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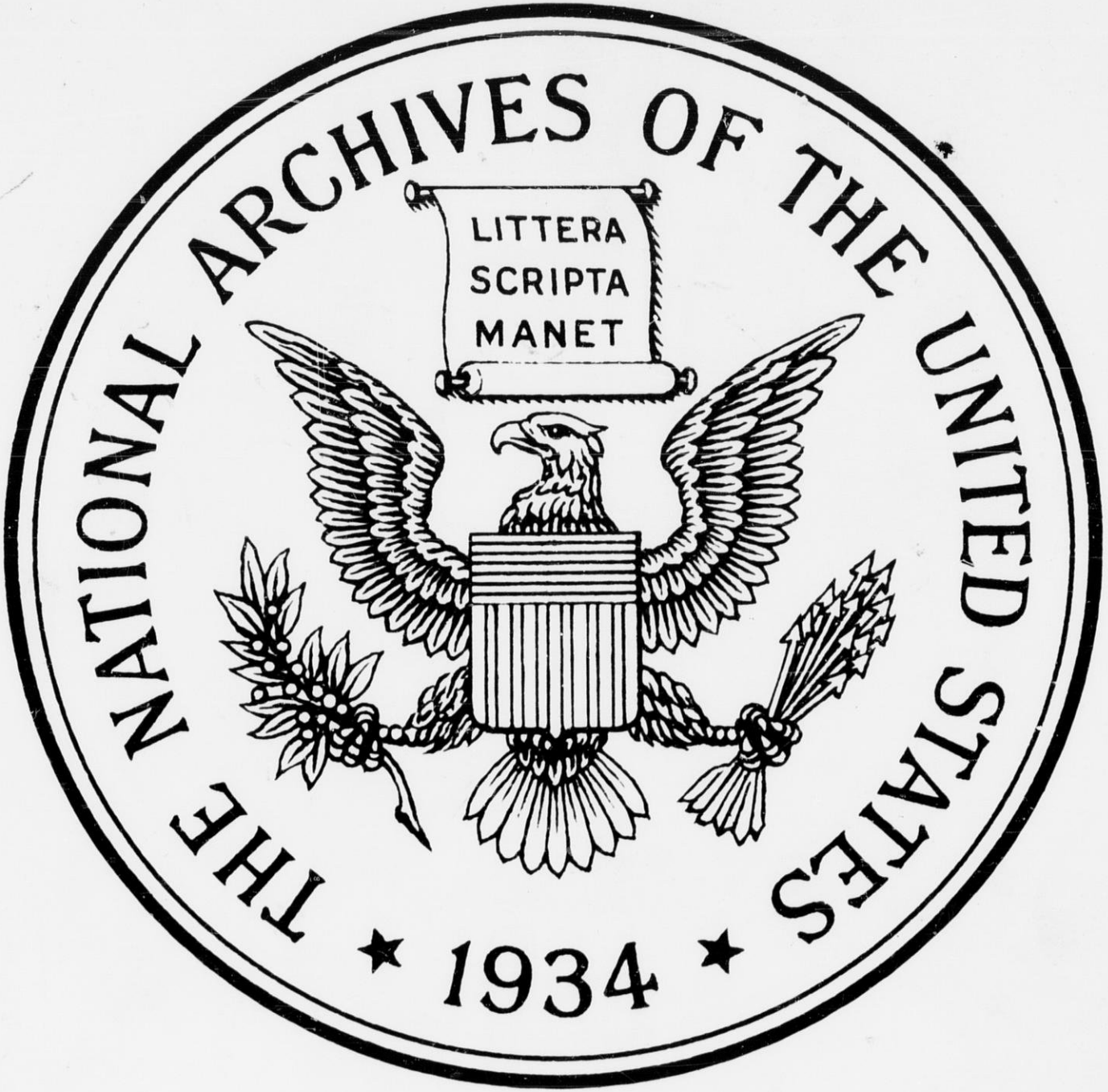
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RECORD GROUP 95

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RECORD GROUP 95

RECORDS OF THE FOREST SERVICE

RECORDS OF THE DIVISION OF OPERATIONS:

OPERATIONS FILE, 1910 - 1923

OF
Pl place with other matter

D
Supervision.

February 18, 1915.

JCK

MEMORANDUM FOR DISTRICT FORESTER:

I have read circular 183-D-5 with great interest, and take the liberty of submitting the following comment:

I presume that on account of its geographical location the Carson Forest ought to offer as good an example of slack work during the winter season as any Forest in this District. Possibly conditions on that Forest are not representative, but I can state with the utmost assurance that there is no slack season on that Forest. During my three years administration of that Forest I remember that one winter for a matter of two or three weeks there were two or three rangerswho were not crowded with work, but the reason for that condition was my failure to get into the field to give certain instructions rather than any reason inherent in the organization.

The end of Improvement work, field inspection by the Supervisor, and the end of the cattle season, on the Carson may be considered to fall approximately on December 1. December is quite fully occupied with cattle counts, which can be made only in

winter for yearlong stuff, and besides is a very busy month for free use business, which, as you know, is very heavy on most of the Districts. In January the Rangers begin taking grazing applications, and the period from January 1 to February 15 is, to my recollection, about the busiest period of the year. The rest of February and the month of March are generally fully occupied in straightening out grazing cases for the coming season, and in beginning the posting of allotments, and on April 1 the new season opens. I think that Supervisor Marsh will subscribe to the foregoing statements.

From the standpoint of the District as a whole I can not reconcile the proposition in circular 183-D-6 with our very evident tendency in all branches of our activity to demand an increasing degree of training and intelligence in our Rangers. The plan outlined apparently implies large Ranger Districts with large forces of Forest Guards during the summer season. There may be places where the size of Ranger Districts can be increased, but in general that part of our work which can successfully be delegated to temporary labor is limited by its very nature. This seems to me especially true of the Grazing work; no part of which, with possibly the exception of counting sheep and patrol of boundary, can be satisfactorily per-

Memo for D. F.

formed by the ordinary Forest Guard, and most of which can in fact hardly be satisfactorily performed by the average Ranger. I am of the opinion that any change in the direction of the plan outlined would be a retrogressive step insofar as grazing is concerned.

In this connection you undoubtedly remember the opinions very emphatically expressed by Col. Roosevelt in his article, which appeared about a year ago in the 'Outlook', on the Kaibab National Forest

Acting Assistant District Forester.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

183-D.5

D
Supervision

February 13, 1915.

MEMORANDUM TO FOREST SUPERVISORS:

Aside from the additional protective force put on during the period of fire danger, the present Forest organization is based on the assumption that the National Forests of the Southwest may be best administered by maintaining a stable, permanent, year-long force. As a matter of fact, the greater number of Forests in District-3 have two, well defined seasons. From April 15th. to October 15th. is ordinarily the period of field activity, and from October 15th. to April 15th. the dormant period, devoted largely to office work.

Manifestly, all field men, through lack of training, education or other qualifications, cannot render productive service during the winter months. Too often, then, Forest Supervisors are put to the necessity of "finding" work for men of this type. The result of such an organization is a lack of sustained productive service, increased expense in correspondence, supplies, etc., and, therefore, an increased cost of administration. While many Forest Supervisors have recognized this fact, they justify their present organization on the assumption that to retain the

services of a good man during the period of field activity, he must be held over during the winter months.

A better fixation of the responsibilities attached to each position, and a closer fixation of the period of time when these duties can best be performed, should result in a more effective organization and remove the reason which at present actuates the desire of Supervisors to maintain permanently their present personnel. The Forest organization may be divided into four units: supervisory, staff, administrative, and protective. Efficiency and effectiveness obviously demand that the supervisory and staffounits must be maintained year-long. However, this is only in part true of the administrative unit. The protective unit is, of course, recognized as temporary. The question, then, is the better fixation of the responsibilities and time of performing these responsibilities of the administrative unit. This suggests a division of the year into the two seasons referred to above. There should be, then, a minimum number of administrative officers retained throughout the two seasons, and a maximum number employed during the season of field activity. For example, instead of retaining five assistant forest rangers at $1100,00 per annum yearlong, substitute twelve men at the rate of $900.00 per annum for a six months' period, from April 15th. to October 15th. It should be clear that better results can be obtained through the close direction of the work of these

twelve men during the season when work can best be performed, than from the work of five men when half of their time cannot be devoted to field activities.

This plan has been roughly outline for one of the Forests in this District, and has developed some very interesting possibilities. The Forest in question now maintains eleven year-long rangers of average pay. Under the new plan, it is found possible, without any increase in appropriation whatsoever, to reduce the number of year-long rangers to six, and increase the summer force to an additional eighteen. (Does not include the usual protective force). Furthermore, each of these six rangers was given a theoretical promotion of two hundred dollars cash, complete forage allowance, and reimbursement for entire travel expenses when away from headquarters. The eighteen men were figured at a salary of $75.00 a month.

To accomplish such a change in organization will require legislation; that is, we shall need the authority to use statutory money for temporary periods. For example, to employ two assistant Forest Rangers at $1100.00 for six months, instead of one for twelve months. Nothing can be done to accomplish this change during the Fiscal Year 1916, but it should be possible, assuming that the change is desirable, to secure the necessary legislation in time for 1917. For this reason, I wish you would give this suggestion your earnest

consideration, in order that the plan may be discussed with you during the present visit to your office for the purpose of discussing Forest finances.

(Signed) Arthur C. Ringland

District Forester.

Copy for Branch of Operation - Washington

D-3 Paper

C
Cooperation, Game Protection.

FOREST SERVICE
GRAZING
Office of the Chief
FEB 17 1915
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February 6, 1915.

MEMORANDUM FOR DISTRICT FORESTER:

I have been greatly interested in Mr. Leopold's memorandum "C-Cooperation, Game Protection" of January 9, and Supervisor Guthrie's letter "C-Coconino, Cooperation, Game Protection" of January 6.

The gist of these communications is that, while on paper, District III is presumed to have a very effective and practicable way of enforcing the game laws of Arizona and New Mexico, in the field it is not getting the results expected from the plan, and it is apparent that some change should be made. In support of this contention quotations are made from a number of the Annual Grazing reports and mention is also made of a number of impressions or beliefs prevailing among the field officers of District III, which while not substantiated by a citation of specific cases, nevertheless are of such character as to justify the conclusion that conditions are as stated.

As a means of overcoming this apparently general point of view on the part of the field officers, the suggestion is made that the enforcement of the State Game Laws be

made more attractive to the field officers by the offer of additional compensation, to be secured either by allowing the local officers to retain a portion of the fines imposed, this being authorized by the State law, or by allowing officers holding commissions as State Game Wardens to receive additional compensation from the State. In order to accomplish this, it is suggested that Regulation G-30 be modified.

It seems to me that both of the plans suggested are objectionable in some respects, and are suggested merely as a means of accomplishing an end which properly should be accomplished through the adoption of improved plans of administration and discipline as it has been in other Districts, notably Districts 2 and 5. In the first place either plan, if approved by the State, would mean increased compensation to the Forest Officers who took any active part in the enforcement of the game laws, and the result of this would be that in states, that would not adopt such a plan, the rangers would be securing a much smaller compensation than the rangers in District III. This in itself, if known in the other Districts, as undoubtedly it would be, would create a feeling of dissatisfaction among the rangers, with a result that they would probably lose some of the interest and effectiveness which they now display in enforcing the State Game Laws.

Another phase of the matter is that, by the provisions of Regulation G-3 and by the provisions of the special agreement entered into between the Forest Service and States, it is a part of the ranger's official duty to enforce the game laws to the greatest extent consistent with the discharge of his duties as a Federal Forest Officer. This premise being accepted, it would seem to me that neglect or failure to discharge these special duties should be regarded as dereliction of duty, rather than as a matter justifying the granting of additional rewards as a means of inducing men to carry out an agreement entered into by the Forest Service.

The enforcement of State Game Laws by the Forest Service is not wholly altruistic or prompted by public zeal. While the existing statutes do not recognize wild game as a Forest product, to be controlled and disposed of by the Federal Forest Service, there is a possibility, and in the mind of the Forester a hope, that perhaps in the course of time public opinion will so change and statutes will be so amended as to concede that the game animals of the National Forests are Forest products controlled by the Forest Service, and to be disposed of as the Forest Service sees fit. While the possibilities of such a change are at present remote, they are not at all improbable, and so the average Forest Officer

in zealously protecting the wild game in his district is after all working in the interests of the Forest Service of which he is a member.

Apart from the preceding consideration, the protection of wild game is considered to be a public duty, which every public officer, whether Federal or State, should discharge to the best of his ability, and in the Bill for 1912 Congress specifically provided that the Forest Service should cooperate with the respective States in this work. Regulation G-70, and the outline of Game policy which follows it, is not the expressed opinion of a single individual or of the Washington office, but rather the combined opinions first; of a Service Committee, and later of a District Foresters' conference, so that it should reflect correctly the policy, the point of view and the attitude of the Forest Service. In two Districts to a marked degree, and in other Districts to a lesser degree, it has been proved practicable to carry out this policy without serious interference with the work of the Forest Service or its interests, and with a marked improvement in general public sentiment. The advances made in the Districts referred to were not due to any combination of circumstances, such as a remarkably favorable public sentiment or strong realization of the economic value of the game, or a more effective and more rigid enforcement of the statutes, but to the contrary were made in the face of

active opposition and under all the difficulties which follow slack enforcement of the laws by State or County officers.

The first step in the effective enforcement of game laws is to reliably determine each ranger's authority under the State Game Warden's Commission, the extent to which the State will protect him in the discharge of his duties as a State Official, and arrangements for a compensation either by the State or the Federal Government for all just and proper expenditures made in the enforcement of the law through the arrest of violators or the prosecution of the cases. When this has been done, and when each Forest Officer has been assured of protection against legal action, bodily injury, or loss of money then the problem becomes purely one of District Administration, and the success or failure of the policy depends absolutely upon the attitude of the District organization as interpreted in the field by the Supervisors in charge of the Forest. Unless the District Forester impresses upon every Supervisor and Ranger that the protection of game is a part of his duty which, if properly executed, will be given consideration to the same degree as any other phase of his work, and if improperly executed or neglected, or ignored, will count against him, and unless failure to cooperate is regarded as neglect of duty and followed by the necessary disciplinary action, our cooperation

with the States will be effective only on paper and not in actual practice. If, however, the District organization does all the things above enumerated, there is no question but that in the course of time public sentiment will sustain the Forest Officer and the Forest Service, and the wild game of the National Forest will be effectively protected without injury to the interests of the Forest Service. It is realized that the average Forest Officer probably will advance the excuse that if he prosecutes the violators of the game laws he will lose the support of the settlers within his District upon whom he is depending for assistance to fight fire, for information with reference to Forest matters and very frequently for shelter, and will thereby lessen the efficiency of his work as a Forest Officer. Experience in the Districts where a really effective effort has been made to protect the game has demonstrated, however, that this is merely a passing condition which will disappear as soon as the local residents become aware of the sincerity and honesty/purpose of the Forest Officer. After that public sentiment will support the Forest Service and its individual members, and there will be a net gain in popular approval rather than a net loss.

A violation of the game laws is of such nature that immediate action is almost always necessary to prove the violation and to secure the conviction of the offender, which means

that the offender must be apprehended and taken to the nearest Justice of the Peace by the Forest Officer himself if a successful prosecution is to be secured. In other Districts this is more or less the rule, but in this District I should judge from the memorandum and letter before referred to, and from my own personal observations that the general practice has been for the Forest Officer detecting the violation not to make the arrest, but to report the matter either to his Supervisor or to the nearest State Official. Just why this should be I do not know, but apparently this practice impairs the efficiency of our cooperation to such an extent as to make it practically worthless. With the qualification that in no case will a Forest Officer allow the enforcement of game laws to interfere with urgent Forest work, I see no reason why Forest Officers detecting violations of the game law, and holding proper commissions from the proper authority should not arrest the offender without delay and push his prosecution in the proper courts. If there is any reason why this should not be done that reason should be used as a basis for modification of the agreements with the States of Arizona and New Mexico. As I recall it, it was not long ago that Game Warden Baca complained to Congressman Fergusson that he was receiving no assistance of value from the Forest Officers and if the opinions expressed by Messrs. Leopold and Guthrie

Memo for D.

are to be accepted Mr. Baca's statements are apparently justified. There ought not to be any false pretenses about this game protection work. The rank and file of the Service should regard it as a duty to be thoroughly and effectively discharged, or else we should disavow the responsibility for the game and refuse to be connected with its protection.

Assistant Forester.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
WASHINGTON

September 15, 1914.

O
D-3, Supervision
Carson (Hdqrs.)

District Forester,

Albuquerque, N. Mex.

Dear Sir:

Reference is made to my telegram of September 12 and your reply of the same date:

I wired you today to defer further action in the matter of the removal of the headquarters of the Carson Forest from Tres Piedras until the receipt of this letter. As a result of a final appeal by Representative Fergusson to the Secretary, I have just had a conference with the latter who after reviewing the whole case has expressed his entire sympathy with the position taken by Mr. Fergusson in objecting to the removal of the headquarters to a point outside the State. He feels that notwithstanding how valid our objections may be to the expenditure of a considerable sum in water development or other improvements, that we should be willing to make that sacrifice if in the end it resulted in the establishment of a satisfactory permanent headquarters in New Mexico. He desires therefore that the removal be deferred, and that further consideration be given to the

JBB

feasibility and ~~best~~ cost of securing a location in New Mexico.

I will be glad therefore, if you will take up again the question of a location at Taos which will involve the construction of a Service telephone line from that place to Servilleta, and also to have a further careful investigation by a competent engineer of the water development at Tres Piedras. You might also consider the possibility of securing the necessary facilities at Servilleta or any other central point in New Mexico in the vicinity of the Carson Forest.

Very truly yours,

A. F. Potter,

Acting Forester.

F. S. D-8
JUL 30 1914
Referred to
OPERATION

O
Carson Supervision,
Supervisor's Headquarters.

July 25, 1914.

REPORT ON CARSON HEADQUARTERS SITUATION.

The Supervisor's office of the Carson Forest was moved in the spring of 1911 from Antonito, where it had been up to that time, to Tres Piedras, by Supervisor C. C. Hall. This removal was made on account of the much more strategic location of the latter place with reference to the forest. Its geographic location made all parts of the forest very easily accessible from it except for the Jicarilla District which is not very easily reached from any point of the rest of the Forest. At that time when the entire forest was being re-organized and a great deal of improvement work done this matter of accessibility was exceedingly important. At the time of removal there appeared to be an adequate water supply in Tres Piedras. Although at that time sufficient and proper quarters for office and dwellings were not available there was a boarding house and good rooms could be secured by transients, and the plan of the officials for constructing at government expense the proper buildings for office and dwelling houses and of mak-

ing Tres Piedras the permanent headquarters appeared entirely feasible. The dry years of 1912 and 1913 raised a serious doubt as to the adequacy of the water supply. An examination was made by Hydroelectric Engineer Whitsit this spring to determine the possibilities of this, and as a result of his unfavorable report, dated May 15, 1914, the Forest Service does not feel justified in spending the necessary five or six thousand dollars more or less to construct the proper buildings and develope a sufficient water supply, with the prospect of possible failure as to the latter.

Living conditions have grown steadily worse during the past three years. There is no boarding place in town and no rooms can be secured by transients. Under the circumstances of entirely inadequate quarters for a portion of the headquarters force, living conditions necessitating an entire lack of the comforts of life for all, and unsuitable office ficilities it would be absolutely impossible to secure and maintain permanently an efficient personnel. There is apparently no prospect of conditions improving. There can be no question of the great advantage of the geographic location of Tres Piedras over any other place. However, no matter how great this advantage may be, its location for a supervisor's headquarters becomes impossi-

ble under the conditions above described. The District Forester and this office agree absolutely upon the necessity for moving the office from Tres Piedras. Supervisor Leopold, formerly in charge of this forest, while on leave definitely recommended the removal about two months ago.

There appear to be but three possibilities as to proper location for the office: Antonito, Taos, and Santa Fe. The latter while being the state capital and possessing all of the business facilities pertaining thereto , besides being a very desirable place to live in, has the disadvantage of being located approximately eighty miles from the nearest part of the forest and two hundred and fifty miles from the farthest, with accoss thereto only by a very indifferent, narrow gage railroad, which circumstance would make supervision costs very high. It would be very expensive, if not entirely impossible, to get the Forest Service telephone system connected with Santa Fe with assurance of satisfactory service. Careful study is not needed to indicate that the advantages of either Taos or Antonito surpass those of Santa Fe.

In view of the history of the headquarters question here and on the whole the comparatively equal merits of Antonito and Taos for headquarters location, I wish to submit as careful a comparison as is possible of the two

places. The difficulty of reducing this to a mathematical basis is evident. It is admitted that it is easy to pick flaws in the comparison, but it is believed that it is better than making a blind statement, and to attempt to eliminate all sources of erroe leads to impracticable refinement.

The accompanying proclamation plat indicates the various ranger headquarters and the approximate distance of each from both Antonito and Taos. The various means of communication and transportation are shown. A glance at the map indicates that so far as geographic location is concerned neither is ideally situated, and both are quite possible.

There are several circumstances, the outcome of which is absolutely impossible to foresee, which will materially affect the question of the best permanent headquarters and which may reverse the wisdom of any decision made now. Among these are:

1. The ultimate administration of the Jicarilla District. Looked at from a broad point of view , disregarding state and district lines, it could undoubtedly be handled more economically either from Durango or Pagosa Springs than from either Tres Piedras or Taos. When compared with Antonito the difference is not so great. In view of the latest advice it is assumed that it will be a permanent part of this forest and is so considered in this report.

2. The possible necessity for installing a Forest Service central in Tres Piedras. This is impossible to determine until our Antonito extension, now in process of construction, is tried out, but there seems to be considerable likelihood of it. In this connection reference is made to my "O-Carson Improvement, Telephone" memorandum of July 25, 1914 covering conference with District Superintendent Pattison of the Mountain States Telephone and Telegraph Company.

3. The rather remote possibility of the bridge across the Rio Grande on the road from Tres Piedras and Servilleta to Taos being abandoned. In this connection it has been rumored generally that the depot at Servilleta would be moved to Caliente Siding this summer. In response to an inquiry by the District Forester, the general manager of the Denver and Rio Grande Ry. was rather noncommital but left the impression that the removal would take place sooner or later. If the road direct from Taos to Caliente, and which is now partially constructed, is completed it will put Taos within about twenty miles by good automobile road of the railroad at Caliente and not only will all of the Taos traffic go out over this road which crosses the river a considerable distance south of the present bridge, but in all probability the mail from Arroyo Seco, Arroyo Hondo, etc., which

now goes to Servilleta, will go to Caliente over the new road. This will greatly decrease the traffic between Taos and Servilleta and Ojos Piedras. The road to Ojos Piedras is already in very poor shape. Even if the bridge is kept up, as it probably will be, the road will ~~probably~~ deteriorate. It is a very round-about way via Caliente from Taos to the Amarilla Division of the forest.

4. The possibility of transferring the north end of the Pecos to the Carson. This territory is very accessible from Taos and there would apparently be some reason for making the transfer. However, such action doubtless would not be taken at present for administrative reasons and in any event probably it should be considered as a natural result of moving to Taos rather than as a reason for it.

In choosing a location for a Forest head quarters the following points are among the important ones to be considered:

1. Accessibility of the various ranger headquarters from the Supervisor's office. For the most part the business of the forest users should be done with the rangers, and in this report the accessibility of the supervisor to the forest users is treated as of secondary importance.

2. Telephone and telegraph communications between the supervisor's office, on the one hand and the various parts of the forest ~~on the one hand~~, and the outside world on the other.

3. Business facilities such as hotel accommodations, stores, banks, etc.

4. While not the most important item, nevertheless the ordinary comforts of life especially for the members of the office other than the supervisor must be seriously considered.

The following is a brief comparison of Antonito and Taos with respect to the above points with a statement of certain unusual features which affect it:

1. Accessibility.

The following table indicates roughly the comparitive distance, time, and cost of the two places from the various ranger headquarters under present conditions . With the exception of Ross the time given is the estimated driving time by team under the most favorable weather conditions. Under conditions here it is my opinion that for general official use an automobile is not feasible. While roads are numerous they are not particularly good and the climatic conditions are such as to prevent their use by automobiles except for a few months in the summer. Moreover, in an ordinary inspection trip a supervisor cannot be content with merely

roosting the ranger station. He must be prepared to visit all parts of the district and this he cannot do unless he has horses with him. The supervisor on this forest should be provided with a team and rig.

Ranger Station	Distance from (miles)		Time (days)		Travel cost (Ry. and meals both ways.	
	Antonito	Taos	Antonito	Taos	Antonito	Taos
Rosa	125	186	1/	2/	$9.88	$22.00
San Antone	23	55	½	1	---	5.00*
**Cow Creek	35	40	1	1	----	3.00*
Borracho	49	50	1	1	1.70	2.00*
Canjilon	67	68	1½	1½	6.10	4.40*
Questa	45	28	1	1	1.50	----
Taos	70	0	1½	0	4.40	----
Total	412	427	7½	7½	25.58	33.48
Average	59	61	1 1/14	1 1/14	3.37	5.69

/Stage and railroad.

*$1.00 toll charge on every trip across the Rio Grande from Taos.

**Summer headquarters, Servilleta District.

The distances and times are soon to be practically a stand off. The following modification should be tentatively made:

So far as we can see Tres Piedras will be the winter headquarters of the Servilleta Ranger Station and Cow Creek the summer (from about April 15 to November 15). So long as there is a timber sale on the district the ranger will need an assistant during the field season. It is very possible that either the ranger or his assistant may have his headquarters at Tres Piedras throughout the summer and thus maintain a sort of substation there, at least to the extent of keeping the supervisor's rig and team there and ready to go into the field at any time. By taking the morning train from Antonito this would materially reduce the difficulty of reaching Taos and all but the San Antone District of the Amarilla Division. Car fare would perhaps balance saving of time under this arrangement but forage cost to the government would be less. This would make the average time slightly less than from Taos. On the whole, though, except for the possible contingency cited under No. 3, page 5 which would make Taos entirely useless, there is no great difference in accessibility, ~~without that it~~ with what there is in favor of Antonito. ~~This is especially true~~ The difference is greater for the Amarilla Division where at least 75% of the forest business is located.

While I believe in extended inspection trips and that, generally speaking, one district, regardless of the amount of work done, should be inspected as thor-

oughly and as often as another, yet there are always more or less unforeseen short trips necessitated, as for instance timber sale inspections, which will come for the most part on those districts which have the greatest amount and diversity of business.

As to accessibility of the office for the forest users: An examination of the list of postoffice addresses of the forest users compiled a year ago shows that 75% of them could more easily reach Antonito while 25% of them could more easily reach Taos.

The railroad and stage time tables effecting travel on the Amarilla and Taos Divisions follow:

Railroad.

