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(May, 1929)

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Yellowstone NATIONAL PARK

FILE NO. 14

MONTHLY REPORT

April, 1931

APRIL, 1931

IMPORTANT

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HORACE M. ALBRIGHT,
Director.

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DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

YELLOWSTONE NATIONAL PARK

YELLOWSTONE PARK, WYO.

ICE OF THE SUPERINTENDENT

May 4, 1931.

The Director,
National Park Service,
Washington, D. C.

Dear Mr. Director:

Following is a report of the activities of the Yellowstone National Park for the month of April, 1931:

000 - General

The month of April saw the opening of activities in the park and an influx of men seeking employment and salesmen trying to place their wares. Toward the latter part of the month several crews were organized and preference was given to men who had served here in previous years and whose services were satisfactory, and to married men from local communities who had been without employment most of the winter.

020 - General weather conditions

Mammoth Hot Springs: The month's mean temperature was 37.8 degrees, which was 0.8 degree per day, on the average, above normal. The rise in mean temperature over the March just preceding was 11.0 degrees. The temperature failed to go as high as the thawing point on only one day of the month, the 2nd. On the other hand, there were seven days when it did not fall as low as freezing. The lowest temperature was 12 degrees on the 3rd; the highest, 62 degrees on the 12th. There were no very marked cold spells, the most noticeable running from the 2nd to the 4th and from the 20th to the 23rd. The minimum temperature in the latter was 17 degrees.

It was another month with light precipitation, the total being 0.95 inch, which is 0.51 inch less than normal. The precipitation deficiency since the 1st of January now amounts to 3.95 inches. The snowfall of the month totaled 3.3 inches, 3.0 inches of which fell within 24 hours, on the 1st-2nd. The ground was bare of snow during most of the month. The heaviest precipitation of the month occurred on the 29th-30th. Upon these two days 0.70 inch of rain fell, 0.69 of which fell within 24 hours.

The average wind velocity was 8.0 miles per hour. There were 3 clear days, 10 partly cloudy days, and 17 cloudy days during the month; and 7 days upon which at least .01 inch of precipitation occurred. The percentage of possible sunshine was 59.

Snow Depths: The following snow depths were recorded by the rangers at various stations and places in the Park at the end of the month, as compared with 1929 and 1930:

	1929	1930	1931
Lake Station	29	Drifts only.	0
Snake River	45	" "	2
Sylvan Pass Station	15	0	0
Riverside	15	Trace	0
Gallatin		Drifts only.	9
Upper Slough Creek	12	0	0
Lower Slough Creek	10	0	0
Canyon	36	Drifts only.	
Bechler River	60	"	14
Old Faithful	Drifts only.	0	0
Cascade	35	65	28
Cooke Station	23	Drifts only.	Drifts only.
Sportsman Lake			29
7-mile post, Snake River			51
Aster Creek			42

The average wind velocity was 8.0 miles per hour. There were 6 clear days, 10 partly cloudy days, and 17 cloudy days during the month; and 7 days upon which no lamp or lamps of probabilities occurred. The percentage of possible sunshine was 58.

Upper Lights: The following minor lights were recorded by the keepers of various stations and placed in the Inspector's hands at the month, as frequent with Jan and Feb:

	Lens	Light	Left
Lake Michigan	29	Entire only.	0
Sandy River	22	" "	0
Spring Tree Station	12	0	0
Stonegate	10	Throw	0
Gallatin		Entire only.	0
Upper Clough Creek	15	0	0
Lower Clough Creek	10	0	0
Canyon	24	Entire only.	
Rankine River	40	"	14
Old Ingersol	Entire only.	0	0
Aurora	32	20	12
Cooks Valley	22	Entire only.	Entire only.
Sportsman Lake			20
Little Creek, Sonora Grove			21
Lake Creek			42

021 - In the Park: The road from West Yellowstone to Old Faithful was open on the 9th. The winter keeper at Old Faithful and rangers stationed at Riverside Ranger Station assisted in opening up this road. It was possible to drive from Tower Falls to the Buffalo Ranch on April 16 and from Mammoth to Tower Falls on the 17th. This road was opened by the mail contractor carrying mail from Gardiner to Cooke, Montana. The road from West Yellowstone to Mammoth was opened up on April 22nd but the section between West Yellowstone and Norris was opened several days previous, and the snow crew which left Mammoth on the 21st had the Mammoth-Norris section open on the 22nd. The Idaho snow plow entered West Yellowstone on April 25, going direct to Canyon and on toward Lake and as part of this road had already been opened by the Lake rangers it was possible to drive to the Lake Ranger Station that same day.

022 - Approaches to the Park: About April 10 a landslide in the Cody Canyon near Shoshone Dam blocked that road to travel for a few days. Work in removing this slide is progressing slowly. At the Overhanging Rock on the Cody road construction has been in progress the latter part of the month, and this road has been closed off and on for travel.

After many breakdowns of the Idaho snowplow the road from West Yellowstone to Ashton was cleared of snow and the plow entered West Yellowstone on April 25. It was possible to drive from Ashton to West Yellowstone several days before the snow plow arrived at the latter point but over a detour that was in very bad condition.

A snowstorm with high winds blocked the Gardiner-Livingston road for travel on the night of April 21st and part of the next day. It shouldbe mentioned here that this storm did not affect Yellowstone Park. The Gardiner-Livingston road at the end of the month was in excellent shape.

100 - Administration

110 - Status of Work

Superintendent Toll has been in Denver practically all month in connection with work on proposed parks and monuments, and he is expected to return to Yellowstone on May 6.

Through the inability of Disbursing Officer Hill to perform his duties on account of ill health his work necessarily fell upon other employees but by the end of the month most of the work was current, and efforts were being concentrated to complete the 1933 estimates. Mr. Hill left the park on the 25th after having lived here for some thirty years and has taken up a residence in Livingston, Montana.

On April 13 Park Naturalist Yeager addressed the Livingston Rotary Club and on April 21 Assistant to the Superintendent Joffe gave a talk before the Kiwanis Club of Livingston on park activities.

120 - Park inspections by

121 - Acting Superintendent

Acting Superintendent Edwards made the usual inspections of the work around headquarters and as soon as the roads were free of snow made several trips into the interior of the park. On April 13 he attended a meeting of the Rotary Club in Livingston at which Park Naturalist Yeager gave an interesting park talk. On the 19th he left for Anaconda, Montana, to attend the annual State Rotary Convention for purposes of increasing interest in the park and furthering acquaintanceships with prominent people of the State. He returned on the 22nd. On the following day, he accompanied Mr. and Mrs. Theodore A. Torgeson to Old Faithful and back to Livingston, Montana. Mr. Torgeson is the Director of International Rotary and resides at Estevan, Saskatchewan, Canada. On the 24th, in company with Assistant to the Superintendent Joffe, a trip was made to Bozeman, Montana, to attend the annual meeting of the Bozeman Rod and Gun Club, and the following two days were spent on a trip to Helena and Great Falls with a view to looking over road conditions, interviewing and becoming better acquainted with newspaper, chamber of commerce and hotel men and furthering the interest of people in the park. On the 28th a trip was made to Livingston in connection with land matters, and on the 29th he attended the funeral of "Packy" McFarland in Livingston.

123 - National Park Service Officers.

On April 7 Field Naturalist Carl Russell arrived in the park with his family to begin his activities for the summer.

Superintendent Sam T. Woodring of the Grand Teton National Park came into the park via the west gate on April 28 and proceeded directly through the park to Livingston to attend the funeral of Packy McFarland. He returned to the park and spent the night of the 28th here, leaving via the west gate the following morning.

140m- Labor Situation

There was a steady stream of men coming into the headquarters office and the engineer's office in search of work. Several crews were organized and preference was given to men who had served here in previous years and to married men with families residing in nearby communities who had been without employment during the winter. Each day sees a number of men seeking employment and there will be no trouble in filling all positions. Most of the men appear ragged, and from the way some of them have been eating one would believe they had not eaten all winter. No doubt as soon as the schools let out there will be a vast army of young people descending upon the park in search of employment.

130 - Circulars, placards, publicity bulletins, etc.

No circulars or publicity stories were issued during the month but the April Nature Notes were printed and distributed. The scarcity of mimeograph paper requires us to conserve as much as possible and we do not feel that we can put out as many publicity stories as we would like to.

200 - Maintenance, Improvements and New Construction - Engineering

210 - Heavy Maintenance

A crew consisting of a foreman and six laborers with the necessary equipment was organized on April 22, their work to consist mainly of the removal of small rock slides that were clogging ditches, opening culverts, and other repairs in need of immediate attention. A section of the retaining wall, twenty-five feet in length and ten feet high, at the Overhanging Cliff on the Tower Falls section was rebuilt and the outfit then moved to the Mammoth-Norris section where washes and deep ruts were developing.

Snow Removal: The work of snow removal started on April 6 with the blasting of the usual drifts in the vicinity of Golden Gate. Clear and unusually warm weather for several days following completed the removal of these drifts naturally and also lowered the general snow level so that on April 18 it was possible to drive a car to Apollinaris Springs without chains.

A snow crew consisting of seven men and equipment of two trucks, tractor and grader was started from headquarters on April 22 and reached the foot of Blanding Hill on the Canyon-Norris road, a distance of eighteen miles, during the day. The remaining eight miles to Canyon Junction was cleared the following day and a camp for the crew established at the Canyon road camp.

