

ORGANIZATION AND OPERATION OF
REGION SIX FORTY-MAN FIRE
SUPPRESSION CREW

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I Introduction

For several years the Forest Service has been aware of the weakness of large, inexperienced crews of "pick-up" labor in combatting project fires in the western regions. In 1939 Region 6 developed the first crew of its kind, a mobile, well organized, well trained, and properly equipped regional fire suppression crew, which acted as a spearhead in attack on the region's large fires. The crew was also a laboratory in which the Forest Service experimented with various fire fighting techniques and tried out new equipment and fire fighter's supplies.

In this report an effort has been made to show the possibilities of this type of crew and to present a working basis for the organization of future crews along similar lines. The complete organization and development of the 1939 crew is presented, and a short resume of minor changes made in the 1940 organization appears at the close of the report.

II Organization of the crew

The plan for the organization of a regional fire suppression crew was first presented by a few progressive fire control men in Region 6. The idea was later given impetus, when in the spring of 1939 the Washington office circulated a memorandum which definitely outlined the plans for setting up such

a crew, made up of men of great physical ability, trained and conditioned in the best methods of fire fighting technique, and capable of handling each foot of fire line effectively without intensive supervision.

It was decided that a good unit for such an experiment would be forty men. Funds were later allotted for a unit of this size, which was set up separately in Region 6 as the 40-Man Crew Project. Redwood Ranger Station on the Siskiyou National Forest was selected as headquarters. This place was selected because it was on a very good highway, had the necessary facilities for setting up a good camp, was quite centrally located in a hazardous area, and because it was close to construction projects on which the crew could work while not on suppression or presuppression work.

An assistant ranger with ten years of fire fighting experience was selected as a leader. He was sent to the Siskiyou Forest headquarters at Grants Pass to begin selection of the crew the first of June. At an earlier date, form letters had been sent to forest supervisors throughout the region requesting them to forward to the Siskiyou office the names of likely candidates from their forests. It was desired to pick men with qualifications which would fit them to fill special assignments on the crew. From the list of candidates assembled at the Siskiyou office, forty men were finally selected by the crew leader. The first recruits arrived at Redwood Ranger Station about the middle of June, and the crew was not built up to the full forty until after

the first of July.

Most of the men on the crew, as it was first organized, had some special abilities aside from being experienced woodsmen and fire fighters. Among them were "cat skimmers", carpenters, bridge men, truck drivers, and men with clerking experience. Four men with considerable experience in handling men and doing construction work were selected as squad bosses. Each squad boss usually had about ten men under him on both project work and on fires.

All of these men had previous experience in the Forest Service. They were required to be in the best physical condition, capable of enduring long hours of hard labor, good hikers, and of pleasing personality. Some were seasoned Forest Service laborers. Some came from logging camps, and a few were forest school students. Age limits were set at twenty and forty years. Single men were preferred, though married men who expressed willingness to leave their families at home were also taken.

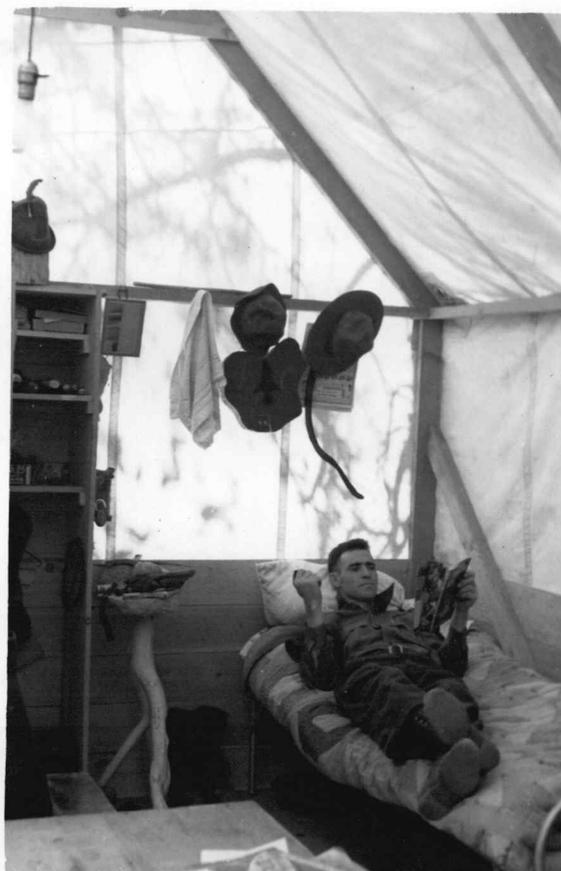
A regular cook was first hired as one of the crew, and men on the crew alternated as flunkies. This system soon proved undesirable, due to the fact that the cooking job required the full time of the cook and did not allow him to keep in condition for fire fighting. It was soon found necessary to hire a full time cook and two flunkies to remain in camp at all times.

The crew leader, being a Junior Forester, was hired on a yearly salary. The squad bosses were paid \$125.00 per month, and the regular men received \$110.00. The cook was hired at \$120.00 and the two flunkies at \$75.00 each per month.

PLATE I



Study hall and quarters in background



Interior of quarters

All of the expenses for the crew were paid out of the allotments as set up for the crew, but the value of work done on road and bridge projects was later appraised and the crew was given credit to the appraised amount from FRD funds. The original allotments for the experimental crew were made up of contributions from all the national forests throughout the United States and not from Region 6 alone.

As the season advanced, it was found necessary to make some changes and replacements in personnel. A few men were found to be unqualified, two left for other jobs, and additions were made in order to maintain a crew of forty men, in addition to the leader, cook, flunkies, and recorder. Some of these men were hired through personal applications with good recommendation, and two were hired directly from other fire fighting crews with whom the 40-man crew came in contact while on fires.

III Building Camp

The first big job confronting the crew upon arrival at Redwoods was the establishment of a camp. Tents were temporarily set up as sleeping quarters. The station's crew house with its kitchen facilities was used most of the season as a mess hall. A temporary office was set up in the Redwood Ranger Station. Latrines were built and used until the bathhouse was constructed.

Work was immediately started on quarters for the men. 14- by 16-foot tents, which would accommodate four men, were used. A good floor was built for each tent, and the sides were boarded up about three feet. The tents were stretched

PLATE II



The bathhouse



Interior of bathhouse

over a light framework. Individual lockers were built in, and steel cots with mattresses were furnished. Sibley stoves, set in sand boxes, were installed in the early fall for heating. As the camp was built in a previously unoccupied area along the Illinois river, it was necessary to clear the land of trees and brush on all the building sites.

Another tent was used as a tool shed. It was set up the same as the living quarters and was large enough to house all the tools, packs, extra fire rations, and miscellaneous supplies. The tool shed was located centrally in the camp ground and adjacent to the truck parking.

The next building to be set up was a study hall. The building used for this purpose was a 16- by 30-foot portable CCC hall, built in sections. It was only necessary to build a foundation for the building and assemble the sections. An office, supplied with telephone and necessary office equipment, was built into one end. This hall was used for all classes, regular meetings, and as a reading room.

A 16- by 42-foot building of similar construction was used for a bathhouse; this building, however, was built entirely by the crew itself. The sections were built in Grants Pass and later assembled on the camp site. Four flush toilets, a urinal, eight showers, two large laundry tubs, and wash racks were installed. Modern plumbing was used throughout, a large septic tank and tile drain system was built, and hot water was furnished from a large, outside wood heater unit.

The last building to be constructed was a 16- by 54-foot

PLATE III



The kitchen and mess hall



Interior of mess hall (kitchen at far end)

Mess hall and kitchen. It was also portable, knock-down construction type. The dining room was large enough to accommodate 46 men. The kitchen itself was equipped with good dish washing facilities, large hotel range, large ice box, and store room. The entire hall was screened and was constructed so that alternate sections of the screened strip could be covered with plywood panels and glass windows in colder weather.

The whole camp was wired, and power was drawn from a local power line. Quarters were wired with a single drop light each. No restrictions were put on the use of appliances and radios that the men wished to use. Three flood lights were installed to light the camp at night for fire call assembly.

600 feet of 1½-inch pipe connected the camp with the local ranger station water supply. Faucets were distributed between tents, and two hydrants with fire hose connections were installed in camp.

The camp was made accessible to the Redwood Highway by construction of about one-fourth mile of graveled road.