Lv.	Antonito	8.00 A. M.	Ar.	Antonito	6.20 P.M.
	Tres Piedras	10.00 "		Tres Piedras	4.20. "
	Servilleta	10.30 "		Servilleta	3.40 "
	Barranca	11.45 "		Barranca	2.15 " (approx
Ar.	Santa Fe	4.20 P.M.	Lv.	Santa Fe	10.00 A.M.

Stage.

Leaves Servilleta 10.30 A.M., arrives Taos, 3.30 P. M.

Leaves Taos, 6.00 A.M., arrives Servilleta 10.00 A.M.

There is no auto stage between Servilleta and Taos.

Stage.

Leaves Barranco about 2.30 P.M. Arrives Taos about 6. P. M.

Leaves Taos 7.30 A. M. Arrives Barranco 11.30 A. M.

Auto part way.

The point as to this is that there is a somewhat more favorable arrangement for doing business from Antonito on the Amarilla Division than from Taos.

2. Telephone and Telegraph Communications:

Antonito.

With the completion by the Forest Service of the Antonito Extension, which will be done probably within a month regardless of what disposition is made of the office, Antonito will be connected by Forest Service line direct with all of the Amarilla ranger stations and, via the Mountain States Company line to Costilla and the Taos Company line from Costilla south, telephone communications, of a rather indifferent character to be true, are to be had with Questa and Taos; and since we have half rates over the former lines anyway and free use over the latter from Cerro to Taos for four more years our 'phone service from Antonito would cost us somewhat less than our present service from Tres Piedras to Questa and Taos. The manager of the Taos Telephone Company states that that company is to install a metalic circuit north of Taos in the near future to con-

nect with the Mountain States at Costilla this will undoubtedly make the service satisfactory. So far as can be seen it will not be necessary for the Forest Service to build a line from Tres Piedras to Servillota or Taos unless the office is to be moved to Taos. There is a telegraph operator at Antonito. Telephone communications will be had from Antonito with all points on the Mountain States lines, over which lines the Forest Service has half rates by virtue of the agreement now in effect with the company.

Taos.

Taos has communications at present with Tres Piedras over the Taos Telephone Company line via Servillota, a distance of approximately thirty eight miles. On this same line there are 'phones at Servillota, Peel's bridge, and two or three near Taos. The Forest Service lines on the Jarilla Division radiate from Tres Piedras but there is no connection between them and the Taos Company line. The Taos manager has stated that it would be impossible to make connection without a switch which would be thrown on only when the lines were actually in use. In other words, to secure communications by means of the Taos Telephone line it would be necessary to keep someone to operate a small switch board at Tres Piedras or where ever the connection were made. In my opinion an arrangement for hav-

ing this kept at the local post office would be highly unsatisfactory besides involving some expense. Granted that such an arrangement with the present postmaster would be satisfactory there is no assurance or even great probability that he will hold the office indefinitely. Practically the only business the Taos Company has now beyond Servilleta is with the Forest Service and without it the manager has stated that the line would not be kept up. In other words, while undoubtedly a monthly or yearly rate could be obtained, it would have to be sufficient to cover the maintenance and provide a profit for the entire line after the removal of the Servilleta Depot. Possibly the Taos line would be moved also. As to this the company states that they do not know what would be done and that they cannot tell us what sort of a rate they could give. With possibly other subscribers near Taos on the same line over which we would have our connection and with the amount of business which we would do with the Amarilla Division undoubtedly dissatisfaction would arise, either to the other subscribers or to the Forest Service. In addition to this and the cost, the experience of this office for a good part of the time since it has been in Tres Piedras has been that it was difficult to get satisfactory service with the Taos Company anyway. The government does not have reduced rates over the Taos line between

Tres Piedras and Taos. In short, it amounts to this: That without doubt the Forest Service would have to build their own line to connect the Amarilla system with Taos. The nearest point that the connection could be made would be at Servilleta and in view of the fact that probably a switch would have to be installed since the system, being a ground line, would be unwieldy, Servilleta would be a very inconvenient place to have the connection. Granted, however, that it were made there it would cost roughly $2000.00 to build this line, and at least three or four hundred dollars and probably more to maintain it and the switch. Since it does not appear necessary to build this line unless the office be moved to Taos this feature in itself is probably the greatest single obstacle to Taos.

There is no telegraph operator in Taos and all messages would probably have to go over the Taos line from the telephone operator. To over come this the Forest Service could of course extend their line ten miles to Caliente Switch after the depot is moved. For communication by telephone with any point whatever not on Forest Service lines the Forest Service would have to depend on the Taos Telephone Company, the character of which service can hardly be compared to that which the Mountain States could furnish.

With reference to point 2, page 5, regarding the necessity for installing a Forest Service central in Tres Piedras:

It was the firm opinion of District Superintendent Pattison of the Mountain States that we would not be able to secure satisfactory service over our entire line from the Mountain Staton office after further increasing the length of the system by the seventeen mile extension to Antonito. While I believe it is true that we have about all one ground line will stant at present, yet it will work under present conditions when everything is in good shape. After the comtemplated transfer it will be possible by connecting the line at Kiawa Mountain with the main line, about five miles to the south, to make the main line of our system run via Cow Creek and Kiawa Mountain, cutting off the line around by Servilleta, thus reducing the distance, even with a spur to Petaca, by fifteen miles and also cutting out the Servilleta 'phone. After the office is moved away there will be one less 'phone in Tres Piedras. This will be sufficient to offset the additional extension to Antonito and will, I believe, give us satisfactory service throughout. It appears probable, however, since the Antonito extension is to be put on any way that if we were to build a line from Taos to connect with our Amarilla system that a sort of central would have to be installed to get satisfactory service.

3. Business Facilities and Accommodations.

Except for the fact that Antonito has railroad facilities and superior telephone and telegraph connections there is no great difference as to this point. Each has a small bank, numerous stores, and the ordinary hotel accommodations of small towns. It might be said that it would be an advantage to be in Taos since it is the county seat of Taos County. On the other hand, Tierra Amarilla, the county seat of Rio Arriba County, in which county is located at least 75% of the area within the Carson Forest, and which is the home of more than twice as many Forest users as is Taos County, is much more accessible from Antonito than from Taos. As a matter of interest: The post office addresses of more Forest users are in Conejos County, Colorado, than in Taos County.

It is true that as a point of interest, largely on account of its long history and the presence of the Indian Pueblo, Taos is much ahead of Antonito and is a point considerably more visited by tourists. As a good advertising point Taos is superior to Antonito and probably will be more so in the future.

4. Living Conditions.

In many ways Taos is a more attractive place in which to live than Antonito. It is a historic, adobe town of possibly 1500 inhabitants, with probably 80% or 90%

Spanish American. In the summer there is considerable of an artist colony in Taos. Rents and costs of living are somewhat lower then in Antonito. The climate is milder. Antonito is a comparatively modern, American, small town of eight or ten hundred people. It is located on the railroad and is easily accessible to Alamosa and other larger towns to the north on the Denver and Rio Grande Railroad. School facilities are undoubtedly much superior to those in Taos. To a certain extent the superior school facilities, and the greater accessibility to medical, dental, and other ~~professional~~ professional services offsets the lower cost of living in Taos. The following is a summary of approximate supervision costs which would be affected by the difference of headquarters location:

	Antonito	Taos
Quarters	$480.00	$300.00
Forage	200.00	125.00
#Travel cost to and from field	80.00	100.00
°'Phone charges, Mt. States or Taos Co.	40.00	20.00°°
Maintenance on switching on an F. S. line from Taos to Tres Piedras.	----	400.00°°°
	$800.00	$945.00

#Long trips only. Numerous short trips to timber sales impossible to figure.

*Exclusive of charges by Mt. States account our connection at Antonito if office in Taos.

**Telegraph service via Taos Co. to Caliente.

***Besides an initial cost of approximately $2000.00 for telephone construction.

SUMMARY:

The office should be moved from Tres Piedras before winter sets in.

Under present conditions Taos and Antonito are the only two towns which warrant serious consideration for office location. These two places compare as follows: in,

1. Accessibility, slightly in favor of Antonito.

2. Telephone and telegraph facilities, considerably in favor of Antonito with the probability, if Taos were chosen, of having to build a $2000.00 'phone line from Taos to the Amarilla Division, which so far as can be foreseen would not have to be built if Antonito were chosen. This in itself is a very strong objection to going to Taos.

3. Business facilities and accommodations, practically even.

4. Living conditions, somewhat in favor of Taos but largely because of the hostile attitude which has been evinced by Antonito against all Forest Service officials as such.

Consideration of the foregoing and also of the uncertain effect that the probable removal of the Servilleta Depot and the Taos mail and railroad point to Caliente may have upon routes of travel, to my mind would not justify going to Taos now and I respectfully recommend that the Carson headquarters be moved to Antonito and that such transfer be made about September 30 if feasible, and providing satisfactory ~~and providing satisfactory~~ arrangements can be made for that time.

Raymond E. Marsh.

Forest Supervisor.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

FOREST SERVICE
JUN 2 1914
Referred to
OPERATION.

ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO

LUNA-OTERO BUILDING
ALBUQUERQUE, N. MEX.

O
Carson-Supervision

May 29, 1914.

FOREST SERVICE
OPERATION
Office of the Chief
JUN 2 1914
RECEIVED
Answered.....

The Forester,

Washington, D. C.

Dear Sir:

In my letter of August 28, reporting on the various requests you received for the moving of the Carson headquarters from Tres Piedras to either Antonito, Taos or Santa Fe, I made the following recommendation:

"After giving the matter the fullest consideration and talking the situation over in detail with Acting Forest Supervisor Marsh (Mr. Leopold is unfortunately on leave on account of serious illness) I have reached this conclusion: I recommend that no action be taken at this time to remove the headquarters now located at Tres Piedras. The present plans, calling for the expenditure of little money, will house the employees now situated at Tres Piedras during this winter. Furthermore, to hold the entire matter in abeyance until next spring will permit plenty of time to deliberate on this very important move. As a matter of fact, neither Tres Piedras, Antonito nor Taos stand out as the one place for the Forest headquarters, and so I feel that so long as we are equipped to carry on the work with reasonable efficiency this winter, the headquarters should remain where we are now located."

On September 5 you approved this recommendation.

Captain Adams will recall the plan to have District Engineer Whitsit make an examination of the present water supply at Tres Piedras and the possibilities of its development. Mr. Whitsit has now submitted his report and his conclusions may be summarized to the effect that the present supply is inadequate and of doubtful purity. He does not decide as to the possibilities of further development other than to make this appear doubtful.

In the light of Mr. Whitsit's report I had a conference this week with Forest Supervisor Leopold (now on sick leave) and Acting Forest Supervisor Marsh. We went over the situation in detail and as a result Mr. Leopold has recommended to me that the headquarters be moved to Taos. In his recommendation I concur and for these reasons:

1. So long as the water question remains in doubt at Tres Piedras, the dictates of good business preclude the expenditure of further money for construction of quarters.

2. Without the further construction of quarters, Tres Piedras is an impossible place to house employees comfortably during the winter.

3. Without comfortable quarters high efficiency, particularly from clerks and subordinates, cannot be expected.

While Mr. Whitsit's report in my judgment is not conclusive, it casts sufficient doubt to settle in my mind

that the judgment of Messers. Leopold and Marsh is sound, and their judgment is based solely on the effect of the present quarters on the efficiency of their staff.

I desire then authority to move the headquarters of the Carson National Forest, now located at Tres Piedras, to Taos. For the detailed report on the situation as a whole I respectfully refer you to my letter "OO-Carson-Supervision" of August 28, 1913, and to Captain Adams since in a measure he has knowledge of the local situation. It is my desire to hear from you at the earliest possible date in order that I may go to Taos and make final arrangements for a move at the close of the present fire season.

It is my plan to inform you fully after my trip to Taos. All that I need now is authority to make tentative arrangements. If you can give this preliminary authority by wire I shall be glad to have you do so.

Very truly yours,

Arthur C Ringland

District Forester.

ADDRESS REPLY TO
"DISTRICT FORESTER"

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

FOREST SERVICE
SEP 2 1913
Referred to
OPERATION.

LUNA-OTERO BUILDING
ALBUQUERQUE, N. MEX.

FOREST SERVICE
OPERATION
OFFICE OF THE CHIEF
☆SEP 2-1913☆
RECEIVED
Answered

00
Carson-Supervision

August 28, 1913.

The Forester,

Washington, D. C.

Dear Sir:

Reference is made to your following letters: "O, D-3, 00-Supervision, Carson", dated August 5 to United States Senator Catron; August 8 to Representative Fergusson from the Acting Secretary; "O, D-3, 00-Supervision, Carson" August 8, from the Acting Forester to Mr. H. H. Dorman, Acting Secretary, Chamber of Commerce, Santa Fe; August 18 from the Acting Secretary to Representative Fergusson; August 14 from the Acting Secretary to Representative Fergusson. All of these letters refer to the plan of moving the present headquarters of the Carson National Forest, now situated at Tres Piedras, New Mexico, to Antonito, Colorado, with suggestions that the headquarters be either retained at Tres Piedras, removed to Taos or Santa Fe, or at least retained within the State of New Mexico.

At the outset, it should be understood that the initiative for this move has been undertaken by the Commercial Club of Antonito, Colorado and the move has only been given official consideration because of their protest against the present location. On August 15, by appointment, I met with the members of the Chamber of Commerce of Antonito, Colorado and listened to their arguments in favor of removal of the present headquarters from Tres Piedras. Their point of view is crystalized in the following extracts from a petition, which I understand it is contemplated to mail to the Secretary:

"The undersigned farmers, stockmen and citizens of Colorado and New Mexico respectfully petition
That the office of the Carson National forest Reserve be removed from Tres Piedras, New Mexico, to Antonito, Colorado.;
That the office of the reserve be placed under the supervision of a competent, practical and experienced Forester;
And you are respectively requested to order an immediate investigation of the unendurable conditions under which the patrons of the Reserve are now laboring.
This petition for the above changes is submitted for the following reasons:
Antonito is about six miles distant from the northerly end of the reserve, and is the commercial center of the northern part of New Mexico and the southern end of the San Luis Valley in Colorado, where the majority of the patrons of the Reserve reside;
Antonito is situated at the junction of the Santa Fe, New Mexico and Durango, Colorado branches of the Denver & Rio Grande Railroad. Antonito is in the southern end of Conejos County Colorado, which is immediately adjacent to Rio Arriba and Taos Counties, New Mexico, in which the Reserve is situate;
Antonito has ample railroad, telephone, telegraph and hotel accomodations and is the nearest commercial center of any kind to the reserve.

Tres Piedras has no telegraph office. It has no telephone connections with the outer world, nor any telephone connections of any kind except the private telephone of the forest service for local use. It has neither hotel nor a bath tub and is almost destitute of white population;

All business with the office of the Supervisor of the Reserve must be transacted either by the unsatisfactory method of mail at long intervals or by the hardships of a long trip through a barren and desert waste to Tres Piedras, with the possible result of finding the Supervisor away and the trip fruitless;

On account of the utter lack of accomodations at Tres Piedras, the traveler coming to the office of the Supervisor at Tres Piedras seldom if ever less than 35 to 50 miles, must either make a second trip through barren regions on the same day to get away from Tres Piedras or bring his own provisions, cook his own meals and camp on the prairie or in the woods, if permitted, as best he may.

The Supervisor's office was located at Antonito until about two years ago, and was satisfactory to all concerned except certain local forestry officials."

At the close of the meeting I informed the president of the Chamber of Commerce, Mr. D. E. Newcomb, Jr., that it would be necessary for me to first consider the petitions and protests of the citizens of Taos and those of the vicinity of Tres Piedras before I could make any definite recommendation to the Forester.

After the meeting, I went to the headquarters at Tres Piedras and secured what data I could showing the advantages or disadvantages of the present location and I am now prepared to make a recommendation.

It will be agreed I am sure that the headquarters for a National Forest must be located as conveniently as

possible for the users and that the comfort of the Forest officers assigned to such a station must be of secondary consideration. The files in the Carson headquarters show that there are approximately 600 users of the Carson National Forest. By postoffices, I find they are distributed as follows:

Alamosa	3
Antonito	19
Arroyoseco	10
Canjilon	38
Cebolla	22
Dawson	1
Denver	2
Duce	5
Elizabethtown	4
Elida	29
Las Tablos	5
Ortiz	115
Pagosa Junction	4
Petaca	14
Questa	57
Red River	24
Taos	27
Tierra Amarilla	24
Tres Piedras	20
Tusas	15
Vallecitos	38
Virsylvia	1
La Jara	4
Manasses	5
Abiquiu	3
Alcalde	1
Arroyo Hondo	12
Black Lake	3
Cerro	7
Chama	3
Chamita	18
Conejos	7
Espanola	1
La Madera	12
Lumberton	2
Lyden	4
Mogote	2
Ojo Caliente	23

Paisaje	1
Park View	8
Pina	1
Rosa	6
Sanford	1
Santa Cruz	1
Valdez	3
Vermejo Park	1

By ranger districts, the users are distributed, with percentages, as follows:

Canjilon District		126	21%
Vallecitos	"	53	10%
Servilleta	"	102	17%
San Antonito	"	155	23%
Questa	"	106	18%
Taos	"	40	8%
Jicarilla	"	18	3%
	Total	600	

The Canjilon, Vallecitos, Servilleta and Taos Districts, comprising 321 users, or 54%, are naturally tributary to Tres Piedras. The San Antonito, Questa and Jicarilla Districts, comprising 279 users, or 46% are tributary to Antonito, Colorado. If, however, we consider about the only three possible places for headquarters - that is Tres Piedras, New Mexico; Antonito, Colorado; and Taos, New Mexico - by ranger districts and percentages, the distribution is as follows:

> Canjilon, Vallecitos and Servilleta Districts, at Tres Piedras, New Mexico, comprising 281 users, or 47%.

San Antonito and Jicarilla Districts, at Antonito, Colorado, comprising 173 users, or 28%.

Questa and Taos Districts, at Taos, New Mexico, comprising 146 users, or 25%.

If we consider a headquarters in the State of New Mexico about 72% of the users will be better convenienced as against 28% should the headquarters be located in Colorado (Antonito).

As the headquarters are now located, that is at Tres Piedras, New Mexico, it will be seen that the convenience of the majority of users is best subserved. This is obvious too from a glance at the map enclosed, which shows that Tres Piedras is practically the geographic center of the Carson National Forest. On the other hand, it cannot be denied that Tres Piedras has some obvious and distinct disadvantages as a location for the headquarters. This town was first located in about 1875, as a result of saw mill operations, incident to the completion of the Denver and Rio Grande Railroad. Today the town is no more than a squalid settlement of perhaps 50 inhabitants, although this number is doubled in the winter when the sheep are on the winter range. It has a postoffice, two stores and a school house (with plans for a new one), but practically no public accomodations. There are no sanitary facilities and at the present time the entire water supply of the town is obtained from two wells - one for domestic purposes and the other for stock. The well drilled by the Forest Service has gone dry.

However, there has been an unusual season of drought for the past four months, so I am told that this condition is quite unusual.

The Forest Service improvements at Tres Piedras at present consist of a residence for the Forest Supervisor, barn and a pasture. A nearby private building is used for an office, the rent of which amounts to $100 a year, and is paid personally by the Forest Supervisor because of the privilege of occupying the Government bungalow. Members of the Forest Service force other than the Supervisor are quite uncomfortably housed. Plans have been made for further improvements, but have been held in abeyance because of the feeling that it might not be wise to invest too much money in the headquarters at this point. I find, however, that a six-room adobe log cabin now within the administrative site can, with an expenditure of less than $100, be made quite comfortable, and this will take care of the ranger attached to the Forest Supervisor's staff. There is also the possibility of moving an abandoned ranger station (due to an elimination) now at Servilleta with but little expense. While this will take care of the force stationed at headquarters fairly well, living conditions at the best will necessarily be crude.

As well as serving the convenience of the majority of users, Tres Piedras is admirably situated for effective field work. All of the ranger stations on the Carson Forest are now

connected by telephone centering in the office at this point. Roads radiate from this town in every direction and two trains a day - ~~both~~ north bound and south bound - stop within a quarter of a mile of the headquarters. There is telegraph communication with Albuquerque and the outside world by means of a Forest telephone line to an exchange of the Taos Telegraph Company at Servilleta.

Antonito is a modern small town situated in Colorado six miles north of the New Mexico line. From it the Denver & Rio Grande Railroad radiates to Santa Fe on the south, Denver on the north, and Durango on the west. It has good hotel accomodations and modern improvements, such as electric lighting and good water supply. Modern office quarters can be obtained at a reasonable rent. So much for the advantages of this town. As to the disadvantages, the living expenses for Forest officers would be high. It is necessary for horses to be maintained in a livery stable, whereas at present in Tres Piedras, the horses are kept in a Government pasture, and taken care of and stabled by the men themselves. Objection is made too by numerous residents of New Mexico to the establishment of an office outside the State for the administration of a Forest within the State. Personally, I see no value whatsoever to such an argument. On the other hand it is a point of view that doubtless should be recognized.

After an inspection trip, when the Carson Forest was first put under administration, I picked out Antonito as the logical headquarters, although Mr. Bronson, who at that time had just left his assignment as Chief Inspector of this District, disagreed with me and felt that Tres Piedras was the place. However, I was influenced in my decision by the fact that at that time we had a large area on the west boundary of the Jicarilla Indian Reservation and also anticipated a measure of control over the timber lands on the Indian Reservation itself. These conditions do not exist today. After Mr. McMillan's resignation, Mr. Hall, who succeeded him, recommended the move to Tres Piedras on the ground of increased efficiency through closer supervision. Because of his recommendation, the quarters were moved to Tres Piedras. Mr. Leopold, the present Supervisor, who has now served on the Carson for some years, very strongly insists that he at no time has regretted this move.

I did not consult with the officers of the Taos Commercial Club, nor did I go to Taos on this trip. I have been there several times and am quite familiar with the surrounding country and so did not feel that this was necessary. There are some good points in favor of Taos as a headquarters. Although a small town, it has quite good facilities and is situated in the heart of a rich agricultural section. This means reasonable living expenses. However, the town is

off the railroad some 35 miles. It is strongly rumored though that a railroad will shortly be built into the town, by extension from the present lines of the St. Louis & Rocky Mountain Railroad, now running to Ute Park. Although off the railroad, there is an automobile stage line connecting the town with the D. & R. G. Ry., at Servilleta, 13 miles south of Tres Piedras. While Taos has telephone communication with most of the Forest, it is not centrally located for overland trips. Furthermore, the Taos Division of the Forest handles but about 25% of the business of the Forest as a whole.

In considering the petitions that have been presented to the Secretary, one fact must be borne in mind. They have been inspired, for the most part, by the proprietors of mercantile establishments who desire Forest Service trade and they have been signed by many men who have no direct business with the Forest Service but have a natural desire to boost their own community.

After giving the matter the fullest consideration and talking the situation over in detail with Acting Forest Supervisor Marsh (Mr. Leopold is unfortunately on leave on account of serious illness) I have reached this conclusion: I recommend that no action be taken at this time to remove the headquarters now located at Tres Piedras. The present plans, calling for the expenditure of little money, will house the employees now situated at Tres Piedras during this winter.

Furthermore, to hold the entire matter in abeyance until next spring will permit plenty of time to deliberate on this very important move. As a matter of fact, neither Tres Piedras, Antonito, nor Taos stand out as the one place for the Forest headquarters, and so I feel that so long as we are equipped to carry on the work with reasonable efficiency this winter, the headquarters should remain where we are now located. I am further moved to this recommendation because of the absence of Mr. Leopold and the desire to disturb conditions as little as possible while he is away.

Very truly yours,

Arthur C Ringland

District Forester.

I omitted to state that, at the close of the Antonito meeting, a promise was made that, if improvement funds permitted, a telephone line would be constructed from the headquarters at Tres Piedras to Antonito, connecting the town of Ortiz. This announcement seemed to satisfy several who were desirous of having the headquarters moved to Antonito; in any event, this improvement will, in a large measure, offset the present inconvenience to the users centering around Antonito.

AR

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
1913

CARSON NATIONAL FOREST

NEW MEXICO

NEW MEXICO PRINCIPAL MERIDIAN

National Forest Boundary
Additions
Eliminations

DIAGRAM FORMING PART OF PROCLAMATION DATED JAN. 14, 1914

Tierra Amarilla (County Seat)

Legend.

District boundaries.
F. S. Telephone Lines
Commercial " "
Railroad lines
Comparative distances.

To accompany O-Parson-Supervisor.
Supervisor's Headquarters, Report of July 25, 1914.

+ District Office letter of transmittal dated Aug 3

ACK

F. S. D-8
SUL 30 1914
OPERATION

Durango
45 mi. from Arboles
Pagosa Springs. Approx 60 mi. from Arboles
Pagosa Jct.
Arboles
Rosa P.O.
Antonito (approx)
Osier
Ortiz
Costilla
Palmilla (See House)
San Antonio R.S.
Lookout
Valeano (Siding)
Hot Springs (See House)
Eagle Rock R.S.
Red River
Questa
Tusas P.O.
Cow Creek R.S.
Tres Piedras
See Detail
Los Tablas P.O.
Cebolla P.O.
Canjilon R.S.
Canjilon P.O.
Vallecitos P.O.
Borracho R.S.
Pelaca P.O.
Servilleta (See House, Tel. Operator) P.O.
Arroyo Hondo
Arroyo Seco P.O.
Taos
San Fernando de Taos
Servilleta Plaza
La Madera
Caliente Switch
El Rito P.O.
Ojo Caliente P.O.
Santa Cruz (Section House) Stage
Lookout
Note that 5 ranges of townships are left out here
45 mi.
73 mi.
150 mi.
55 mi.
To Pecos

RES.
IND.
JICARILLA APACHE
AMARILLA
GRANT
TIERRA
CANYON DE CHAMA GRANT (UNCONFIRMED)
PELACA GRANT
ARROYO HONDO GRANT
LEROUX GRANT
ANTOINE
MARTINEZ
PUEBLO DE TAOS GRANT
LOBATO
PIEDRA LUMBRE GRANT
GALLOSA
SERNA
RANCHO DEL RIO GRANDE
MAXWELL
SANGRE DE CRISTO

T.32N.
T.31N.
T.30N.
T.29N.
T.28N.
T.27N.
T.26N.
T.25N.
T.24N.
R.5W.
R.4W.
R.2E.
R.3E.
R.4E.
R.5E.
R.6E.
R.7E.
R.8E.
R.9E.
R.10E.
R.11E.
R.12E.
R.13E.
R.14E.
R.15E.
R.16E.
T. 28 N. R. 9 E.
22
7th Std. Par. N.
6th Std. Par. N.

D-3

May 1, 1911.

O
D-3, OO-Personnel
Carson

District Forester,

Albuquerque, N. M.