The Idaho snow plow arrived at West Yellowstone on April 25, and being available for our use on a rental basis, was put in operation on the park roads on the 26th in place of the shoveling crew. On April 30 the plow had reached the eight mile post above the Snake River entrance with an estimate of two additional days necessary to clear that section.

Public utility operators George Whittaker and the Transportation Company contributed the labor of eight men and a truck as far as Canyon Junction on this work.

Norris-Madison Roadside Cleanup-Project 530.2: The crew for this project was organized on April 27 and camp established at Madison Junction. About ten days will be required to burn the brush and debris cleared and piled last fall.

Water System, Mammoth - Project 486: This project is under the joint supervision of Engineering and the sanitary department, and consists of the installation of approximately two miles of steel water pipe line from a new intake on Glen Creek to the reservoirs at Mammoth. The intake and about one mile of trenching was completed during the fall months of last season and this season's work will be the completion of the trenching and the installation of the pipe.

The construction camp was established at the old site near the intake on April 27 with a crew of 35 men and the necessary equipment. Trenching should be completed about May 15 and the pipe contractors will then begin the installation of the pipe.

Mammoth Sewer-Project 492: The Mammoth sewer system is programmed as a two year project, this year's work to consist of the construction of a sewage disposal plant and sludge beds and approximately 40% of the mains and service connections.

Construction was started April 20 with a crew of forty men and two foremen and equipment of one air compressor operating jack hammers and pneumatic spades.

3100 lineal feet of trench has been completed to date, totaling 1400 cubic yards of excavation, of which 35% is classified as common and 65% as solid rock.

Two pipe laying crews of three men each began work on April 27, and to date have completed the laying of 340 lineal feet of fifteen inch pipe and 75 feet of eighteen inch pipe.

Bid prices on the necessary pipe were much lower than had been anticipated and excavation costs are falling slightly below the original estimate, and it appears that ten to fifteen per cent more work can be accomplished than was programmed in our work plan.

220 - Improvements

Carpenter Shop: The Foreman Carpenter and his helpers were engaged in miscellaneous repairs to buildings at headquarters. The B.P.R. buildings were completed during the month.

Electrical Department: The work of this department consisted mainly of maintenance of electrical and telephone systems at headquarters. Electrical appliances were installed in the summer mess house and an additional transformer was installed to serve the mess house.

Paint Shop: Work of this department consisted of painting in certain buildings at headquarters, laying linoleum and painting fire equipment.

Sanitation Department: The Master Plumber and assistants were engaged in maintaining water and sewer systems at headquarters and operating 9 heating plants. In addition, miscellaneous repairs were made to plumbing fixtures in various buildings. Other work consisted of completing the log work, finishing the roof and lining the inside of incinerator at Mammoth with firebrick. Work on the water system consisted of laying and excavating for galvanized pipe for supplying the Mammoth incinerator with water; constructing concrete reservoir for supplying the incinerator and also to take care of expansion; excavating and laying galvanized pipe for supplying new comfort station at Mammoth, auto camp and 3 additional hydrants with drinking water. Work on the sewer system consisted of constructing a leaching cesspool to take care of the incinerator at Mammoth; excavating and laying tile pipe from incinerator to cesspool; remodeling the inside of one comfort station at Mammoth Auto Camp. Work was commenced on the Mammoth water system on April 27.

240 - Improvement of approaches to park

Construction programs of the adjacent States include several projects of direct benefit to travel to and from the Park entrances.

Montana will resurface and oil 22 miles of newly constructed road between Livingston and the North Entrance and 12 miles of the Livingston-Bozeman road with their own forces. Idaho's program includes the oiling of a section of road leading to the West Entrance and lying between Warm River and St. Anthony. Wyoming has already let the contract for regrading the 17 mile section between Pinedale and Jackson toward the South Entrance, and their plans call for additional bids for work in that vicinity in the near future.

300 - Activities of other agencies in the park

310 - Public Service contractors

Mr. Whittaker operated his Mammoth store for the convenience of Mammoth residents and received most of the business from our local people. He is very much pleased with the patronage he is getting and is taking good care of his customers so that there has been no criticism of the service rendered.

Mr. C. A. Hamilton arrived in the park via the west gate on April 18 and proceeded immediately to Old Faithful to get his place in readiness for the coming summer.

Mr. George A. Larkin, President of the Yellowstone Park Fuel Company, and a representative of the Haynes' Picture Shops, Inc., arrived in the park on the 29th.

Point Hope: Part of this depression should end of building in our-
ale building on boardwalks, laying lineleum and painting the equipment.

Building Inventory: The Barrow Trades and Apprentice were
engaged in building work and some repairs in laboratories and operating
heating plants. In addition, school lumber repairs were made by planing
floorers in various building. Other work included at installing the ice
work, finishing the roof and lifting the tanks of laboratories at Barrow
with fiberglass. Part of the water system consisted of laying and assembling
for pipeline and the repairing the Barrow Inventory water; con-
structing sewage removal for supplying the laboratories and also to take
care of equipment; repairing the drainage plus the repairing the
modern stations at Barrow, were also made a additional repairs for building
work. Part of the water system consisted of constructing a laundry sewage
to take care of the laboratory at Barrow; measuring the water lines
laboratory to supply; installing the tanks of the modern stations at Barrow
into Point Hope. Work was completed on the Barrow water system on April 17.

400 - Improvements of equipment in work

Improvements equipment of the equipment during the year
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lines and it. Barrow, operating the already in the electric is operating
the 17 mile work in between Barrow Barrow and Barrow located the work equipment,
and work also will for additional lighting the work is work visibility is 24
hour hours.

500 - Lighting of other operations in the work

510 - Public service buildings

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is the work on the work.

400 - Flora, fauna, and natural phenomena

410 - Ranger, naturalist and guide service

The usual patrols were made by the ranger force for the observation and protection of the park wild life and all game seen was noted to be in very good condition. There was only a small amount of skiing done this month due to the roads opening up. The monthly game count was taken on April 28 and 29 with a fair count of elk but very light on other animals with the exception of sheep. Several of the rangers have been on annual leave this month.

The Chief Ranger, in company with Harry McFarland, was busy from April 4 to the 8th buying pack animals for use this coming summer in our pack train. They purchased 4 horses and 7 mules at this time. Chief Ranger Baggley was on sick leave from April 9 to 23rd inclusive, and about a week of this time was spent in the Park Hospital at Livingston.

On April 25 an inspection trip was made by the Chief Ranger to the Buffalo Ranch.

420 - Museum Service

The work of the Educational Department has progressed steadily during the past month. The selection of the ranger naturalist staff is complete and the papers returned from Washington. Considerable time has been spent by the Park Naturalist on conferences and installation work with Mr. Russell.

All the regular 4" x 5" negatives for which there were no prints, were taken from the regular files and sent to the photographer for prints. These have been returned and the correct number placed on each print and are now ready for labeling.

Approximately 2500 pictures pasted during the month and a loose-leaf index to the albums was worked out and is now in usable form. Between 3 and 4 weeks remain to complete this project.

Eighty-seven books, pamphlets, etc., were received during the month. A large number of these were obtained by Mr. Russell as a gift from the Biological Survey.

Mr. Alfred Poveh, recently appointed Park Naturalist, arrived in the park on May 2 for duty.

440 - Insect Control

Fred T. Johnston, Forest Assistant, was in attendance for 8 days at the U.S.F.S.Personnel Training Camp for Insect Control held at Dillon, Montana. All phases of the methods used in controlling mountain pine

beetle were discussed and practiced at this camp.

Mr. Johnston also spent several days preparing a working plan for the mountain pine beetle control project to be undertaken in the Bechler River region. Copy of the plan is attached elsewhere in this report. Also, considerable time was spent in gathering equipment and personnel for this insect control and type map crew.

Actual control work in the Bechler River region will probably start on May 8. Mr. Terrell of the Bureau of Entomology is being assigned to assist in this project by Mr. Evenden, Entomologist.

460 - Birds

Almost all of the Yellowstone summer birds are to be found at this time. Observations on water fowl disclose that the larger flocks are steadily diminishing as the mating season approaches. Two sand hill cranes were observed near the Fountain Ranger Station on April 25. Large numbers of geese were reported as returning to the park for the nesting season.

470 - Animals

All the game animals having the advantage of an extremely mild winter are in excellent condition. The new growth of grass the past month has made forage conditions very good. The snow has practically disappeared on all ranches and counts were not successful although the count of elk was a great deal better than in January and February. Very few winter killed animals are found and the ticks are not doing much damage.