In addition to the bare necessities, recreational facilities were constructed and improved. Ground was cleared and leveled for a softball diamond; a volleyball court and three horseshoe courts were set up; a punching bag platform and horizontal bar were set up; and the existing swimming pool was greatly improved by throwing up a gravel dam across the Illinois river just below the camp. The latter job was done

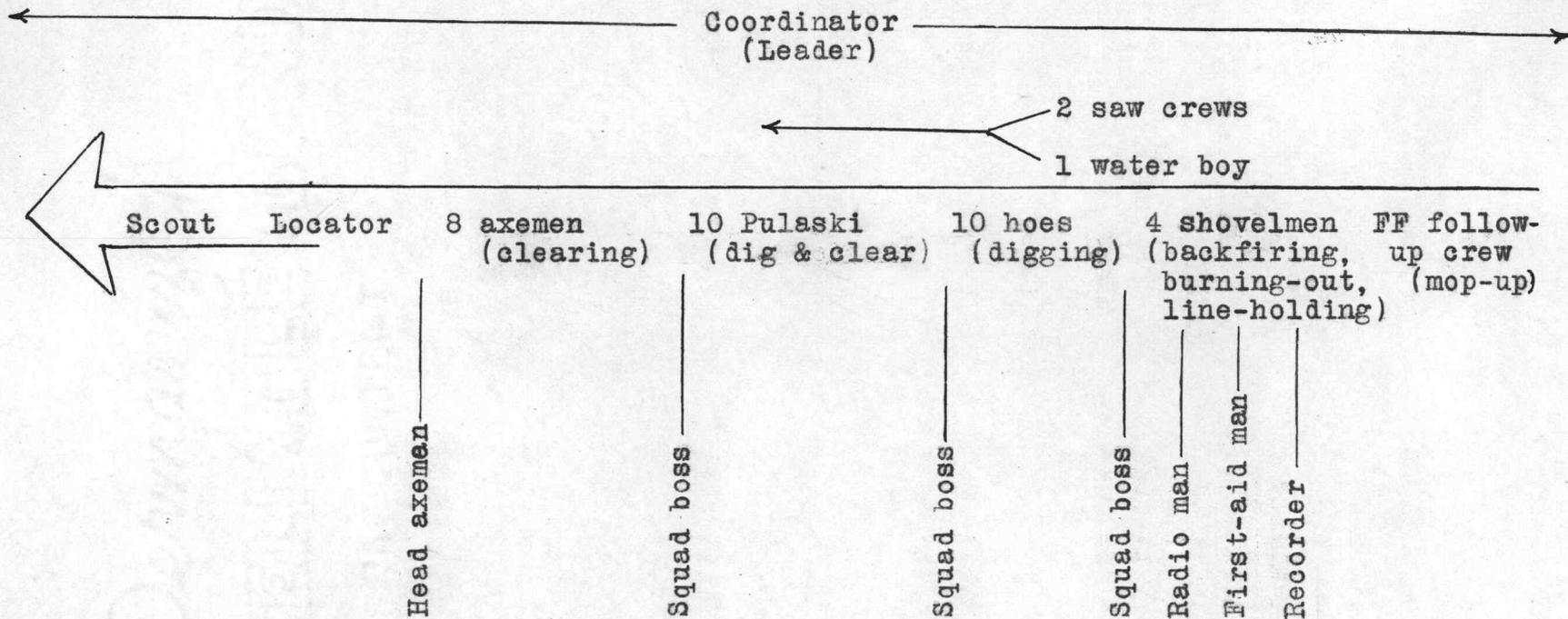


Figure 1. Line Construction Organization of 40-Man Crew

with a bull dozer.

IV Fire Training

By the end of the initial two weeks, plans were made and started in operation for a well rounded fire training program. The early plans called for only half of the crew being detailed to fire training at one time, while the other half worked on the regular construction jobs. This idea was soon abandoned and plans were made for training periods in which the whole crew could take part at one time. Some of these periods were for hikes of one day or more, including work on hypothetical fires, while some were for half day periods near camp. The crew was to be used wherever possible for training purposes on early local fires.

The first problem confronting the crew in the training job was the acquisition of a tool supply adapted to the needs of this particular outfit. Through purchase and exchange with the local forest warehouse the equipment was gradually brought up to a fairly high standard. Regular fire tools were used for training purposes.

Fire training was started soon after the first influx of crew members. Before any training was done, however, it had been decided that an adaptation of the "one-lick" method of fire line construction would be used, and that the crew would be trained to work as a unit in its technique. The system actually used can most properly be called the "progressive method", rather than "one-lick". The regular organization is shown in Fig. 1.

While on fire fighting, the squad bosses were each in charge of about ten men. They were chosen to head up the tool unit to which they seemed most adapted. The head of the axe squad was an expert axeman and could act as head scout when necessary. The man in charge of the pulaski squad was also an expert axeman. The other two squad bosses were both long experienced fire fighters.

The leader, with the aid of the squad bosses, organized the remainder of the crew into the various units to which they seemed best qualified. Two sets of buckers and fallers were picked to fill that roll, and the axe squad was made up of the most experienced axemen. Great care was not so essential in the filling of the pulaski, hoe, and shovel units. With a few minor changes the original organization was maintained throughout the season. It was soon found that the job of water boy was often one of the toughest assignments on the crew, and a practice was made of rotating it among the different members. The radio man carried the radio and stayed in the shovel squad. The first-aid man, who had to carry first-aid supplies, was also detailed to the shovel squad.

At an early date a fire control man from the regional office was assigned to the crew to give lessons in fuel type mapping for men interested in taking the job of recorder in the crew. The recorder was to keep a complete record of the activities on fire and training trips. Classes were also held for men who wished to become radio operators. After the first few training sessions, both a recorder and radio man

were chosen, who filled those positions for the remainder of the season. An experienced first aid man had been hired for that purpose.

All of the training sessions were preceded by an evening conference of leader and squad bosses in which various details of the training session were reviewed and discussed. The squad bosses were encouraged to aid in the organization of training work. Most of the first training periods were opened by the leader with a "chalk talk" before the crew in which he outlined the purpose and objectives of the particular training job.

All of the early training was carried out under conditions which involved no fire. However, a definite pattern of procedure was adhered to in all action taken and the work was always set up around a hypothetical fire. As soon as the crew was organized for fire fighting, each man was given a number and assigned a pack with fire tool. This equipment was numbered according to the man's place in the line, and all the packs and tools were kept stored in numbered order in the supply truck. The crew was divided by numbers into two truck loads and the same men always rode in the same trucks. Besides the supply truck, the crew had two trucks for transportation of men.

An electric siren was mounted on one of the trucks to summon the men. Ten minutes after the siren sounded the men were to be loaded and ready to go. The supply truck usually followed the last load of men, and the leader always rode in the lead truck to direct the route. Upon arrival at the point

where trucks were to be left the men unloaded and lined up in order of numbers, filed past the supply truck, and received their packs from one of two regular men assigned to the job of loading and unloading packs. When the packs were to be loaded the procedure was just reversed.

On training trips in which no hike was to be made, the packs were left at the trucks and only the tools were taken out. Where a hike was made, the packs were carried. A practice was also made of keeping men in order of numbers while hiking. Upon arrival at the point where fire line construction was to start, the men dropped their packs, if they carried them, and kept the necessary tools. Men were then given any further instructions by the leader or squad bosses, and line construction was started. If they were not returning to the starting point, a few men were sent back occasionally to bring up the packs. If necessary, one man could carry three of these packs.

As most of the men were well experienced in the use of the various fire tools, little training in fundamentals was necessary on the line. The greatest part of the training came in the development of the progressive-method technique in which the whole crew would move along smoothly as a unit. On these training trips the scout blazed the line to be followed by the head axeman. The leader acted as a coordinator for the whole crew and gave instructions to squad bosses to be passed on to the individual men under them.

The progressive method of line construction was used from the start, and a wider variance from the "one-lick" method was made as the training progressed. It was found that the finish-

ing of definite parts of the line construction job by each man before moving on was an advantage in time saving and quality of line. If the cutting of a small tree or pole was started by one man, he usually finished it. The hoe men each built short pieces of trail before moving on, rather than simply taking one lick in a place.

The objective was to keep every man working and properly spaced. An arbitrary interval of 20 to 60 feet between men in line was set at an early training period. This spacing worked well from the standpoint of efficiency and safety. When men got closer than the minimum, the one ahead moved up to a new position, and when wider gaps than 60 feet developed, the man ahead continued to do more work along one section to let the rear one catch up.

No passing in line was permitted, and each man held his numbered position at all times. The head axeman was under a certain pressure all the time in simply finding the best line location along the blazed route. The other axemen followed him up, the first ones chopping only enough to allow them to get through. The rear axemen and head pulaski men widened the clearing to the full width. Part of the pulaski men, depending on fuel type, worked as trenchers; and the hoe crew was responsible for a finished line. Shovel men worked in line widening and finishing, when they were available; but they were held mainly for the backfiring and burning-out job for which they were responsible on real fires.