Dear Sir:

In reference to your letters of April 20 and 26:

Your recommendations in regard to the personnel of the Carson, including the selection of Forest Assistant Leopold as Deputy Supervisor and the transfer of Harry C. Hall to the Alamo, are approved. Action on Mr. Leopold's promotion and salary has not yet been taken. While it is clear that Mr. Leopold should receive a higher salary upon his assuming the duties of Deputy Supervisor, I am not yet prepared to approve a promotion of $400 in his case. I am going over all of the statutory promotions in order to secure more comprehensive information on the entire situation before recommending the promotion of a number of individual officers. I will be able to inform you definitely within a few days of the recommendation made in Mr. Leopold's case and in the meantime you are authorized to transfer him to the Carson as Deputy Supervisor.

aBL

Copy sent to District Forester
at.....

F. M. A.
F. M. A.

D-3

I enclose a copy of a letter which I am sending today to Senator Guggenheim in reference to the action taken in the case of Harry C. Hall.

Very truly yours,

H. S. Graves.

Forester.

Enclosure.

DRESS REPLY TO
"DISTRICT FORESTER"

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

FOREST SERVICE
MAY 1 1911
Referred to
OPERATION.

STRICKLER-LUNA BUILDING
ALBUQUERQUE, NEW MEXICO

April 26. 1911.

00 (D)
Carson, Personnel.

FOREST SERVICE
OPERATION
Office of the Chief
MAY 1- 1911
RECEIVED
Answered.....

The Forester,

Washington, D. C.

Dear Sir:-

Your telegram of April 24 and your (O) D-3 Personnel Carson letter of April 19 are received.

Deputy Supervisor Hall first made application for the supervisorship of the Carson in a letter to this office dated April 14, a copy of which is enclosed. I replied by telegraph April 17 (enclosed) that I had decided to recommend the transfer of an experienced Supervisor to take charge and also to recommend his transfer as Deputy of the Alamo. On Friday, April 21, Mr. Campbell returned from a grazing conference held at Antonito on April 18 and informed me that Hall, in effect, had made the boast that he would get the supervisorship of the Carson regardless of the recommendations of the District Office, In a conference

with Mr. Waha on April 10 Hall threatened to resign unless he were given the supervisorship, and yet, when I saw Hall at the time of MacMillan's resignation he fully understood that he was not to be recommended.

I want to refer specifically to the statements in your letter as given to you by Senator Guggenheim. First; the Senator states that Hall "is extremely popular with local residents and users of the Forest and is considered by them the first executive officer on the Forest who has thoroughly understood and considered local conditions in his administration." It is true that Hall is a man of pleasant address but the Senator is uninformed concerning his thorough knowledge of conditions on the Carson. As a matter of fact, Hall does not even know the country. This was absolutely demonstrated as a result of the inspection made by Mr. Campbell and myself last Summer. I make this statement not so much in the way of criticism but only because I strongly suspect that the knowledge of local conditions is borne of Hall's egotism. Again, no weight can be attached to the statement that Hall has "strong local standing." At the most, this "standing" would probably consist of the desire of Waushauer, a mortgagee of a large part of the sheep on the Carson, and Antonio Ortiz, a local Don and Secretary of the Los Pinos Woolgrowers' Association,

to see Hall made Supervisor. MacMillan had an unholy alliance with the sheep interests and I have no desire to see Hall's strength matched against the shrewdness of these men or a Deputy Supervisor in this District under any kind of obligation to these men or any others outside the Service which would influence his official actions. Finally, I want to call particular attention to the following: "the Forest users are anxious to have H. C. Hall retained on the Carson and have been disturbed over the reports that in the personnel changes contemplated he was to be transferred to another Forest." The Forest users could have had no intimation of the contemplated transfer except from Hall, because even Hall himself did not know until informed by my wire of April 17 and your letter was written on April 19. Obviously, Hall personally solicited the aid of Senator Guggenheim by wire, or it was done at his instigation by others, and unquestionably, as indicated by the tenor of his remarks to Campbell, with his full knowledge and consent. Were there no other reason than this, this action alone is sufficient to satisfy me that he is not the Service type of man; that he has not the Service ideals and the Service spirit.

Last Summer's inspection convincingly showed that Hall had no force. He was a tool of MacMillan. As a case in point; after the inspection was completed MacMillan

wrote to each Ranger on the Forest and asked for the complete itinerary of Mr. Campbell and myself (copy of letter enclosed). He evidently was preparing to defend himself. Hall knew of this letter (which has just come to light) and when asked why he did not report the fact stated that he was afraid. I do not want Hall too harshly judged; he suffered considerable grief under MacMillan, and at last, in January 1911, told a great deal of what he knew of McMillan's mismanagement which he had concealed before. At the same time he was so passive that he showed a weak character.

As I stated in the 00 (D) Carson Personnel letter of April 20; the Carson needs new blood; it needs not only a new Supervisor but just as necessarily a new Deputy. It will be no easy task for Supervisor C. C. Hall to put the Carson into good shape even though he has the enthusiastic support of his Deputy. This he will get from Leopold, but obviously not from Hall. I want to put Hall under entirely new conditions, and to give him a chance to make good. While I am sure you will appreciate that if Hall should now remain on the Carson it would greatly weaken the power of the District Office as far as he is concerned; should, however, in your judgment it be best for Hall to remain on the Carson, I shall gladly waive the District considerations which make this assignment so inadvisable.

The Forester.

To summarize: I recommend that Harry Hall be not allowed to remain in any capacity on the Carson but be transferred as Deputy on the Alamo; his association with MacMillan has destroyed his usefulness on the Carson; his desire to be Supervisor would only embarrass C. C. Hall; his resort to political influence would destroy the respect of the Carson rangers and the confidence of his superior officers; he has not made entirely good on the Carson but should be given an opportunity elsewhere under new conditions.

I am glad that you have approved the transfer of C. C. Hall but I want to urge again the appointment of Leopold as Deputy. Leopold has the unanimous endorsement of the District Committee and will undoubtedly make a worthy successor to Supervisor Hall when he leaves, as he desires to within a year. Harry Hall in our judgment will never be more than a mediocre Deputy Supervisor, so in any event he can not be recommended for Supervisor.

I trust that it will be possible for you to wire me your decision. Supervisor Hall will report at Antonito May 1, and I am very anxious for Leopold to join him at that time.

Very truly yours,

Enclosures

District Forester.

COPY

Antonito, Col.,
April 14, 1911.

OO
Carson, Personnel.

District Forester,

Albuquerque, N. M.

Dear Sir:-

I understand that an appointment to fill the vacancy caused by Mr. McMillan's resignation has been made. If this is true, I rgret it very much, for I had asked both Mr. Ringland and Mr. Clapp, that although I did not desire the supervisorship here, I be allowed to remain in charge until I could prove my ability to properly handle the situation. I believe it is only just that my request be granted.

Since my conversation with Mr. Ringland, my personal affairs have somewhat changed, and I now desire the promotion to the supervisorship. I need not remind you of the grief and misery that I have been forced to tolerate during the past two years, nor of the efforts I have put forth toward the best interests of the Service, even though under the most adverse conditions. Only recently, in order to follow up the work which I have

undertaken, I refused an offer to become a member of one of the most prominent firms in the San Luis Valley, where I was assured of clearing at least $2500. per year.

I believe that I am more qualified than any other person to satisfactorily carry on the work, and bring about a readjustment of matters, which as you know have been so mismanaged. I consider that I am most entitled to the promotion to the Supervisorship here, and I most certainly expect it.

This is a matter of very great importance to me, and I respectfully request that you advise me by wire (at my expense if necessary) as to just what action has been taken, in order that I may base my plans accordingly.

Very truly yours,

(Signed) Harry C. Hall,

Acting Supervisor.

COPY

Sept, 20, 1910.

Mr. Bert G. Phillips,

Taos, N. M.

Dear Sir:-

I will appreciate it very much if you will send me immediately, a resume of the trip taken by Mr. A. C. Ringland and J. K. Campbell while they were upon your District.

I want to know exactly where they went, how long they remained, what roads, what trails, and what portions of the country they proceeded over, and a short synopsis of anything they may have said in reference to the administration of your District while with you.

Very truly yours,

(Sgd) Ross McMillan,

Supervisor

ADDRESS REPLY TO
"DISTRICT FORESTER"

FOREST SERVICE
APR 24 1911
Referred to
OPERATION.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

STRICKLER-LUNA BUILDING
ALBUQUERQUE, NEW MEXICO

April 20, 1911.

00 (D)
Carson, Personnel.

FOREST SERVICE
OPERATION
Office of the Chief
APR 24 1911
RECEIVED
Answered.....

The Forester,

Washington, D. C.

Dear Sir:-

On April 18 I wired you as follows:

"situation on carson demands experienced supervisor request authority transfer hall from alamo to carson may one will involve no change in salary status deputy balthis will remain acting supervisor alamo please wire situation urgent"

At the same time I took the matter of Mr. C. C. Hall's transfer up with him. He replied that he would accept the transfer to the Carson if given a free hand and strong support. A copy of my letter to Mr. Hall is attached.

It is necessary to take immediate action not only because of the demoralized condition of the administration of the Carson but because of the application of Harry Hall, now Deputy on the Carson, to the position of Supervisor on the same Forest. I informed Mr. Harry Hall

that while his services were appreciated, it is considered best to have an entire change of executive officers on the Carson, and for this reason it is proposed to make him Deputy Supervisor on the Alamo.

I want to emphasize just as strongly as possible that it is of imperative importance to make a complete change of the Carson personnel. Both the Supervisor and Deputy Supervisor should be new men, and I also believe it will be necessary to either transfer or drop out many of the Rangers. McMillan had a very strong influence over Deputy Supervisor Hall and nearly all of the Rangers. This influence was for no good to the Service. Harry Hall under proper conditions will make a fair Deputy Supervisor, but this can not be brought about if he is left on the Carson. Furthermore, it would be unfair to Supervisor Hall to have his administration embarrassed in any way. He must be given a free hand. While it was first proposed to recommend the appointment of Mr. Leopold as Supervisor, it is now recommended that he be made Deputy on the Carson in place of Harry Hall. If in the course of time he makes good, as I have every reason to believe, he will be recommended to take charge of the Carson when Mr. Hall leaves to take over his fruit ranch in Oregon.

The Forester.

Supervisor Hall tells me that Balthis has made good as his Deputy on the Alamo, and for this reason he will be recommended to take charge when Mr. Hall leaves, At the same time I want to transfer Harry Hall to become Balthis' Deputy.

I earnestly hope you can approve these recommendations. The Carson needs a strong hand, and I know of no Supervisor better fitted in the District to take over the loose administration of this Forest than C. C. Hall. Leopold will make him an excellent Deputy. He has made good on the Apache and during his detail in this office.

Very truly yours,

Arthur Sherburne Hyland

District Forester.

Enclosure

COPY

April 15, 1911.

00 (D)
Alamo, Personnel.

Forest Supervisor,

Cludcroft, N. M.

Dear Mr. Hall:-

Your letter of April 8 is received.

I am very glad you fully understand the necessity for compelling me to wire you, as there are several statutory vacancies both in the Supervisor and Deputy Supervisor rolls which must be filled by May 1. It was for this reason that it was imperative that I should know your plans. While I regret that you have had difficulty in arranging your affairs in Orego, yet I am very glad indeed that it is still possible for you to remain for awhile at least in the Service.

As perhaps you know, Supervisor McMillan of the Carson has resigned. At present the Forest is in a demoralized condition and needs the strong hand of an experienced Supervisor to put this Forest in shape. You have done this so well on the Alamo that I should like to have you go to the Carson for at least a temporary period - say until January 1 - to re-organize the administration there. I judge from your letter that you can properly leave the Alamo and if you agree to this plan, I shall recommend the promotion of Mr. Balthis

Forest Supervisor.

to Supervisor of the Alamo at $1800. If you go to the Carson I shall recommend the appointment of Forest Assistant Leopold of the Apache to Deputy Supervisor of the Carson at $1600. Mr. Leopold, since he has been in the Service, has made an excellent record and we look to him to become one of our strongest executive officers. So in the event of your going to the Carson and cleaning things up there by January 1, it is my plan to have Mr. Leopold at that time assume the supervisorship. Of course, at the end of that period, if conditions are still unchanged in Oregon, one of two things can be done - either your transfer to Oregon for work in the Service near Medford can be recommended, or arrangements can be made for your services elsewhere In District-3, where they no doubt will be needed.

I appreciate the fact that I am asking a great deal of you to tackle the Carson problem and especially since such a request should ordinarily be accompanied by an increase in salary. The situation in this respect is just this: There is now but one vacancy in the statutory roll in this District for $2200. Mr. Guthrie, the Supervisor of the Apache, has been recommended for this vacancy. He has been in this District in the capacity of Supervisor for some years and I am sure you will apprreciate that because of this fact the increase should be given to him. Much as I would like to recommend you for

Forest SuperVisor.

promotion, the simple fact that there will be no vacancy, precludes a possibility.

I hope you will appreciate this letter and understand that we want very much you should take up the work of the reorganization on the Carson in the same way you have so well done on the Alamo. In view of the fact that I must notify the Forester before May 1, will you kindly give this letter your immediate attention and write me fully or wire if possible.

Very sincerely yours,

A. C. Ringland.

District Forester.

O

April 19, 1911.

D - 3, OO-Personnel
Carson,

District Forester,

Albuquerque, N. M.

Dear Sir:

In further reference to your telegram of April 18:

Senator Guggenheim informs me that Deputy Supervisor H. C. Hall of the Carson is extremely popular with local residents and users of the Forest and is considered by them the first executive officer on the Forest who has thoroughly understood and considered local conditions in his administration. For these reasons, Senator Guggenheim's informant states, the Forest users are anxious to have H. C. Hall retained on the Carson and have been disturbed over reports that in the personnel changes contemplated he was to be transferred to another Forest. I explained to Senator Guggenheim the necessity for placing a thoroughly experienced Forest Supervisor of demonstrated executive capacity on the Carson and he readily concurred in the transfer of Supervisor Hall from the Alamo. He would be glad, however, to have you consider the advisability of retaining Deputy Supervisor Hall on the Carson in

D. F. 3.

view of his strong local standing, and also of placing him in charge in case a vacancy in the Supervisorship should again occur.

I will be glad to have you consider these suggestions in connection with the present and prospective personnel assignments involving the Carson.

Very truly yours,

Henry S. Graves

Associate Forester.

0

April 19, 1911.

D - 3, 00-Personnel
Carson.

Memo for the Forester.

The following points are suggested in reference to District Forester Ringland's recommendation that Forest Supervisor C. C. Hall be transferred from the Alamo to the Carson. Mr. C. C. Hall entered the Service as Forest Ranger on January 1, 1906. He became Forest Supervisor on the Derrlodge National Forest, Montana, in 1907. He has thus had four years experience as Forest Supervisor on the Deerlodge and Alamo National Forests, both Forests whose administration involves intensive grazing conditions and requires exceptional judgment and experience in handling the grazing ~~administration.~~ business. Deputy Supervisor Harry C. Hall of the Carson National Forest became a Forest Ranger in the Service on December 21, 1907. His period of service is thus considerably less than that of Supervisor Hall. While Deputy Supervisor Hall's record indicates that he is a competent Forest officer, he is clearly lacking in the experience and demonstrated executive ability concerning which there is no question in the case of Supervisor C. C. Hall of the Alamo.

The allotments to the Carson for the ensuing grazing season provide for 10,500 cattle and horses and 170,000 sheep. During the last grazing season 568 permits were issued on this Forest. The ranges are in many instances fully stocked and applications made for much more stock than the Forest can carry. This fact, combined with the further fact that a large percentage of the grazing permittees are Mexicans, makes it essential that a Supervisor thoroughly experienced in grazing administration under intensive conditions be placed upon this National Forest. For this reason District Forester Ringland has recommended the transfer of Supervisor C. C. Hall from the Alamo to the Carson. Such action appears distinctly necessary rather than the promotion of Deputy Supervisor Harry C. Hall to the Supervisorship of the Carson, because of the urgent need for a Supervisor on this Forest of experience and proved capacity in executive work under similar conditions.

It should further be considered that all of the Supervisorships and Deputy Supervisorships are now placed upon the statutory roll and that promotions of deserving officers can only be made as vacancies in the statutory positions occur. It would be very inadvisable

therefore to promote Deputy Supervisor Hall to the vacant Supervisorship in the District over other Deputy Supervisors until the merits of the other Deputies have been fully considered and reported upon by the District Forester. Otherwise grave injustice may be done to other Deputy Supervisors of longer terms of service and equal or greater capacity.

WWG

Acting Assistant Forester.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
WASHINGTON

ADDRESS REPLY TO
THE FORESTER
AND REFER TO:
O
Fire - D-3.

Deming, New Mexico,
June 14, 1921.

Dear Mr. Headley:

I have already written that either Mr. Leopold or Mr. Pooler was with me on the trip in District 3, Mr. Leopold on the Sitgreaves and Apache and Mr. Pooler on the Gila and one corner of the Datil. Mr. Kircher also accompanied us over the Gila and was with me about three days on the Datil. To have them present was a source of immense satisdaction to me. All differences were thrashed out then and there. We saw things as are thru the same eyes and in all cases we came to a conclusion which in last year I had not similar opportunities of reaching on the ground.

Mr. Leopold was, as I have already written you, quite astounded to find so many omissions. Mr. Pooler said that during the allotment conference with the Forester he was inclined to be cocky and unduly proud of the status of District 3 protection layout, its entire organization, and of its execution of plans, etc. Now he feels chagrined. He frankly admits that until this season inspection methods followed failed to give him a glance into affairs as they actually prevail. Fred Winn said at the outset of our discussion of Gila affairs - "When I started into the field two weeks ago I thot I had a good layout. Now I think it not worth a damn". Mr. Pooler also said that he feels very piqued in the knowledge that an outsider had to come in to point out to him many things that he should have caught up last year.

I will not describe findings at every point, but will merely write enough to give you an insight into the protection organization as found.

Season: The season opened earlier than usual. Taking the District as a whole part of the P. force were employed in advance of the average opening dates. A fairly general storm during the first part of May allayed the situation materially--to such an extent, in fact, that during the period of our

inspection on the Sitgreaves, in some parts, fire danger did not prevail and the regular force was off on other work. This condition held in the west half. The employment of guards in advance of May 1 was probably O.K.

The yellow pine land of the Apache, Datil, and Gila was dry and inflammable during our stay on these Forests. The composite types in the higher elevation were still damp. There is a question, if an emergency in advance of the regular opening date ever does prevail in that type. Even if dry, in view of absence of risk, the danger is very slight. Lightning does not occur until late May or June. Human risk is nil. Another point of interest is the prevailing idea of occurrence of midseason emergencies due to extreme dryness in the pine type. In that type the hazard is either very high or very low. Tall dry grass is the first cause of the abnormality of hazard. The District says now, we had a light winter. By the middle of the season the situation will then be one to warrant the employment of emergency guards. I am inclined to differ with them and Kircher agrees with my views. I claim that in so far as determinable the combustibility of that tall grass is probably as great after 40 days of dry weather as it is following a dry spell of 50% longer duration. Furthermore the slight difference in moisture content of the soil as between a 40 day or 70 day dry spell has no effect , or rather no practical effect, upon the combustibility of the grass. Therefore, on an average year the grass would burn as readily as it would right now. If so an emergency does not exist. This, by the way, is a thing about which there is need for exact information.

This year men went on early in the high country on the Gila. The need for this is also questionable. Country is damp, and, as stated before, risk is practically absent. There is need for a lot of educational work along this line in the District/ Kircher is the only man in the District who has clearly thot his way thru these questions. I believe during the trip Mr. Pooler became somewhat converted to our viewpoint.

Kircher did an excellent job last season. As an example: In the Mogollon Mountains on the Gila three primary lookouts within a radius of six miles of one another had been financed for several years. After much argument he prevailed upon the Supervisor to do away with one. After our trip the Supervisor has agreed to use the second as a lookout fireman.

In the Black Range five primary lookouts were used. He cut them to two primary, one on Datil and one on the Gila, made two into secondaries, and eliminated one entirely. In that whole region the risk is small, timbered area very narrow, and number of fires annually during past 6 years has only run 3 to 4. He cut five guards from the Sitgreaves. That Forest

now has, according to the Supervisor, a 3 hr. maximum elapsed time radius. Only about 18 fires per year occur on the Forest. 15% of the Forest has a very low hazard.

Records:

Fire records on the Sitgreaves and Apache are very fragmentary. I did not reach the offices of the Datil and did not take time to inspect the records at the Gila headquarters.

Last winter the District office started the compilation of a group of statistical figures for the Forests. This I believe to be a mistake. The Supervisors needed the benefit of the analysis that such compilations require; besides to do that sort of work for Supervisors is poor organization practice.

On the Sitgreaves no statistics whatever have ever been kept. The fire reports for two seasons were missing between 1914-20. Spot map showing location of fires has been kept excepting for the fires of 1920. The finding of this group of maps was apparently a surprise to the Supervisor. A map showing similar data is kept on the Apache. Ten day records have never been kept on the Forests. Such records are compiled in the D.O. for each Forest.

Shortly after my visit to Albuquerque last March the District Forester instructed all Supervisors to analyze reports of all man-caused fires and to dig out causes and answer as to what might be done about them in future. On Sitgreaves and Apache this was not done so far as the Supervisor knew. The Supervisor of those Forests could not tell me whether stockmen or camper were chiefly responsible for the so-called camper fires. There must be something done to get Supervisors to make such studies. It is necessary to get into their heads what the job before them is. For this reason I am hopeful that you will recognize the wisdom of requiring the compilation of the data which I recently submitted for your approval in this connection.

The District Forester has ordered with ironclad force that commencing this season fire reports must relate facts and must be complete. Also that report must be reviewed and initialed by either the Deputy or Supervisor. Examples of how it works on the Apache:

May 14 the Grant Creek Fire started. History.

Started	1:30 P.M.	(Guess)
Discov.	2:05	by Reno Lookout
Cross shot	3:04	by Blue "
Start	4:05	by Fire foreman and guard at Hannegan

Supervisor Selkirk had awaited at Hannegan several days for us. On May 20 the Supervisor remarked about this fire and in answer to what the start time was he

said two hours, and explained it by saying the delay was because Blue Mt. could not be rung to report a cross reading and in the meantime the boys thot the fire was one which burned a few days previous in the same direction as the reading given by Reno Lookout.

Neither he nor the Fire Chief, so far as he knew, had made an investigation to learn why Blue Lookout had not reported or answered its call. May 21 I picked up the report on the fire as written by the Fire Chief and found that only one hour of the two hour delay was because of the failure of Blue Lookout, and upon cross questioning we got these facts: At the hour Reno first reported the fire foreman was scrubbing the floor. He received the report, tried to ring Blue, failed, and continued to scrub and clean up about the cabin. He says he thot the fire was one in another District which had burned several days before. Blue Mt. failed to respond to calls which he placed at intervals. At 3:04, or one hour later, Blue called and gave the cross reading by which the fire was located on the map. Why Blue was idle no one knew, but surmised that he was off the tower during the lightning storm. The foreman then with the fireman went out in a 40 acre pasture to get horses. At 4:05 they made the getaway and without food. Upon reaching the fire, with good speed, the foreman decided it was too big to fight (2½ a.) with two men so he sent the fireman back for help and grub. The fireman returned to meet the District Ranger en route with a small force.

I am relating all this to illustrate how, despite the fact that the Supervisor has been at this station for at least two days, he had not gotten the facts of the first fire of the season, nor neither had he checked up to get the reasons for the failure of BlueLookout as he had stated it to us.

A Gila case: The Deputy Supervisor on the Gila had been to a fire during April on Little Creek. It had been left and broke out anew and had an altogether tragic history, among other things that of including a deputy, a ranger, and several employees of a permittee and the permittee himself going to the fire without tools. The fire was M.C. resulting from a branding fire. The man responsible had slipped thru the Deputy's fingers. The reports, written by the ranger and O.K'd by the Deputy, showed nothing irregular. We visited the burned area (160 a.) with the ranger. Upon questioning him by processes of persistent digging the District Forester little by little got the real facts. He had the Deputy meet us the next day. The Deputy was properly handled and I daresay in the future his methods will be different. He was told that an account

giving the history of the case and his management of the fire would be filed in his personnel folder and that it would reflect seriously against his record.

Mr. Leopold is making a general inspection of the Apache and he will await, I presume, his formal report before taking up with Selkirk his failure in this instance reported on the preceding page.

Supervisor Hoyt of the Sitgreaves has personally reviewed each fire report of the current season and apparently has the facts of each case well in hand.

The statistical records computed last winter in the District Office have yet not been set up in finished form for distribution to the field. I have endeavored to point out to both Mr. Leopold and Pooler that in the future the Supervisors should do the job of keeping the records up to date. Mr. Pooler apparently is converted to that viewpoint. Mr. Leopold's final opinion I do not know.

Detection:

Last season Mr. Kircher made a rather extensive survey of seen and unseen areas from lookouts. He found duplication and eliminated it in most instances. Based upon the number of fires occurring annually within the field of view within which many of the remaining lookouts are primarily depended upon to discover fires, there seems still to be certain lookouts which might well be made secondary. Then, too, the primary lookout system, especially on the Gila, seems overbalanced as compared with the number of firemen employed. In the Bear Wallow fire division, practically devoid of stockmen who reside on the range, there is one primary lookout and one fireman, Mogollon Division 2 primary lookouts and 3 firemen and the District Ranger. Mr. Pooler has indicated the intention to investigate the service actually rendered by these primary lookouts with a view of reorganizing on the lookout fireman basis if results show safety of that scheme.

There still remains a lot to be done in both the Mogollon and Black Range Gila, and on the Apache and Datil, in mapping to determine just what part of these Forests is thoroly overlooked by present detection organization. In a general way it all is, but in detail not. If such a survey were made certain changes in position of present organization might prove advisable.

Every lookout point visited, including both secondary and primary, is equipped with a tower, some of which are in a very dilapidated condition, but in the main are all well built and are in good shape. The tower on Promontory Butte, Sitgreaves, 107 feet high, is in a dangerous condition. I have suggested its abandonment and if replaced that steel be used. With but one exception all towers examined are provided with some sort of a lightning conducting device.

Locating devices range from well installed facilities to absolutely "bum". The latter condition is decidedly prevalent. The District standard device consists of a galvanized iron protractor set on a small board which in turn is usually nailed solidly to an upright about 4 feet high which sits in the middle of the platform of the tower. Alidades are the open-sight style (usually) made in local tinshops.

No ready means of orienting the devices is provided. To orient it requires a complete dismantling. As an exception to this rule the Sitgreaves has an awkward way of doing it. All orienting is done by compass. I have suggested the use of Geological Survey data.