Elk: Due to the open ranges the elk are scattered and drifting, and making a good count is almost impossible. At the end of the month the bulls had shed their antlers and new ones had made their appearance. A count of elk on April 27 and 28 disclosed 7,696 divided as follows:

E L K

	Bulls	Spikes	Calves	Cows	Unknown
Blacktail	113	24	32	107	250
Mammoth to Blacktail via Turkey Pen Trail					90
Blacktail to Hellroaring					231
Hellroaring to Park Line	17				
Mt. Everts	1			75	
Buffalo Corral and Mammoth					17
Game Preservation Ranch			84		57
G.P.Ranch to Beaver Dam Lakes	39				197
Beaver Dam to Horse Pasture					411
Slough Creek to Geode Creek	150	75	260	829	
Pebble Creek to Lamar Canyon					1136
Cottonwood Basin					215
Slough Creek					1980
Gallatin					1031
Swan Lake and Willow Park	4			7	
Madison Junction and Fountain					75
Grayling					4
Old Faithful					25
Bechler River		7	13	40	
Norris					75
Lake					25
Total	324	106	389	1058	5819

Deer: All deer seen during the month were noted to be in good condition and are very scattered. Several new salt troughs were made and placed over the summer deer range, and it has been noted already that deer have been frequenting these new troughs. A count taken in connection with the elk count disclosed a total of 316, as compared with a count of 706 in February. The prevailing fine weather accounts for the small number counted. The following table gives the number of deer counted by districts:

Blacktail	12
Mammoth to Blacktail	13
Blacktail to Hellroaring	1
Hellroaring to Park Line	15
Buffalo Corral and Mammoth	35
Game Preservation Ranch	126
Slough Creek to Geode Creek	12
Pebble Creek to Lamar Canyon	7
Cottonwood Basin	7
Slough Creek	2
Gallatin	6
Old Faithful	25
	316

Antelope: On April 8 eighty antelope were counted at Hellroaring and on April 11 six were seen at the Buffalo Ranch. Seeing antelope so far from their winter range this early in the month is a very unusual sight. One hundred eleven were counted in the vicinity of Tower Falls on April 14. All antelope seen were noted to be in good condition. Three hundred sixty-three were counted in the game census divided into districts as follows:

Blacktail	75
Mammoth to Blacktail	19
Mt. Everts	10
Game Preservation Ranch	12
Slough Creek to Geode Creek	135
Pebble Creek to Lamar Canyon	61
Slough Creek	51

Moose: Thirty moose were seen the latter part of the month and their condition was noted as good. Two or more of these animals may be seen in Willow Park almost any evening. The following table shows the moose census by districts:

Hellroaring	2
Slough Creek to Geode Creek	7
Gallatin	3
Swan Lake	5
Willow Park	3
Bechler River	10

Sheep: In connection with the elk count a total of 77 mountain sheep were counted - 65 between Mammoth and Blacktail via Turkey Pen Trail and 12 at Tower Falls. During the latter part of February 24 sheep were counted on Specimen Ridge from the Buffalo Ranch. The sheep have not been seen since that time but there is no doubt they are still in that locality, which would give us a total of 101. Their condition is noted as fair.

Buffalo - Lamar River Herd: This herd of buffalo was in excellent condition and during the early part of the month started to forage for themselves. On April 14, 526 were observed at the mouth of the Lamar River and at the Horseshoe. Feeding of the main herd was discontinued on April 17. The calves were fed the entire month and will be turned out to forage for themselves on May 1st. Approximately 75 tons of hay was fed at the Buffalo Ranch during the past month. Cottonseed cake was fed daily to the calves.

Buffalo - Cold Creek-Pelican Herd: Nothing of interest to report.

Smaller Animals: The usual numbers of smaller animals were seen over the park during the past month and numerous signs of mink were seen on the Gallatin River. Beaver, from all signs seen, are noted to be plentiful in nearly all park waters. Snowshoe and jack rabbits have lost their white winter coat.

Bears - Black: The bears of the black family have been reported seen in all sections of the park. Due to their depredations in Mammoth it was necessary to start trapping them and liberating them at distant points from Mammoth. To date three bears have been given free rides from Mammoth to other points. It has been reported that two black bears have been killed on the Gardiner dump, although this information is not authentic.

Bears - Grizzly: This species, as well as the black, are being seen over the entire park. The inside of the Crystal Springs cabin has been completely wrecked by bears, whether grizzly or black is not known.

Buffalo and Other Ranch Activities: At the Buffalo Ranch feeding of the older buffalo was carried on until the 17th of the month. The calves were fed the entire month. Several irrigators were on duty at this ranch the latter part of the month cleaning ditches and preparing for the summer work. Ditches at the Game Preservation Ranch and Gardiner Ranch were repaired and are ready for use. A great deal of ditch work was necessary on the Game Preservation Ranch as the cloudburst which occurred last fall had either washed them out or filled them in. Alfalfa and oats were sown on the Gardiner Ranch the latter part of the month.

480 - Natural Phenomena - Mammoth Hot Springs

The month of April was marked by a decided increase in activity over the entire Mammoth formation. Of all the terraces, Narrow Gauge and New Highland alone remain unchanged since the last report. Blue Springs underwent a slight decrease and the activity at Orange Spring Mound was slightly increased. The greatest increase occurred at old Angel Terrace where at least five times the amount of water is flowing forth than was noted in March.

490 - Miscellaneous

Word was received from Moran and from the State Game Warden of Wyoming regarding parties in Moran going to the Upper Yellowstone-Thorofare country for the purpose of trapping beaver. Upon receipt of this notice, the ranger at the Thorofare Ranger Station was notified to be on the lookout for these parties but they did not put in their appearance and it was thought that probably the trappers had been scared out. Many of the patrols in trying to locate these trappers were carried on with a park ranger and the Forest ranger who is also stationed in that region.

500 - Use of Park Facilities by the Public

510 - Increase or Decrease in Travel

All entrance and exit travel during the month was via the north gateway. Week-end travel was very heavy due to excellent weather conditions. Travel as recorded at the north entrance is as follows:

Total preseason - cars 261; visitors 756

Travel at the close of the month consisted of 6283 visitors traveling in 2134 cars as compared with 4776 visitors traveling in 1673 cars last year, and 3470 visitors traveling in 1241 cars in 1929.

530 - Visitors

Mr. and Mrs. Theodore A. Torgeson, Estevan, Saskatchewan, Canada. Mr. Torgeson is Director of International Rotary. They arrived in the park via Gardiner on April 23 and left via the same gateway the same day, having made the trip to Old Faithful and return. Mr. Edwards accompanied them on the trip.

O. C. Lamport, Helena, Montana. Mr. Lamport is Secretary of the Helena Chamber of Commerce and was formerly Montana State Adjutant for the American Legion and has for years been keenly interested in the park.

600 - Protection

630 - Destruction of predatory animals

During the past winter, with snow conditions considerably below normal, which in turn made easy traveling for the coyote and extremely hard for the rangers, a total of 98 coyotes were destroyed as compared with 134 during the winter of 1929-30.

In former years permission was always given to permanent Government employees other than rangers to hunt and kill coyotes in Yellowstone National Park. Last fall this privilege was not granted, in view of the fact that the hunting and destroying of coyotes is considered part of a ranger's duty and not a privilege and to stop any promiscuous shooting of firearms in the park. It should be noted here that last year holders of these special hunting permits killed only 12 coyotes.

Killing of game by coyotes this winter has been noted as lighter than in previous years. Actual game killed by coyotes is given in the annual game report.

The coyote hides were disposed of to the highest bidder, the Government and private hides being sold at the same time. As the private hides were sold on open bids they sold for a little more than the Government hides which were sold on sealed bids.

The first sale of hides was held in Mammoth Hot Springs on February 20, at which time 38 Government hides and 31 private hides were sold. Beckman Brothers of Great Falls were the successful bidder, giving $9.47 each for Government hides and $10.64 each for the private hides. The second sale of hides was held on April 13. As there were only six Government hides on hand for this sale, no bids were received at Mammoth and it was necessary to take these hides to Livingston for disposal. Don Strong of Livingston was the high bidder with a bid of $7.00 each for the Government hides and $7.50 each for the six private hides.

During the winter two marten were caught in coyote traps and at this last sale one of them was sold to the same bidder at a high bid of $6.00. The other marten hide was turned over to the Yellowstone museum.

The following table shows the disposal of the 98 coyotes destroyed this year:

Name	Government	Private
Beckman Brothers (bid)	38	31
Don Strong (bid)	6	6
Director	7	
Retained by rangers		10
Left over from last year	2	
	53	47

Grand Total.....100

It should be noted here that all coyotes killed are divided on a fifty-fifty basis. The four extra Government hides are accounted for by rangers who killed an odd number and were given the smaller half but of a little better quality than those for the Government.

Coyote kills for the winter of 1930-31 are disclosed as follows:

Name	Number	Name	Number
Baggley	2	Trischman	1
Greer	5	Hanks	8
Grimm	4	Ogston	6
Skinner	18	Elliott	1
McCarty	18	Dart	1
Chapman	4	Arnold	2
Jones	2	Phillips	6
Anderson	10	Aiton	1
Dupuis	9		

Total.....98

We realize that should next winter be a severe one, the depredations and game kills by coyotes will be excessive and very stringent measures will have to be undertaken in order to effectively control this animal.

900 - Miscellenous

Hospital and Medical Service: Dr. P. L. Gailmard, Resident Physician, reports as follows for the month of April:

Office Calls 55
Home calls 92
Total.....147
Calls of over 150 miles 2

Post Office: Bids were opened to provide for continuing of the contract stations at Lake Outlet, Canyon Junction and Tower Falls, and awards recommended to store owners at those points who have heretofore handled these stations.

Lease for quarters for classified stations at Old Faithful and Fishing Bridge were transferred from C. A. Hamilton, to Hamilton Stores, Inc., in line with transfer of Mr. Hamilton's store business in the Park.

In general, business was about normal for April, and increased rapidly the latter part of the month, as the summer population began to drift in.