The snagfallers and buckers worked along with the shovel crew, behind the whole crew, or on any particular job to which

Name of fire _____ Forest _____
 Sector _____ Date _____
 Kind of crew ⁽¹⁾ _____ Condition ⁽²⁾ _____ Observer _____

Log of the Day		Explanation
Hours of sleep: ⁽³⁾	Crew awakened:	
Meals: ⁽⁴⁾		
Travel to fire:	Left camp - - - - Time:	
	Auto- - - - - Time: ⁽⁵⁾ Miles:	
	On foot on trail- Time: Miles: ⁽⁶⁾	
	On foot no trail- Time: Miles: ⁽⁷⁾	
Began work on fire: Quit work on fire:		
Travel to camp:	On foot no trail- Time: Miles:	
	On foot on trail- Time: Miles:	
	Auto- - - - - Time: Miles:	
	Arrived at camp:	

Crew organization:	No. men	No. hrs. worked on fire	Total man hrs.	Tools
<u>Construction</u> ⁽⁸⁾				
Overhead ⁽⁹⁾ - - - - -				
Laborers - Clearing - -				
- Digging ⁽¹⁰⁾ - -				
- Sawyers ⁽¹¹⁾ - -				
- Machine op. ⁽¹²⁾				
- Other (not SOS)				
Total - Construction - - -				X X X X X X X X X X
<u>Burning out and holding</u> ⁽¹³⁾				
Overhead ⁽¹⁴⁾ - - - - -				
Laborers - - - - -				
Others - - - - -				
Total - Burning out&holding				
GRAND TOTALS				

Total chains of line produced by above construction work _____; chains per man hr. _____
 Method used: _____

One lick, or other (explain) ⁽¹⁵⁾
 Total chains of line burned out and held by above work _____; chains per man hr. _____

Chains per man hour constructed and burned out and held: _____

Time and length of rest periods: ⁽¹⁶⁾ _____

Remarks - Special conditions affecting production of line: _____

Figure 2 (See reverse side for instructions)

INSTRUCTIONS

Use this form to summarize crew activities and performance on one unit of fire line. Start a new record each day, or during a day whenever there is a material change in the size of the crew or its organization or whenever there is a major change in cover type that will affect the crew for several hours. (Example: Passing from snags or brush into green timber.) A chain-by-chain tally of the same unit of fire line must be made on sheet B and the two forms must be identified as one report. (These forms are intended for use in studying line construction with hand tools. Make a separate report of tractor line construction.)

The following instructions refer to the numbered items (1), (2), etc. on the front of the form:

1. Show whether the crew was made up of CCC, loggers, etc., and give details in "Remarks" if necessary.
2. State whether men were "fresh" or "tired", etc. at the beginning of the work period.
3. Record the average number of hours the laborers slept in the 24 hours before the beginning of the work period.
4. Record the time of day all meals and lunches were eaten before, during, and after the work period.
5. Record travel time in hours and fractions to nearest $\frac{1}{4}$ hour.
6. Pace all distances the crew travels on foot (surface distance) and record to nearest $\frac{1}{4}$ mile.
7. Use the "Explanation" or "Remarks" space to record waiting time or lost time not accounted for in travel time or work on the fire.
8. Line construction includes locating, clearing and digging a line to stop the spread of the fire or from which to burn out or backfire. Includes cold trailing. Does not include trails built for no other purpose than to facilitate the movement of the crew.
9. Includes the crew boss, line locator, squad bosses, and other overhead who contribute to the construction of the line. Does not include radio men, cooks, packers, etc.
10. When dual purpose tools such as the "Pulaski" are used, estimate and distribute the time between clearing and digging.
11. Fallers and buckers.
12. Operators of small machines only. Examples: Bosworth trencher; power saw.
13. Burning out and holding (or holding when direct method is used) the line after it is constructed. Usually this job does not last for more than a few hours after the line has been burned out and the job is terminated when the fire is dying out along the edge or the mop-up crew takes over.
14. Include only the overhead contributing to this operation. It may be necessary to prorate the overhead between "construction" and "burning out and holding."
15. Show the total number of chains of line successfully worked by the burning out and mop-up crew. (See 13 above for specifications of the job.)
16. Record time of day and length of rest periods including time spent in eating lunches on the job; thus, 10:10-10:22 a.m. Do not subtract lunch or rest periods of less than 30 minutes from the hours worked. Rest and lunch periods of more than 30 minutes should be deducted.

they were assigned.

The pulaski crew, being in the center of line building activity, was exceptionally well adapted to taking up slack under varying type conditions. In heavy brush most or all of the pulaskis could be used as axes, and under light brush conditions they were used as trenchers and worked along with the hoe crew.

The recorder followed the crew at his convenience after line construction had started, but he had his regular place in line on hikes. Fig. 2 represents the form on which line production records were kept. In addition to this current record, he also kept a complete diary of the crew's activities from the time they left camp until they returned. He was hired as an extra man on the crew and his full time could be spent in this work when necessary. His time in camp was spent in organizing data from the crews trips, whether training or fire.

In training sessions, the objective was toward the highest development of the progressive method in quality of line and production of line per man. Each member was made to feel his responsibility for the completion of a definite part of the line. Emphasis was placed on maintaining a smooth progression in which all men were working to capacity rather than a line in which part of the crew was working to the relief of others. The impetus of the team-work idea in a rapidly moving line seemed to create enough interest to keep most men doing their part at all times. Rest stops of five to ten minutes for the whole crew were made at about one-hour intervals. Men carried

lunches in sacks tied to their belts; and, if work continued for more than one-half day, about one-half hour was taken out for lunch.

Whenever possible, the line construction was reviewed by the leader, as he took the men back over the line and pointed out various flaws and possible changes in location or construction. Discussions on technique were always held in the field upon completion of the construction work, and sometimes special meetings were held in camp for this purpose. Actual fires were the best training, and after the first of these had been experienced, special meetings were held in camp in which the men could discuss these fires fully.

V Presuppression

The 40-man crew was organized primarily as a fire suppression unit, and the completion of work projects was of secondary importance. It was, of course, absolutely essential that the crew be ready for fire at a moments notice. This required the construction and maintenance of telephone lines to work projects away from established telephone lines, and trucks and fire packs were kept in first class shape at all times.

It was necessary to build several miles of line to the road and bridge project. Another line was built to take care of a crew which cut the camp wood. A man was kept at the telephone when no one was working near the set. A line was also extended from the ranger station to the camp office. Extension bells were mounted on the roof of the office and left connected when no one was in the office, so that rings

Table I -- Tools Carried and Used by the 40-Man Crew.

Number	Item	Weight in pounds each
4	Axes, cruiser's	2 $\frac{1}{2}$
6	Axes, swamping	3 $\frac{1}{2}$
10	Pulaskis	3 $\frac{1}{2}$
10	Hoes, hazel	3 $\frac{1}{2}$
10	Shovels, baby	2
12	Fusees	1 $\frac{1}{2}$
2	Saws, falling w/ handles	10
1	Bag, back-pack w/ pump	6 $\frac{1}{2}$
4	Axes, falling	4
2	Oil cans, 1-pint	1
4	Wedges, wooden	1 $\frac{1}{2}$
10	Axe stones, carborundum	1 $\frac{1}{2}$
10	Files, 10-inch	1 $\frac{1}{2}$
4	Bags, water, 2 $\frac{1}{2}$ -gallon	1 $\frac{1}{2}$
1	Bag, water, 5-gallon	1

Table II -- Contents of Average Pack.

Number	Item	Weight in pounds
1	Packboard, Trapper Nelson	5 $\frac{1}{2}$
1	Head-light w/ 3 extra batteries	1 $\frac{1}{2}$
1	Canteen w/ water (to carry on belt)	2 $\frac{1}{2}$
1	Sleeping bag	5 $\frac{1}{2}$
2	Lunches (in cloth sack to hang on belt)	1 $\frac{1}{2}$
1	Ration, 3-day	11
	Cook and mess outfit or extra equipment	2
	Personal effects	2
	Tool, fire (average weight)	4
Total weight		35 $\frac{1}{2}$

could be heard some distance from the office, as they came in.

As the same tools were used for training and actual fire fighting, they had to be put in shape as soon as the crew returned from a trip. Often the men had some extra time after returning from a training session and put their own tools in condition. Otherwise, a few men were detailed to this job. Table I gives a list of tools carried by the crew.

Two truck drivers were assigned to each truck on long trips, but only one man was responsible for maintenance of each truck. Each driver was required to keep the truck assigned to him clean and serviced and to order parts or make any necessary repairs as needs arose. As the trucks were new, there was little maintenance other than regular servicing. The same trucks were used for both regular project work and for fire trips.

