their finger tips on sustainable productivity, growth rates and growth potential, area in each timber type, diameter and age-class distribution and more.

For future management decisions an accurate estimate of inventory is required. A minor error projected over the 100 year planning period could cause major deviations between paper planning and on the ground realities. As this is the first test of a completely new and integrated system, problems were bound to occur and lessons learned in this cycle will be applied to the next. It is unknown how the pace of computer development will proceed but for this type of project bigger and faster computers are needed. The trend is for more and more information to be collected and used in addressing new forest practice rules so the demand for computer power will increase. We estimate having to track up to 4,400 different possible stand conditions. An obvious area to streamline is data entry. The forest is currently testing a

programmable data recorder that will eliminate the re-entry of data from field forms to computer disk. The recorder will be able to check data as it is entered and eliminate most typographical errors.

The space age could make its mark on JDSF if a Global Positioning System (GPS) is used for accurately locating plot centers (see Newsletter No. 40). There has been a problem in assigning the plot to the correct forest cover type for analysis. With GPS linked to a Geographic Information System all inventory data could be easily accessed and stratified by management area, watershed or whatever unit was desired by managers. At some organizational level this type of system will be a necessity in order to meet the demands of the new forestry regulations.

This paper is dedicated to the entire staff at Jackson Demonstration State Forest whose knowledge and friendship has been inspiring.

STAFF NOTES

Forest B. Tilley, Forest Manager of Jackson Demonstration State Forest since 1977 has decided to retire this year. Forest spent the early part of his career with CDF in several fire control positions. He came from a district ranger job in Humboldt County to fill the Assistant Forest Manager position on the Forest. Upon Jean Sindel's retirement in 1977, he promoted to the Forest Manager position. Under his leadership, staffing and programs have expanded to better meet the mandates that are placed on the state forest program.

His retirement is effective July 31, 1992 and the staff is having a retirement party for him on August 1 at Wagon Camp on Jackson Demonstration State Forest. We wish Forest the best in his future endeavors (one of which is remodeling his cabin near Lake Tahoe).

Helping out with the timber sales preparation this summer are Forestry Aides Christy Daugherty and Scott Rosikiewicz.

RECREATION PLAN IN FULL SWING

By Tess Albin-Smith, Admin Officer

We've written about the great recreation master plan JDSF had prepared in 1990 by the consulting firm, Community Development By Design. We thought our readers would like to know what's happened since then.

A lot of personnel changes took place that first year. Thom Sutfin and Rich Eliot who helped guide the Recreation Program in the plan development phase, went to the Soquel State Forest. I came to JDSF as Thom's replacement and to make a long story short, we hired Tom Larsen, Robert Byers, and Pam Lindstedt to fill old and new recreation positions. Another important part of our team is forest manager Forest Tilley. His active interest in the program and knack for planning lent much stability to this green staff in the early stages of plan implementation.

Okay. We have a plan. We have staff. What do we do first?

There are two criteria in the setting of priorities for recreation improvements: location and condition of facility. The Recreation Plan defined a recreation "corridor", which is roughly the area extending from the east-end camp-

grounds adjacent to Highway 20, over to the west-end campgrounds at Camp One. Current planning calls for recreational development within the recreation corridor.

The second criterion for setting priorities is related to the facilities. In 1990, JDSF already had 21 campgrounds with 52 sites. The new Recreation plan is divided into five phases, staged by priority. Our priorities are:

- *To repair existing facilities;
- *To eliminate user conflicts if possible;
- *To reshape existing campgrounds to maximize privacy, resource protection, and natural features; and
- *To create new facilities to mitigate conflicts and/or utilize good areas for camping.

FIRST THINGS FIRST

We decided our highest priority is protection of resources and prevention of camper pollution. Repair of outhouses were rated high.

Before we had regular weekend patrol, our campground outhouses were a primary target for campground abuse. They have been pushed or winched over, cut up for firewood, or simply



Fig 1. Trail guides with recycling box for a trail at Camp 20

burned in place when no one is looking. The recreation team has repaired and rebuilt all the damaged outhouses and installed several needed facilities and more are scheduled.

It should be mentioned right off that crews from Parlin Fork Camp have been indispensable in the Recreation program. They mill the lumber for the outhouses and picnic tables, install heavy gates and barriers to help control and restrict traffic in unwanted areas, build trails, and construct and repair campground facilities. Without the building expertise and great attitude of the crews and their supervisors, none of these improvements could happen.

After outhouse repair and construction, "Conflict resolution" placed a close second in priority. Any recreation area is prone to user conflicts. Highest priority is preservation of property, resources, and keeping the peace. More priority is given to low cost, uncomplicated changes that can solve big problems.

An easy problem to solve was the trailhead to the Forest History Trail. This is one of the best trails on the State Forest, but access to the trail entailed entering into an area surrounded by a private concession. Complaints were many, and CDF and the private caretakers wanted to maintain use of the trail with two access points. An easy solution with a big payoff in user satisfaction led to construction of a new trailhead, and staff prepared new trail signs and a new trail guide to orient visitors from either access point.