Postmaster Lindsley was on annual leave at the end of April, leaving Assistant Postmaster C. C. Marsh in charge during his absence.

Church Services: Easter services were held in the Chapel by Rev. L. D. Smith on Sunday evening April 5th. Several members of the Episcopal choir from the Livingston church came up, and assisted by local singers, a fine musical program was rendered, and the attendance was good.

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Members of the Yellowstone organization were greatly grieved when they learned of the death on the night of April 24 of Harry "Packy" McFarland. Packy had been failing in health for some time and when he had a stroke on the afternoon of the 24th he was rushed to the hospital in Livingston, where he died that night, death being attributed to heart failure. Packy was one of the old timers of the park, having served some fifteen years here and he had more than thirty years service with Uncle Sam to his credit. He was beloved by everyone and was a familiar figure around headquarters in the summer, riding on his "buck" horse a great deal of the time. He held the position of Foreman and was in charge of grounds, putting up ice, repairing tents, etc. Packy was buried in Livingston on April 29, and six of his old buddies - Bob Lacombe, Sam Woodring, Joe Douglas, Harry Trischman, Roy Brown and William Wiggins - all in uniform - acted as pall bearers. He was laid to rest in his Park Service uniform and the flags at headquarters were flown at half mast on the day of the funeral. Many of the Park people attended the funeral and the floral tributes were beautiful. Packy's son, George, came to the park from his home in Des Moines, Iowa, to make arrangements for the burial and to settle up the

estate, and every possible assistance and cooperation was extended to him by the park people.

A meeting of the park chapter of the Izaak Walton League was held in the Canteen building on April 30 but as so few members responded no business could be transacted.

Very truly yours,

Guy D. Edwards,
Acting Superintendent.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

TRAVEL REPORT

YELLOWSTONE National Park for the month of APRIL, 1931.

	This Month	This Travel Year To Date	This Month Last Year	Last Travel Year To Date	Increase for Travel Year Number	Increase for Travel Year Percent
RIVATE TRANSPORTATION:						
rs first entry, ...	261	2029	183	1549	480	31
rs reentry, ...		104	0	124	-20	16
torcycles, ...		1				
Total motor vehicles, ...	261	~~2134~~ 2082	183	1673	461	~~25~~ ~~28~~ 24
rsons entering via motor hicles, ...	756	6283	532	4776	1507	31
rsons entering via other ivate transportation, ...						
Total persons entering via private transportation, . . .	756	6283	532	4776	1507	31
HER TRANSPORTATION:						
ersons entering via stages, .						
ersons entering via trains, .						
ersons entering otherwise, . .						
Total other transportation, .						
AND TOTAL ALL VISITORS, . . .	756	6283	532	4776	1507	31

	This Year	Last Year	Increase Number	Increase Percent
utomobiles in public camps during month, ...				
ampers in public camps during month, ...				

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TRAVEL REPORT

...TELLOWSTONE National Park for the month of _____, 1948.

	This Month	This Travel Year To Date	This Month Last Year	Last Travel Year To Date	Increase for Travel Year Number	Increase for Travel Year Percent
...VATE TRANSPORTATION.						
...r first entry.	201	[illegible]	126	1249	480	21
...e reentry, ...		146	0	116	-.4	14
...orcycles		1				
...otal motor vehicles, . .	221	1247	126	1365	421	[illegible]
...ATS.						
...sons entering via motor ...icles, ...	741	8444	620	6774	1670	21
...sons entering via other ...vate transportation, . . .						
...tal persons entering via ...vate transportation, . . .	962	8835	620	6774	2061	24
...D TRANSPORTATION.						
...sons arriving via buses, .						
...sons entering via trains, .						
...ons entering otherwise, . .						
...tal other transportation .						
...ND TOTAL ALL VISITORS.	750	4400	880	4700	1200	21

	This Year	Last Year	Increase Number	Increase Percent
...ssengers in motor buses during month				
...ffic by public lines during month, . . .				

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DEPARTMENT OF THE INTERIOR

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STATUS OF AUTHORIZED PROJECTS

YELLOWSTONE National Park for the Month of APRIL, 1931

Description of Projects	Percent Constructed To Date	Percent Constructed This Month	Percent Constructed Last Month	Probable Date of Completion
2 - Mammoth-Norris Road	98 99	0	0	July 1, 1931
5.1 - Madison-Old Faithful	100	0	0	Oct. 15, 1930
5.4 - Signs	68 75	3	0	
5.5 - Post Const. Maint.	40	6	0	July 1, 1931
5.6 - Bear Feeding Grounds	95	0	0	~~Sept. 20, 1930~~ June 20
5.7 - Lewis River Bridge	100	1		
6 - Old Faithful Trails	30			July 1, 1931
8 - " " Parking	95			July 1, 1931 (1st)
9.1 - Artist Point Cleanup	100			
9.2 - Artist Point Oiling	20			
0.1 - Norris-Madison Oil	50			
0).2 - Norris-Madison Cleanup	98 99	3		May 10, 1931
0).3 - " " Bridge	0			
2 - E. Ent.-Lake Butte Cleanup	99			
3 - Canyon-Tower Jct.Cleanup	100			
5 - Mammoth Water System	35 45	5		July 1, 1931
2 - Mammoth Sewer System	25 50	25		July 1, 1931 (1st)

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S T A T U S O F A U T H O R I Z E D P R O J E C T S

[illegible] ..... National Park for the Month of [illegible], 1961

Description of Project	Percent Completed to Date	Percent Completed this Month	Percent Completed Last Month	Target Date to Complete
- Lincoln-Toledo Bed	90	0	0	July 1, 1961
.0 - Madison-Ft Washington	100	0	0	Oct. 15, 1960
.4 - Tioga	[illegible]	0	0	
.5 - Deer Creek, Utah.	40	0	0	Oct. 1, 1960
.6 - Deer Meadow Canyon	80	0	0	[illegible]
.7 - Lewis River Bridge	100	1		
- Old Faithful Trails	90			July 1, 1961
- " " Parking	40			July 1, 1961
.1 - Crater Lake Library	100			
.2 - Crater Lake Office	80			
.3 - Zion-Lodge Gas Off	30			
.4 - Zion-Lodge Gas Library	90	1		Oct. 15, 1960
.5 - " " Bridge	3			
- G. Sq.-Lake Drive Library	90			
- Sequoia-Dead Tree Clearing	100			
- Yosemite Tower Trails	40	5		July 1, 1961
- Yosemite Tower Trails	70	[illegible]		July 1, 1961

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STATUS OF PERSONNEL

YELLOWSTONE National Park for the Month of APRIL, 1931.

	This Month		This Month Last Year	
	Appointed	Non-Apptd.	Apptd.	Non-Apptd.
Number of employees beginning of month,	71	15	76	10
Number of additions, ...	3	152	5	25
Total, ...	74	167	81	35
Number of separations, ...	3	5	7	7
Number of employees close of month, . .	71	162	74	28

Number of promotions during month	2	0
Aggregate amount of annual leave taken,	145 days 6 hrs.	161-1/2
Aggregate amount of sick leave taken,	31	30
Aggregate amount of leave without pay,	27	9
Military leave	14	5

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NATIONAL PARK SERVICE

STATUS OF PERSONNEL

[redacted] National Park for the Month of [redacted], 1941.

	This Month	This Month Last Year
Permanent Full-time. Part. Part-time.		
Number of employees beginning of month	71	73
Number of additions	2	1
Total	73	74
Number of separations	2	2
Number of employees close of month	71	72
Number of furloughs during month	0	0
Cumulative amount of annual leave taken	[redacted]	152-1/2
Cumulative amount of sick leave taken	21	30
Cumulative amount of leave without pay	0	0
Military leave	14	0

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DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

REPORT OF PARK REVENUES

YELLOWSTONE National Park for the Month of APRIL, 1931.

	This Year	Last Year
Park revenue on hand beginning of month, ...	None	None
Received, ...	11,355.51	2939.40
Total, ...	11,355.51	2959.40
Remitted, ...	11,355.51	2959.40
On hand close of month, ...	None	None

Park revenues received this year to date, ...	$ 259,084.91
Park revenues received last year to date, ...	$ 293,168.77
Increase ~~xxxxxxx~~ Decrease	$ 34,083.86
Per cent of increase ~~xxxxxxx~~ decrease	11

DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

REPORT OF PARK REVENUES

[illegible] National Park for the Month of [illegible], 1947.