The individual packs were kept fully supplied at all times. The packs themselves were mostly pack boards of the Trapper Nelson type and of the medium size. A few Trader Horn and Yukon pack boards and a few packsacks were also used. The men showed varied preference as to pack board types, but no preference was shown for packsacks over pack boards and the packsacks were gradually discarded as new pack boards were obtained. Table II shows the contents and weights of the contents of the average pack. Most of the men kept their packs supplied with a few personal articles, such as socks, soap, towel, etc. Some of them carried a few extra clothes in their pack, but most of them kept these articles handy in their tent, packed them in a small duffle bag on the truck,

Table III -- Ration List, 1-man 3-days.

Item	Weight in pounds	Calorie content
Eggs, powdered	$\frac{1}{2}$	1,330
Cervelat	1	1,800
Bacon (canned)	1	2,600
Soup, concentrate	$\frac{1}{3}$	2,500
Potatoes, dehydrated	$\frac{1}{3}$	1,800
Rice	1	1,600
Apple concentrate	$\frac{1}{3}$	1,500
Sugar	$\frac{1}{3}$	900
Tomatoe juice	$\frac{1}{3}$	100
Hard tack	1	1,600
Coffee	$\frac{1}{4}$	-----
Lemon drops	$\frac{1}{3}$	850
Anchovy paste	$\frac{1}{8}$	600
Dates	1	1,600
Figs	1	1,400
Salt	$\frac{1}{8}$	-----
Butter (canned)	$\frac{1}{3}$	3,500
Milk, powdered	$\frac{1}{3}$	2,300
Total	11	25,980

Table IV -- Desirable Substitutes for Ration.

Item	Weight	Substitue for
Dried beef	1 Lb.	Cervelat
Lemon juice	12 Oz.	Tomatoe juice
Grapefruit juice	12 Oz.	" "
Raisins	12 Oz.	Dates
Cheese	8 Oz.	Anchovy paste
Peaches	1 Lb.	Figs
Apricots	1 Lb.	"
Spaghetti	2 Lb.	Rice
Oatmeal	2 Lb.	"

and left the bags with the supply truck while they were on the fire. A change of clothes was almost a necessity on a few extended trips.

Throughout the summer, continual experimentation and trial was carried on to find the lightest and most palatable dry ration to be carried in the fire packs. On nearly every trip one or more new articles were tried. Some were objectionable to the taste of the men; some were found to be so low in nutritive value that they were not very desirable; and some were too perishable. Of course, it was essential that the ration be fairly well balanced.

The packs were supplied at camp with a 72-hour ration, and under test it was found that this limit could be stretched a day or more in emergencies. As it was soon found that individual selection of food articles did not usually result in a balanced ration, it was necessary to put up standardized rations for each pack and then let men make additions of their own, if they desired. Some opportunity was given for substitution. Canned bacon, canned butter, and a few other articles, which were put up in larger than individual portions, were not carried by all men, but different men carried different articles and pooled their supplies when meals were prepared on the fire line. A very substantial and acceptable ration was worked out as the season progressed and is shown in Table III. A list of articles which might be added or substituted and for which a number of men showed preference is shown in Table IV. On all fires on which the crew worked, in

PLATE IV



Fire pack contents (sleeping bag not shown)



Loading for a fire trip

addition to the dry rations, they started with two lunches, obtained either at camp or on the road.

A substantial supply of ration material was kept on hand in camp at all times to immediately replenish the packs upon return from a trip. As many extra supplies as possible were also carried in the supply truck to restock the packs when the opportunity was afforded on fires. Upon return to camp the packs were opened and all used or damaged stock was replaced from the supply kept in camp.

VI Suppression

A comparatively elaborate dispatching system was used because of the necessity for availability of the crew any place in Region 6. The crew was always subject to call directly through the regional office. As originally planned, employment was to be limited to Class "C" fires. However, when Class "C" fires requiring the services of the crew developed within the Siskiyou National Forest, the Siskiyou office was given authority to handle the crew entirely as it saw fit without preliminary instructions from the regional office.

On fires in any of the forests of the region, except the Siskiyou, dispatching was handled through the regional office. The forest wishing the services of the crew called the regional office and stated their situation. If the fire was bad enough, the crew was sent at once, unless it was employed on a more serious one. Where conditions were such that immediate action of the crew was not absolutely needed, but where there was possibility of future developments, stand-by was called.

Stand-by was often ordered when such fires were burning in different sections of the country at the same time. When it had been decided to send the crew to a fire, the regional office called the forest supervisor, and he in turn called the crew.

As soon as a fire call was received at camp the men were called together and preparations were made to start. Sometimes they were out on the work projects and had to be called in. If they happened to be in camp, the siren was sounded. In several cases the crew was notified of the possibility of a call and had lunches ready and were standing by for the final call. When calls were received just before meal time, the men were usually given time to hastily eat a meal. This was an actual saving in time on the road and gave the kitchen help time to set up lunches to be taken on the trip. Just prior to starting, the siren was always sounded to assemble the men at the trucks, where they loaded, got any further orders, and were checked to make sure that all were present.

It was found through trial that the trucks were adequate transportation up to about 200 miles, but on the longer trips the men needed the comforts of busses to be in the best shape for hiking and work upon arrival at the end of motor transportation. Three new $1\frac{1}{2}$ -ton, stake Chevrolet trucks were supplied. One of these was used for hauling supplies and was taken to every fire regardless of distance. It traveled with the men when they were transported in trucks and independently when busses were used. The other two trucks

carried 20 men each and were equipped with removable sets of old buss seats. These trucks were quite satisfactory for all short trips and were used exclusively on all of the Siskiyou fires.

For several reasons the practice of using busses for long trips was adopted. In the first place, the men were given an opportunity to rest up enroute. Often the fire call came after the men had finished a strenuous day on one of the projects or had just been relieved from one fire to be taken to another on a different forest. For another reason, the two truck drivers, regularly assigned to each truck, were given a chance to rest up with the other men and were relieved of the strain of driving while tired. Although travel by special bus was a little more expensive than with trucks, the busses could make better time on long trips.

As far as was practicable, the comforts of the men were taken care of enroute to and from fires. On long trips arrangements for regular meals at restaurants were made by telephoning ahead to forest offices enroute and letting them make final arrangements at restaurants in their city; or, as in some cases, arrangements were made by telephoning directly to the restaurants themselves. Hotel facilities were likewise scheduled, when the crew was transferred long distances from one fire to another.

The supply truck was always taken as far as possible; and, when the crew had arrived at this same point by bus or truck, the packs were unloaded and the procession toward the fire was immediately started. One of the camp flunkies traveled with

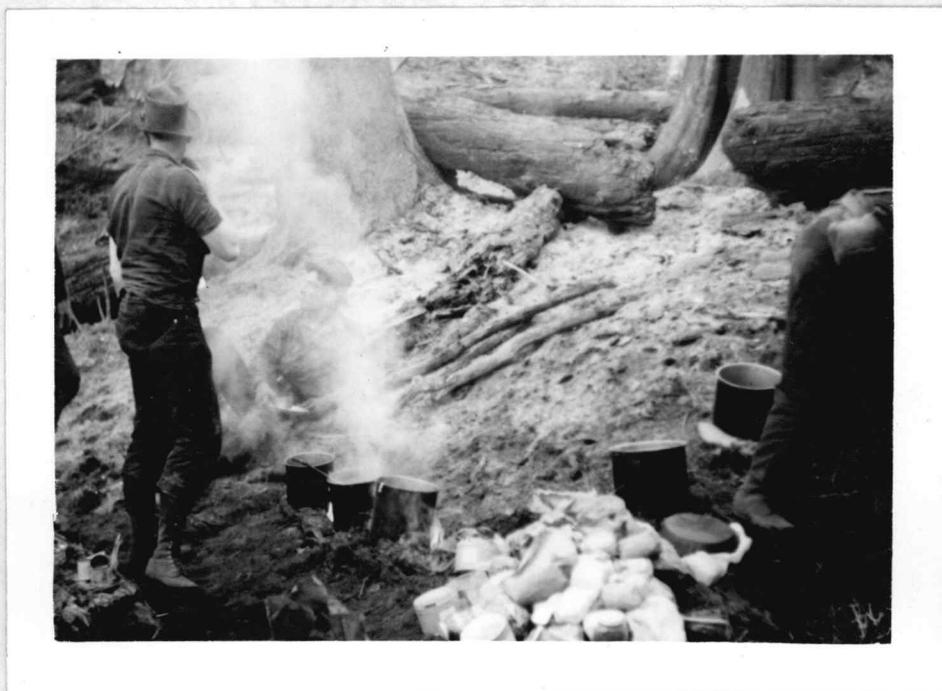
the crew and stayed with the trucks when they were on fires.