Most of the iron protractors are warped badly and are insecurely fastened to the base. Consequently the alidade moves over humps and valleys. Many of the alidades are loose on their pivots and have bent sight wires. One seen was without sight wire. On the Sitgreaves one alidade was without sight wires of any kind. The lookout uses as as a sight guide the notch in the head of the pivot screw and on to a match at the far end of the alidade. On another lookout, same Forest, Blue Mt., in fact, the alidade's vanes were out of line and the indicator was at least $\frac{1}{4}$" wide at the point, or instead of pointing the degrees or half degrees the indicator covered three degree spaces. This instrument is not of District standard design. It is the worst I have ever seen in use. Many of the supporting posts are set on the platform of the tower; others extend thru the floor in the manner indicated by the dotted line of this drawing. The later type of installation gives a solid

base. The former type are all wobbly and move as weight of man and wind plays upon them. Reno Lookout, Apache Forest, was the most faulty in this respect. Both the man in charge of fire in that region and the Supervisor had inspected the layout several days before our arrival, and so far as we could determine no plans were under way to remedy the faults. Fox Mt., a primary lookout, Datil,

occupied for at least two seasons, is not provided with a locating device. I did not visit it, but got the information from Ranger Roger at Luna, who says while Fox Mt. lookout oversees a lot of the Luna District, his services have been or are limited because the man cannot give mechanical readings. Last fall Mr. Kircher pointed out these deficiencies to Supervisors concerned. Mr. Hoyt had previously visited this spring the two points on this Forest where the worst layouts were seen. Nothing done. On the Gila, the two outfits at Mogollon Baldy and Center Baldy were in a most deplorable condition. Well set up devices, excepting for the absence of provision for orienting, were seen on Green's Pk., Apache; Highland Park, Datil; Bearwallow, Gila; Diamond Pk., Gila; Hillsboro Pk., Gila. These are the only satisfactory ones of 17 points seen. A miserably poor showing. The District Forester agrees.

I have given the description of the devices used in Districts 1 and 5. Three has accepted it as its future standard.

Lookout personnel with but two exceptions live anywhere from ¼ of a mile to 4 miles from their jobs. At Highland Park, Datil, and Deer Springs, Sitgreaves, on top. Others as follows:

Forest	Lookout	Primary	Secondary	Distance live away
Sitgreaves	Promontory		x	1½ miles.
"	Lake Mt.		x	about 1¼ "
"	Blue Mt.		x	2 "
Apache	Green Pk.	x		3 "
"	Big Lake Mt.		x	¼ "
"	Reno		x	¼ "
"	Bear Mt.		x	4 "
Datil	Eagle Pk.	x		3/8 "
"	Negrito		x	1½ "
Gila	Bearwallow	x		1 "
"	Mogollon Baldy	x		1½ "
"	Center "	x		2½ "
"	Diamond Pk.		x	" "
"	Reads Pk.		x	½ "
"	Hillsboro	x		3/8 "

Plans are under way to get the personnel on top and to enclose top of the tower. In the Black Range, out of four lookouts and firemen employed none are in communication from 6 P.M. to 8 A.M.. In the Mogollon one man says he goes up the tower once each hour. The balance of the time he stays in a dugout.

Equipment and Supplies:

At two stations, Reserve, Datil, and Ranger Painter's headquarters, Kingston, the tool supply was found in O.K. condition. This is two of approximately 24. With those exceptions axes were either very dull or loose on the handles, in most instances both; saws dull and in some cases rusty and pitchy, and list incomplete. On the Sitgreaves the old idea of scattering of tool boxes with tools and cooking utensils still prevails. Caches at outlying points have been robbed until now only fragments of the original stocks remain. The Apache, Datil, and Gila, follow the practice of gathering up and redistributing tools each year. On all Forests visited more thot needs to be given the question of selection and distribution of tools, not to mention care and need for sharpening facilities, now in the majority of cases either absent or badly worn. A complete reorganization of equipment should be undertaken without delay.

On the Sitgreaves we found that in conformity with Par. 18 of D-3 fire standards, which reads: "Tool boxes must be checked and tools must be in first class shape at the beginning of the fire season", Rangers had checked most of the tool caches. They had taken no action to lighten handles of axes, to sharpen axes, to clean and put saws in condition to use or to requisition tools needed to bring stock up to the standards extablished in the plan.

There prevails an apparent shortage of tools on the Gila, Apache, and Sitgreaves, but I feel certain that if a complete round-up of all tools were made and a redistribution worked out to fit the labor supply and type of cover an actual surplus of most articles would be discovered. Grinding facilities are short and the supply of axes is not large.

In most places tools are well marked.

Rations of character and in form adaptable for convenient use on fires are not provided. Neither does the District fire standards nor fire plans of the Forest require that food be taken by firemen to fires. In some places now pack kyaks contain food supplies, but commonly not. Mr. Kircher will prepare an emergency ration list and in future Supervisors will be instructed to provide all firemen with one to three sets of those rations.

Lanterns for night travel are not provided.

Cooperation:

The field for developing cooperation among local

people and permittees, so far as I could see, is yet merely scratched. No organized thot on the subject now prevails on the Forests visited. I have discussed this subject from modern viewpoints with all officers seen. Mr. Leopold and Pooler both have copious notes and progress within the next year or two might be anticipated.

In spite of absence of any definite policy or line of action, I am leaving the District with the feeling that a very favorable attitude toward the Service and its protection policies prevails.

On the Datil and Sitgreaves a possibility of developing a limited amount of financial cooperation came to my attention. On the Datil the State of New Mexico owns about a township of timber land. Toward the cost of protection of it the State has paid nothing. On the Sitgreaves a coal land holding company owns 30,000 acres of well timbered coal bearing land. To date it has not contributed anything. Mr. Leopold intends to have the respective Supervisor dig into these cases. No other large ownership of timber land prevails. Cooperation with the Indian Service on the Apache and Sitgreaves is lagging. I will write again on this question.

Law Enforcement:

A good start hasbeen made on the Sitgreaves, but as a whole on the Forests visited need for a lot of educational work is evident. For example, Supervisor Selkirk, Apache, has interviewed one Justice of a possible three. He did not know whether his rangers had talked to other Justices or not. No action had been taken to establish relations with the various County Attorneys on the Apache. A Ranger on the Sitgreaves told me that his fireman had a few days previously put out a fire on a sheep allotment and had found near the fire sheep tracks, and a man's track containing a peculiar mark. The Ranger had the following day or two after watched the owner of the sheep unload flour from a wagon. He made tracks in the dust between the wagon and the warehouse identical to those found by the guard at the fire. I asked the Ranger what he had done about it. His reply was to the effect that when he asked the sheepman if he had set the fire on the hill the day or two days before the man said no and claimed that he had not been up there. That's all there was to it.

Only one instance of a Ranger's desire to absorb the function of the court was encountered, that being by Ranger Slossens of the Sitgreaves. In his own peculiar

verbose way the Supervisor did the best he knew how to correct the Ranger's viewpoint. Success had not followed during the period we were on the Forest. In general, I believe the majority, probably 99% of the members of the personnel of the Forests visited are keen for rigid enforcement of the fire law. All they need is training.

New Mexico's new fire law became effective on June 10. It is patterned after the Oregon Law and apparently is an effective instrument. Credit for its preparation and passage is due to the District Forester and Mr. Kircher. The latter rode herd on it at Santa Fe until its passage was assured.

I suspect just a bit that the conservatism of the Assistant to the Solicitor in D-3 is somewhat of a hindrance to the slambang methods of law enforcement practiced in District 5 and in some parts of District 6.

A Ranger school comparable to that held in D-1 last winter would do a lot of good in a training way in law enforcement.

Personnel:

The personnel of the protection forces of all Forests is chosen from the industry of the country. All are he fellows, chiefly cowpunchers, high heel boots and all. A few homesteaders are interspersed here and there on every Forest visited. The latter are representatives of the type one would expect to find nowadays on homesteads 75 miles or more from railroads. High heel bods as a footgear for firefighters in the rough country, and it is rough land of the Apache and Gila, are also representative of a type which without a horse is lost. With a horse in the Mogollons and Black Range of the Gila they would not be quite useless, but their usefulness quite likely would be seriously impaired because in all probability roundabout routes to fires would have to be followed if horses were used, and after arrival the high heel would be no asset to hillclimbing or traveling around side hills.

The District recognizes the possible inefficiency of cowboy type, but claim that the cow ranches are the only field from which it can draw protection personnel which knows the country. They might pay more for men who would work and thereby pick up a few firemen for the rough lands.

The cowboys come on the job with a string of from two to five horses in each case. Pastures are short and overgrazed at best. With the surplus horses about, the latter

factor is becoming serious, to the extent that feed in abundance for even one horse is not furnished at some stations. The District has to take action soon to revegetate pastures and to control the surplus horse nuisance.

The fire plan requires "that most men keep 1 horse up and saddled between the hours of 8 or 9 and 9 or 6 or 9 and 7. On short feed horses shrink in flesh on this treatment even when shifted from day to day. Horseowners become disgruntled as they see their horses day by day growing thinner. This was particularly noticeable on the Gila. One good horse well fed would answer all demands.

I believe that less attention is given to comfort of personnel of the summer force in D-3 than in any other District. Cabins minus floors and windows, no stove in three places, and in three others very poor ones; insufficiency of pots, pans, and table utensils is the rule. Food supplies when furnished by the Service is extra plain, no butter, no sweets, no spuds in places. The difficulty they have with personnel might be obviated in part if a little higher standard of living were established. If a little better food than served in cow camps and if a little more pleasing environment were provided certain good men might be attracted from the cow outfits year after year.

They by no means now fail to get back some men, but it is the exception rather than the rule. All men interviewed evidently were interested in the work even where dissatisfied with the horse-feed arrangements. All were ablebodied.

Fire Standard #2 directs Rangers to give all guards at least one day of personal instructions at the beginning of the period of employment. Every guard excepting one reported that the District Ranger or Chief Fireman had visited him and instructed him on the day he reported for duty or shortly after. Only in a few cases (two or three) were the lookouts and firemen without written instructions. These were, however, very short and savored strongly of perfunctoriness. As far as they went they were O.K., but they did not fully cover the field. The D.F. told all Supervisors to take a first hand in the preparation of the instructions. On the Apache wither the District Ranger or the Chief Fireman wrote them and the Deputy approved them. On the Datil the Supervisor took little hand but passed it on to the Rangers. One Ranger followed the example set by the Supervisor, he passed it on to a brand new non-eligible assistant. The assistant, not having anyone to hand the job down to, did the best

to discharge the task. The Supervisor of the Gila wrote all instructions to short termers.

I think the whole force lacks knowledge of suppression technique. They do not have an opportunity to learn it. An occasional big fire occurs. They are fought, I suppose, hit or miss fashion and everyone has forgotten about it before another occurs. I have strongly advocated the study of the principles of Osborne's manual, with the ever prevailing axiom, speed in travel and headwork on the job. Headwork, however, develops with experience usually.

At Highland Park and Eagle Pk. Lookouts on the Datil good use of the lookout men and firemen was being made. A 50' tower on high land was completed and a house was well under way. At Eagle Pk. a small tower was all but finished and work on a house is to start as soon as the tower is completed.

Personnel in many other places might be handled so as to get a lot of work done if brains, temporary telephone lines, extension bells or howlers and portable telephones were used to keep sight of job hooked into communication with lookouts, etc. The matter has been thoroly gone into with both Mr. Pooler and Leopold. Next year instead of fire plans saying that during periods of low risk the District Ranger will give guards work to do, they will provide a specific job for every man based upon definite plans. The country is fairly bristling with jobs to be done. The situation makes one's feet itch with the desire to be a Supervisor so as to experience the satisfaction of doing things rather than forever seeing things not done that might be done. This subject will be written about further in another letter.

Publicity:

The Forests visited are so remote from modern means of advertising that very limited opportunity of newspaper publicity is offered. At the headquarters of the Gila in Silver City the local paper is evidently keen for news and it frequently is given items by the Supervisor's office.

The Datil Rangers in the District I reached all did some publicity stunt during Fire Prevention Week. The Apache had no program, so the Supervisor said. The Sitgreaves Supervisor had not worked up anything before I left the Forest on about the 13th of May. The Gila Rangers were supposed to make talks before schools but were unable to do so because on account of shortage of money some of the schools closed early this year.

District 3's accomplishment in fire warning posting does not improve on the average. Pretty poor where we traveled, with the exception of one District on the Gila. Our travel included a trip to every District of the Sitgreaves. the Greer part of the Alpine and Blue Districts of the Apache, the Luna, Reserve and OBO Districts of the Datil, the Mogollon, Mimbres, and Black Range Districts of the Gila.

Mighty effective work has been done thru the new State Fire insurance or prevention Commissioner by Mr. Kircher. The first issue of the publication of this State Bureau was dedicated to Forest fire prevention and appeared during the fire prevention week. You have undoubtedly received a copy. The Commission also received an appropriation this year to be used for popularizing the idea of fire prevention in homes, business, and field. The Commissioner did not know what to do with the money. Kircher advised that some of it be used to institute a fire prevention course in public schools. The Superintendent of Public Instruction has promised to make the teaching of the course mandatory in all grade schools. Part of the appropriation above mentioned will be used for preparing material or text for the course. Details yet remain to be worked out.

An extensive publicity program was staged by the District Office on Arbor Day, which, followed by the publicity of fire protection week, floated a quantity of material out to the public.

Plans:

The Sitgreaves did not have its plan completed by the opening of the fire season. On May 7 the Supervisor was busy reversing it and probably did not get it out until about the 24th of May.

The other Forests visited had their plans all in the hands of field men before the opening dates.

The plan contains many important points, but on the other hand much material essential to any plan is absent. I won't burden this letter with the description of the plans. The big point is that those who write plans fail to think out their problems in advance. As an example: Supervisor Winn, while at White Creek, was worrying about the risk represented by the influx of fishermen along White Creek. Asked if they came every year, his reply was yes. Yet his fire plan mentioned not that risk nor did it provide for ways and means of handling it or controlling it. A similar instance was caught up on the Apache. Campers enter the Blue Range country from the south in numbers which seem large to local officers. The Supervisor mentioned

the risk they involved, but not a line of thot did the fire plan indicate he had given that factor in advance. There were many things he could have done. Most of the people pass the Clifton and Honeymoon R.S.. He could have required registration, camp fire permits, a patrol of the area once a week, that the Honeymoon Ranger keep the chief fireman advised as to the number of people passing and whither they were bound.

We have talked plans and plans building until I am plans blind. It is hoped that next season plans will indicate application of more hard thinking and less stereotyped form.

I have written a memo. to the District Forester, a copy of which you will receive as soon as it is typed. After reading it and this letter and others which I will send you might wish to write something to him. I want to have you know that he is worried and that he is doing all that anyone can expect a D.F. to do within his knowledge of the problem. He accepted none of my principles without discussion and if he finally agreed he prepared to act. I want to come back next spring to measure results.

Very sincerely yours,

(Sgd) E. W. Kelley

Inspector.

Copy

Albuquerque, N.M.
June 13, 1921

Not to be sent to D.F.

O
Supervision-District Three

Mr. Roy Headley,
Washington, D. C.

Dear Mr. Headley:

As briefly as consistent with need of presenting a good working picture of conditions here, I will relate in installments an account of my observations. Will you please have copies made of letters for my files.

Work Plans

District 3 has perfected its ranger work plans. The final outline of the last plan reached the field about 4/6/21. For a number of years monthly work schedules were required of rangers. The latter scheme called for one copy of schedule to be submitted at the beginning of each month . These were to be vised by Supervisor, commented upon and returned for revision if the Supervisor thot necessary. At the close of the month the procedure called for a second copy from the ranger showing accomplishment.

The Deputy Supervisor of the Datil Forest says the schedules were submitted, received and filed. No check on that Forest was made. The Supervisor of the Apache gave no clearly stated description of how he used the schedules. I judge there perfunctory practice also prevailed. The Supervisor of the Gila did make use of the schedule since he is interested in such administrative methods. The Supervisor of the Sitgreaves reports that he has examined the schedules as they were received and he also claims to have checked them with reported accomplishment at the end of each month. If so judging from the condition of protection administration his review and checking failed to get many jobs done that should be done.

District ~~Nxm~~ Three's new Ranger Work Plan conforms very closely to District 2's. It sets no date upon which any job shall be done but the monthly schedule does estimate the time needed to do the listed jobs. Copies of both annual and monthly sections go to the Supervisor but no report of accomplishment is submitted. Inspection is depended upon to discover how performance checks with plans.

Mr. Leopold is very much opposed to establishing date limits for performance of jobs. That policy is fine in principal perhaps, but opposes the facts that we are up against - the failure to have certain work done at the time at which by all

means it should be done. He has agreed that absolute date limits must be established for completion of repair of telephone lines, repair lookout devises, repair fire tools, completion of fire plans,in fact all fire control features possible of despatch before the opening of the fire season.

The idea of holding supervisors to accountability for failure to have those things done is OK but to do so doesn't reimburse the U.S. for suppression costs or damage done if bills run large and fires become disasters because the necessary advance work has not been done. I tried to get across the idea that administrative practice should be designed to guarantee that all advance suppression steps possible of despatch be done before the opening of the season. I believe that a system of promise cards will be set up as an adjunct to the work to call attention say on April 10 that certain jobs must be completed by May 1. The yearly plan will state that those jobs are to be completed during April and the monthly plan for April willprovide time for the doing of them.

You will be interested to know that Mr. Leopold's discoveries in the field were a genuine surprise to him. He never realized before that a supervisor failed to do so many things. For example. The new work plan scheme went out without specific instructions that it be put into effect by any particular date. The supervisor of the Sitgreaves altho the plan had been in his office for one month did not recall its receipt. The Apache wanted a year in which to initiate the operation of the plan. He found that an old time ranger did not know the meaning of rotation grazing, that Supervisor Selkirk of the Apache had never heard of the burro system of handling sheep, neither did one of his rangers. He was astounded to find neither the supervisor of the Sitgreaves nor the Dept. nor the supervisor of the Apache knew what constitutes an emergency as defined by the Service. The only emergency these two supervisors had in mind was a big fire which required the hiring of crews of men.

Mr. Leopold has always held the opinion that training or educational courses like those of Dist 2 were not necessary. The main object to accomplish as he has seen the job is to cultivate a man's imagination by permitting him to choose reading matter; for example, he thot and is right to a certain degree that if a ranger reads a thesis on mythology (?) he would develop imagination to assist him in his daily work. After getting his first real insight into administration as it actually prevails he says what we need is primer stuff not only for rangers but for some supervisors. He now is planning to develop for use next winter telephone courses grazing courses, etc. He frankly says that this trip has been a revelation to him. Highbrow ideas have been blasted by seeing affairs in their true aspects.

By the way he questions whether or not the results of

Keplinger's work in D2 shines as brightly on the ground as it does on paper and by description of it from D2 men. The inspections made in D2 last summer he says failed to discover any outstanding evidence to support D2 contentions. To have this point of view is interesting at least.

The Mullin work unit has been analyzed and applied. It is simple and will be workable with a little more refinement. It is based upon the time given to handle the average cow upon the range. By exhaustive studies Jim found that the average cow cost in rangers time 5 6/10 minutes. Then he proceeded to ascertain how many board feet of timber required 5 6/10 minutes of administration. This figure in rangers sales was 75 B.F. and 164 B.F. in project sales. An investigation of time given to uses, land adjustments, land classification, protection and improvements pointed out that for certain units of area to those activities, the average ranger gave 5 6/10 minutes. Here they are. For each

25	acres	of	area	- 5 6/10 minutes to	Improvements
85	"	"	"	" "	Uses
112	"	"	"	" "	Land adjust.
112	"	"	"	" "	Protection
745	"	"	"	" "	Cooperation

These figures were all worked over on to an hours basis then reciprocals substituted for those figures. The reciprocals are the factor used. They are for

Grazing 92. per 1000 head)
Project sales .57 M.B.M.)
Non-project sales 1.4 M.B.M.)
Prot.,imps. uses, etc.,)
6.6 per 1000 a.)

In fact all these factors equal the part of an hour or hours that is or are required to adm. 1000 head stock
4 sheep = 1 cow, etc.

To find the number of work units in the Greer Ranger District, Apache

8,000	cattle	8000		
20,000	sheep ÷ 4	5000	= 13,000 x 92	1196
500	N.F.Ranger sales	500	500 x 1.4	700
350,000	acres area Dist.		350,000 x 6.6	2310
			Total	4206 units

of work or 4206 hr. required to do the classified work. Units do not include classified time.

The average number of work units per Ranger District for the entire District is 2400. On forests visited they ran from 1500 to 4200 approx.

The factors as applied do not however give an accurate measure of work because the last factor 6.6 which combines protection, improvements, etc. is used irrespective of the fact that there is no lands adjustment work in an individual district. It also is applied to the gross area of ranger districts in measuring the size of protection job, whereas on the Cherelan District of the Sitgreaves 50% or more of the District's area is asbestos and to it the ranger gives no protection time.

In an application of the units to the Greer district we found that the allotment of funds for the District were barely sufficient to pay for the hours necessary to discharge the classified work. It is known that the ranger in addition to doing the classified work also spends a material lot of time on unclass.

Jim is now working out independent factors for protection, improvements, and lands work. When he develops them it will be possible to get a more accurate measure of work of ranger districts because on the Carson for example where protection is nil that activity can be ignored and so on right thru.

I must tell you that the supervisor of the Apache - Selkirk- had never heard of the Mullin unit. I asked him what he thought of it and he said, What is it? A fine example of a supervisor in name only. Had never heard of the burro or bedding out system of handling stock nor of the work unit of the District.

This leads up to his idea of time studies. His reply to the questions of how much time his rangers should spend in the field to do their respective jobs was "around 50%". Asked how much time they did spend, he said I don't know. I haven't analyzed time for a long period. Mr. Leopold was the following evening going over an Apache Ranger's diary. The supervisor was in the room but took no part in it. Leo pointed out to the ranger duplications of trips, how he could have put up trail signs incidentally, etc. The next morning before leaving Iwas talking with Mr. Selkirk about loss of time and told him if a supervisor would interest himself in such things he could render an immense service in the solution of one of our most perplexing problems. He said, "I don't believe in that sort of thing. These boys are all doing their best. I don't believe in questioning men like Leo did last night. It makes a ranger feel that he is being put thru the mill like a criminal." What can one do with a man of that state of mind?

This is how it works. A new house and small barn were to be constructed at Blue R.S. Apache. A carpenter was hired and placed in a vacant stat position. The ranger said work on the house started about Nov. 1 and was not ready for occupancy until late April. The ranger, a floater ranger after Xmas and this carpenter beside part time of a fourth stat. man worked on the project. Very proudly the supervisor said that the house and barn were all built on contributed time. No thot of the five months. The house was a job that should have been completed even with un-

skilled labor in not to exceed 2 mos. and the barn in two weeks. I have cautioned the D.F. against the employment of noneligibles specifically for house construction where to do so clearly violates the stat. limitation on cost of buildings. In two instances this was done. He said that it would not occur again. An excellent job was done on both houses.

I am enclosing a map showing the travel of Ranger Simmons (Datil) and a brief transcript of his diary covering a period of 8 months. Simmons is a $1700 ranger (Deputy in a ranger place). Held to be a high grade man. He is too fat to climb a tower or a tree on telephone work. Forty-two girth would rule him out. You can judge for yourself whether or not his diary shows $1700 management of ranger's time. He has a good personality, speaks plausibly on all subjects, and bubbles over with esprit de corps. His case clearly shows the need of a system of rating personnel which willtake into account more of what a man actually does and less of what he doesn't.

I have gotten some insight into the inner workings of the D.O. personnel situation, particularly that of Operation.

Mr. Pooler says Redington played strongly to two favorites -Shepard and Leopold. When the vacancy in Operation occurred he went outside the Service to get Leo. Before Leo left the masses recognized that Leo was being pushed ahead of his experience and when from outside he was brought back and placed in a position requiring mature judgment and ripe experience the field felt somewhat bowed up about it. Pooler thinks Redington made a pretty serious error in making the appointment because he apparently feels that Leo is not temperamentally fitted to render to the Service his highest worth in the Operation field. He shortly after his appt. to D4 told Leo of the feeling against him (Leo) by the field force. Leo's pride arose and he asked for an opportunity to make or break in Operation. The other day when the offer of Dana's place reached Leo - one of the chief considerations for his refusal of it was just that thing. He feels that as yet he has not made - and the desire to do so is overwhelming. Frank told him when the Dana place was refused that he did not feel Operation was Leo's strong field and that say inside of two years or after Leo has had a fling at O of sufficient duration to make, he could expect a switch to P.R. Kircher then would go to O. Pooler says Leo is agreeable to that switch.

Personally, I think Leo has done well in light of his experience and the handicaps under which he works but you know that I also believe he moves along with his feet somewhat off the ground. But he lowered several inches during the past month.

My stock of paper is exhausted. Am at Deming awaiting nine hours for a train connection on the S.P. for Tucson.

Sincerely yours,

Evan W. Kelley
Inspector

Copy

Banning, Calif.
6/28/21

O
Fire

Dear Mr. Headley:

I wired yesterday of my departure from D3 to D5- a month late. You perhaps wonder why I spent so much time in the Southwestern District. For three reasons. One, the job represented by the trip across the Sitgreaves, Apache, Datil and Gila countries was too big for the allotted time. Two, there is a bigger need for attention to the economic side of protection here than I believe any one has realized and third, since I came to the Coronado at considerable expense to investigate the Catalina fire I felt that to get a fair working knowledge of conditions as effecting fire control matter would be good business; accordingly, I spent twelve days with Supervisor Calkins.

You have raised the question of the F.F. expenditures in the District during the first 10 day period of June. Part of it was spent for real need but a large portion was spent because no one, excepting Kircher, has thot his way thru the common fire control problems. In a former letter Mr. Pooler's standpoint was described. Leopold is just beginning to feel his way along and to see the light.

A letter in May from the District Forester to the Supervisors pointed out an existence of a climatic emergency and urged that emergency men be put on wherever and whenever the Supervisors thot necessary. The tone of the letter was of rather scare line nature. Naturally Supervisors responded considering only the climatic and natural conditions. Presence of trail crews, possibility of getting protection by use of means other than that of employment of emergency guards was but lightly exploited.

The Catalina fire too excited everybody but Kircher. Under pressure of the Tucson Chamber of Commerce and a hogwild editor of the "Tuscon Citizen", Supervisor Calkins of the Coronado was I think thrown a little off his usual stable balance. The result was employment of emergency guards, I believe and so does Kircher, in excess of justification about 50%. The spread of the Catalina fire also has scared the members of the force to the extent that altogether too many men are hired to fight fire regardless of size. I saw a fire upon which $288.00 was spent. It should have been controlled for half or less. Fear of another break like the Catalina is the reason. Fear, I strongly feel, is based only upon what the Catalina fire did after mistakes and unpreparedness rather upon the actual reason for it.

Noted
WBH

The cover of the Forests is dry to be sure, temperatures are high, relative humidity low, and a large number of people are in the Coronado Mts. How much drier or whether or not an abnormal number of people are in the wood no one knows. The District has yet to think its way thru problems that you talked about in California 6-8 or 10 years ago. It needs a lot of counsel and I don't know but what a man assigned to fire from District 5 where conditions are more like Dist. 3 than any other place.