	This Year	Last Year
ark revenue on hand beginning of month	None	None
eceived	11,[illegible]	[illegible]
Total	11,[illegible]	[illegible]
emitted	11,[illegible]	[illegible]
n hand close of month	None	None

ark revenues received this year to date	$ [illegible]
ark revenues received last year to date	$ [illegible]
Increase	$ [illegible]
Per cent of increase	11

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NATIONAL PARK SERVICE

REPORT OF TELEPHONE AND TELEGRAPH BUSINESS

YELLOWSTONE National Park for the Month of APRIL, 1931

	This Month	This Month Last Year	Increase	Percent Increase
)CAL BUSINESS				
les of circuit maintained	528	528	0	.0
. of telephones connected	178	161	17	~~10~~ 11
. of measured service calls				
. of other local calls				
tal No. of local calls	4530	3607	923	~~25~~ 26
ak load in calls per day	244	178	66	37
ceipts from measured service calls				
ceipts from coin boxes				
ceipts from telephone rental				
TOTAL RECEIPTS				
NG DISTANCE BUSINESS				
. Outbound calls	109	97	12	12
. Inbound calls	137	77	60	~~77~~ 78
Total...	246	174		
TOTAL LONG DISTANCE CALLS				
ak load in calls per day	15	14	1	07
ceipts from Long Distance business				
LEGRAPH BUSINESS				
essages via Western Union				
essages via				
TOTAL MESSAGES				
eipts from telegraph business				
of money transfer messages				
of money transfer receipts				
AL RECEIPTS TELEPHONE & TELEGRAPH DEPT-				

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DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

REPORT OF INFORMATION ON TELEPHONE BUSINESS

[illegible]

National Park for the month of [illegible] 1951

	Gross Month	This Month Less Gross	[illegible]	[illegible]
[illegible] BUSINESS				
[illegible] of [illegible] [illegible]	888	388	0	.0
[illegible] of telephone [illegible]	171	163	17	.5%
[illegible] of [illegible] service calls				
[illegible] of other local calls				
[illegible] of [illegible] or long calls	1830	3807	[illegible]	[illegible]
[illegible] amount of calls per day	94	175	65	[illegible]
[illegible] from [illegible] service calls				
[illegible] from coin boxes				
[illegible] from telephone [illegible]				
TOTAL [illegible]				
[illegible] BUSINESS				
Outgoing calls	108	87	12	12
Incoming calls	187	77	00	[illegible]
Total...	[illegible]	164		
TOTAL LONG DISTANCE CALLS				
[illegible] of calls per day	15	14	1	07
[illegible] [illegible] [illegible]				
[illegible] STATIONS				
[illegible] [illegible] [illegible]				
[illegible]				
TOTAL [illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				

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NATIONAL PARK SERVICE

*ELECTRICITY GENERATED, SOLD, USED, ETC.

YELLOWSTONE National Park for the Month of APRIL, 1951.

	This Month	This Travel Year To Date	This Month Last Year	Last Travel Year To Date	Increase for Travel Year Number	Increase for Travel Year Percent
urrent generated, ...	53800.	648442.0	55730.0	654130.0	-5688.	~~-008~~ -009
old to park operators, . . .	1161.5	63350.6	1419.0	66396.9	-3046.3	-04 -05
old to others, ...						
urnished to other Governmental agencies, ...						
ed by National Park Service, lost in transit, etc., . . .	~~52638.5~~	~~585091.4~~	~~54311.0~~	~~587733.1~~	~~-2641.7~~	~~-004~~
Total current generated, . .	53800.0	648442.0	55730.0	654130.0	~~-5688.0~~	~~-008~~ -009

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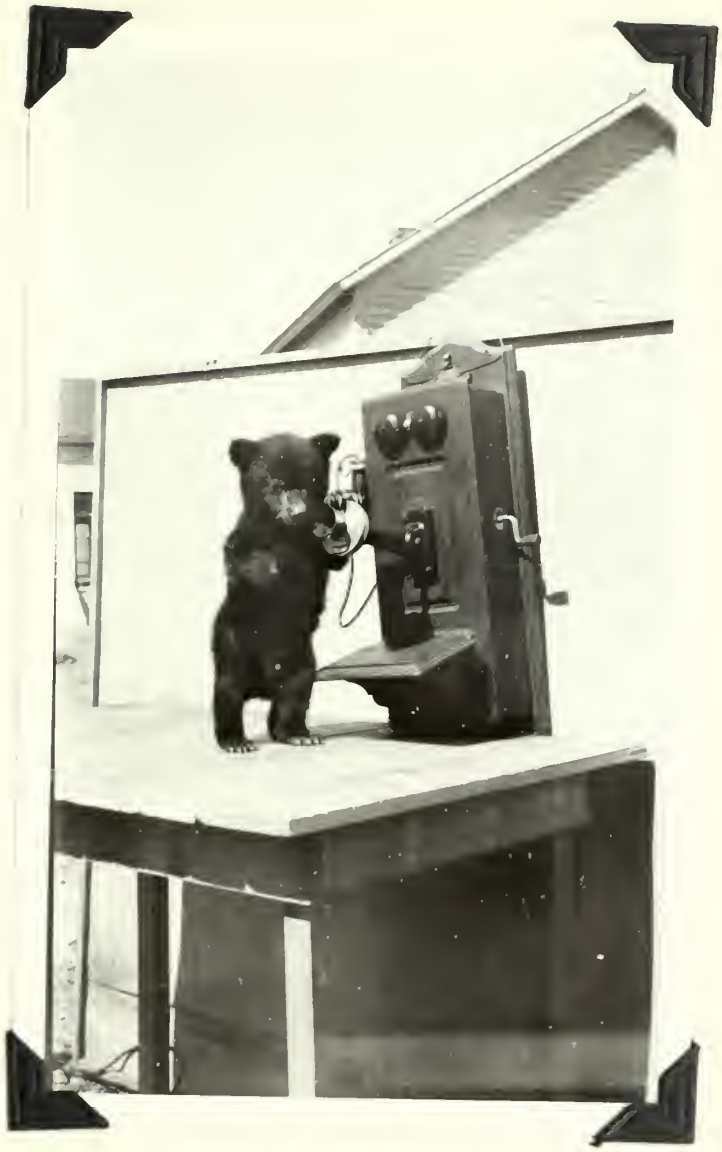
ount receivable from the sale of electricity, ... $ 58.07

Indicated by K. W. H.

New incinerator at Mammoth Hot Springs. Similar incinerators are now in use at Old Faithful, Fishing Bridge, Lake and Canyon. Appropriations are available for 1932 for another incinerator at West Thumb.

Weaning buffalo calves. The calves are placed in separate corrals away from their mothers sometime in January and are kept separated from the main herd for several months.

Two months old Yellowstone Park bear. This bear has been taken to raise by Asst. Park Naturalist Yeager with a view to recording observations in the life of a bear cub. This is his first attempt to use all four feet in an attempt to "hold on."

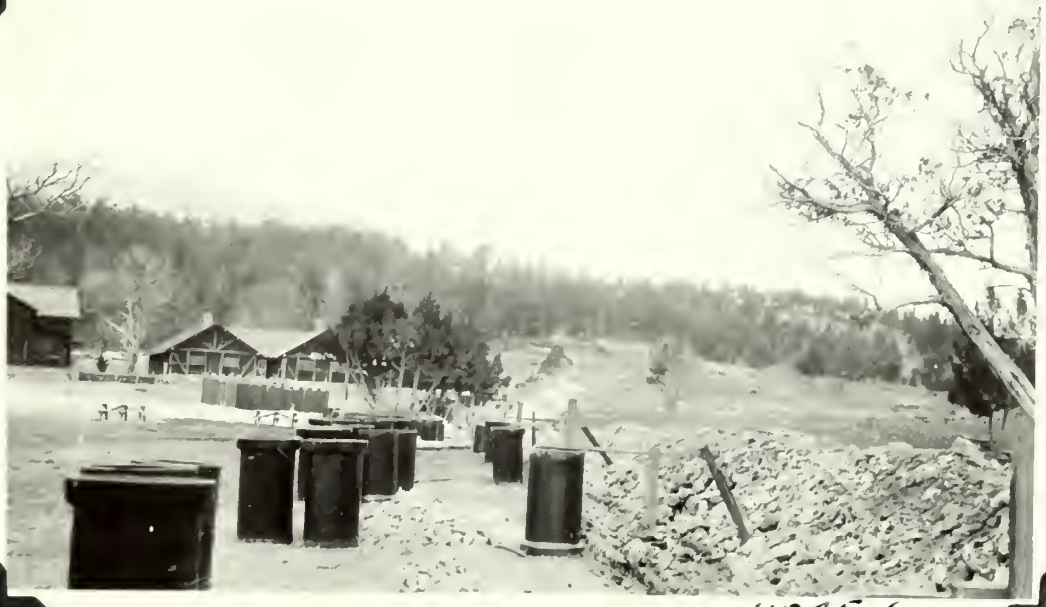


"Paging Mr. Hoover." Two months old Yellowstone Park bear extending invitation to President Hoover to include the Yellowstone in his western itinerary this summer.

11045-2.Mammoth Sewer,Project #492.Ditch line through Mammoth Camp Ground and Houskeeping unit.

11045-3.Mammoth Sewer,Project #492.Same as above picture with view continued to the right.

11045-4. Mammoth Sewer, Project #492. Ditch line for main above Camp Ground toward Mammoth.



11045-6. Mammoth Sewer, Project #492. Closeup of ditch in Camp Ground. Material in right foreground typical of 65% of excavation.

April 15, 1931.

PLAN AND INSTRUCTIONS FOR THE BECHLER RIVER MOUNTAIN PINE BEETLE CONTROL PROJECT

Prepared by
Fred T. Johnston, Forest Assistant.

Approved _____, 1931.

George F. Baggley
Chief Ranger.