The first man in the regular line received his pack first, and the others received theirs in consecutive order. If lunches were carried, these were handed out with the packs. Each man, after receiving lunch and pack, immediately joined the line and started the hike. The well established practice of going as far as possible at night was strictly adhered to; and, when the hike was not made in the daylight hours, an effort was made to go far enough that the crew could be at the point of attack by daylight. Where the crew arrived in the vicinity of the fire at night and only a short hike was necessary, they were bedded down at the trucks and started before daylight in the morning.

The ease of mobility of the 40-man crew proved to be one of its greatest advantages. All the necessities of the men were carried by them, and a camp could be made or broken in a few minutes. Flashlights of the head-light type were used, and travel could proceed at night as well as in the daytime. The men, without exception, were good hikers and knew how to take care of themselves on the trail. On long hikes, depending on terrain, a steady pace of about $2\frac{1}{2}$ to 3 miles per hour was set by the leader, and regular rest periods of five or ten minutes were made about once an hour or oftener in steep country.

"Camp", as used here, means simply a place where the crew assembled to bed down and cook a meal. No elaborate camp was made in any case. Each man fixed a place for his own

PLATE V



Cooking on fire line



Radio on the line

bed. One or two fire pits were dug out and rocks were roughly set on either side to hold the large aluminum kettles carried in part of the packs.

Several of the men were capable fire cooks, and usually two or three men volunteered to prepare the meal. When the meal was to be prepared, the "cooks" collected from different men the articles needed to make up the meal. Each man carried plate, cup, knife, fork, and spoon as personal mess. When meals were prepared, they were announced and the men filed past the fire and helped themselves. One or two men were selected the night before to prepare the morning meal. Usually, when the crew was working on fires, two or three of them were relieved late in the afternoon to set up a camp and prepare an evening meal. The leader usually picked the camp spot and had the packs moved to that point.

Men were individually responsible for the preparation of their own noon lunches from the ration they carried, after the prepared lunches had been used up. Several articles suitable for ready consumption without cooking were carried. Lunches were carried in small cloth sacks tied to the belt and were eaten on the line during rest periods. Individual army canteens were carried by each man. This water supply on the line was supplemented by several large canteens carried by one or two men acting as waterboys. On one fire water was dropped by plane.

The crew was self-sustaining for a minimum of 72 hours on the rations it carried. If the men were required to

work much longer than this period in back country without access to a food supply, rations for extended periods were brought in by FF or CCC packers, pack stock, or by airplane, depending upon the particular circumstances.

However, on all of the larger fires on which the crew was kept for extended periods, it had occasional access to regular fire camps. Whenever it was possible to use established fire camps without reducing the effectiveness of the crew, these camps were used. Rations were thus saved, as was time in preparing meals. Seldom more than one or two meals were eaten at any one fire camp, but on several occasions lunches to be taken with the men were obtained at the camps.

It was imperative that the crew keep in fairly close contact with Forest Service overhead on the fire. The crew was always sent into the most inaccessible sectors of the fire and did not return to any established camp at night. They also worked more or less independently of other crews in pushing line around hot sectors and into unworked areas. Radio was, therefore, the usual means of contact. On most fires, the regular scouts with radios maintained contact between the 40-man crew and the fire overhead. They often stayed over night with the crew and sent and received messages for it. They also aided somewhat in keeping the crew posted on conditions of the fire and activities of crews on other sectors. When no other radio was available, the crew radio was set up and operated by the leader or the regular radio man on the crew. No schedule was maintained by the 40-man crew, and difficulty was often experienced in making contacts

with base camps.

For the most part, the operation of the crew in line construction was the same in principle as that described under training methods. The leader, of course bore the brunt of responsibilities for the crew as a whole, and the scout and squad bosses shared a few extra responsibilities within the crew. The leader received and wrote all messages and, to the best of his ability, maintained contact with fire overhead. A great part of his time was spent in scouting the fire far ahead of the line construction. When he was with the crew, he acted as a coordinator for the various units, worked ahead of the head axemen part of the time as locator, and did actual work on the line where his service was needed on hot spots. He also had the responsibility of seeing that the line was being held behind the burning-out crew until the line could finally be taken over by other crews.

The scout, when not engaged in scouting duty, was head axeman in the line. When no regular fire scout was available on the sector which the crew was working, and when the crew leader was engaged elsewhere, this man spent most of his time in scouting out the fire ahead of the crew.

The boss of the axe squad kept his position at the head of the line as locator. The other squad bosses were held individually responsible for the work of their squads. After the training season, however, little supervision from the squad bosses was required, and under ordinary conditions they built line along with the other men. They occasionally got together to discuss the proper placement of the line.

When extra men were needed to hold hot spots, they were taken out of the various squads and sent back. The leader often conferred with the squad bosses before making his own decisions.

The responsibility placed on the various squads themselves was the same as described in the training program. The axemen were always kept busy in all cover types. Where chopping was heavy, they were worked to capacity to keep ahead of the men behind them; and, where chopping was light, they did as much clearing as possible to allow more pulaskis to help in trenching. The pulaski squad took up the slack in all types by doing much of the chopping, where chopping was heavy, and by doing trenching mostly, when chopping was light. The hoe crew was responsible for a completely trenched line. The shovel crew followed on the trenched line as fast as burning-out could be accomplished. It was necessary in all cases for the crew to hold its own line until it could be taken over by another crew. The duties of the recorder were the same on fire as in the preseason training. When lines on a sector were completed, the recorder sometimes helped in burning-out and in patrolling burned out line.

The falling and bucking crew worked where their services were needed most and as directed by one of the squad bosses or the leader.

Before very many fires had been fought it was generally conceded by Forest Service officials who had seen the crew in action that it was by far the most effective and versatile unit yet developed for combatting the types of large fires with which Region 6 had to cope. It required no overhead and camp set-up and could be rushed directly to the head of

the fire as soon as it arrived on the forest. The men were capable of doing a creditable job of fire fighting, even after making long hikes into very rough country. Their individual training made each of them readily adaptable to taking the lead in line construction, in cases where all men, including squad bosses, had to build line to keep ahead of the fire. In most cases the crew was assigned to the hottest parts of the fire, and, as the hot spots changed, the crew was shifted from one sector to another. Night travel, early breakfasts, and late dinners were common occurrences.

In some situations, the most effective line production was attained by splitting the crew into two equal units, with usually two squad bosses to each unit. When this was done the men were divided by odd and even numbers, the even-numbered men making up a crew that would go one way and the odds making up a crew that would go in the opposite direction from the point of attack. This practice worked well in cutting off dangerous points of the fire. The crew could thus begin on the hottest spot early in the morning and work both ways toward less hazardous country.

The smaller crews worked to advantage also in building line through low-resistance-to-control types. The advantage here was due to less walking time and more actual time on line construction than where all of the forty men were traveling over the same line. On different occasions the crew was split into several units with a good distribution of tools to hunt out and control dangerous spot fires.

The crew readily adapted itself to the different forest

types in which it had experience. The most impressive work was probably accomplished when the crew was worked as a single unit in the heavy-resistance-to-control brush types of the Siskiyou. However, in this type there was usually extra heavy axe work, while trenching was a simple matter of scraping the accumulation of leaves to one side of the line. With proper moisture conditions burning-out in this type was always very successful. In second growth and old growth fir types, where the debris on the ground was heavy, the line construction force was weakened somewhat by the need for dropping off more than the regular number of men to hold line.

In pine types the progressive method of line construction worked fine. On low-resistance-to-control types the crew worked to advantage when divided into two units.

On one large fire in the lodgepole pine type of eastern Oregon, spot fires were in constant need of attention. A large part of the crew's success on this fire was attributed to the close checking of these innumerable spot fires.

Contrary to the original plans for making the crew exclusively a line building unit, on nearly every fire they were required to hold their own line from a few hours to a whole day or more in the absence of FF or CCC labor to back up the line. This condition reduced the effectiveness of unit but saved line that might easily have been lost, if it had not been held by the crew itself, or if it had been turned over to insufficient line patrol from other crews.

By far the greatest weakness of the 40-man crew organization was this very condition. After completing a day's

work on the line, rather than to lose line, they were often held there and prevented from obtaining needed rest until late at night, when the chances of losing the line were not so great. When this practice was continued for very many days in succession, it markedly reduced the morale and efficiency of the men.