It is too bad that Kircher did not continue on the fire assignment for two years more because he has the correct view point and apparently the standing with supervisors to put it over.

Very sincerely yours,

Evan W. Kelley
Inspector

D
Supervision
D. O. Program
1923

INTRODUCTION

Attached is the District Office program of work for 1923, grouped under fifteen specific Objectives. An advisory committee of five D-3 Supervisors has assured me that it is entirely feasible for Supervisors to group their programs under the same identical objectives - making comparisons between Forests easy - and <u>each Supervisor is requested to program his 1923 work in this way</u>. Rangers should continue to use the present Ranger work plan form as modified by the several Supervisors, but can easily identify jobs with Objectives by use of the Objective number, thus I, II, etc. This, however, is left optional, although I hope some Rangers will give the suggestion a trial.

The new system will accomplish the following purposes:

(1) Emphasize as "<u>Objectives</u>" the real things we are all working for and toward - leaving to District Office and Forest programs and to Ranger work plans the various jobs to be undertaken for their attainment.

(2) Facilitate consideration of the adequacy of the several programs of work to secure the desired degree of progress toward the attainment of the general objectives.

(3) Facilitate the exercise of priority-judgment in determining the best use of available resources in men and money.

(4) Focus attention on urgently needed increases in men and money by tying programs of work in more closely with allotments.

(5) Facilitate correlation in District Office by grouping program features under general "Objectives" rather than by offices. This can be done without any diffusion of responsibility.

(6) Facilitate qualitative definition of inspection under various objectives to insure emphasis of fundamentals all along the line.

(7) Facilitate the recording of actual progress toward attainment of objectives and of accomplishment of the financed features of programs. This can be accomplished at the close of each year by use of yellow insert sheets, and each year such a follow-up report - page for page - will be made by the District Forester to the Forester and by the Forest Supervisors to the District Forester.

In order to accomplish these several purposes, the following <u>instructions</u> should be closely adhered to by Supervisors in preparing their programs:

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*Note: Programs need not be absolutely confined to 1923 work - ample provision for listing other work is found in these introductory instructions.

(1) Program all work that sticks out as requiring early attention, i. e., things that are really essential to adequate progress in attaining the various objectives.

(2) Schedule for the particular calendar year only work that can reasonably be executed in that year without increases in men or money.

(3) Where material progress on a job is expected in the calendar year but the job cannot be concluded in the year, indicate thus - "1923 Cont." as continuing work.

(4) Mark as "Urgent" the particularly necessary programmed but unscheduled work. This will focus discussion on the relative importance of particular scheduled and unscheduled jobs by Forests or groups of Forests. For jobs in this class be prepared with a statement of additional resources needed.

The above system for indicating priority is the best we have been able to work out and it is hoped that with use a better priority system can be evolved.

There will be no "Supervisor" or "District" conference next spring, but a series of group allotment and program meetings will be held during the last half of January, which will barely allow time for assembling the District financial needs for presentation at the Service Allotment conference in Ogden in mid-February. I am very anxious to discuss the various Forest programs in their relation to allotments, organization and personnel, and accordingly desire each Supervisor to formulate his program as comprehensively as the intervening time will allow and bring it with him to the meeting of his allotment group. A copy is wanted for the District program binder and it will facilitate consideration here if you will mail this copy to the District Office marked for my personal consideration just as soon as available. Where not earlier available, Supervisors should bring in the District Office copy when they come. The program discussions this procedure makes possible may result in changes in individual Forest programs and may also suggest changes in the District Office program as well.

Sufficient copies of the District Office program are being furnished Supervisors to supply all Rangers and Deputies, since its use should prove helpful in promoting good team work throughout the District as a whole. The program will bear careful study, and frequent use for reference purposes and criticism of it with suggestions for improvement are invited and will be very welcome.

FRANK C. W. POOLER,

District Forester.

December 19, 1922.

OBJECTIVE IX.

To prevent destruction of Forest cover and land through erosion with attendant economic and industrial loss.

District Office Program.

(1) Basic Data.

1923 (a) Assemble and digest available data bearing on erosion problem this District, results of control investigations elsewhere and specific statement of control project inaugurated in District. (Jones with coöp. Leopold.)

(2) Control Policy.

1923 cont. Development of erosion control policy and technique for District. (Leopold - coöp. other offices.)

(a) Legislation.

1923 1. Study out necessity for revision of organic law by Congress, extending our watershed function to all National Forest lands, rather than retaining present legal limitation to watersheds of navigable streams and reclamation projects. (Cheney.)

1923 2. Study out necessity for establishing "Land-Owner Responsibility" for erosion control, and feasibility and ways and means for putting it into effect. (Cheney.)

(b) Organization.

1923 cont. 1. Induce Agricultural Colleges, through extension service, to undertake development and demonstration of control technique and assume leadership, especially off the Forests. (Leopold.)

1923 cont. 2. Keep our own organization abreast of developments in erosion diagnosis, causation and control. (All offices.)

1923 cont. 3. Establish or extend direct relations with the following, with the objective of working out definite machinery for exchange of information and correlation of study and effort.

U. S. Reclamation Service -
Washington. (Forester on request District Forester.)
Pecos Valley. (Mullen and Arthur.)
Rio Grande Valley. (Jones and Douglas.)
Salt River Valley. (Leopold and Swift.)
Colorado River. (Leopold.)

Water Users' Association. (Same as above.)

New Mexico Agricultural Federation. (Jones.)

Arizona Industrial Congress. (Swift.)

(c) Technique.

1923 1. Draw Work Plan for "bottom-fencing" demonstration on Salt River watershed. (Leopold, Grazing and Swift.)

1923 cont. 2. Follop up "Control Plant" project with B. P. I. (O)

1923 cont. 3. Follow up experiments on willowing, check dams, bank control, etc., already under way. List to be drawn by O. (O - Coöp. other Insps.)

Urgent 4. Initiate demonstrations of Talbot's findings on tank silting. (G)

(d) Educational Work.

1923 1. A popular bulletin or other publication, available in quantity, pointing out the causes, effects, extent and significance of erosion in the Southwest. (Leopold - coöp. PR.)

Urgent. 2. A bulletin illustrating control methods, as soon as methods have been sufficiently worked out. Meanwhile, as temporary compilation for use of field.

1923 cont. (3) Inspection with particular regard to:

(a) Location of specific areas requiring localized remedial attention and suggested remedies. (O, L, G - coöp. other Insps.)

(b) Adequacy of Supervisor's grazing program and current progress to correct erosion due to overstocking or overgrazing (local or general) and curable by grazing control including fencing projects. (G - coöp. other Insps.)

(c) On sale areas - adequacy marking policy and local brush disposal work from erosion standpoint with due regard to conflicting demands of erosion control, fire protection and reforestation needs. (S - coop. other Insps.)

(d) Along roads and trails - utilization brush in minor erosion control work instead of burning. (O & DE - coop. other Insps.)

Urgent (e) Work for some common standard of what constitutes a satisfactory condition of a watershed, (G, L, S, O.), and some manner of recording improvement or deterioration in watershed conditions effected by each Supervisor. (O)

OBJECTIVE X.

To secure satisfactory range management and the stocking of the National Forest ranges within their carrying capacity as established after consideration of the demands of timber production and watershed protection as well as forage values. Subject to the foregoing, the production end of grazing administration, rather than the distribution-of-preference end, should be emphasized. This Objective necessitates preliminary grazing research or studies work, grazing management plans (to cover the entire District ultimately), the ultimate extension of grazing reconnaissance to all National Forest units and ultimate knowledge of the economic needs of the industry.

District Office Program.

(1) Grazing Studies.

1923 (a) Publish bulletins giving results salting and water study. (Talbot.)

1923 (b) Dissemination of studies information through direct contact between studies men and administrative officers and collection administrative views as to additional needed studies work. (Talbot.)

1923 or 1924 cont. (c) The management phase of the brush range study. This would resolve itself largely into a determining of the main principles of handling such ranges. An important part of it would be a close study of the carrying capacity which we want over many of these ranges which are frequently watersheds. This carrying capacity would be one defined in the light of forest and watershed protection and erosion rather than the actual numbers of stock which the forage might carry throughout the year. (Talbot.)

1924 or 1923 cont. (d) The management phase of our bunch grass ranges. This would probably attack the problems of the best methods to use such ranges tied in with damage to reproduction, overgrazing of short grasses, fire menace and erosion. (Talbot.

Note: Priority as between (c) and (d) cannot be established until after Investigative Committee meeting in January.

(2) Grazing Reconnaissance & Management Plans.

1923 (a) Santa Fe - preparation of grazing reconnaissance report and management plans for completed portion of Pecos Division. (G with advice Supervisor.)

(b) Santa Fe - complete grazing reconnaissance (approximately 330,000 acres Pecos Division) by June 30. (G.Reconn. party.)

1923 (c) Datil - provide reconnaissance party for extension grazing reconnaissance to approximately 225,000 acres and through periodic inspections maintain technical control. (G)

1923 (d) Permanent assignment technical grazing men to two National Forests to aid Supervisors in application grazing reconnaissance and in development better management plans. (D.F.)

Urgent (e) Same as to various other National Forests.

(3) Range Appraisal.

1923 (a) Complete review range appraisal reports of Forests. (G - Cooperrider.)

1923 (b) Prepare summary range appraisal reports of Forests and tabular standard form for comparison. (G - Cooperridor.)

1923 (c) Conferenceswith stock associations and others on grazing appraisal work, including subject of fees. (G - D. F.)

Urgent (d) Development method use of range appraisal data for management plan purposes. (G - Cooperrider.)

(4) Game Production.

1923 cont. (a) Assist Supervisors in organizing game interests in Arizona. (G - Coöp. Leopold.)

(b) Study out what plan of Limitation of Kill and method of managing big game will best fit Forest interests. (Leopold - Coöp. G.)

1923 (c) Review of Supervisors' recommendations for completion of big game refuge system for submission to State. (G - Coöp. Leopold.)

Urgent (d) Conduct Arizona legislative and of Kaibab Game Management Plan. (G - Coöp. PR, Leopold and Swift.)

(e) Revision Game & Fish Handbook.

1923 cont. (5) Stock Meetings.

(a) Attendance regular State stock association meetings. (D. F., Kerr - sometimes Scott.)

1923 cont.

(6) Inspection with particular reference to:

(a) Use being made by Supervisors of range management and reconnaissance data in developing satisfactory conditions on ground.

(b) Adequacy Supervisor's reduction program to meet Forest and watershed protection requirements on the ground and success in putting into effect.

(c) Adequacy Supervisor's program to meet local excess stock problem and success attending efforts.

(d) Adequacy Supervisor's program to secure short season removals and success attending efforts.

(e) Satisfactoriness existing established seasons and adequacy Supervisor's program to secure desirable modifications.

(f) Adequacy of and adherence to Supervisor's program for handling grazing adjustments on cut-over areas or areas to be cut over in ensuing five to ten years. (See also Objective III (2).)

(g) Adequacy of and adherence to Supervisor's program for correcting distribution stock on range with particular reference to relieving overstocked areas and utilization of unused ranges constituting fire hazard, with due regard to watershed protection.

(h) Adequacy Supervisor's range improvement program, including boundary and erosion control, fencing, and success in carrying it out.

(i) Adequacy local salting plans.

(j) Satisfactoriness Supervisor's handling new applicants.

(k) Adequacy Supervisor's program for meeting need for additional stock associations.

(l) Compliance terms annual allowance letter.

(m) Compliance outstanding grazing standards and record requirements.

(n) Supply general assistance as needed in settlement local range controversies and in bolstering defective programs.

(G - Coöp. other Insps.)

INSPECTION SCHEDULE - 1922

DISTRICT 3

FOREST	D. F. *	GENERAL	OPERATION	GRAZING	LANDS	FOREST MAN.	DE(R. & T.) **	FA	L ACTING
Apache		Kircher (7/1-31)	Kircher (7/1-31)		Cheney (5/1-20)	Randles (9/21-10/10)			Jones - Jan. 1 - 31 Marsh - Feb. 1 - 28
Carson		Kircher (9/1-30)	Kircher (9/1-30)			Lang (9/21-10/10)		Morris (9/18-22)	Marsh - Mar. 1 - 31 Kerr - Apr. 1 - 30
Coconino		Marsh (F.up)				Marsh (5/12-31)			Jones - May 1 - 31 Kircher - June 1 - 30
Coronado					Cheney (8/6-18)			Morris (5/8-12)	Leopold - July 1 - 15 Marsh - July 16- 31 Kircher - Aug. 1 - 15
Crook									Leopold - Aug. 16- 31 Leopold - Sept 1 - 15 Jones - Sept 16- 30
Datil		Jones (F.up) (6/1-30)			Jones (6/1-30)				Marsh - Oct. 1 - 31 Kircher - Nov. 1 - 30 Leopold - Dec. 1 - 31
Gila		Marsh (F.up) (9/1-25)			Jones (7/9-21)	Marsh (9/1-25)		Busch (2/12-16)	
Lincoln			Mullen (8/20-9/5)	Kerr (10/1-31)				Busch (2/6-10)	
Manzano		Leopold & Mullen (4/1-25)	Leopold & Mullen (4/1-25)			Randles (8/1-15)		Busch (10/8-12)	
Prescott						Randles (7/1-20)		Morris (5/15-17)	
Santa Fe		Leopold (5/15-6/25)	Leopold (5/15-6/25)	Scott (9/1-30)		Marsh (8/1-20)			
Sitgreaves			Mullen (6/25-7/10)			Marsh (6/1-10)			
Tonto		Leopold (7/15-8/15)	Leopold (7/15-8/15)					Morris (2/12-17)	
Tusayan						Marsh (5/1-12)		Morris (5/8-12)	

Note:
* D. F. Inspection - no attempt made as yet to schedule D.F. inspection trips. They will be tied in closely with trips of Washington inspectors.
** DE Inspection - after Minor R. & T. program for C.Y. 1923 is approved, DE schedule will be sent out.

MISCELLANEOUS TRAVEL

Ogden Grazing & Operation Conference	- Pooler, Kerr, Scott, Leopold (2/15-)
Attendance State Ass'n Livestock Meetings	- Pooler and Kerr or Scott
Various Forests	- Marsh - trip with Eldredge of Washington 3 (6/11-7/10)
Madison Laboratory	- Marsh or Randles (Oct.)
D-1 (?)	- Leopold (9/15-10/10)
Washington office	- Talbot - final arrangements Salt & Water Bulletin for publication, (Mar. 1 - May 15)
Bernalillo County	- Cook (Coop. County Agent) joint agric. and forestry meetings, Series 20-25 night meetings (Jan., Feb. and March)
Silver City	- Cook - preliminary arrangements similar series(Jan. 1 week)
Attendance following fairs	- Cook (Santa Fe Fiesta, 1 wk.Sept.), (Raton Fair, 1 wk.Sept.), (Prescott & Phoenix Fairs, 3 wks. Oct.), (N.M.Ed.Ass'n conven. Las Vegas, 1 wk. Nov.)
Yuma	- Leopold - conf. P.J.Preston, Proj. Man. Col. River Rec. Proj. on watershed conditions, and silting ( )
Phoenix	- Leopold - conf. C.J.Craigen, Proj. Man. Salt River Rec. Proj. (with Supervisors Forests) in August on watershed condition
El Paso	- Jones - conf. L.M.Lawson, Proj. Man. Rio Grande Rec. Proj. on watershed conditions and silting (in July)
Carlsbad	- Mullen - conf. L.E.Foster, Proj. Man. Carlsbad & Hondo Rec. Projects (with Supervisor Lincoln) on watershed condition and silting (in Sept.)
Attendance series inter-forest Ranger meetings to [illegible]	- Pooler and representatives all offices, (fall season)

PROJECT TRAVEL

Range Appraisal	- Kerr, Scott (7/1-8/31), Cooperrider (7/1-11/30) (All Forests to be visited)
Grazing Studies	- Talbot (to follow)
Grazing Reconn.	- Cassidy, party chief, Santa Fe (to complete by _____). (Datil, western div. (_____ to _____)
Turpentine Survey	- Lang (Sitgreaves 5/1-31)
Timber Apprais.Study	- Lang (Various Forests, 7/1-31)
Flag.Lbr.Co.Apprais.	- Randles (Coconino, 5/11-6/10)
Management Plan	- Randles (Apache, 9/1-20)
Final Mt.Rec.Plans	- Jones (Crook, 4/15-30)
Gross Kelly Exch.	- Jones (Santa Fe, 4/6-10)
Frijoles Nat'l Mon.	- Cheney (Santa Fe, 9/9-21)
Entry Surveys	- Myers, party chief, (to follow)
Research - Liaison	- Pearson (to follow)

12/18/22

RECORD GROUP 95

RECORDS OF THE FOREST SERVICE

RECORDS OF THE DIVISION OF RANGE MANAGEMENT:

GRAZING - WORKING PLANS, CARSON NATIONAL FOREST, 1912 - 1916

Form 771a
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

OUTLINE AND INDEX

GRAZING CHAPTER—SUPERVISOR'S ANNUAL WORKING PLAN, 191

FOREST SERVICE
District No. 3,
RECEIVED
OCT 30 1912
Referred to
Grazing.

Carson National Forest October 20, 1912.

PART TWO—PROTECTION AND DEVELOPMENT

PART TWO -- PROTECTION AND DEVELOPMENT.

(1) Grazing Reconnaissance:

a. Required, Reasons why:

In my last years report I recommended an examination of our ranges by Mr. Jardine, with a view to determining the feasibility and need of a regular grazing reconnaissance, and to formulate whatever tentative organization which seemed necessary along the lines of scientific range management. I wish to again make this recommendation, although I am not as certain at this time that we are as yet prepared to take full advantage of the intensive reconnaissance of the entire Forest. I believe that this question can be very well held in abeyance, pending an experienced examination of our ranges. Since last year progress in grazing administration has been made which enables me to foresee more clearly the exceedingly great improvement in Range management which we are able to make in the future without the aid of scientific reconnaissance data, and I am inclined to think that we should consider very carefully the advisability of incurring heavy expenditures for reconnaissance under the present still rather unsettled range conditions. After the grazing administration has become stable and comparatively well organized it is possible that we will not only be able to derive much greater benefit from scientific reconnaissance, but reconnaissance methods will also have improved to where the data obtained will be more usable.

b. Accomplished. Results obtained:

While no regular scientific reconnaissance has been attempted on this Forest so far, I feel that satisfactory progress has been made in the study of range conditions and management. The conclusions reached, and the plans proposed for the future have already been discussed under Part 1 of this report.

c. Planned. Methods proposed:

I am not yet prepared to recommend any specific methods for possible future grazing reconnaissance.

(2) Losses of Live Stock, from --

a. Disease. Remedial measures taken. Required:

As already stated under Part 1, 5-a, no cases of Scabies have been detected on the Forest during the past year. 15 cattle were lost on the Canjilon District by reason of a

(2) Losses of Live Stock , from --

a. Disease. Remedial measures taken. Required (Cont):

disease purported to be black leg. I am inclined to doubt the reliability of this diagnosis.

b. Poisonous plants. Remedial measures taken. Required:

Losses through poisonous plants on this Forest are comparatively slight. The worst losses consisted of death of sheep during the early spring as a result of eating Pingue, or rubber weed, which is very abundant on the lower ranges up to about 9000 feet. Judging from the statements of experienced sheepmen, and from my own observations, I am inclined to think that liberal salting is all that is necessary to obviate these losses. Kansas Sulphur Salt, as explained by Mr. Kneipp, is the best for this purpose, and is also the kind most generally used in the sheep camps. It is impossible to estimate the exact number of sheep lost through Pingue, since these losses are simultaneous with the annual heavy losses due to poor feed on the winter ranges.

c. Predatory animals. Remedial measures taken. Required:

No serious losses from predatory animals have occurred until very recently, when loafer wolves are reported to have stampeded three bands of sheep on the Vallecitos District and killed about 100 head in one night.

(3) Prairie Dogs and other range-destroying Rodents:

a. Abundance and need for extermination:

Although a considerable annual fluctuation in the abundance of prairie dogs is noticeable locally, I believe that a general increase has occurred since 1911. Local extermination work on a small scale is a benefit to private agricultural interests only, and is, therefore, I believe not the duty of the Forest Service. General extermination on a large scale by the Biological Survey, in cooperation with the Forest Service, is the only practicable and sensible plan, and the undertaking of this work is a very urgent necessity.

b. Exterminative work accomplished and proposed:

No poison was distributed during the past year, and no expenditures along this line are recommended for the reasons given under Part 2, 3-a. The receipt for poison is, of course, always supplied on request.

(4) Water Development:

a. Area, location, and grazing capacity of range not utilized because of lack of water:

With the exception of certain areas of limited extent included within pending eliminations, there are no ranges on this Forest completely unutilized because of lack of water. The need for water development is, however, in no way reduced by this fact, since one of the main requirements for the proper utilization of at least half of our ranges is to provide an increase in the number, and an improvement in the distribution, of stock watering places. This requirement is, of course, the first essential in working toward uniformity in utilization, and it will not be possible to make much further progress toward this end on the Vallecitos, Servilleta and Jicarilla Districts without the development of additional watering places.

b.& c. Water developments completed during year, and planned for coming year:

No water developments were planned or undertaken during the past year by the Forest Service. Repair work was done, however, under Special Use on about three tanks, and several new tanks are planned at the suggestion of this office by certain permittees on the Servilleta District, to be constructed during the present fall.

Under the authority given on Page 3 of Mr. Waha's C-Carson-Allowances letter of January 8, 1912, it is planned to require the improvement of about 19 watering places by and on the allotments of the permittees affected, as follows:

Canjilon District,	-------	7 Springs.
Vallecitos "	-------	4 Springs.
San Antone "	-------	6 Springs.
Servilleta "	-------	2 Tanks.
Total	-------	19 Projects.

Almost without exception the spring developments will consist of erecting a pole fence around the present seep; sinking a small hole in the seep, to be walled with rock, and an outlet, which will be a "V" shaped trough set in the ground and connected with a log trough outside of the fence, in accordance with the needs of each case and the volume of water available. The Rangers will cooperate to a certain extent in the construction work, and the details of construction work will be left in their discretion.

PROTECTION AND DEVELOPMENT (Cont):

(4) Water Development(Cont):

b. & c. Water developments completed during year, and planned for coming year(Cont):

It is planned to make a volumetric measurement of the flow of certain springs on the Canjilon District, and to observe the number of sheep watered and the conditions in each case, in order to gather definite data as to the amounts of water required for this class of stock during various times of the year.

(5) Permanent Improvements:

a. & b. Brief resume of improvements constructed and benefits, and of permanent improvements required:

No grazing improvements have been constructed or planned, or are planned to be constructed within the near future by the Service. One Special Use for a small drift fence has been approved under the new drift fence policy now in effect. This is the case of O. J. Niles, for 100 cattle, on the Taos District, ranging in Capulin Canyon.

Reference is made to G-District-Supervision circular #80: I am very much in favor of the new policy concerning drift fences. On account of the limited prevalence of the cattle industry on this Forest, however, the policy is not practicable here, except on the Tusas cattle area, and on the Taos Division. I consider that no especial advantage would be gained, except on the Taos Division, where the plan will work out to excellent advantage, on account of the mountainous character of the country and the ease of constructing drift fences across the canyons.

(6) Damage to Forest Reproduction:

a. Extent of damage:

Damage to reproduction through grazing is, on this Forest, confined to the community goat areas. This statement applies, of course, entirely to visible damage to good size reproduction; the tramping out of young seedlings being much less noticeable and more extensive. A certain amount of spruce reproduction has been cropped down until the young trees have assumed a hedgelike growth on certain bedding grounds within the spruce type. On the whole, however, the tramping out of invisible seedlings is undoubtedly by far the most important kind of damage on this Forest. Since there have been no

(6) Damage to Forest Reproduction (Cont):

a. Extent of damage (Cont):

very recent seed years, no opportunities for detailed observations have been presented.

b. Preventive measures adopted. Planned:

The first and most essential step in handling this problem is the proper regulation of goat grazing. The measures adopted and the results obtained have already been described in detail in Part 1.

(7) Revegetation of Depleted Ranges:

a.& b. Extent of areas requiring reseeding, and Methods to be followed; natural, artificial:

There are no areas on this Forest for which artificial reseeding is recommended. By far the most important need for reseeding is within the small spaces between the hummocks on the bunch grass ranges which have been heavily grazed by sheep. On these areas the bunch grass is left untouched, while the intervening sod of short grass has been largely destroyed. Reseeding of these intervening spaces will undoubtedly take place naturally when the overstocking of sheep has been reduced, and the proportion of horses and cattle using the bunch grass ranges has been increased.

c. Areas upon which an improvement in forage conditions has been secured: (1) By natural reseeding, (2) by artificial reseeding:

A very apparent amount of natural reseeding has taken place during the past year on certain areas, especially within the Vallecitos District, which had been badly abused during preceding years, but which during the past season were protected by careful administration and the avoidance of overstocking. As an example, the lower part of Burracho Canyon, embracing approximately four Sections, which during May, 1911, bore practically no visible forage of any kind whatsoever, was during May 1912 very fair gramma and blue stem range. On a great many parts of the Forest there can also be observed large numbers of old sheep trails, made under the blanket allotment scheme, which, under the new individual allotment scheme have grown up thickly with annual grasses and herbs.

(8) Herbarium:

a. Need for collection of principal herbaceous plants. b. Number of plants collected. c.Number of plants identified. d. Number of specimens in office herbarium:

The proper collection of herbarium specimens is not possible without getting into the field with a team. Since there is no Government team on this Forest, and since in the course of ordinary field trips, especially in connection with grazing work, a team is of limited usefulness, either hitched up, or the horses being used under saddle, The collection of herbarium specimens requires a great deal of extra time, the expenditure of which I did not feel justified at the present stage of grazing administration. No specimens have been collected so far, nor have any been submitted for identification.

(9) Improvements in Methods of Handling Stock:

a. Required. b. Adopted during the year. Results secured:

As already discussed under Part 1, 5-c, a more thorough enforcement of the salting requirement is very much needed. Sheepmen must also be educated to utilize forage on the areas slightly obstructed by down timber. There is a very great need for enforcing more frequent moving of camp by sheep permittees. Various degrees of progress has been made during the past season by the several Rangers in this line; the principal obstruction to a perfect observance of our requirements being the limited distribution of water on certain Districts. With the exception of the three points named above, the methods of handling stock on this Forest are quite satisfactory.

c. Planned:

Reference is made to C-District-Supervision Circular #80: Regular, organized, or cooperative round-up work is entirely impracticable on this Forest. The question mentioned in your circular is, therefore, not applicable here. The discussion under Part 1, 5-d, will, I think, be sufficient basis for the above statement.

Aldo Leopold.

Forest Supervisor.

COPY.

G

Cooperation-Carson
Biological Survey
Jicarilla Dist.Inspection
Oct. 8 to 26, 1916.