INTRODUCTION:

Yellowstone Park is now dealing with the first major insect control project in its history. The knowledge that a dangerous invasion of mountain pine beetle threatens to consume the lodgepole forests of the park has reached the public, who will be watching the results of the control measures instigated,with a severely critical eye. The "ghost forest" of Crater Lake National Park, where there are thousands of acres of standing dead trees, is a forceful reminder of the ravages of this insect, once it becomes uncontrollable. The Targhee National Forest, which borders Yellowstone Park on the southwest, has spent three years and many thousands of dollars combating the infestation which has slowly migrated towards and finally reached the forests inside of the park boundary. The entire Falls River Basin, one of Yellowstone's few remaining wilderness areas, is in danger if this infestation is not checked immediately.

The life habits of the insect are such that control measures are practical only for a short period during the spring and fall. Any beetles that escape in the spring attack new trees during the summer and multiply very rapidly. Small areas or groups of infested trees appear far in advance of the original infestation, and become more and more difficult to treat. This is true of the mountain pine beetle in an epidemic stage and this is the condition which we are striving to stop at the start.

Too much stress cannot be placed upon the importance of combating this infestation thoroughly, and combating it thoroughly upon its first appearance is the determining factor in successfully eradicating the pest.

The Yellowstone National Park mountain pine beetle control project will undoubtedly be one of the most important to be recently undertaken. The aesthetic safety of one of the world's greatest playgrounds, and of an American heritage, is threatened. No effort must be spared in attempting to completely suppress this depredation and a definite plan of organization must be instituted if efficient results are to be obtained. The purpose, therefore, of these plans and instructions is to stress the importance of this fact and to aid the officers charged with the responsibility of the Bechler River Control Project in securing these results.

The methods of control herein outlined have been submitted by Mr. James C. Evenden, Entomologist in Charge of the Couer d'Alene, Idaho, Forest Insect Field Station, and are applicable to the situation we are confronting at Bechler River.

PURPOSE OF PROJECT:

The purpose of this project is to secure 100% control of the mountain pine beetle infestation throughout the working units herein described. In brief, treatment of every infested tree and treatment of every beetle in the infested trees in each working unit is the definite aim of this project.

ORGANIZATION:

The personnel of this project shall consist of one camp manager, fifteen spotter-burners, three packers, one teamster, one cook and flunky. At any time, however, the personnel may be increased or decreased at the discretion of the Forest Assistant or Chief Ranger. A permanent Park Ranger shall act as camp manager and be responsible to the Forest Assistant or Chief Ranger for the proper conduct of all phases of the work. The remaining personnel will in turn be directly responsible to the camp manager for the proper performance of the duties to which they are assigned. Permanent park officers assigned to this project will act as crew foremen as directed by the camp manager, and will be in charge of and responsible for the work of the spotting-burning crews.

The organization shall be divided into three separate crews of six men each. One crew foreman, four spotter-burners and one packer shall comprise a crew. The practice of assigning park officers to crew foremanship, so that each officer assigned to this project shall receive some experience in this capacity, will be followed, but since there will be only three crew foremen at a time the remaining park officers will act as spotter-burners until assigned to crew foremanship.

DUTIES OF THE PERSONNEL:

Camp Manager. The responsibility of all phases of the work rests upon the camp manager. He will spend a good portion of his time in direct supervision of the work of the treating crews. Very close supervision is extremely important to avoid carelessness in spotting and treating of trees, wasting of oil and delays which are unnecessary. The short working season and importance of efficiency require the maximum speed and accuracy of every member of the organization. The need for close supervision, therefore, is readily apparent.

The camp manager will order all supplies, keep records of all equipment, time slips, change of personnel, if any, progress reports, weekly reports, --in brief, he will manage all phases of the field work.

Crew Foreman. The crew foreman will be in charge of the spotter-burners and packer assigned to his crew, and will give orders regarding the procedure of his crew. He will run the compass line, and pace the distance traveled, as elsewhere described in this plan, and will keep a daily and weekly record of the activity of his crew--number of trees treated, method of trees treated, acreage or mileage covered, etc.

Spotter-Burners. The work of the spotter-burners is as the name implies, spotting or locating the infested trees and burning them according to the methods herein outlined. It is of great importance that these men become thoroughly familiar with the technique of spotting and the different methods of burning, as well as the conditions determining the method of burning to be used.

Packers. Each packer will be equipped with two or three pack horses, one saddle horse and the necessary equipment to pack oil, tools,

water, etc., to the spotting-burning crews. One packer will be assigned to each crew and he will assist in the treating of trees by having oil and tools available at all times, aiding in filling sprayers with oil, etc. He will care for his stock and have the horses saddled and ready to go before breakfast to avoid delay of the crew. He will assist in moving camp if so directed by the camp manager.

Teamster. The teamster will haul oil, etc., as directed by the camp manager. He will assist in moving and setting up camp, haul wood and supplies, and be at the disposal of the camp manager for any necessary camp maintenance.

Cook. The number of men at mess may vary, so no definite sized crew may be expected by the cook. He will cook for the entire organization and be expected to provide a neat and clean mess. He will notify the camp manager of his needs for groceries, etc. each day and if so directed by the camp manager he will keep a daily record of meals served. He will be prepared for and have material on hand for putting up lunches each day, but will only be expected to furnish the men with this material so they may proceed to put up their own lunches. He will serve meals at hours determined by the camp manager and at the discretion of the camp manager these hours may be changed; that is, if it is deemed necessary to begin work at daylight to offset wind conditions, the camp manager will arrange the schedule accordingly.

Flunky. The flunky will serve meals, wash dishes, supply the cook with wood, water, etc. He will be at the cook's disposal where assistance is needed.

AREA TO BE COVERED:

The area to be covered this season is divided into three units. The units are outlined so that the most dangerous areas may be worked first in order, leaving definite boundaries for future work and covering what appears to be the maximum acreage workable during one burning season.

Rock Creek Unit. This unit covers approximately five sections, or 3200 acres, and is bounded by the west and south boundaries of the park, Robinson Creek Trail and Robinson Creek. It is believed that this unit is the most dangerous and should be worked first. Camp may be established close to the park boundary on Rock Creek to benefit by an accessible road.

Robinson Creek Unit. This unit covers approximately two sections or 1280 acres, and is bounded by the west boundary of the park at the north of Rock Creek unit, and the extreme edges of the mature stand of timber on Robinson Creek as shown on the type map. This area appears to be the second most dangerous section and should be worked as soon as the Rock Creek unit has been completed

Camp will either be established on the Forest Reserve close to the park boundary on Robinson Creek or at a more suitable location inside the park. The first mentioned location is accessible by wagon, but it may

be found practical to pack camp into the unit from Bechler Ranger Station.

Wyoming Creek Unit. Approximately three and one-half sections, or 2240 acres, is covered by this unit, and it is bounded by a north and south line one-half mile east of Wyoming Creek, which runs from the south boundary of the park to the Bechler Meadow road. From this point on the Bechler Meadow road an east and west line is run to the Robinson Creek Trail. The west boundary of the unit follows the Robinson Creek trail to the Bechler Ranger Station and then follows the Bechler road to the park boundary. This unit should be worked last. Good camp sites are accessible by car near the center of the unit.

Where there are no natural unit boundaries, lines will be run with compass and blazed well to establish boundaries, as directed by the camp manager.

METHOD OF CONTROL:

The method of control which will be used on this project is a combination of spotting and treating at the same time, rather than making two separate operations of it. This eliminates the "follow-up", or treating crew, and because of the scattered nature of the infestation it is believed that more satisfactory results will be obtained from this method.

The crew foreman will run the compass lines on the area assigned to him and the spotter-burners will work abreast of him inspecting the trees on strips one chain wide. The crew will preferably work in a "geese flight" formation as this is found advantageous in accurately determining one chain distances. The packer will follow closely behind the crew with oil, sprayers, tools, etc. and when an infested tree is located the man locating it will shout "Bugs". This will be the signal for the crew to halt and treat the tree or trees necessary before proceeding farther on their lines. The crew foreman will keep a record of the number of trees treated, approximate location and other details as listed on a form which will be supplied for this purpose.

INSTRUCTIONS FOR SPOTTING:

In all forest insect control projects, spotting is the first and most important step of the operation. A large per cent of the infested trees which are missed by the spotters will remain untreated, leaving a potential source of reinfestation within the area, which often defeats the purpose of the project. In addition to the potential danger of such trees, and after the project has been put to the expense of establishing a camp within an area it is economically essential that all infested trees within the area covered by the survey be treated. In brief, then, it is the duty of the spotter-burners to locate and treat, as efficiently and economically as possible, all infested trees within the areas assigned to them.

The insect we are combating is known as the mountain pine beetle (Dendroctonus monticolae), which attacks and kills healthy, mature western

white pine, western yellow pine, lodgepole, sugar pine, white-bark pine, and sometimes Engelmann spruce when in association with infested pine. The adult insects are rather stout, black, cylindrical barkbeetles, varying in length from $3\frac{1}{2}$ to $6\frac{1}{2}/25$ of an inch. These beetles bore through the outer bark and construct long perpendicular egg galleries directly beneath the bark, which slightly groove the wood and extend up the tree. At the bottom or start of these galleries, which vary in length from 12 to 30 inches, there is normally a slight crook of an inch or more. Eggs are deposited along this gallery which soon hatch into small white grubs or larvae. In feeding, these larvae excavate individual larval mines at right angles to the egg gallery, which vary in length and width, and are exposed on the surface of the inner bark. When mature the larvae construct a small cell at the end of the larval mine in which the transformation to the new adult takes place. During this transformation the insect goes through what is called the pupal stage, and the small cell is termed a pupal cell.