Before leaving the subject of trails; in the last two years most of the old JDSF trails have been upgraded and improved with the help of the Demonstration and Experiments staff. (A description and map of trails was prepared under an earlier JDSF Newsletter.) Most of our trails are educational and trail markers eventually become outdated or lost, creating confusion among visitors. New trail guides and markers from the highway have been a big help (fig 1). New trails constructed so far are the Camp One area (Loop Trail), the Dun-

lap/Chamberlain Trail connection and the new Forest History access trail.

Other conflicts are less easily solved. Hunting and shooting are forms of recreation that don't mix well with other activities. Horseback riding, off-road vehicle riders, and bicycling are other potential sources of conflict with campers and hikers and amongst themselves. A new west end horse camp (Red Tail) was developed to accommodate local equestrians (fig. 2) who may wish to camp on the State Forest (a campground 17 miles inland is the only other area where horses are allowed overnight.) ATVs (all-terrain vehicles) are still not allowed off the road. Bicycles are not allowed on some trails. Many areas have been closed to vehicle access which helps confine patrol to a smaller area, but displeases hunters. Target practice shooting is tolerated in rock pit and other areas, but we advise all participants to clean up afterwards.

Much of our user conflicts, violations, and forest abuses have been curbed by the diligence of our patrol personnel. Drinking parties, abandoned vehicles, and garbage, including animal parts left from hunters and fisherman remain a problem. Another big help was the addition of "camp hosts" (fig. 3). Starting early last year, JDSF advertised for

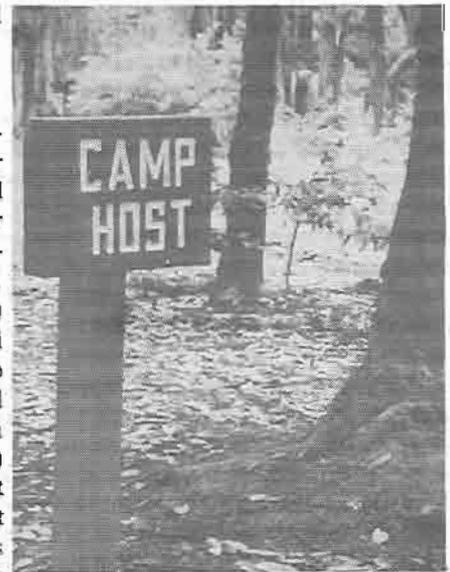


Fig 3. Camp host sign indicating where caretakers are located.

two hosts having their own fully-contained camp trailers; one on the east and one on the west end of the forest in our two most popular campground areas. These people are the "caretakers" of the campgrounds, keeping track of campers, issuing permits, cleaning and stocking outhouses, and picking up litter. They are truly our eyes and ears on the State Forest and often help prevent and/or identify sources of vandalism.



Fig 2. This sign gives priority to equestrian campers at two campgrounds on Jackson Demonstration State Forest.

The theme of 1991 was to abate problems and the last major item on the first year list was to create signs to identify roads, trails, and landmarks. Thanks to the wood shop at Chamberlain Creek Conservation Camp, visitors can find their way around the State Forest campgrounds and trails far more easily than before.

SECOND YEAR IN PROGRESS

1992 will see some bigger projects for construction crews. Some of the projects will be joint efforts between staff of the Recreation and Demonstration Programs, such as the "Demonstration Highway" project and the Ernest Memorial Arboretum. Demonstration staff will handle the educational aspects, and Recreation staff will help with the scenic/rest area aspects and maybe some trail building. The big recreation project in progress is Wagon Camp, which is being completely remodeled. It has always been one of our most popular group camping areas, and will be available for group reservations or open

camping when it is finished this summer. Another big project is transforming the Camp One (Egg Taking Station) area to a day use interpretive area. The Department of Fish and Game has promised to cooperate on the preparation of an educational display on the life cycle of salmonids, which are collected and milked during their migration up the South Fork of the Noyo River. The setting is perfect for day use picnicking and water play and the new display will enlighten visitors on the mysterious structures in the area.

Other projects online for 1992 relate to resource protection. Staff will construct more new outhouses in popular areas and reshape two campgrounds that are quite open and lack privacy. Wide open campgrounds, like the old Wagon Camp, tend to invite overcrowding of vehicles and give visitors a bad first impression. Our staff believes that giving the campgrounds a more natural, attractive appearance will inspire campers to maintain their condition. So far, this philosophy is working and has resulted in a great cost savings.

WHAT'S IN THE FUTURE FOR RECREATION ON JDSF

Campgrounds and facilities will be improved and expanded according to the plan. Other planned additions include the re-activation of an educational evening fireside program, and more interpretive signs and trails to recognize historical logging and train routes.

We are pleased to report the improvement in attitudes of clientele resulting from the changed campground appearance. The patrol staff and camp hosts are also making great strides in keeping things nice. Aside from the need for continued staff visibility in our campgrounds, there is growing concern about shooting and dumping. The latter will be a more serious problem when the local Caspar dump closes in October of 1992. Issues to be addressed in the future are the continuation of no-charge camping, increased patrol, and use of recreational firearms on the State Forest.



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