Taos, N. Mex.

November 1, 1916.

MEMORANDUM FOR SUPERVISOR

I was greatly surprised at the excessive loss of stock from predatory animals that is occurring on the Jicarilla District and by the number of predatory animals seen and the amount of sign. We secured fairly accurate reports that at least 600 sheep had been killed during the present grazing season by coyotes, wolves and bobcats. This does not include small lambs actually lost during the lambing period. This is almost 5 per cent of the total number of sheep permitted on the District, and when you add to that another 5 per cent that undoubtedly will be lost during the winter months, we have a loss of 10 per cent from this source alone which no sheepman in any country can stand and run his business profitably. 15 calves were reported killed by wolves during this season. This is not a very large per cent of the permitted stock. However, I am confident that a very much greater loss from wolves has occurred than is reported. For instance, one shareman of Manuel Trujillo stated to me that he had 30 head of cattle on shares and that this season the calf crop was so short that he

was unable to pay the 20 per cent toll to the owner out of the calves that he had raised. Certainly the calves have been lost from some cause, but one unfamiliar with the wolves' method of dealing with young calves might lose a very large number without realizing what was causing the loss. Last year Tom Cordova lost, he says, every one of his calves from wolves and he was running at least 50 head of cattle. This year he has lost but two, but in order to save the calves this year he has been forced to practically herd his cattle and to corral them every night. The driving in of his cattle to his corral every night has been exceedingly hard on the range and it is causing the grass to be trampled down in the vicinity of the range with erosion setting in rapidly. But can we consistently prevent him from bringing his stock in from the range every night while if he does not do it he will lose all of his calves, and two years' loss of calf crop in succession will put any man out of the business.

One example of the damage that wolves are doing occurred while I was on the District, and I secured firsthand knowledge which is absolutely reliable. On the night of October 17 a band of wolves, the number is not known, but probably about six, as I saw the tracks

of six wolves together in that same vicinity a few days later, got into a small band of dry ewes that had been cut from the main band in the afternoon and killed 80 head that night. This loss amounted to at least $500. This same permittee had already lost something like 40 head from wolves and therefore his profits for this year have been reduced to a minimum. Wolf tracks were seen on all parts of the District, and I believe that they are worse in that region than they ever were on the Tierra Amarilla Grant or the Servilleta District, and I believe it is safe to say that there are 5 coyotes and bobcats on that District where there is one on any other part of the Forest.

In view of these facts it seems to me that a most urgent endeavor should be made to secure at least one Biological Survey trapper for that District to begin work early next spring, as I think it would be of little avail to try to trap the country during the winter months.

Both cattle and sheepmen for the most part realize that they are up against it and are seriously considering placing of a bounty of at least $35, and possibly $50, on wolves and also a bounty on wild cats and coyotes. If this was done it would probably rid

the country of the animals temporarily at least. In this connection, and having direct bearing on the efficiency of the bounty system, it should be remembered that while there is a bounty of $15 on wolves and $2 on wild cats and coyotes, the script in that county is almost worthless. Even if this small bounty were available in cash there would be a different story to tell regarding the numbers of predatory animals, but with the bounty off and fur prices not extra good, there is no inducement for trappers to go into the country.

The actual damage that is sustained by the Service where predacious animals are so plentiful is very great, beside the loss to the stock owners. For instances, sheepmen will not run their bands in the rougher areas and brush ranges, and consequently there is a marked tendency to overgraze the open and smoother areas. In other words, the range is not utilized evenly, and where cattle must be corraled of nights the range is tramped out for a quarter or half of a mile around the corral. But it would be as consistent to force a sheepman to use a poison area as the rough lands where loss is sure to occur, and to prohibit corral of cattle would be fatal to the industry in some cases. The only remedy is extermination of these animals.

(Signed) E. S. BARKER

Deputy Forest Supervisor.

RECORD GROUP 95

RECORDS OF THE FOREST SERVICE

RECORDS OF THE DIVISION OF INFORMATION AND EDUCATION:

NEWS ARTICLE FILE - FIRE, 1915

G

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C.

FOREST SERVICE
Office of the Forester
INFORMATION
OCT 15 1915
RECEIVED
Answered

FOREST SERVICE
★ OCT [illegible] ★
Referred to
PUBLICATION

October 13, 1915.

MEMORANDUM FOR MR. GRAVES.

Dear Mr. Graves:

Referring to your memorandum of October 11, the Acting Secretary has approved for publication in Popular Mechanics the article "Applied Science in Forest Fire Fighting," by Mr. Aldo Leopold. Please have the Librarian of the Department notified of the date of publication of this article.

Very truly yours,

Private Secretary.

See also: D 3 9/30-10/15/15
Popular Mechanics, 10/15/15

FI October 11, 1915.

MEMORANDUM FOR THE SECRETARY

Dear Mr. Secretary:

Permission is respectfully requested for Mr. Leopold tp submit the enclosed article, "Applied Science in Forest Fire Fighting", to Popular Mechanics, for publication in that magazine.

Very sincerely yours,

Henry S. Graves

Enclosure. Forester.

Approved:

Secretary.

D. S. E.

D. S. E.

RETURN TO
INFORMATION

APPLIED SCIENCE IN FOREST FIRE FIGHTING

By Aldo Leopold and Charles H. Jennings
XXXXXXXXXXXXXXXXXXXX U. S. Forest Service

The work of detecting and extinguishing forest fires on our 163,000,000 acres of National Forests is developing many mechanical appliances of special interest. Among these are the alidade-protractor, the fire-map, the fire-tool box, and various "take-down" or collapsible tools, all of which are used in conjunction with the lookout towers which have been built on mountain tops affording strategic viewpoints. Generally there are about six towers to every Forest in the West, each commanding a good view of from 100,000 to 500,000 acres, and connected by special telephone lines with the nearest ranger station.

On the platform on the top of each tower is mounted a protractor -- a horizontal disk whose edges are graduated to 360 degrees. This disk is oriented with its zero pointing toward the true north. In its center is pivoted an alidade. This is like a pointed ruler with vertical, slitted vanes like rifle sights. When the alidade is "sighted" in a certain direction its point registers a "bearing" on the protractor, expressed by a certain number on the graduated edge.

The fire map, which hangs on the ranger station wall, is a detailed map of the area commanded by the lookout towers. On it each lookout tower is represented by a point, from which hangs a silk thread. With this point as a centre, there is

drawn on the map a graduated circle corresponding in orientation with the graduated protractor in the lookout tower. When the ranger lays the thread across the graduation representing the "bearing" of a fire as determined from one lookout tower, the line of the thread accurately indicates the direction of the fire from that tower. When the ranger gets another "bearing" from a second lookout tower and indicates its direction by stretching a second thread, the point where the two threads cross represents the location of the fire on the map, and shows him exactly where to go in order to find it.

Fire-fighting tools include axes, saws, hoes, mattocks, rakes, shovels, and sometimes ploughs. These tools must be packed on horses from the tool boxes located in the forest to the scene of the fire. Obviously, a bundle of a dozen rakes or hoes is a hard thing to tie on a horse. Hence the tools are made collapsible, take-down, or folding. Some of them are shown in the accompanying illustration.

A fire-lookout, watching from, say the Hopi Tower, spies a telltale column of smoke. He sights on it with his alidade and reads the bearing which is, let us say, 44. Immediately he telephones the ranger, "Fire bearing 44 from Hopi Tower!" Immediately the ranger phones a second lookout at, say Red Butte Tower, who commands a view over the same country. Perhaps the second lookout has already seen the smoke. "Fire bearing 300 from Red Butte Tower!" he replies. The ranger lays his threads on 44 and 300, respectively. They cross, let us say, at the forks of Indian Creek. He knows then, that

a fire is burning at the Forks of Indian Creek, fifteen miles away, and the point is, he knows it in five minutes instead of, perhaps, five hours, and is enabled to attack it quickly instead of after a long delay in which it has had time to get a good start.

The system of fire control, which is based on this use of simple mechanical instruments, is applied by the United States Forest Service at a cost of about 3 mills per acre per year, and saves annually millions of dollars' worth of valuable timber. It is cheap insurance.

# # #

RETURN TO
INFORMATION

Furnished to Mr. Arthur Dahl,
433 California Street,
San Francisco, California.
Correspondence: Dahl, Arthur 10/6-11/5
15
See also:
Correspondence: D 3 9/30-10/28/15
Popular Mechanics
10/15-21/15

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RECORD GROUP 95

RECORDS OF THE FOREST SERVICE

RECORDS OF THE DIVISION OF INFORMATION AND EDUCATION:

NEWS ARTICLE FILE - GAME, 1916 - 1920

Revised

RESTOCKING THE NATIONAL FORESTS WITH ELK

Aldo Leopold, U. S. Forest Service

The American elk is a splendid animal, and an asset in any forest. On the other hand, the elk is endowed with an inborn appetite for alfalfa hay, four long legs, and a fine scorn for haystack fences. The Forests need elk, but the settler needs hay. This is the sum and substance of the problem of reintroducing elk on the National Forest ranges. The work is obviously of the kind which should be pushed with zeal but conducted with discretion. The object of this paper is to present certain arguments as to "where" and "how", with particular reference to the National Forests of Arizona and New Mexico.

The question of introducing elk into a given locality naturally resolves itself into two parts: (1) Suitability. Is the locality good elk range?; (2) Advisability. Will their introduction result in unavoidable depredations?

There are two interesting theories as to what constitutes good elk range.

S. N. Leek, who has studied the Wyoming herds for years, advances the proposition that the original distribution of elk was determined largely by the presence or absence of natural salt licks or alkali springs. He points out that the original distribution of the Wyoming herds bears out this theory. In whatever degree this may be true,

it is a fact that salt for livestock is today distributed throughout the National Forests, and small herds of elk could if necessary supply themselves from this source without appreciable loss to the stockmen.

The second theory is that elk thrive only on running water. The original distribution of elk in the Southwest strongly substantiates its correctness. Elk were never found, for instance, on the forests of the Arizona Plateau, where the volcanic formation absorbs the water and there are no running streams.

In addition to the elk's requirements as to water and salt, there are of course the obvious requirements of suitable and available feed and cover. It is not at all certain that elk require high summer range. In 1846 Parkman found elk summering at the base of the Black Hills, on Laramie Creek, and in several other localities well out on the plains. Moreover the species originally ranged over a large part of the central and northeastern states. Elk seem to prefer a higher percentage of grass, as compared with browse, than deer, and willow browse seems to be a favorite and possibly necessary winter food. Judging from old horns, from written records, and from the movements of the two introduced herds now at large in the Southwestern National Forests, elk will summer as high as sheep, i.e. practically to timber line, and are able to winter as high as range horses, which, in the Southwest is approxi-

mately the upper limit of the Yellow Pine type, at an altitude varying from 7,000 to 8,500 feet.

On the basis of the foregoing, the following tentative general conclusion is offered as a guide for practice in the Southwest: Any National Forest Range is suitable for elk that contains plenty of running water and some browse, and whose lower limit includes winter range not higher than the yellow pine type.

The advisability of introducing elk on any suitable range depends first of all on the probability of depredations. This probability, judging tentatively from meagre experience, seems to depend largely on three factors; (1) the configuration of the country; (2) the extent and distribution of agriculture; (3) the manner in which the elk are liberated.

Place elk in a country of broad V-shaped drainage basins, and it is only natural to expect that every blizzard on the tips of the "V" will throw the elk against the ranches along the bottom. When this happens the haystacks will feel the shock. Even in summertime, if the elk must water near ranches, they will be tempted to feed there also.

On the other hand, if elk are placed in a country of broken irregular topography of such a nature that their natural movements will not bring them in contact with ranches, especially during the winter season, the probability of

depredations will be lessened.

If, however, ranches, or even potential ranches in the form of agricultural lands, are widely scattered throughout the whole region, and especially if such lands lie adjacent to the winter range, the introduction of elk seems inadvisable under any circumstances.

The manner in which elk are introduced seems to have a pronounced effect on their subsequent habits. This effect may be best explained by two concrete examples.

In 1915, fifty head of Yellowstone elk were liberated on the Pecos River in the Santa Fe National Forest in New Mexico. The shipment arrived in winter and before being turned loose, were fed for several weeks in a corral, which was located on the river in the midst of a ranch community adjacent to their proposed range. When liberated the herd remained intact and located permanently on the nearby mountains. Every winter they make for the nearest ranch and stay there. Considerable depredations have resulted.

In 1913, eighty-five head of Yellowstone elk were liberated on Clear Creek on the Sitgreaves National Forest in Arizona. They were turned from the crates directly into the woods. Since then they have scattered far and wide, and they are still scattering. The vanguard has reached the Datil Forest, 130 miles to the eastward. These elk have annoyed ranchers very little or not at all.

These two cases at least suggest that the manner

of liberating the animals has the following effects: (1) Ranch-fed elk remain banded together, locate promptly, and freely seek ranches during hard weather; (2) Unfed elk scatter widely, locate slowly in small groups, and show no marked disposition to seek ranches during hard weather.

These two cases alone of course do not prove anything. They are, however, indicative of what may be expected under Southwestern conditions. Until disproved the above conclusions should be used in the Southwest as a means of adapting the behavior of the elk to the needs of the situation. In some cases it will be advantageous to have the elk scatter; where this is desired follow the crate-to-woods plan. In other cases it will be advantageous to locate the elk on a specific range; where this is desired corral-feed them on that range at some spot removed from ranches. Temporary confinement in special pastures would probably have the same effect as corral-feeding.

An amusing instance of the stick-to-itiveness of ranch-fed elk occurred recently on the Uracca Ranch in northeastern New Mexico. The Uracca herd had been hanging around the ranch buildings breaking into the alfalfa field and the orchard, and otherwise conducting themselves as a general nuisance. The manager of the ranch determined to push the herd back into the mountains, in the hope that they would stay there. He gathered a dozen cowpunchers and drove the elk five miles up the nearest canyon. The "drive" worked

all right going up, but the elk beat the cowpunchers back to the ranch.

The foregoing discussion does not aim to reduce the handling of elk to a formula. This, obviously, cannot be done. Neither does it claim to represent conditions elsewhere.than in the Southwest. It is hoped, however, that it will invite discussion which will eventually lead to sound general rules of practice for handling the elk-stocking problems on the National Forests. Lack of at least a little dependable knowledge will lead to placing elk where they do not belong, and the resulting depredations will discredit the work of game conservation.

Where mistakes have been made in the introduction of elk and depredations are resulting, the regulated use of dogs under the supervision of the proper officials is suggested as a possible means of preventing damage. Protected elk are generally tame. Systematic dogging whenever they appear at a ranch, coupled possibly with the judicious use of birdshot, ought to instil a more wholesome respect for haystacks and incidentally make the animals a more difficult prey for poachers.

Upon the introduction of elk in any Forest an effort should be made to procure the addition of a "depredation clause" to the State Game Law. Such a clause should authorize one of two methods of redress for aggrieved

land owners. Either (a) The State Game Warden should be authorized to issue permits to kill protected birds or animals, with rigid restrictions as to time, place, number, and disposal of carcasses; or (b) The county should be required to pay claims for damages. The latter method has worked out very successfully in the east, but the former will probably be preferable in the west on account of the chronically depleted treasuries of thinly settled western counties.

Last and not least, the intelligent handling of elk-stocking demands a close correlation of policy and methods between the Forest Service and the States. Cooperative agreements between the Forest Service and State Game Departments should in all cases specify that no new species of animal, bird, or fish shall be liberated on a National Forest without the prior consent of both parties officially concerned. The lack of such agreements will result in misunderstandings and lost motion, and often in damage.

It should be born in mind that while the perpetuation of the elk as a species is imperative, its reintroduction into every Forest is by no means advisable. The elk is the only American game animal in the handling of which the question of interference with livestock and agriculture arises as a rule rather than as the exception. Moreover the capturing, shipping, crating, feeding, and

liberation of a bunch of elk is a very costly operation. Its novelty, and often its attendant opportunities for publicity, are prone to make officials forget that for the cost of a single elk a half million acres might be patrolled for half a year against violators of the game law. For the cost of a herd of elk a threatened species like the antelope or mountain sheep might be saved from extermination.

RETURN TO FILE
INFORMATION

RESTOCKING THE NATIONAL FORESTS WITH ELK

Aldo Leopold, U. S. Forest Service

The American elk is a splendid animal, and an asset in any forest. On the other hand, the elk is endowed with an inborn appetite for alfalfa hay, four long legs, and a fine scorn for haystack fences. The Forests need elk, but the settler needs hay. This is the sum and substance of the problem of reintroducing elk on the National Forest ranges. The work is obviously of the kind which should be pushed with zeal but conducted with discretion. The object of this paper is to present certain arguments as to "where" and "how", with particular reference to the National Forests of Arizona and New Mexico.

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The second theory is that elk thrives only on running water. The original distribution of elk in the Southwest strongly substantiates its correctness. Elk were never found, for instance, on the dry forests of the Arizona Plateau, where the volcanic formation absorbs the water and there are large areas without running streams.

In addition to the elk's requirements as to ~~water and~~ salt, there are of course the obvious requirements of suitable and available feed and cover. It is not at all certain that elk require high summer range. In 1846 Parkman found elk summering at the base of the Black Hills, on Laramie Creek, and in several other localities well out on the plains. Moreover the species originally ranged over a large part of the central and northeastern States. Elk seem to prefer a higher percentage of grass, as compared with browse, than deer, and willow browse seems to be a favorite and possibly necessary winter food. Judging from old horns, from written records, and from the movements of the two introduced herds now at large in the Southwestern National Forests, elk will summer as high as sheep, i. e. practically to timber line, and are able to winter as high as range horses, which, in the Southwest is approximately the upper limit of the Yellow Pine type, at an altitude varying from 7,000 to 8,500 feet.

On the basis of the foregoing, the following tentative general conclusion is offered as a guide for practice in the Southwest. Any National Forest Range is suitable for elk that contains plenty of running water and some browse, and whose ~~lower~~ limit includes winter range ~~not~~ within ~~higher than~~ Or below the yellow pine type of Forest.

The advisability of introducing elk on any suitable range depends first of all on the probability of depredations. This probability, judging tentatively from meagre experience, seems to depend largely on three factors: (1) the configuration of the country; (2) the extent and distribution of agriculture; (3) the manner in which the elk are liberated.

Place elk in a country of broad V-shaped drainage basins, and it is only natural to expect that every blizzard on the tips of the "V" will throw the elk against the ranches along the bottom. When this happens the haystacks will feel the shock. Even in summertime, if the elk must water near ranches, they will be tempted to feed there also.

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In 1913, seventy-two head of Yellowstone elk were liberated on Clear Creek on the Sitgreaves National Forest in Arizona. They were fed for a short time at a locality removed from ranches, and then turned directly into the woods. Since then they have scattered far and wide, and they are still scattering. The vanguard has reached the Datil Forest, 130 miles to the eastward./ Except in a few localities, these elk, so far as known, have annoyed ranchers comparatively little over most of their range.

These two cases at least suggest that the manner of liberating the animals has the following effects:

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It should be borne in mind that while the perpetuation of the elk as a species is imperative, its reintroduction into every Forest is by no means advisable. The elk is the only American game animal in the handling of which the question of interference with livestock and agriculture arises as a rule rather than as the exception. Moreover the capturing, shipping, crating, feeding, liberating, protecting, and paying damages on a bunch of elk is a very costly operation. Its novelty, and often its attendant pportunities for publicity, are prone to make officials forget these points. the cost of a single elk a half million acres might be parallel for a whole hunting season against issuing the game law. For the cost of a herd of elk a state might save its antelope or mountain sheep from extermination.

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OUTER'S BOOK PLUS RECREATION

The Outer's Book Company, Publishers
9 So. Clinton St.
Chicago, Ill.

FOREST SERVICE
Office of the Forester
INFORMATION
FEB 18 1918
RECEIVED
Answered .....

DAN B. STARKEY
President
EARL S. BARBER
Vice-President
STANLEY B. ROGERS
Secretary and Treasurer

CHICAGO, Feb. 12th, 1918.

Mr. John L. Cobbs, Jr.,
U. S. Dept. of Agriculture,
Washington, D. C.

Dear Sir:

I have only just found time to examine the article by Mr. Leopold on "RESTOCKING THE NATIONAL FORESTS WITH ELK". I shall be glad to make use of it in an early number, together with the very interesting pictures accompanying it.

Please accept my thanks for the article.

Yours very truly,

Dan B. Starkey.

DBS GK.

Acting
Copy sent to District Forester
at Albuquerque

FOREST SERVICE
ENGINEERING
★ DEC 15 1917 ★
REFERRED TO

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

FOREST SERVICE
★ DEC 15 1917 ★
REFERRED TO
ENGINEERING.

ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO

GAS AND ELECTRIC BLDG.
ALBUQUERQUE, N. MEX.

EC
Information.

December 10, 1917.

The Forester,

Washington, D. C.

Dear Sir:

Your letter of December 3 is received and also Mr. Nelson's letter of November 28.

Mr. Leopold admits that some of the pages to which Mr. Nelson calls attention were misleading but it is believed that they have been changed to a satisfactory basis in the enclosed revision. Mr. Leopold desires to submit the following explanations.

a. Elk on Coconino Plateau. This office has a record of nearly 50 pairs of old elk horns and the localities from which each were obtained and this record bears out the statement that no elk were found on those parts of the Arizona Plateau devoid of running streams. There were of course a few streams around the edges of the plateau and on these elk were found. We agree however that the paragraph on page 2 should be made more explicit and this has been done.

b. Our report did not show that the Clear Creek elk were fed even for a short time and we are glad to stand

rester,

corrected on this point. This office was aware of some damage by this herd but have received no information that this damage was as extensive as reported by Mr. Nelson. All the damage we have heard of however was confined to a very small part of the present range of these elk and with the exception of this part, it is believed that the conclusion still stands that over most of its range this herd has done very little damage. Compared with the Pecos herd we believe that it is also still true that the total damage was comparatively little. The paragraph has been altered to conform with the above.

c. It is believed that Mr. Nelson's estimated cost of $100 per head delivered in the woods would be lower than the average cost. Two years ago this office got actual rates and figured expenses on bringing a bunch of elk to the Mogollons. In these expenses were included the cost of sending a man after them, feeding enroute and organizing a drive from the railroad terminal to the mountains. The total cost figured several hundred dollars per head. Mr. Leopold had in mind in making the comparison that one paid Game Warden at a cost of $400 could patrol half a million acres for a whole hunting season and that this sum would be about the same as the cost of the delivering and protecting elk per head. It is conceded however that the wording was insufficient to bring out the whole idea and this wording has been changed accordingly.

d. It is believed that the last comparison between

Forester,

the cost of a herd of elk and the preservation of antelope and mountain sheep is sound, but it is conceded that it was poorly stated. The idea was that the antelope and mountain sheep of a state might be saved for the cost of a herd of elk. Including damages it is readily conceivable that through a ten-year period a herd of elk might cost a state up to $1,000 per year which would put on three paid Deputies throughout the hunting season and three paid Deputies devoted particularly to antelope and mountain sheep patrol would, we believe, stand a very good chance of turning the scale for these animals in New Mexico. The wording has been changed accordingly.

Very truly yours,

PAUL G. REDINGTON, District Forester,

By John Keir, Acting.

Enclosure -

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

November 28, 1917.

Mr. Herbert A. Smith,
Editor, Forest Service,
Department of Agriculture.

Dear Mr. Smith:

I have received your letter of November 20 submitting a copy of Mr. Leopold's article, "Restocking the National Forests with Elk," for suggestions and criticism. I know of no reason why Mr. Leopold's article should not be published, with certain modifications which I will suggest below. Thus amended the article should be useful.

There are several points in the article which need modification, as follows:

The second paragraph on page 2 states that elk were never found on the forests of the Arizona Plateau. This is a mistake, since I am informed that old antlers have been picked up at various points on the Arizona Plateau, showing that elk did range there in early days. The elk, of course, require water and could not live permanently where no water existed.

In the second paragraph on page 3 I would suggest that the ending of the final sentence read: "Higher than the yellow pine type of forest."

In the next to the last paragraph on page 4 the statement is made concerning the elk introduced on the Sitgreaves National Forest of Arizona that "these elk have annoyed ranchers very little or not at

all." This statement is certainly wholly at variance with facts. When at Winslow, Arizona, recently, the nearest town to these elk, I learned that the State game warden and a local attorney have investigated serious complaints against the destruction of crops on ranches by these elk during the past season, and reported that they have destroyed potatoes, oats, and hay, also that last winter they completely destroyed a haystack belonging to one rancher. The losses by these elk, as itemized on five different places, amounted to $1,250 for the past season. I was informed that there is considerable complaint about the depredations of these animals, and that the State of Arizona is now preparing to build elk-proof fences about some of the ranchers' fields in order to protect them. By that you will see that Mr. Leopold's statement is wholly misleading. With the increase of dry farming throughout the National forests the advisability of restocking many of these forests with elk is open to serious question.

Mr. Leopond's statement earlier in the paragraph just mentioned that the elk "were turned from the crates directly into the woods" in the Sitgreaves Forest is not exactly correct. The elk were located on the Sitgreaves Forest wholly through my suggestion to people having the matter in charge. A corral was built for them and a small amount of hay accumulated. I am informed that the elk were first fed for a few days, until the hay was exhausted, and then were released. I agree with Mr. Leopold that elk should not be placed in an enclosure and fed near ranches, but if they are taken to the interior of a forest far from ranches during the winter season it would be necessary to corral and feed them for a short time while the snow was deep in order to

prevent losses which might otherwise occur. This would not have any effect later on the habits of the elk in relation to ranches, and would not interfere with their becoming widely distributed, since there would be no fenced supply of food available in the neighborhood of the corral.

My next criticism refers to the closing part of the final paragraph. The statement that "for the cost of a single elk a half-million acres might be patrolled for half a year against violators of the game law" is scarcely a statement of fact. With the elk furnished on board cars at the Yellowstone National Park at $5 each, the cost of placing them on a National forest anywhere in the West would certainly be less than $100 each, and for that sum it appears to me it would be a difficult matter adequately to patrol a half-million acres for six months.

Furthermore, I question the final sentence, "For the cost of a herd of elk a threatened species like the antelope or mountain sheep might be saved from extermination." This statement scarcely conforms to our experience in this matter. The remnants of our antelope and mountain sheep are located over a large part of the Rocky Mountain States and thence west through Nevada and southern California. The $1,000 or $1,500 that a considerable herd of elk might cost would certainly not save either the sheep or the antelope from extermination, since much more than that sum is being expended annually for that purpose, and the number of these animals, I fear, is steadily lessening. The $1,500 would be but 'a drop in the bucket' of the sum necessary to accomplish this purpose. The increasing occupation of the West will

surely end in the destruction of the antelope except in fenced areas, and the mountain sheep may eventually be restricted to a comparatively few localities. It would be unfortunate to issue a statement like the closing one in this article, which makes such a difficult matter appear so simple. We need the strongest efforts of all concerned in order to have any effect in safeguarding these two important game animals.