When the transformation is complete the new adults bore away the intervening bark between cells and congregate beneath the bark for some time before emergence, or they may bore emergence holes directly out from the pupal cells. When emerging after congregating several insects may use the same emergence hole, or quite often advantage is taken of cracks in the bark, woodpecker work, etc.

Insect-attacked trees are first located by the presence of small pitch exudations (pitch tubes) which form at the mouth of the entrance hole, or by the boring dust at the base of the tree. Pitch tubes are not always present. When the attack is extremely heavy there are very few, if any, to be seen, so one cannot depend upon this rule as an infallible guide. This is easily explained by the fact that the total flow of pitch is distributed through so many entrance holes that there is not sufficient to form tubes. On the contrary, when the attacks are light, the flow of pitch is so strong that the attacking beetles are washed from their galleries and the attack is unsuccessful. Large pitch tubes are usually, though not always, an indication of a pitched-out attack. Fresh woodpecker work is a true indication that there were and possibly are insects beneath the bark. However, it does not prove that the insect is the mountain pine beetle. Later in the season the foliage of the infested trees begins to fade, which can be used as a guide to infested groups. This may occur in some areas in the fall, but by April or May a large per cent of white pine trees attacked the previous season will show discolored foliage.

There is no infallible rule which can be given to you for the proper marking of infested trees from external evidence. The rules which have been listed will lead you to the tree that has been attacked, then it is for you to determine if it should be treated. It will be necessary for you to examine nearly every tree by removing a piece of the bark. If you find that the tree was killed by the mountain pine beetle and that there are insects beneath the bark, then it should be treated.

It is in the marking of trees for treatment which show external evidence of attack that the good judgment of the spotters must be called upon. In this connection it is necessary that the spotters have a general idea of

the seasonal history of the mountain pine beetle. The manner in which this insect works has been described to you so that in a very short time you can determine if the tree has been attacked by this insect. However, it must then be determined if the insect broods are still present beneath the bark before the tree can be marked for treatment, as it is very obvious that there would be little accomplished by peeling trees from which the beetles had emerged.

Though there is but one generation of the mountain pine beetle per year, an overlapping of the broods does occur which often causes confusion to the spotters. Normally the insect passes the winter as a larva which matures into a new adult during June and emerges in July. However, deviations from this rule are often encountered and broods are often found overwintering in the egg and new adult stage. During long seasons the insect broods from early attacks often mature and pass the winter as new adults instead of larvae. These new adults emerge during June and attack new trees so that during the course of a project where trees containing overwintering larvae are being treated, one will often encounter trees with new adults, as well as new attacks. Such trees are always in the minority and serve as the exception rather than the rule, but their occurrence often confuses the spotters.

Another complication which may be encountered is when the attack only exists on one side of the basal portion of the tree. Infested trees of this character are often missed by the spotters passing by the unattacked side of these trees, but the most serious complication or confusion which will arise from these trees is when the uninfested portion of the tree is attacked later in the season, or the following season. This results in the spotters finding insect broods in this basal portion of the tree when the insects have emerged from the remainder. With a little practice these trees can be easily determined, and passed without marking. The fact that the foliage has fallen from the limbs with the general condition of the trees will indicate that the insects are to be found in the base only, usually on one side, and that by the time the spotter's examination has been completed the tree will have been treated.

INSTRUCTIONS FOR TREATING:

There are two methods for treating infested trees, namely, the felling-burning and the standing-burning methods. The felling-burning method consists of cutting the tree or group of trees, lopping off the limbs, sawing the tree into convenient sized logs, ricking the logs, piling on the branches and setting afire. In many cases the infested tree can be felled, soaked with oil and successfully burned where it lies. Both of these burning procedures are found to be practically 100% efficient. When trees are felled, however, the stump must either be completely peeled or very thoroughly burned to kill what beetles remain in them. The standing-burning method consists of spraying oil or gas-oil thoroughly over the bole of the tree to its infested height and then setting it afire.

The determining factor which will decide which tree shall be felled and which burned standing is based upon what can be seen of the

height to which the individual tree is infested, and the height to which the individual infested tree can be burned. For example, the smaller diameter trees are almost sure not to be infested higher than they can be burned successfully standing. Even large trees may in many cases be burned successfully where witches broom and large branches assist in crowning the tree out. However, there is no definite way of knowing which tree must be felled and which can be successfully treated by the burning-standing method except by careful observation of each individual tree. Weather conditions are a determining factor in deciding which method to use. Cold damp days following a storm or during a storm and windy days make the burning-standing method of treatment impractical. On days of this kind the felling-burning method should be practiced exclusively. Also, on afternoons when the wind comes up the crews should be equipped to proceed with the felling-burning treatment.

Standing-burning Treatment. The object to be obtained in this method is to generate sufficient heat on the bark of the tree to kill the developing broods of young beetles which are working between the bark and the wood.

The equipment used consists of compressed air sprayers of four gallons capacity equipped with carrying strap, oil resistant hose or metal tubing connections to an automatic shut-off and a long nozzle having an aperture the size of a No. 55 drill. Careful experiments have demonstrated that this size and form of nozzle gives best results with the oil. The light fuel or gas oil used has somewhat the burning qualities of kerosene. In timber where the infested portion extends much beyond 20 feet high, particularly where the boles are clean and free from limbs, it is necessary to use steel extensions which are made in sections three feet long. By coupling three of these together the oil may be thrown somewhat in excess of 30 feet high. Cases are provided so that several sections of the extensions may be carried with the pack outfit supplying the burners with oil.

The tanks are filled about three-fourths full of the oil and pumped up to a moderate pressure. Too high pressures cause breaking up of the oil stream. A few tests will give the burner an idea of the feeling of the pump when the most effective pressure is obtained, which is about 20 pounds, and as far as possible this pressure should be maintained at about this point. For most men the tank is carried more effectively on the left shoulder at an angle of about 35° with the body. The automatic shut-off is operated by the right hand. The oil is rather caustic and will blister the skin if it comes in contact with it to any considerable extent. For this reason the clothing should be such as will give good protection and spilling of the oil on the clothes or hands should be avoided as far as possible. Burners are required to carry a large rag along to wipe the oil off of the outside of the tank after filling. The rag can be carried between the lower end of the strap and the tank where it will dry out sufficiently for long use. Plenty of extra clothing should be available to allow frequent changing since more or less spattering with oil is unavoidable. Unguentine should be used freely where burning has occurred. Precautions should be taken to see that oil soaked clothing does not become ignited.

Before starting to throw the oil on a tree note should be made to see that there is sufficient oil and air pressure to complete the application. A stream of oil is directed against all parts of the trunk up as far as there is any indication of insect work, care being taken to distribute it evenly and avoid spattering. The base of the tree often has thicker bark and particular care must be taken to soak this section thoroughly. Since it is desired to create intense heat and burn out the entire top , if possible, advantage should be taken of any heavy or dry limbs close to the trunk and oil sprayed on them. If two or more trees to be treated stand close together they should be sprayed and burned at one time since added heat and a better burn results. After the trunk has been soaked throughout added pressure is pumped in the tank if necessary and a lighted match thrown at the base of the tree. As the flame starts, additional oil is sprayed on to build up as much volume of flame as possible and this is carried on up the tree. A good flame developed at first results in a hotter burn and more frequent crowning out with less oil than if the fire starts slowly and it is necessary to attempt to build up the flame after the bark has been partially burned.

Where there is any doubt about the treatment reaching high enough to kill all the bugs the extensions should be used. It is much more effective to use them and burn out the tree at one burning than to have to go back and attempt to burn out the top after the lower part is burned. Sometimes poles or brush placed against the base of the tree helps to carry the fire up. Do not hesitate to ask the crew foreman whenever there is any question regarding whether or not the burning is being properly done. Cold winds greatly retard the effectiveness of treatment and it may at times be advisable to burn in the evening or at night where such interference becomes serious. The same action may be necessary towards the later end of the treating season when danger of the fire running develops. General action to prevent fire spreading may be avoided by taking advantage of the early morning or evening hours to burn certain sections having bad fire conditions or those where the wind strikes. These may often be treated following rains or showers.

Care and attention to details in this matter develop the skill of the burner, and enable more efficient burning to be accomplished with the expenditure of less oil and a constant effort to improve the quality of one's work should be made. There are many details which cannot be covered in a memorandum of this nature and much depends on the individual efforts of the burners to make the work effective with the least possible expenditure of oil and time. All the packing, mapping and spotting, in fact all the results of the entire effort are dependent upon the efficiency of the burning operation.

Summary for Effective Work

Avoid: Wasting oil;
Useless treatment;
Skipping infested sections;
Insufficient heat at base;
Missing any bug infested tree;
Lighting before you are ready.

Do: Reach all infested sections of the tree;
Distribute the oil evenly and thoroughly;
Make sure you have oil and air pressure to build up heat after lighting;
Build up a quick heat;
Make sure the heavy bark at the base of the tree is well treated.

GET ALL THE BUGS

Remember we may have 10 infested trees next year for every one we miss this year.

EQUIPMENT:

Camp Equipment. Office tent, sleeping tents, mess tent, stoves for tents, cook stove, kitchen equipment, extra bedding, grindstone, files, rope, nails, first-aid kit, extra axes, etc.; horses and equipment, horse feed, etc.