It was found, after experience on two different fires, that the outfit was very effective on mop-up. On the east side of the Saddle Mountain fire the crew worked one day on mop-up after the fire had been partially corralled. In this instance the fire had burned itself out in green timber, and there were numerous, smoldering spot fires and some of the main fire front still burning. The crew was split up into four squads, each under a squad boss and composed of men from axe, pulaski, hoe, and shovel squads. The different groups, working independently, hunted out the spot fires, put lines around them, and in most cases dug the fire out and extinguished it with dirt. The same thing was done with any portions of the main fire front that were found burning. The remainder of the front was simply "cold-trailed" and left as dead fire line. No continuous line of any length was built, and each small fire that was found burning was worked on by the squad who found it until it was well trenched and usually out. Several miles of broken fire front were thus covered in one day, after another large crew of fire fighter, had started to build an elaborate continuous line around this sector.

The crew later worked four days on the other side of this fire under similar conditions of green timber and low

Table V -- Held Line Production, 40-Man Crew 1939,
Compared to Region 6 Standard.

Fire	Resistance to control rating Chains			Total line worked		40-Man Production Held line per man-Hr.	R-6 Standard Same held line per man-Hr. Chains
	Low	Med.	High	Chns.	Hrs.	Chains	Chains
Horseshoe Bend	51	42	19	112	67.4	1.66	0.53
Wheeler Creek	15	25	22	62	46.5	1.33	.45
Saddle Mountain (East side)	55	30	9	94	87.1	1.08	.62
Willard	32	20	7	59	42.5	1.39	.56
Eagle Creek	40	124	63	227	319.8	.72	.42
Big Cow Creek	97	39	4	140	100.5	1.39	.73
Total or average	290	280	124	694	663.8	1.04	.51

Table VI -- Cost Distribution for 1939 Crew

Overhead	\$ 2,642
Subsistence	5,491
Camp construction and maintenance	6,245
Fire training	1,082
Fire suppression	6,742
All labor, transportation and miscellaneous costs on road and bridge construction	8,712
Total	<u>\$30,914</u>

rate of spread. In this case, however, the axe crew was given liberty to go ahead independently of the remainder of the crew. The main objective was to get a trail through the heavy underbrush, so that the remainder of the crew could come through later, build trench where necessary, and do general mop-up work. A few pulaskis and shovels were used with the axe squad to cool down spots that needed immediate attention. Very little line was actually built on this sector, but several miles were made safe enough to leave to FF patrolmen, and the sector was completed before bad fire weather again developed.

At the end of the fire season the records on the various fires on which the crew worked were organized and several computations were made to set up some measures of comparative efficiency for the crew over the season. These measures included rate of line production in comparison with rates of other crews and costs of line production in comparison with costs of other crews.

The 40-man crew held-line production record was compared to the Region 6 standard by computing the time taken by the 40-man crew to build the sum of the various lengths of line in the different resistance-to-control types and computing the comparative time that would be taken by Region 6 standard for the same length of line in the same resistance-to-control types. This comparison is shown in Table V, where it is reduced to a comparison of chains of held line production per man-hour. It was based on only six fires, as data on the others were not sufficiently accurate to be used. In all,

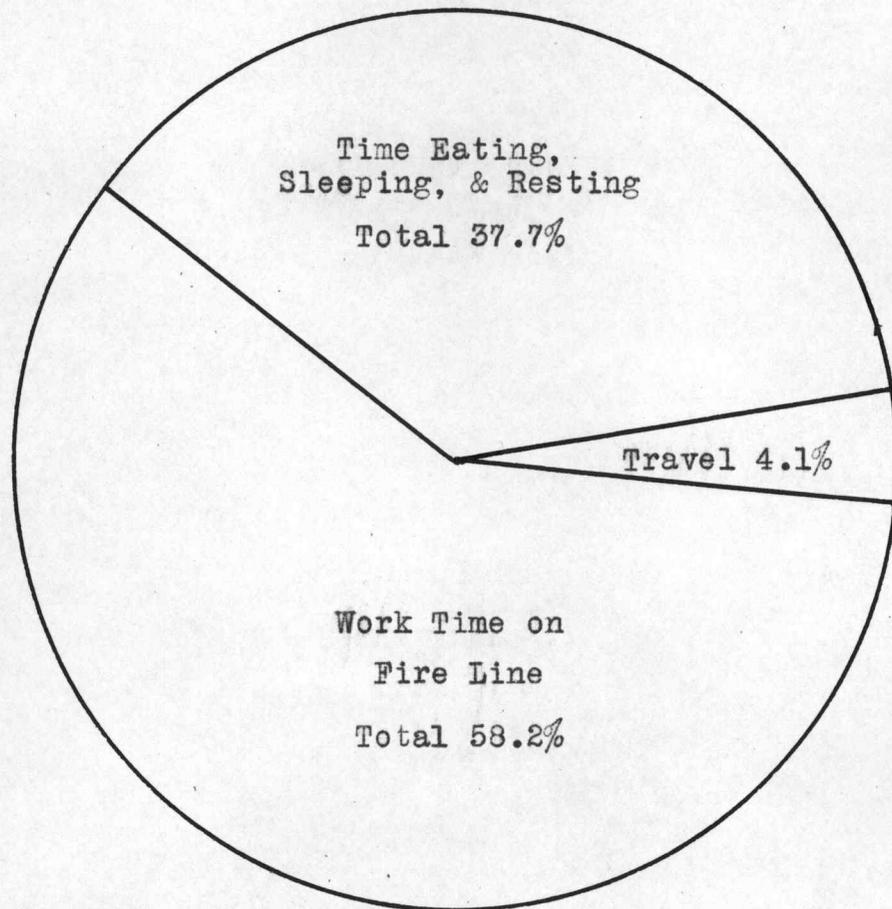


Figure 3 Time Distribution of 40-Man Crew on Fires.

over 28 miles of line were worked in 1939, besides a large amount of unrecorded line on spot fires.

In further comparing the work of the crew, it was found that the 40-man crew had an average production of 0.34 chains of held line per man-hour, as compared to an average of 0.07 chains of held line per man-hour for large crews working on fires of over 300 acres in Region 7 over the period 1936-1938. This figure of 0.34 and 0.07 chains per man-hour is considerably less than in the first comparison, as time on line holding, burning-out, mop-up, and all travel time on the fires is included, in addition to the actual time in line construction.

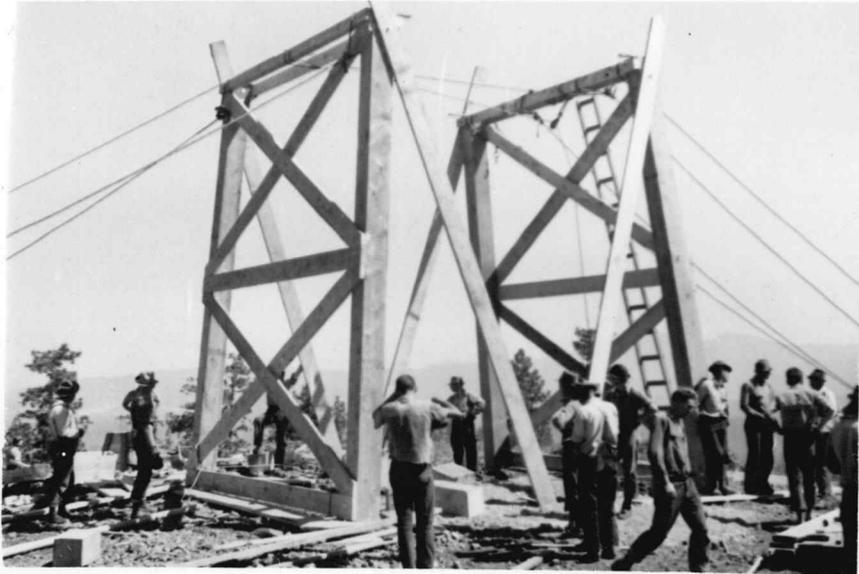
It can be seen from these comparisons that the 40-man crew's average production was more than double the Region 6 standard and about five times the actual average production for large crews employed on all large fires of the region during the previous three years. It should be noted here, also, that the 40-man crew was at somewhat of a disadvantage in such comparisons because it was dispatched to the farthest and usually the roughest sectors of every fire. In such cases the factor of fatigue and travel time is greater than average. In other cases, the crew was used chiefly for holding of dangerous sectors of line, in which periods little line production would be recorded.