Sincerely yours,

E W Nelson

Chief, Biological Survey.

FOREST SERVICE
★ FEB 6 1920 ★
Referred to
INFORMATION

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO

EC
Information.

GAS AND ELECTRIC BLDG.
ALBUQUERQUE, N. MEX.

January 31, 1920.

FOREST SERVICE
OFFICE OF THE FORESTER
INFORMATION
☆ FEB 6 1920 ☆
RECEIVED
Answered

The Forester,

Washington, D. C.

Dear Sir:

I have Mr. Smith's letter of January 24.

Mr. Leopold and myself are entirely agreeable to the publication of his article in the form approved by you. The only object of my letter of January 20 was to explain our position and point out wherein we believed your office was mistaken on the points under discussion.

Mr. Leopold and myself and every other member of this office insofar as I know are by no means arguing for absolutely free speech in articles prepared by Forest officers. We fully appreciate the necessity for a solid front. Our arguments are confined solely to differences of opinion as to facts and as to good policy, which differences must inevitably arise when articles are reviewed by persons other than the writer and his immediate associates.

Very truly yours,

Frank W. Pooler
District Forester.

January 24, 1920.

FI

District Forester,

Albuquerque, N. Mex.

Dear Sir:

Your letter (EC, Information) of January 20 is received. I am uncertain whether Mr. Leopold would like to have some action taken to secure modification of the article before it is published, so that it will more accurately represent his views.

In view of the fact that so small a departure from Mr. Leopold's own statement was made on page 6, I should hardly suppose he wishes further action on this point, in the face of a strong opinion in the Washington Office that there are regions for which the Statement does not hold good.

The change on page 14 is not due solely to the criticism made by the Biological Survey. Had the passage stood as originally written by Mr. Leopold, I am sure that it would not have been approved by the Secretary's Office even though the Biological Survey had raised no objection. The Department policy is against advocacy of specific bills in such articles. Further, the Forester himself felt that a modification of Mr. Leopold's form of statement was desirable.

The point is partly that we want to avoid the appearance of being a house divided against itself. The Forester has taken an active part in trying to shape up the situation and bring about cooperation between the Forest Service and those interested in game protection. As an organization, the Service should follow his lead and individual effort should be coordinated with his.

If Mr. Leopold were here and able to become fully informed as to the question of policy in all its details and as

to the best strategy to employ, in view of all the elements and conditions involved, I feel confident his own judgment would be in entire accord with that of the Forester. Long-range handling of such matters means necessarily that at times there will be some difference of views. It does not seem to me that under such conditions conforming our own ideas to those of the Forester means the imposition of a censorship denying to the individual proper latitude for the expression of his own conclusions.

If Mr. Leopold does not feel reconciled to acceptance of the changes made on page 14, the only course that I can see is for him to telegraph the American Game Protective and Propagation Association to omit the passage. I do not see how we could put through a substitute passage that would be acceptable to him, the Biological Survey, and the Secretary's Office. If he were on the ground perhaps we could, but time and distance combined make the obstacles too great, I fear.

Very truly yours,

Gilbert A. Smith

Editor.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO

EC
Information.

FOREST SERVICE
OFFICE OF THE FORESTER
INFORMATION
☆ JAN 24 1920 ☆
RECEIVED
Answered

GAS AND ELECTRIC BLDG.
ALBUQUERQUE, N. MEX.

January 20, 1920.

The Forester,
Washington, D. C.

Dear Sir:

Your letter of January 16 is received.

I am glad that Mr. Leopold's article was modified and sent to the publisher rather than being returned for correction.

Mr. Leopold and myself have no objection to the changes made except as follows:

Page 6 - In this case the recreation literature is, in our opinion, often at fault. The Forest Service has, in some cases at least, advertised hunting where the stock of game was not sufficient to justify such advertising. While such advertising may appeal to the unthinking tourist, it will not appeal in the long run to the thinking sportsman.

Page 14 - We think that the history of game refuge legislation as modified does a serious injustice in not mentioning the Hornaday campaign. In spite of any errors in judgment which may have been made during that campaign, the fact remains that the Permanent Wild Life Protection Fund is

Forester...

the only organization which has ever made a serious attempt to mobilize public sentiment in behalf of a Federal Game Refuge Bill. Such mobilization of public sentiment involves more trouble, effort, and expense; requires more skill and judgment and is more necessary to the end in view than the mere introduction of a bill. It therefore should be mentioned in any article purporting to give a history of game refuge legislation. Mr. Leopold feels that he is placed in an embarrassing position by the fact that the mention of it has been striken from his article. As a matter of policy it would also seem wise to try to guide rather than kill the initiative of private organizations who are willing to put on game refuge campaigns. We will never get refuges by merely introducing bills in Congress. Mr. Leopold desires me to present the above argument not at all with the idea of explaining his personal embarrassment but altogether with the idea of arriving at a policy which will produce results.

Very truly yours,

Franklin Pooler
District Forester.

FI January 21, 1920.

Mr. E. W. Nelson,
Chief, Bureau of Biological Survey,
Department of Agriculture.

Dear Mr. Nelson:

I enclose for your file a clean copy of Mr. Aldo Leopold's article, "Wanted - National Forest Game Refuges", which is to be published by the American Game Protective and Propagation Association. All but the last two pages are as they were in the copy previously sent you, and which you returned here. These pages have been rewritten to conform with the suggestions contained in your letter of January 12.

Very sincerely yours,

Herbert A. Smith

Editor.

Enclosure.

A.L.

A.L.

WANTED - NATIONAL FOREST GAME REFUGES

Aldo Leopold
Assistant District Forester
Southwestern District
U. S. Forest Service.

During the past five years, about 1500 deer per year have been killed on the National Forests of New Mexico and Arizona. The area of these Forests is 20,000,000 acres, of which about three-fourths, or 15,000,000 acres is natural deer range. This is a production of one buck per year per 10,000 acres, or 16 square miles.

The New England states have recently been publishing their estimated annual kill for 1919. New York claims thirteen thousand. This is about as many deer as Arizona and New Mexico combined have produced in ten years. I do not know the New York deer ranges, but you could probably pack them all into one little corner of our Southwestern National Forests. What is the significance of these figures?

Before stating a conclusion, certain allowances should probably be made. The eastern woods, because of greater rainfall and more vegetation, probably ought to produce, acre for acre, twice as many deer as the mountains of the Southwest. (Bear in mind, though, that these mountains are not desert, - they are first-class deer country.) It might also be that our Southwestern figures are too conservative and New York's figures are too high. But the conclusion is nevertheless inevitable that there are mighty few deer left in the Southwest.

The conclusion is correct, and no statistical calculations are necessary to prove it. Any stockman or Forest Ranger can point out stretches of forest half as big as an eastern county that hardly contain a single deer. Forest Service game census figures indicate that even the best southwestern deer country averages about two deer per square mile. Turkey are correspondingly scarce, while the condi tion of other big game is even worse.

Of course it was not always so. Anyone who has read the Spanish explorers, or the history of the Santa Fe Trail, or who has talked to the "old timers" who are still with us, is aware of the fact that the Southwest once contained nearly as much big game, and as great a variety of big game, as any other part of the Rocky Mountain region. Anyone who has hunted for it is also aware of the fact that this game is now largely gone.

It is not the purpose of this article to cry over spilled milk, nor to explain the reasons for the spilling. We are here concerned solely with the constructive question of what can be done to remedy the situation.

A glance at actual conditions on almost any Southwestern Forest reveals two striking facts. These stand out in such bold relief as to immediately command the attention of the observer.

First, certain valuable species are hanging on the very verge of extermination. In New Mexico at least five species are in this condition. Mountain sheep, formerly abundant, are reduced to about a hundred head. Antelope, formerly probably numbered in six figures, are reduced to about fifteen hundred head. Javalinas or Peccaries are all gone but one little herd. Ptarmigan,

one of the State's greatest natural curiosities, are down to one or two small flocks. Sonora Deer, little creatures the size of a large dog, but with incomparable heads - are down to a mere handful. (We need not dwell on the Southwestern Elk and the Buffalo, whose disappearance was probably inevitable. Anyhow they are gone.)

The significent fact about most of these nearly exterminated species is that the remnants occur in compact herds in certain well defined localities. These herds are, of course, protected by the State laws, but neither are these laws well enforced nor are hunters prevented from going after "other game" on the ranges they occupy. Consequently, these remnants continue to be killed off. It hardly seems necessary in these days to say that the wiping out of a species is a ~~social crime~~ wanton barbarism, especially species of such high value, from both a sporting and aesthetic point of view, as mountain sheep and antelope. It should also be remembered that both mountain sheep and antelope are exceedingly difficult (if not impossible) to replace by artificial restocking.

The necessary conclusion is that the ranges of nearly exterminated species should be closed to hunting altogether. How is this to be done? Mere closed seasons have not accomplished the end in view. I do not believe it can be accomplished except by the establishment of Game Refuges.

The second salient fact is that enormous areas of good game range have become practically depleted of breeding stock, and as far as game is concerned are lying idle. The naturally uneven

tribution of game has thus become much accentuated. On the typical Southwestern Forest of, say, one million acres, deer are today comparatively abundant on one-tenth of the area, which is often inaccessible, and very scarce or absent on the other nine-tenths. The heaviest hunting occurs on the accessible parts where the supply is already low. This places the greatest strain at the weakest point. As a result tens of millions of acres of game country have been "cleaned", and, of course, are producing no game. With the demand for hunting running far ahead of the supply it would certainly be the very negation of good management to allow these great gameless areas to continue unproductive. The problem is, how are they to be restocked and kept restocked? Game refuges are the only device so far suggested for accomplishing this end, in which men who know game have any confidence. It seems to be agreed that the natural migration or "overflow" from a properly designed system of Refuges will constantly tend to keep the depleted areas stocked.

REFUGES AND BUCK SHORTAGE

There are important incidental problems which will find their solution in a proper Refuge System. One of these is the problem of buck shortage. Most States quite properly allow the killing of deer with horns only. In the Southwest this has resulted in a noticeable shortage of bucks. In many localities hunters tell of seeing dozens of does, but not a single pair of creditable horns. It is not unlikely that many does are barren through lack of males. If this is the case, the productive capacity of even the miserable remnant of deer must be seriously reduced. There is moreover,

of actual physical deterioration through breeding of does immature males. It is said that this has actually happened in European forests where too many prime stags were continually killed off.

The problem of buck shortages is not a new one. It has been up before and as often as it arises some ill-advised person advocates an open season on does. When a man is trying to build up a herd of cattle and has a shortage of bulls, what does he do? - kill off cows? Decidedly not. He devises means to get more bulls. Should we then open the season on does? In view of the already short supply, such a solution is unthinkable. We must get more bucks.

The writer submits that Game Refuges offer a perfectly practical way of getting more bucks. Fawns are naturally born and raised, male and female about equally. But it is well known that deer are polygamous, and that the larger, stronger bucks appropriate the does. Therefore, in a state of nature, where there are as many bucks as does, and where the males are not artificially reduced, there is a constant excess of probably seventy-five per cent of non-breeding males.

Now a Game Refuge is, with respect to this problem, in a state of nature, and will constantly produce excess bucks. The herd bucks and their does will naturally appropriate the protected Refuge range, and crowd the excess bucks into the surrounding territory, where they will not only furnish hunting, but tend to breed the barren does that exist there. In other words, Refuges will constantly and automatically tend to correct the buck-shortage. They are the logical and necessary means of correcting the one weakness of the "buck-law" system.

REFUGES AS SUMMER PLAYGROUNDS

Hundreds of thousands of people depend on the National Forests as their principal hunting grounds, but an even greater number use them for summer camps and cottages. To an ever-increasing degree, the National Forests are becoming the summer playgrounds of the West.

What does the average American seek, and expect to find, in the National Forests? Climate, scenery, trout fishing, and the sight and enjoyment of wild creatures. The first three he finds, and abundantly, but does he see and enjoy game? Generally not. What little game there is left is so wild that an occasional deer track is about all the excitement in this line that Uncle Sam can offer his average guest, at least in the regions with which I am most familiar.

The particular regions most used by summer vacationists are naturally the rugged scenic areas, and these, generally speaking, are the kind of locations suited for Game Refuges. There is one thing quite certain about the Refuge Plan - game will become abundant and tame within the Refuges themselves. When refuges are established, many recreational areas will probably be within or near their boundaries. Where this is the case, the abundance of fearless wild creatures will add not a little to the recreational value of the Forests. Lawful fishing is to be left open on the proposed refuges.

REFUGES AND LIVESTOCK

Of course there are arguments against Game Refuges in the National Forests, but they are mostly fallacious. Take, for instance, the now exploded impression that these proposed Refuges would interfere with the livestock industry, and would be strenuously opposed

ne stockmen on the grounds that the game might eat forage that is now raising beef and mutton. In the first place, our big game, generally speaking, does not consume much stock forage. With the exception of elk, game lives on plants which ~~sheep or~~ cattle do not eat. In the second place, generally speaking, there is no stock range not actually overgrazed which does not have enough excess or inaccessible feed to support all the game any reasonable man would want to see. There is in fact no appreciable conflict of interests, except ~~possibly~~ in the case of elk, and elk should, in general, be confined to the special localities where exceptional conditions exist ~~National Parks.~~ As a recent writer has said: "Bringing elk into a ranching country is like getting a bear by the tail and not knowing how to let it loose."

On the contrary, it may well be said that it is a positive asset to a stockman to have a Game Refuge established on his range. Firstly, it keeps off hunters. Careless hunters, armed with high-power rifles, not only accidentally cripple and destroy ~~thousands of~~ many head of livestock each year, but actually endanger, by their indiscriminate shooting, the lives of the stockman's rangeriders and herders. As an instance, the cowboys in the employ of one of the largest cattle outfits on the Gila National Forest in New Mexico once served notice on the manager that they would do no more riding during the fall months, for fear of stray bullets.

Secondly, the very existence of a Game Refuge intensifies the necessity for keeping down predatpry animals. The Government having in recent years taken over this work, the stockman with a national game refuge established on his range has a strong argument for securing adequate help in keeping down predatory animals in his neighborhood.

To try and raise game in a Refuge infested with mountain lions, wolves, coyotes, and bobcats, would, of course, be even more futile than to try and run a profitable stock ranch under similar conditions. Predatory animals are the common enemy of both the stockman and the wild life conservationist, and the establishment of Game Refuges will further strengthen the alliance between sportsmen and stockmen and give new incentive against these pests. ~~Except in the elk country of Wyoming,~~ stockmen have not been slow to see these advantages, and in the Southwest, at least, they have come out strongly for Game Refuges. Instead of opposition we had, for instance, on the ~~Alamo~~ Lincoln National Forest in New Mexico, the almost amusing spectacle of the stockmen and sportsmen engaging in a good-natured dispute over how much country a certain proposed Game Refuge in the Guadalupe Mountains shoud cover. This was in 1916, when the Hornaday Bill was before Congress. The sportsmen recommended about one-half of the Guadalupe Mountains as a proposed refuge, whereupon the stockmen held a mass meeting and demanded that the whole Guadalupes be set aside as a Refuge. This was, of course, impossible, since it was not and is not the intent of the plan to create very large or unduly numerous refuges. This incident shows that stockmen are not opposed to the Refuge plan.

A second and gratifyingly rare argument against Game Refuges is that they will unduly restrict available hunting grounds. The only answer to such an objection is this: Of what use are hunting grounds if they contain no game? It is not intended to include more than a fraction of the total area of hunting grounds (probably about twenty per cent) and the remainder is big enough for the whole country to hunt on, given the game.

STATE VS. NATIONAL REFUGES.

A third argument which has been advanced against National Game Refuges is that the Act of Congress necessary to authorize their establishment would infringe upon "state rights." Those who advance this argument seem to feel, first, that any extension of federal activity in game matters is wrong in principle and secondly, that a federal game refuge system would be an "entering wedge" which might ultimately weaken the state's ~~established title~~ *claim* to the (non-migratory) game within its borders. These objections obviously merit a very careful answer.

The objection to any extension of federal activity in game matters on the National Forests seems futile and academic. The Federal Government is the owner and manager of 150,000,000 acres of Forests, and should take an intelligent and active interest in the production of game on its lands, the same as any other landowner. If it failed to do so, the state in which these Forests lie, and whose citizens depend on these Forests for recreation, would be the first to suffer by its neglect.

The "entering wedge" argument also falls to pieces on analysis. The authority of the federal government to establish refuges rests not on any title to the game, but on its title to the land which must be crossed before the game can be taken. If a private landowner establishes a refuge on his lands, nobody construes his action as a subtle attack on the state's title. Why should not the federal government do at least as much as any other intelligent landowner, if it is for the public interest? ~~As a matter of fact every federal refuge bill so far proposed actually recognizes, by~~

~~location, the states undisputed title to the game, and the passage of such bills would seem to give added legal sanction thereto. These "states rights" arguments seem to be merely an effort to obscure the issue in a cloud of political dust.~~

A third and much more pertinent objection which has been advanced against the proposed federal refuge system is that the states themselves can establish refuges on the National Forests, and that federal action is therefore unnecessary. As a matter of fact, most of the western states have already done this to some extent. What is the answer to this argument?

Let it be said at the outset that the writer cares not a whit who establishes refuges on the National Forests, provided only it be done quickly and done right. ~~I believe that this also reflects the official attitude of the Forest Service.~~ It is also absolutely essential that the refuges be patrolled and enforced after establishment, but this does not really enter into the argument, since the Forest Rangers and the State's Deputy Game Wardens must in any event join forces to perform this function efficiently. They are already doing this where state refuges have been established.

The real question is: Do state refuges "fill the bill" on the National Forests? We need not theorize on this question; the answer can be given from experience. The answer is that in actual practice, state refuges have proven satisfactory only in those states having well-developed, well-financed, non-political game departments. In those states where the game wardenships are still political appointments (this, unfortunately, means most of the West) state refuges have not "filled the bill." The reasons have been as follows:

(1) Poorly selected locations, often representing the idea of some individual Legislator or the desire of some stockman to keep hunters off his range.

(2) Poorly correlated locations. Most projects are handled piecemeal, without reference to any other project.

(3) No definite boundaries. Sometimes no boundaries at all are given, the area being designated simply as a certain mountain range.

(4) Boundaries constantly changed. Where locations are poorly selected in the first place, stability can hardly be hoped for.

(5) No money for patrol. License money has even been taken away from "political" state game departments and devoted to other purposes or "pork."

(6) Refuges too large and too few. The "overflow" radius varies with the locality and requires the judgment of experts.

(7) Special concessions granted as political favors. Happily this has been rare, but the demoralizing effect on public sentiment is very great.

It seems unnecessary to elaborate the above points. They are weaknesses inherent in any ~~political~~ administration of scientific work. Suffice it to say that in some cases these ~~"political" refuges~~ bid fair to discredit the whole refuge idea. In Arizona, for instance, one well-intentioned Legislator wanted to make a "game refuge" of Coconino County, an area twice the size of Rhode Island. Most of Arizona's refuges include whole isolated ranges of mountains thus absolutely preventing any overflow value. Such contortions of the game refuge idea are really not refuges at all, but merely huge game preserves. They serve to protect the game within their borders to the extent that they are enforced, but they also serve to concentrate the hunting on the mountain ranges remaining open, and where these open areas are near cities they soon become cleaned of all game. Thus the net benefit is about zero. It may as well

Id here and now that no real refuge cuts off all the hunting any game unit, but rather prevents the cleaning out of any unit. In short it puts the spigot in the side instead of the bottom of the barrel.

It should be distinctly understood that the forgoing conclusions apply only to the big game problem of the National Forests. There is little similarity between this problem and any other. State refuges elsewhere are not only desirable but necessary. It should also be understood that the forgoing conclusions are not a ~~criterion~~ criticism of any particular state or state game department. Many ~~political~~ wardens are good men but they are often working with a millstone around their necks. What with political pressure, legislative interference, unstable tenure of office, and lack of funds, it is small wonder that good results are not obtained.

REFUGES VS. CLOSED SEASONS.

Many well-intentioned people have advocated totally closed seasons as an alternative for game refuges on the National Forests. Personally I am convinced that refuges would actually produce far better results. Under yearlong closed seasons the game becomes too tame, so that when the season is opened again, the slaughter is likely to be very heavy. Furthermore, while yearlong closed seasons are rather easy to enforce with respect to the city hunter, they are next to impossible to enforce with respect to the people that live in the mountains. An appearance of partiality is thus set up which is by no means conducive to that healthy public sentiment necessary for successful law enforcement. Last but not least, yearlong closed seasons are in one sense a negation of the fundamental idea

of use which underlies the administration of the National Forests. They should not be used as a regular device for game management, but only as a last resort where game management has failed. It hardly seems good business to resort to closed seasons where real constructive game management has not even been tried.

It, of course, stands to reason that if the situation is not taken in hand, the game will be reduced to a point where there will be no other alternative, and closed seasons will be absolutely necessary. This is already the case with some species. The whole point of this argument is that it should not be allowed to become the case with the rest.

AFTER GAME REFUGES: WHAT?

The establishment of game refuges on the National Forests is the first and most important step toward making these big public properties produce game efficiently. The effect of a good refuge system will be to build up the supply. Additional and more refined methods will also be needed to regulate that supply in a manner consistent with its relative importance, and to regulate the relative abundance of species. These refinements will follow progressively, as they can be worked out and adopted. What we need most now is to save the goose that lays the golden egg.

GAME REFUGE LEGISLATION

The first effort to secure game refuges on National Forests was in the 58th Congress when, on December 17, 1903, a bill for that purpose (H.R. 8135) was introduced by Mr. Lacey, the father of the Lacey Act. This bill failed to pass, and a considerable delay ensued until the 62nd Congress when, on April 26, 1912, a more comprehensive bill (H.R. 23839) was introduced by Mr. Kent, which provided for cooperation with the States in the establishment of such Federal refuges. Congress again failed to act, and during the 64th Congress, on August 9, 1916, another bill (H.R. 17381) was introduced by Mr. Hayden. This followed closely along the lines of the bill introduced in the 62nd Congress, and met a similar fate. During the 66th Congress, on June 21, 1919, a bill (S. 2182) was introduced by Senator Nelson, and during the same Congress, on July 14, 1919, another bill (S. 2455) was introduced by Senator Robinson for the purpose of establishing game sanctuaries in National Forests. Both of these bills are similar to those introduced in the 62nd and 64th Congresses.

During the war period many States passed bills, some of which merely served to complicate the situation. Either the Robinson or the Nelson Bill is likely to be up at the present session of Congress, and national legislation along this line ~~will probably be introduced again, and its passage fixs~~ is earnestly to be hoped for. The big game problem differs from other and more important internal problems in that it can not wait. It has already waited too long, and each additional year of

delay will add to the difficulty of putting our game on a permanent productive basis. The game is going, and refuge bills will be of little avail after half of our most valuable species are gone. What are the American people going to do about it?

# # #

FI

January 16, 1920.

MEMORANDUM FOR THE SECRETARY

Dear Mr. Secretary:

Permission is requested for publication by the American Game Protective and Propagation Association of the enclosed article by Mr. Aldo Leopold, of the Albuquerque office, on National Forest game refuges. The Biological Survey concurs with the Forest Service in recommending that this permission be granted.

Very sincerely yours,

(Signed) E. A. Sherman

Acting Forester.

Enclosures.

J.W.n.

WHS

d. TC

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FI January 16, 1920.

District Forester,

Albuquerque, N. Mex.

Dear Sir:

On January 8 I received a letter from Mr. R. F. Holland, Vice-President of the American Game Protective and Propagation Association, asking permission to publish Mr. Aldo Leopold's article, "Wanted - National Forest Game Refuges".

As it was necessary to have the approval of the Biological Survey for such an article, in addition to the approval of the Secretary's Office, I at once initiated action to secure this approval.

After consultation with Mr. Nelson of the Forest Service, we made several minor changes, to prevent the passages from being inconsistent with the expressed views of the Biological Survey. Some other changes were made in order to make the article more accurate, from our own viewpoint.

The changes made here are shown in the copy of the article enclosed with this letter as penciled corrections. The reasons for the changes are as follows:

Page 3. "A social crime" is hardly a correct term for the extinction of a species, to my mind.

Page 6. The paragraph describing the scarcity of game on the National Forests is somewhat in conflict with some of our recreation literature. While it is perhaps true that the average visitor to a National Forest does not see game, the average is swelled by the people who visit points like Pike's Peak and the Eagle Creek camp ground. In some of the National Forests we believe game is pretty abundant. Therefore we added the clause at the end of

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A.L.

the paragraph. I hope that Mr. Leopold will not object to this change, or indeed to any of those made.

Page 7. The first part of the first paragraph was in direct conflict with the views of the Biological Survey, as set forth by Mr. Vernon Bailey at one of the meetings of the Society of American Foresters. At that time Mr. Bailey said that sheep and deer eat practically the same things. The next to the last sentence in this paragraph seemed to restrict the possible places for encouraging elk more closely than our Forest Service policy would accept as necessary.

Page 8. Mr. Nelson felt that the words "except in the elk country of Wyoming" should be left out, as tending to give a wrong idea of the position of the stockmen in that region.

Pages 9 and 10. The article took for granted that the title of the States to game is fully established. This is a moot question. It is the belief of the Forest Service and of the Biological Survey that, if the Supreme Court of the United States ever has this question before it, it may rule that the title rests in the people, not in the individual States. This point was involved in a case before the Supreme Court some years ago, but has never been passed on by that court.

Pages 11 and 12. The changes on these pages were made because of the feeling in the Branch of Grazing that we are, as a result of careful work, securing a cooperative attitude from State game organizations, and that the existing friendly relations might be unfavorably affected by too much emphasis on "the political character" of these State game administrations. Mr. Leopold's real point, I think, is better brought out through the changed language.

The last two sections of the article were rewritten in order to make them conform with the suggestions of the Biological Survey, contained in Mr. E. W. Nelson's letter to the Forester of which a copy is enclosed.

On account of the delay in the transmittal of that letter, it was not possible to send the article to the Secretary's office for Departmental approval until today. I have written Mr. Holland apologizing for the delay in securing authorization, and promising to forward the article to him early next week.

Very truly yours,

Herbert A. Smith

Enclosures.

Editor.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

FOREST SERVICE
★ JAN 14 1920 ★
Referred to
INFORMATION

January 12, 1920.

The Forester,
Forest Service,
Washington, D. C.