Spotting-treating Crew Equipment. (6-man crew)

Report forms
1 compass, F. S. Standard
1 talley register
1 map of forest area
5 hand axes with sheaths
3 spray tanks
2 9-foot extensions
1 extra nozzle (with crew)
1 extra hose (with crew)
1 extra nozzle parts (with crew)
Extra gaskets (all sizes, with crew)
1 light felling saw
2 light axes
2 pack horses
Oil tanks to carry oil
Rack to carry spray tanks when not in use.

Camp Manager's Equipment.

Time book
Time slips
Stationery
Envelopes
Camp Manager's weekly report
Crew Foreman's weekly report
Pencils
Drawing board
Maps
Extra equipment

The Camp Manager will be responsible for and keep a record of all equipment.

CARE OF EQUIPMENT:

It will be the duty of each man in each crew every night to see that all equipment used by the crew is in workable condition so that all unnecessary delays will be avoided. In the course of the field work there will be a certain amount of wear and tear on equipment and occasional loss. Such damage or loss when properly explainable will be excused but when due to carelessness, payment therefor will be required.

CAMP RULES:

It is suggested that each member of the organization keep his personal equipment in duffle bags or strong seamless sacks. Moving camp is an expensive and laborious task and it is not possible to haul trunks and excess baggage.

Any preparation for the following day's work such as repairing pumps, sharpening axes, etc. should be made in the evening so that the crew will not be delayed in starting out in the morning.

All camps will be kept and left in a neat and sanitary condition, and refuse will be burned or buried. A pit will be dug at each camp for the disposal of garbage, and care will be taken against the pollution of any streams or springs.

FINAL REPORT:

A report covering the details of the project will be made out in the Chief Ranger's office from the records kept by the camp manager.

N.P. 1931
C. Form A

CAMP MANAGER'S WEEKLY REPORT

Project_____ Unit_____ Camp_____

Production Record for Week of _____ to _____

Day	Crew Trees Treated	Crew Man-days	Crew Trees Treated	Crew Man-days	Crew Trees Treated	Crew Man-days
S						
M						
T						
W						
T						
F						
S						
TOTAL						

Grand total trees spotted_____ Grand total trees treated_____

Meals Served

Day	Number
S	:
M	:
T	:
W	:
T	:
F	:
S	:
Total	:

A. Total effective man-days treating _____

B. Total effective man-days spotting_____

C. All other man-days _____

D. Total man-days paid _____

E. Total man-days contributed _____

A, B, and C should equal D and E.

Remarks:_____

_____

Signed _____
Camp Manager

A. Includes Crew Foreman and all men contributing to the actual treating of trees
B. Includes Chief Spotter and all men of spotting crew.
C. Includes Camp Manager, Cooks, Flunkey, Bull Cook, etc.
D. All man-days paid from project funds.
E. All contributed man-days except supervising overhead not attached to camp.

N. P.
C. Form B

1931

TREATER'S WEEKLY REPORT

Week of _____ to _____ Crew Symbol _____

Project _____ Unit _____

Record of Trees Treated

Day	Number of Trees Treated	Section or Area Worked	Man-days	Area	Remarks
S					
M					
T					
W					
T					
F					
S					
TOTAL					

Remaining territory to be covered from present camp _____

_____

Number of days required to complete present camp area _____

Remarks (suggestions, requirements, etc.) _____

_____

_____

_____

Signed _____
Chief of Treating Crew

Department of the Interior
National Park Service
Yellowstone National Park

JJ-6

MORANDUM FOR THE PRESS: By: Joseph Joffe
elease ON RECEIPT Assistant to the Superintendent

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Yellowstone Park, Wyoming, April 00: Telephone operators "listening in" to call the other night from Yellowstone National Park to Grinnell, Iowa must have ard a conversation which made them perk up their ears. Park Naturalist Dorr Yeager has taken a cub bear to raise, having brought the youngster in from d Faithful on his back, a ski trip of 92 miles. A box has been fixed up in e Yeager kitchen, which the cub calls home, and a record is being kept of his ight, growth, manners, etcetera.

A few nights ago Mr. Yeager called his mother at Grinnell, Iowa, and during e course of the conversation the cub bear was brought to the phone and spoke s little piece into the receiver, vieing with the trained seals, dogs and other imals now broadcasting over the radio. There is nothing more realistic to the y of a human child than that of a cub bear and when Mrs. Yeager first heard the y she immediately thought that the stork had paid a visit to the home of her n and daughter-in-law, who have been married for about two years.

The necessary explanations were made and the party on the Grinnell end of e line said that she realized that the Yellowstone was a home and preserve for e wild animals of the forest but that she had never hoped to live to be able converse with any of them from a distance of about fifteen hundred miles. ve heard of the 'call of the wild'", the elder Mrs. Yeager remarked, "but s 'long distance call of the wild' is a new one on me!"

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Department of the Interio)
National Park Service
Yellowstone National Park

JJ-5

EMORANDUM FOR THE PRESS:
Release ON RECEIPT

By: Joseph Joffe
Assistant to the Superintendent

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Yellowstone Park, Wyoming, April 00: "Seeing the world through a porthole" as been a familiar phrase for years with the Navy but seeing Yellowstone National ark from the back of a park ranger is a new experience in beardom.

In early February Park Naturalist Dorr G. Yeager started on a ski trip around he loop road with a view to studying the hot water phenomena in winter. Upon ar-ival at Old Faithful there was considerable excitement over the finding by the interkeepers of a pair of bear cubs born to Mrs. Jesse James, of the bear hold-up ribe. Natural history books contain very little regarding the early period in ie life of a wild bear so Mr. Yeager decided to bring one of the cubs into head-iarters to study and note the daily developments in a bear's life.

As the mother was more or less in a dormant state it did not require great ffort to secure one of the cubs. The wife of the winterkeeper sewed a pocket in ie back of the parka worn by Mr. Yeager and the following day the trek around ie loop continued. Jesse James, Jr. was born on January 20 and when the trip arted he weighed 24 ounces, measured eight inches in length and had not yet ened his eyes to see what the world was like. He traveled over the Continental vide twice in the trip from Old Faithful to Thumb and while enroute from Lake the Canyon one eye opened for the first time. Not before fifteen more miles d been covered did the other optic open so by the time the Grand Canyon was ached the youngster was able to observe this stupendous spectacle which park sitors come thousands of miles to see.

Jesse James, Jr. has taken up his home in the Yeager residence and his every vement is being observed. "He's a bottle baby and requires a great deal of time attention", Mr. Yeager said, "but I feel that the results are going to be rth the effort."

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No. 1030—Met'l.

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

MONTHLY METEOROLOGICAL SUMMARY.

tion, Yellowstone Park, Wyo. ; *month,* April, 1931.

Temperature (Degrees Fahrenheit.) Max.	Min.	Mean.	Precipitation. (In inches and hundredths.)	Character of day.	Per cent of Possible Sunshine
45	25	35	.15	Cloudy	21
30	20	25	.05	Cloudy	23
42	12	27	0	Clear	80
48	20	34	0	Pt.Cl'dy	79
54	29	42	0	Pt.Cl'dy	65
56	38	47	0	Cl'dy	42
60	36	48	T.	Pt.Cl'dy	68
44	26	35	0	Clear	98
45	27	36	0	Cloudy	62
55	32	44	0	Cloudy	65
61	34	48	0	Cloudy	72
62	36	49	0	Clear	100
56	32	44	.01	Cloudy	34
44	30	37	.01	Cloudy	48

ATMOSPHERIC PRESSURE. (Reduced to sea level; inches and hundredths.)

Mean 30.073; highest 30.70, date 20

lowest 29.69, date 7

TEMPERATURE.

Highest 62, date 12; lowest 12, date 3

Greatest daily range 31, date 27

Least daily range 8, date 29

MEAN FOR THIS MONTH—

1871	82	93	31	04	39	15	45	26	41
1872	83	94	38	05	37	16	38	27	34
1873	84	95	..	06	38	17	31	28	33
1874	85	96	34	07	34	18	33	29	34
1875	86	97	38	08	39	19	39	30	44
1876	87	98	40	09	31	20	31	31	38
1877	88	99	36	10	43	21	33	32	
1878	89	00	42	11	34	22	33	33	
1879	90	01	36	12	36	23	33	34	
1880	91	02	37	13	38	24	36	35	
1881	92	03	37	14	38	25	40	36	
	39								
	43								
	43								
	39								
	41								
	42								

Normal for this month 37.0

Absolute maximum for this month for 44 years 77

Absolute minimum for this month for 43 years -3

Average daily excess (+) or deficiency (−) of this month as compared with the normal +0.8

Accumulated excess (+) or deficiency (−) since January 1 +356

Average daily excess (+) or deficiency (−) since January 1 +3.0

PRECIPITATION.

Total this month 0.93; snowfall 5.3

Greatest precipitation in 24 hours 0.69, date 29-30

Greatest snowfall 5.0, date 1-2

Form No. 1030—Met'l.

U. S. DEPARTMENT OF AGRICULTURE.

WEATHER BUREAU.

MONTHLY

METEOROLOGICAL SUMMARY.

STATION

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MONTH

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8—1650 U. S. GOVERNMENT PRINTING OFFICE: 1929