One of the biggest advantages this crew had in production over other crews was in its ability to sustain itself on remote sectors. Walking time, as well as the resultant fatigue factor, was tremendously reduced, once the crew was established on a particular sector. The time chart, Fig. 3

PLATE VI

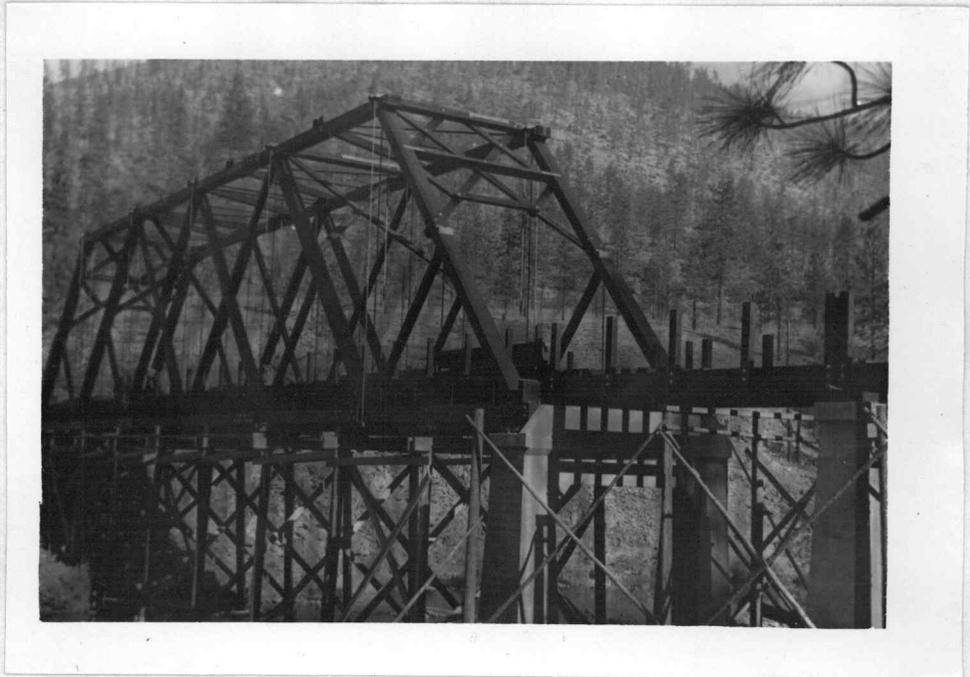


Throwing up dam for swimming pool



Erecting lookout tower

PLATE VII



Josephine Creek bridge under construction



Jackhammer at work

As on fire suppression, the crew was, for the most part, kept organized under squad boss units on all projects. Until the greater part of the camp was completed, one squad boss, who was an experienced carpenter and general construction man, worked a crew on camp construction. Another squad boss, an experienced road man, was put in charge of the road project. The remainder of the crew worked under the other two squad bosses on the bridge or road, depending on where they could be worked to the best advantage. No attempt was made to keep any definite number of men under each squad boss on construction work, but rather, the squads were adjusted to fit the needs of the jobs being performed. On any particular day the number of men on the various squads might range from four men in a squad delegated to maintain fire packs after a fire, to perhaps 15 or more men under the man in charge of road work. There was often enough work around camp to keep one or two men busy on camp improvement, maintenance, and wood cutting jobs. Due to the experience and dependability of the men hired for the crew, close supervision was seldom a problem.

The recorder spent most of his time on office work when he was not on a fire. He kept a complete diary on the fires and wrote it up in a presentable form upon return to camp. All of the fire-line production record sheets were carefully gone over and final computations completed in the office from data recorded on the sheets in the field and from the fire diary.

PLATE VIII



Framing timbers for 60-foot stringer bridge on
Eight Dollar Mountain road



Small stringer bridge under construction

One man was engaged full time as purchasing agent and accountant. Another put in nearly full time as stenographer and timekeeper and aided the accountant on monthly reports. The leader, when not in the field, was usually kept busy in the office on correspondence, report writing, and preparation of various plans on personnel management, presuppression, suppression, and construction projects.

The office work was comparatively complicated, as reflected in the large office overhead. The project was new and an experiment from the beginning. An accounting system had to be set up and adapted to the needs of the project. Camp development, presuppression, suppression, and work projects were each broken down as far as possible into various jobs, and each job was set up as a separate project in the accounting system to facilitate later determination of their relative costs in the whole 40-man crew project.

As the crew was subordinate to the supervisor, his office made approval on all large purchases, handled the assembling of the payroll from time slips turned in from the crew office, issued bids for subsistence supplies, bought large orders of staple supplies on such bids, purchased practically all materials used in construction work, and furnished all the tools and materials in the fire suppression and presuppression supply.

Quite a large part of the subsistence supplies was bought directly by the crew's purchasing agent from local merchants. Invoices for such purchases were forwarded to the supervisor's

PLATE IX



Ripper at work



Bank sloping

office, through which payment was made to the merchants. Duplicates of all purchase orders made by the supervisor's office were forwarded to the crew office, and the same cost accounts were kept by both offices and periodically checked against each other.

Regular rental rates were charged by the Siskiyou Forest on all trucks and road machinery used by the crew, but no gasoline or oil was charged to the crew. Gasoline and oil used by the crew, while at Redwood Ranger Station, was taken from the station's supply and was simply recorded and the record forwarded to the supervisor's office. Oil company credit cards were used on fire trips, and the settlement on these purchases was handled entirely by the supervisor's office. Costs for the crew are shown in Table VI.

VIII Camp Life

Discord, due to working conditions at the camp and on the road and bridge projects, was almost entirely absent. Regular Forest Service regulations were followed in establishing working hours on the projects and in holding the men in camp, when not working, during the fire season. Eight-hour days were maintained straight through the season on project work, with four hours constituting a day on Saturday and six days constituting a week. Very little annual leave was granted during fire weather, but later in the fall accumulated leave was granted, as far as possible, at the convenience of the men.

When the men were hired, they knew that they had to possess a number of high physical qualifications and, also,

that they must train and be prepared at all times for strenuous fire duty. Soon after the crew arrived at camp, a set of rigid camp regulations was made up and posted. These regulations stated the hours of work expected on work projects, as well as on fires, hours on duty subject to fire call, requirements for uniforms, and rules governing personal habits and conduct.

It was decided that the men should wear a uniform of good appearance but one which would be serviceable in fire fighting. The men were allowed to choose their own uniform and selected forest green trousers and shirts and red crusher hats. This outfit was found to be very comfortable and suitable for camp use and light labor but did not stand up under the hard wear of fire fighting. After a few fires, most of the men turned to overalls and hickory shirts for this work. The red hats proved very distinctive and with the hickory shirts and overalls made a very serviceable and appropriate outfit. Many of the men found that a good quality, composition-soled shoe was much more comfortable than caulked boots, was considerably cheaper, and lasted nearly as well as the caulked boots in this kind of work. A quite general practice on long trips was to wear the light, green clothing on the trip to and from the fire and to carry the heavy clothes in a duffle bag.

A close check was always kept on men leaving camp. Except in emergencies, no one was allowed to be far enough from camp that he could not get back and be ready for travel in ten minutes after the siren had been sounded. Men were

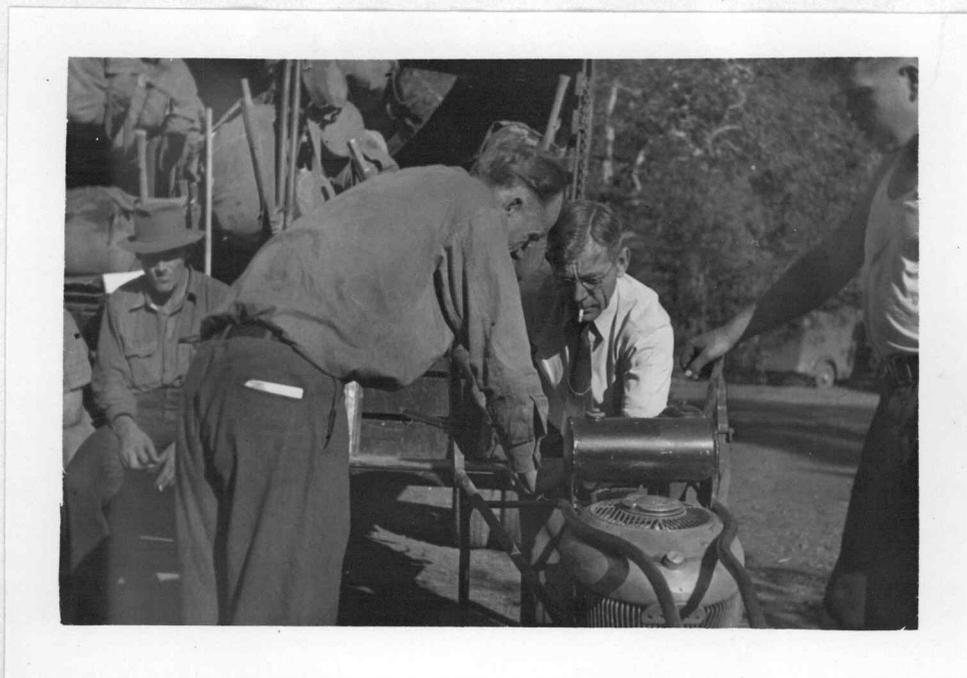
allowed to make short business trips to the local town. Although the town was within one-fourth mile of camp and within range of the siren, men were required to sign out when they left and check in when they returned. Only a limited number of men were allowed to go on any one evening and a different group went on different nights of the week so that all men had the chance to go at least once a week.

They were required to attend all meetings held for the benefit of the whole camp. During most of the season, when the crew was in camp, general meetings were held about once a week. All of these meetings were kept very democratic and were held for discussion of camp and fire problems, and for the making of important announcements. A bulletin board was also maintained in front of the hall in which meetings were held.

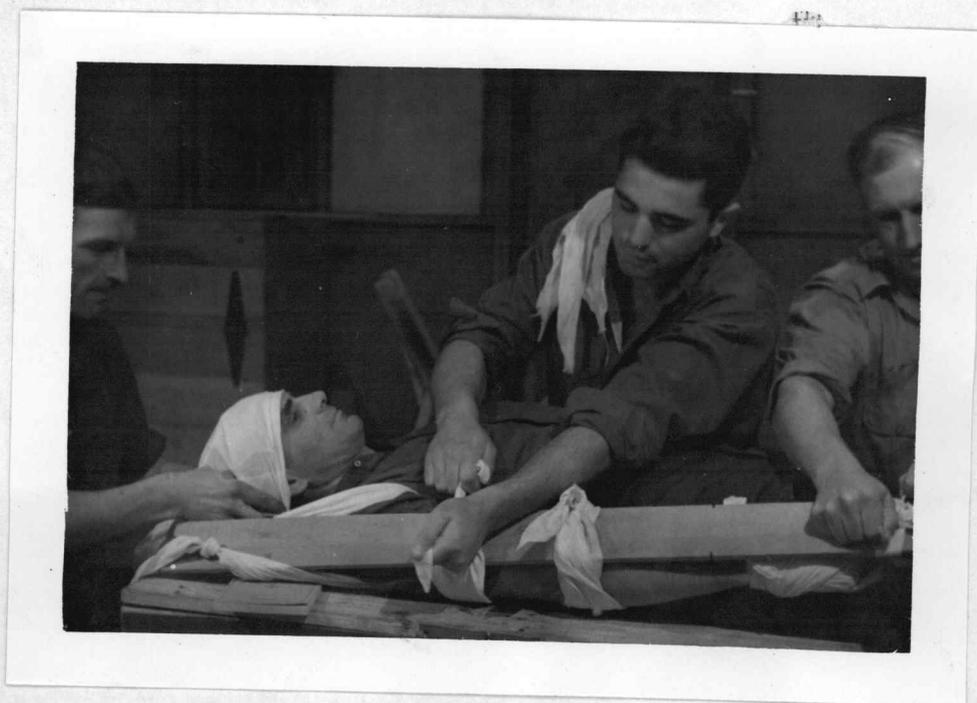
Personal habits were encouraged to be kept at the same standard as for regular forest guards. Drinking of alcoholics was strictly prohibited, and drunkenness or gross misconduct was sufficient cause for dismissal. Men were asked to keep a neat appearance and to dress consistently with the class of work being performed. Each man was held responsible for keeping quarters and grounds policed to the same standard as that of regular guard quarters.

Throughout the summer, interested men were given a chance to take part in several educational activities carried on in the camp. The first-aid man for the crew had authority as an instructor to teach Red Cross first-aid and life saving and held regular classes in each of these subjects when the crew was not on fires. One of the squad bosses, who had

PLATE X



A Bosworth trencher under trial



First-aid instruction

received considerable safety training in the CCC's, held several classes, especially for the truck drivers, in which he presented various safety measures applicable to their work. Some of the regular meetings and several of the special meetings held for the whole camp were devoted entirely to presentation of educational topics in fire suppression technique. Several reels of educational pictures were made available to the crew and presented by Forest Service personnel. Most of the crew was given experience in the operation of a Bosworth trencher, which was placed with the crew for experimental purposes. A supply of reading material, maintained by different forest officers, was kept at the disposal of the men in the study hall.

A well rounded recreation program helped to keep the men contented while they were confined to camp and probably aided to a large degree in supplying needed conditioning exercise that would not be fully supplied in regular labor. A baseball team was organized and Sunday games were played regularly with CCC teams and local teams. Volley ball games were played nearly every evening between groups within the crew. Enough interest was shown in horseshoes that three sets of pegs were necessary and a final horseshoe tournament was held later in the season.

Probably the greatest feature of enjoyment was the swimming pool adjacent to camp. With crew labor the existing pool was greatly widened and deepened by damming the river below it. Two good spring boards were also installed.

Any of the men desiring to visit the local theatre were allowed to go to one show a week. They signed out at camp

and went in a group under the responsibility of one of the men or one of the squad bosses. During periods of low fire danger, two different trips were made to the Oregon Caves for the benefit of those wishing to make this excursion.

IX Conclusions

The 40-man crew in its first experimental year lived up to the greatest expectations of its sponsorers. Even at the disadvantage of taking the roughest and most inaccessible sectors of every fire to which they were assigned, a notable record in held line production was established. It might seem that the full-time maintenance of such a crew at higher than usual fire fighter rates might offset to a considerable degree the value of such a crew. However, the crew also proved to be a very good financial investment from the standpoint of fire suppression costs.

Shortly after the crew's first large fire, which was the Horseshoe Bend fire on the Siskiyou National Forest, the supervisor of the forest told the crew that it had more than made its summer's wages on this one fire by its early interception and holding of some of the most dangerous sectors.

One of the most significant evaluations of the crew's efficiency is probably shown in the final cost figures. At the end of the season it was found that the total expenses, exclusive of the road and bridge projects, when prorated over the fire line production, made a cost of \$871 per mile of line. If only fire training, fire equipment costs, transportation, and suppression figures are considered, the cost per mile of line was only \$325. A cost summary for 229 miles

of line on six of the region's largest fires shows that the average cost to build and work each mile of line was \$1,991. If the mop-up costs are conservatively estimated at one-third of this \$1,991 and subtracted from this total figure, it is found that the cost per mile of line for the crew, with all expenses included, is about one-third cheaper than the average for regular FF crews. By the same comparison with only fire expenses for the crew included, the cost of the crew per mile of line built was only about one-fourth that of regular FF crews.

A short reference to the 1940 40-man crew should be appropriate at this point, although complete statistics are not available on the crew at this writing. Aside from a very few minor adjustments, the 1940 crew was continued under the same system as that of the 1939 crew.

A capable Junior Forester headed the crew, and the same high standards were maintained in selecting men. At the end of the 1939 season each man on the crew had been given one of four qualitative personnel ratings and a complete personnel record had been kept. Those rated in the lower quarter in value to the crew were not rehired for the 1940 crew. About half of the old crew returned and were hired as "experienced" men and given a higher rate of pay than new recruits.

The new crew had little work to do in camp construction and maintenance and spent the greater part of its time in continuation of the road job started in 1939 and on the construction of another new road near camp.

The new crew was set up more on the basis of an experiment

than even the 1939 crew. It was to be capable and available for any kind of fire work, rather than purely line construction. However, most of the fire fighting experience for the season consisted of line building under conditions comparable to those under which the previous crew worked.

One notable exception to the 1939 crew was that of taking the camp cook on all trips with the crew. He was hired on the condition that he would be required to cook on fires as well as in camp. His physical qualifications were as high as any of the other men on the crew and with a limited amount of training in camp was able to stand the rigorous hikes with apparently little ill effects. His help in preparing meals on the fire line allowed the crew, as a whole, more time for rest and better meal were enjoyed.

A few minor changes were advantageously made in personnel management. A schedule of men wishing to take annual leave was kept throughout the summer, and leave was not allowed to accumulate. The men enjoyed more freedom in being allowed to visit the local town whenever they wished, except when stand-by for fire call was in effect. They were, however, required to get permission and sign out each time they left camp and state the place where they could be found at any time. Recreational and educational activities were continued along lines similar to the 1939 program.

Although the crew did less fire fighting in 1940 than the previous year, it retained decisive proof of its value and practicability in the work it did on the region's worst 1940 fires. "It is hoped that the crew can be continued",

stated Regional Forester Lyle F. Watts at the close of the last fire season. "It has proved to be one of the best ideas ever tried in project fire organization."

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Reference:

Anderson, Rolfe E. and Cliff, E. P. 1940. U. S. Forest Service, Fire Control Notes, pages 47-62, Vol. 4, No. 2.

Note: This report is drawn mostly from the experience of the author, who worked both 1939 and 1940 seasons as a member of the crew. Material for tables and charts appearing in this report has been taken from the above reference. Photographs were taken by the author.