Dear Colonel Graves:

Under date of January 10, Mr. Smith, Editor of the Forest Service, refers to me for comment and suggestion, an article on National Forest Game Refuges, by Mr. Aldo Leopold. As a whole this is an excellent article and I shall be glad to see it published. I agree with you as stated by Mr. Smith that the article on Game Refuge Legislation should be modified to cut out personal references. I think, however, it might be well in an article as comprehensive as this one to mention the steps in the progress of such legislation. Mr. Leopold is entirely mistaken in his statement that "the first attempt to formulate a comprehensive program for National Forest Game Refuges was the Hornaday campaign of 1916." I would suggest that it might be well to state in this program, something along the following lines:

The first effort to secure game refuges on National Forests was in the 58th Congress when, on December 17, 1903, a bill for that purpose (H. R. 8135) was introduced by Mr. Lacey, the father of the Lacey Act. This bill failed to pass and a considerable delay ensued until the 62nd Congress when, on April 26, 1912, a more comprehensive bill (H. R. 23839) was introduced by Mr. Kent, which provided for cooperation with the States in the establishment of such Federal refuges. Congress again failed to act and during the 64th Congress, on August 9, 1916, another bill (H. R. 17381) was introduced by Mr. Hayden. This followed closely along the lines of the bill introduced in the 62nd Congress and met a similar fate. During the 66th Congress, on June 21, 1919, a bill (S. 2182) was introduced by Senator Nelson, and during the same Congress on July 14, 1919, another bill (S. 2455) was introduced by Senator Robinson for the purpose of establishing game sanctuaries in National Forests. Both of these bills are similar to those introduced in the 62nd and 64th Congresses.

I think the information concerning the similarity between the bill introduced in the 62nd Congress and that in the 64th, which Mr. Leopold refers to as the Hornaday Bill, should be made plain to Mr. Leopold. He, undoubtedly through lack of information on the subject, appears to think that the ideas in the Hornaday Bill originated with Dr. Hornaday when, as a matter of fact, they did not as is shown by reading the bill introduced in the 62nd Congress. Dr. Hornaday simply took over

the ideas of the earlier bill and then, as you will remember, exploited them as the Hornaday plan, thus building up a large amount of publicity for himself. In the West I have found that the Hornaday publicity has been effective in misleading game conservationists with the idea that he was the originator of the ideas in his bill and was the man primarily involved in getting legislation. You of course are well posted concerning the facts in this case.

There is another radical statement made in this article in the paragraph immediately preceding that on "Game Refuge Legislation" under the title "After Game Refuges: What?" There he states that later on additional and more refined methods will have to be adopted, but these are not needed or practicable now. These I certainly object to since we are trying to bring about at the earliest possible date, a joint handling between the Forest Service, Biological Survey, and State Game Wardens, of the big game shooting in some, at least, of the Western States. If we can secure an arrangement of this kind it will, I believe, have an even more far-reaching effect than the carrying out of the game refuge plan on the forests, since with the limited license system the shooting of game in any part of a State could be stopped whenever needed and prohibited until the supply had again become sufficient. Such a law in reference to the Olympic elk in ~~Arizona~~ Washington came very near passing at the last session of the State Legislature and I am hopeful it may go through next time. We are also trying to bring about such a plan in Arizona and I am inclined to think there is a possibility of getting legislation along those lines in that State. This being the case I certainly would not consider a statement such as Leopold makes as to the unimportance of other phases as compared with the game refuge plan, a proper one.

I am retaining the carbon copy of the article by Leopold for our files.

Very truly yours,

E W Nelson

Chief of Bureau.

FI

January 9, 1920.

Memorandum for Mr. Smith:

Mr. Nelson and I have read over Mr. Leopold's article. Before it can be approved it will be necessary to re-write a good many passages. These have been marked. Mr. Nelson's personal opinion is that the publication of articles like this only serves to stir up the muddy waters, so to speak, and does not do the game situation any good. The article is a careless, sloppy piece of work. If you think it worth while to do so, the objectionable passages can be rewritten and the article made inocuous. I do not believe that it can in any sense be of any advantage to the Forest Service to have it published, for the reason that the tone in which it is written is absolutely lacking in restraint. ~~A~~ man who read this article and who did not already agree with ~~[illegible]~~ Leopold has to say would ~~either believe that~~ very likely ~~[illegible]~~ take the opposite side.

L L C

Albuquerque, New Mexico.
December 20, 1919.

Mr. John B. Burnham,
233 Broadway,
New York City.

Dear Mr. Burnham:

I have just received your letter of December 15. It is only about a week ago that I completed a statement about game refuges in the West. I had no idea that you would want it because it is as long as an ordinary magazine article. I sent it to Washington with the recommendation that it be placed in "Outdoor Life" but would much prefer, of course, that you use it if you care to. I am enclosing a copy of it herewith. I am also sending a copy of this letter to Mr. Herbert A. Smith, the editor for the Forest Service at Washington. In case you want this article, please take it up with Mr. Smith whose o.k. is necessary before it can be published over an official title.

It has never occurred to me that there would be any real serious conflict betweeen a proper system of game refuges and the desires of the hunting public. I know that if we could only have permission from Congress to establish game refuges here in the Southwest that I would stake my reputation upon the fact that we can put it through without curtailing the hunting even temporarily. My thoughts

Copy for Mr. Smith

on the subject which you ask for are all expressed in the article above mentioned. Incidentally, there are also some pretty good illustrations to go with it.

Enclosed is a paper on aerial legislation which I ran into the other day and which I think would interest you. I imagine we are all agreed that hunting from airplanes and the distrrbing of game by airplanes has got to be prohibited, and that the more agencies we can get to commit themselves on this policy the better. This leads me to suggest that your association might place its views before the Manufacturers' Aircraft Association, which body is the author of the enclosed statement. It would be a good thing for them to know that the sportsmen have an interest in aerial affairs.

I am mighty sorry that you can not make it to be out here in January. In addition to the Supervisors' meeting there will be the annual convention of the New Mexico G.P.A., and the annual dinner of the Albuquerque G.P.A. If your plans should allow of the change, we would be awfully glad to see you even on short notice. Meanwhile I wish you luck in handling the Yellowstone situation. I am afraid I am not posted on the difficulties which you say are occurring there this winter although I have always had a decided feeling that there has been a lot of side-stepping and needless conflict of interests up in that country.

Incidentally, our refuge system will not involve any elk since we want no more elk in the Southwest. Accordingly there would be no feeding problem. We are, of course, much in favor of the perpetuation of elk in and near the National Parks and elsewhere where they will do no damage but I think it is an enormous mistake to scatter them over the whole country.

Very sincerely yours,

Enclosures -2

Aldo Leopold.

_____, Secretary

NEW MEXICO GAME PROTECTIVE ASSOCIATION.

FOREST SERVICE
★ DEC 20 1919 ★
Referred to
INFORMATION

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO
EC
Information.

GAS AND ELECTRIC BLDG.
ALBUQUERQUE, N. MEX.

FOREST SERVICE
OFFICE OF THE FORESTER
INFORMATION
☆ DEC 20 1919 ☆
RECEIVED
Answered

December 13, 1919.

The Forester,

Washington, D. C.

Dear Sir:

Enclosed herewith are three copies of an article by Mr. Leopold entitled, "Wanted - National Forest Game Refuges". This is a revision and extension of an article submitted some years ago which was disapproved by your office. It is believed, however, that the material has been so changed that the previous disapproval does not warrant any particular consideration at the present time. At the back of the article is given a list of official photographs, copies of which should accompany it to the publisher if you will be so kind as to supply them.

Mr. Leopold suggests that this be submitted to "Outdoor Life", which is published at Denver. We have not established connections with this magazine and therefore are not sure that they will desire to publish a serious discussion of this kind. If not, we would be glad to have Mr. Smith use his own judgment about where it should be placed. The object, of course, is to call the need for a game refuge bill to the attention of as large

...ester...

a number of readers as possible.

Very truly yours,

FRANK C. W. POOLER, Acting District Forester,

By John Kerr

Enclosures-

Dan B. Starkey, *Pres.*
Earle S. Barber, *Vice-Pres*

OUTER'S BOOK
The Magazine with The Camp Fire Flavor

Stanley B. Rogers,
Secretary and Treasurer

The Outer's Book Company, *Publishers*
9 South Clinton Street
Chicago, Ill.

Nov. 14th, 1917.

FOREST SERVICE
Office of the Forester
INFORMATION
NOV 19 1917
RECEIVED
Answered .....

Mr. John L. Cobbs, Jr.,
In Charge of Information,
Forest Service, 930 F St., N. W.,
Washington, D. C.

Dear Sir:

Mr. Cave has forwarded to me the article by Mr. Leopold on "The Wilderness Fallacy", which I am very glad to receive. Doubtless, Mr. Cave has thanked you for the courtesy, but I want to add my thanks to his.

The text meets with my entire approval and the photographs are certainly wonderfully interesting. It is just the kind of material for which I have been looking, and I shall be glad to receive more along the same line, whenever it is possible to obtain it.

The first issue of the consolidated OUTER'S BOOK-RECREATION will be off the presses within a day or two, and I am going to send you an advance copy in order that you may see the lengths to which we go, in an endeavor to produce a beautifully illustrated magazine.

The photographs submitted by Mr. Leopold lend themselves admirably to our purposes, and out of his short article we will make a very heavily illustrated feature, which we hope will please both him and you.

With best wishes, I am

Yours very truly,

Dan B. Starkey.

DBS GK

The Magazine with The Camp Fire Flavor

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY
WASHINGTON, D. C.

ADDRESS REPLY TO
CHIEF, BUREAU OF BIOLOGICAL SURVEY,
AND REFER TO

FOREST SERVICE
Office of the Forester
INFORMATION
OCT 15 1917
RECEIVED
Answered .....

October 13, 1917.

Mr. Herbert A. Smith,
Editor, Forest Service,
Department of Agriculture.

Dear Mr. Smith:

In the absence of Mr. Nelson , I beg to acknowledge the receipt of your letter of October 11 with enclosure, returned herewith, from Mr. Aldo Leopold. Mr. Leopold's article on the 'Wilderness Fallacy' is very interesting and presents an important subject in an attractive manner. In a few cases he seems to generalize too broadly on insufficient data and for this reason it is suggested that two or three statements be modified or omitted as indicated in the copy. The proposed changes will not seriously alter the context or impair the importance of the article. With these minor corrections the article may well be approved and will undoubtedly interest a large number of readers of 'Recreation'.

Very truly yours,

W. C. Henderson

Acting Chief, Biological Survey.

(Enclosure 6254)

Copy sent to District Forester
at Albuquerque

FI October 2, 1917.

District Forester,

Albuquerque, New Mexico.

Dear Sir:

Your letter (EC-Information) of September 24 is received. I can not agree with you in regard to the inclusion on page 6 of Mr. Leopold's article of the paragraph advocating the systematic dogging or the judicious use of birdshot, even when done under the suprevision of the proper officials.

Inasmuch as the State game laws specifically prohibit the use of dogs, I feel that we should lay ourselves open to very serious criticism by advocating such a measure. To me this paragraph is a weak point in an otherwise constructive article.

I believe that we can find suitable illustrations in our collection. In view of Mr. Cave's interest in game protection and propagation, it will probably be a good idea to submit the article to him.

Very truly yours,

A. F. Potter.

Acting Forester.

JWW.
WAS

C O P Y

RECREATION

Edited by Edward Cave
2 W. 33rd St.,
New York.

New York, September 20, 1917.

Mr. Aldo Leopold,
c/o New Mexico Game & Fish Protective Assn.,
Albuquerque, N. M.

Dear Mr. Leopold:

I have been particularly interested in the splendid work you have been doing in game conservation work and much impressed by your contributions to the "Pine Cone".

Do you find sufficient time from your various activities so that you might write an occasional article for RECREATION? It seems to me that there is a good opportunity to strike out along original lines in wild life conservation propaganda and I would like to have your cooperation.

If this suggestion appeals to you, will you be so kind as to suggest a series of three or four articles which you might like to write?

Sincerely yours,

Signed-Edward Cave

EC:MHW

FOREST SERVICE
★ SEP 29 1917 ★
Referred to
PUBLICATION

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

FOREST SERVICE
Office of the Forester
INFORMATION
SEP 29 1917
RECEIVED
Answered

ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO:

GAS AND ELECTRIC BLDG.
ALBUQUERQUE, N. MEX

EC
Information.

September 24, 1917.

The Forester,

Washington, D. C.

Dear Sir:

In reply to your letter of September 17, concerning the article by Mr. Leopold, "Restocking The National Forests With Elk";

It was Mr. Leopold's idea in recommending the article for the Journal of Forestry that it was somewhat technical and in parts dry and would therefore be better suited for a technical rather than a sporting magazine. However, if your office thinks the article is sufficiently interesting and if the necessary photographs can be added, we would be very glad to have you see whether any of the sporting magazines want it.

In connection with the question of photos, attention is called to the illustration in the enclosed pamphlet. We are quite sure that the State Game Department would be glad to loan this cut or to supply a print from which to make a cut, in the event that you decide to

Forester,

offer the article to a sporting magazine.

In regard to omitting the paragraph on dogging of elk, we of course appreciate your point but are very reluctant to see it omitted for the reason that it is one of the few real interesting points in the article. In the revised copy enclosed herewith the paragraph has been retained but a clause has been added showing that the suggestion should be carried out only "under the supervision of the proper officials". We really believe that the suggestion is valuable and trust that you will be able to pass it as modified.

An additional paragraph has been added on page 5 concerning a recent instance which I think adds to the value of the article.

Enclosed is a copy of a letter from Recreation. In the event the article is to be offered to a sporting magazine, it might be well to send it to Mr. Cave for inspection.

Very truly yours,

PAUL G. REDINGTON, District Forester,

By [signature], Acting.

Enclosures-

January 13, 1917.

FI

District Forester,
Forest Service,
Albuquerque, N. Mex.

Dear Sir:

Reply to your letter of December 15, enclosing two articles by Mr. Leopold, has been delayed because of the illness of Mr. Smith who was handling the matter. Mr. Zon, the editor of the Journal of Forestry, tells me, however, that in any event he cannot make immediate use of the articles because of the abundance of other material on hand.

Mr. Leopold's articles contain a great many constructive suggestions and will undoubtedly serve a useful purpose. It would seem desirable, however, to make certain modifications in them before they go out.

In the article, "Forestry and Game Conservation", the statement in the first paragraph on page 2 that the game resources of the National Forests are in as depleted condition today as they were ten years ago, and the statement in the second paragraph on page 3 that the big game on the National Forests is disappearing, do not agree with the records in

the Branch of Grazing here. These show that on most of the Forests the game is slowly increasing. Certainly our activities in protecting the game and enforcing the laws have greatly increased. I am also informed by Grazing that they have a good idea of the amount of game on the Forests and fairly accurate figures for nearly every ranger district, which would seem to call for a modification of the statements in this connection contained in the last two lines of page 3 and the first paragraph of page 11.

In the first paragraph on page 2 and in the paragraph that follows, and in lines 7 to 10 on page 5, Mr. Leopold takes the position that foresters have temporized with the game problem and have failed to anticipate the need for game management. While we have not been able to do as much constructive work as was desirable, we have, I think, wherever possible taken the necessary steps to work out a solution. The need for the systematic handling of the game situation has, it seems to me, been thoroughly recognized by the Service. The main reason why we have not been able to deal more constructively with the matter is because of our lack of jurisdiction over the game. I feel strongly that the fact that the States have jurisdiction over the game should be clearly brought out in the article and the reader left under

District Forester

no misapprehension as to the actual state of affairs. I may add that the name "game management", suggested by Mr. Leopold, has been used by the Forester for several years.

In the article, "The Wilderness Fallacy", are also several points that I should like to bring to your attention. The statement on page 2 that the extermination of mountain lions should make it possible to take 100,000 deer annually without injuring the supply should, I think, show some basis for the calculation. As it stands, it appears somewhat exaggerated, though it may be entirely correct.

In connection with the statement in the last two lines on page 4, I am told by Grazing that it has been definitely proved that wild sheep do not contract scabies from the domestic animal. I am also told by Grazing that it is doubtful whether the lumpy jaw of the antelope is caused by contagion from cattle.

If you and Mr. Leopold agree with the suggested changes, please make them in the way you think best and return the articles at your convenience. The copies you submitted are enclosed herewith.

Very truly yours,

L. Findley Burns

Acting Editor.

Enclosures

FOREST SERVICE
★ DEC 19 1916 ★
Referred to
PUBLICATION

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO:

GAS AND ELECTRIC BLDG.
ALBUQUERQUE, N. MEX.

EC
Information.

December 15, 1916.

The Forester,

Washington, D. C.

Dear Sir:

Enclosed herewith are two copies each of two additional game articles prepared by Mr. Leopold, as follows:

Forestry and Game Conservation

It is requested that this article be reviewed and if found without objection transmitted as promptly as possible to the Society of American Foresters for publication in the Proceedings.

Mr. Leopold has given more or less assurance that this article would be available in the near future and it will therefore be appreciated if it can be transmitted in time for publication in the January issue, if the Society finds it acceptable. An extra copy of this letter is being sent to the Society to let them know that the article is on the way in case they have need of it.

The Wilderness Fallacy

It is requested that this be reviewed and if found

Forester,

without objection transmitted as promptly as possible to the Forestry Quarterly.

Very truly yours,

Acting District Forester.

Enclosure -

THE WILDERNESS FALLACY

By Aldo Leopold
U. S. Forest Service

When the pioneer hewed a path for progress through the American wilderness, there was bred into the American people the idea that civilization and forests were two mutually exclusive propositions. Development and forest destruction went hand in hand; we therefore adopted the fallacy that they were synonymous. A stump was our symbol of progress.

We have since learned, with some pains, that extensive forests are not only compatible with civilization, but absolutely essential to its highest development.

The same fallacy that characterized our idea of forests was bred into our attitude toward game and wild life, and unfortunately it has not yet disappeared. There are still millions of people whose opinions on wild life conservation, if they have any, are based in some degree on the assumption that the abundance of game must bear an inverse ratio to degree of settlement, and that the question of how long our game will hold out must be measured by the time it will take for man to completely occupy the land.

It is the writer's belief that this assumption is not only incorrect, but that it is exerting an incalculably mischievous influence against the progress of the movement for wild life conservation. To let the public think that

economic progress spells the disappearance of wild life, is to let them believe that wild life conservation is ultimately hopeless.

It is true that the settlement and economic development of the United States has inevitably brought into operation many factors inimical to wild life, but a careful analysis of each will almost invariably reveal an accompanying counter-influence decidedly beneficial to wild life perpetuation.

Hunting, for instance, destroys millions of game animals and birds yearly. But at the same time hunting has destroyed millions of natural enemies of game. The destruction of predatory animals should enable man to take yearly, for his pleasure and food at least part of the enormous amount of game which, in a state of nature, were the food of "varmints".

Agriculture, for instance, has usurped a large part of the former haunts of game. But to some extent at least it has replaced the natural coverts with artificial ones. At least in the case of small game, a square mile of farming country may have as great a capacity for raising wild life as a square mile of wilderness. In some cases, agricultural development has done more than this. It has literally created a game supply. In eastern New Mexico, for example, there is a large area which has recently been homesteaded by dry-farmers. It formerly had little or no small game. Today it is abundantly stocked with prairie chickens. They came by natural migration,

attracted by the stubblefields, and are rapidly spreading westward with agriculture. Nature was actually improved upon by civilization.

Artificial drainage has destroyed many marshes and lakes which were formerly the feeding and breeding grounds of myriads of wildfowl. But at the same time man is building yearly hundreds of artificial lakes. A good example is the huge swamp created by the Keokuk Dam across the Mississipp. This is now one of the best shooting grounds in the Central West and by way of becoming an important breeding place for wood duck. Moreover it is permanent, whereas the natural swamps along the Mississippi often dried up. In the end, we will probably give the wildfowl as many waters as we are taking from them.

Overgrazing of the public domain of the West no doubt was a powerful factor in the destruction of the antelope, mountain sheep, mule deer, turkey, and sage-grouse. But now these same grazing ranges are coming to be dotted with thousands of artificial reservoirs for watering stock. Millions of acres of "dry range", --waterless deserts almost devoid of life ~~are~~are being made usable for stock, and, incidentally, for game. And at least on the National Forests and on the holdings of progressive stockmen, overgrazing has ceased and the ranges are recoevering. Without any doubt, intelligent use of the western ranges/with respect to all for grazing purposes can be made an improvement on nature our western big game except the buffalo. While there was no excuse for the wholesale extermination of this splendid

animal, the ultimate disappearance of the huge migratory herds was inevitable.

Forest fires and prairie fires incident to the early stages of settlement burned up or starved out a great deal of game. But today these destroyers are on the wane. Under the influence of man they are approaching zero, whereas many fires ravaged the aboriginal wilderness, set by lightning and by the Indians. The time will come when there will be much less destruction by fires than took place before the coming of the white man. A sign of the times is found in the National Forests, where except in extremely dry years fires are being held down to the almost negligible average of a few acres each.

A few diseases of game are supposed to have been induced by settlement -- though probably to a lesser extent than is generally believed. Scabies is alleged to have spread from domestic to mountain sheep but the latest researches indicate that this is not the case. It is also doubtful whether the actinosis (lumpy jaw) of antelope was derived from domestic animals. The enemies of the game have probably suffered from imported diseases just as badly as the game itself. Western coyotes have died by thousands of rabies. Moreover man is to an increasing degree able to check the ravages of natural epidemics among game. He is studying the wild duck disease. He has prohibited the importation of diseased quail from Mexico. Some day civilization

will prevent more diseases of wild life than it introduced.

Finally, a great and ever-increasing area of game range has been actually occupied by railroads, dwellings, and cities. In part, such areas are lost to wild life. But out native birds, at least, have readily adapted themselves to the new conditions. Dozens of species like the chimney swift, the house finch, and the eastern robin now actually prefer the haunts of man. It has become a common achievement to have 30 pairs of birds make their home on a half-acre city lot. Who shall say that a square mile of suburban dwellings, with modern methods of bird feeding and housing, can not raise more wild life, though of a partly different kind, than the original wilderness?

Notable instances are not lacking in which the abundance of game seems to bear a direct rather than an inverse ratio to the degree of settlement. Compare, for example, the National Forests of New Mexico -- comparatively speaking a wilderness -- with the thickly settled New England States. In 1915, according to estimates prepared by the New Mexico Forest rangers, 656 deer were killed on 13,000 square miles of mountain forests; roughly one per twenty square miles. Maine, Vermont, Michigan, and New York, in the same or immediately preceding years, averaged roughly one deer killed per five square miles -- a preponderance in productiveness of four to one. Who shall say that only a wilderness can raise deer?

It has often been contended that the fencing of the western ranges has destroyed the antelope. As far as concerns the occupation of the range by solid blocks of homesteads, this is probably true. But this is not the whole story. A recent analysis of figures collected by the Forest Service on the remnants of antelope in New Mexico show that of the thirty-eight herds now existing, thirty-two are found on the open range and six in large fenced pastures. The open-range herds average 30 head each, but the pasture herds 127 head each. Three-fourts of the herds reported as increasing are in fenced pastures, and all but one of the herds reported as decreasing are on the open range. The pasture herds average four times as large and several times as thrifty as the open range herds. Who shall say that only an unfenced wilderness can raise antelope?

Even those who do not believe that a wilderness is essential to a supply of game are likely to assume that where there is a real wilderness left, the game supply is comparatively safe. Alaska, the greatest remaining wilderness in North America, is by way of contradicting even this assumption. It appears to be a fact that even in the remotest region of Alaska indiscriminate slaughter is spelling the doom of the game supply. No wilderness seems vast enough to protect wild life, no countryside thickly populated enough to exclude it.

It seems safe to call a fallacy the idea that civilization excludes wild life. It is time for the American public

to realize this. Progress is no longer an excuse for the destruction of our native animals and birds, but on the contrary implies not only an obligation, but an opportunity for their perpetuation. American wild life is confronted by only one unmitigated menace -- indiscriminate slaughter. Its future as a part of our permanent national environment is in our hands -- or its blood will be on our hands -- as the case may be.

# # #

RECORD GROUP 95

RECORDS OF THE FOREST SERVICE

RESEARCH COMPILATION FILE:

ADMINISTRATION - 2, REPORTS OF SUPERVISORS' MEETINGS, 1911

RETURN TO FILE
SILVICS

PROCEEDINGS

OF THE

FIRST ANNUAL SUPERVISORS' MEETING

DISTRICT 3

NOVEMBER 9 - 14, 1911.

FOREST SUPERVISORS' MEETING - DISTRICT III

EL PASO, TEXAS

November 9 - 16, 1911

RETURN TO FILE
SILVICS

The first meeting of the Forest Supervisors of District III convened at 11 o'clock in the court room of the Federal Building at El Paso, Texas, on November 9, 1911. The total attendance during the meeting was thirty-nine, including Mr. Graves, Capt. Adams, Mr. Clapp, and Mr. Jardine from the Washington office. The attendance from the various Forests was twenty-three, and from the District Office, other Districts, and Experiment Station, twelve.

The especial feature of the meeting consisted of the papers and discussions on "Economy". The different branches of the Service work, General Administration, Protection, Silviculture, Grazing, and Lands were each in turn taken up with particular reference to the ways and means of securing more economical administration under each head. Particular emphasis was laid upon Fire Protection.

The reading of papers and discussions on Economy occupied the time from noon, November 9, to noon, November 11. The subject of Fire Protection was covered in the afternoon session of the 11th. On Monday, November 13, the morning session was given to Silviculture and the afternoon session to Personnel and Inspection and Improvement. On November 14 the

subjects of Grazing, Lands and Game Protection were covered. The day of November 15 was given over to committee work and final vote on the resolutions presented by the committees was held on November 16, after which formal adjournment of the meeting occurred. Special conferences with District Forester were held on November 17. In addition to the entertainment arranged for by the committee the meeting was rendered pleasant through the courtesy and hospitality extended by officials and individual citizens on behalf of the city of El Paso.

Mr. Graves arrived in the afternoon of the eleventh and remained until the fourteenth.

Before deciding upon the program for the meeting all officers were requested to submit a list of subjects which it was desired should be discussed. These subjects were then grouped and classified and a definite program made out. Opportunity was given to every officer to submit a paper or lead a discussion on any subject in which he was particularly interested.

Four general committees and six special committees, with chairman and secretary for each, were appointed. The general committees were Operation, Silviculture, Grazing, Lands; the special committees, Economy, Education and Publicity, Personnel and Inspection, Protection, Trespass, and Entertainment. The first part of the meeting was devoted to the reading of papers and open discussion and so far as possible final action

was taken in the open meeting on subjects presented for discussion. When this could not be done the subject was referred to the proper committee for report and resolution. Throughout the discussion the essential points pertaining to the work of the respective committees were recorded by the secretaries. At the conclusion of the discussion a day was devoted to committee work and the remainder of the time to the reports of the committee, discussion and final action on the resolutions presented. The committees and roll of members in attendance follow:

General Committees:

Operation: Mr. Andrews, Mr. Eldredge, Mr. C. C. Hall, Mr. Stewart, Mr. Peck, Mr. Waha, Mr. Willson (Secretary).

Silviculture: Mr. Calkins, Mr. Johnston, Mr. Kiefer, Mr. Mattoon (Secretary), Mr. Pearson, Mr. Rogers, Mr. Smith, Mr. Woolsey.

Grazing: Mr. Douglas, Mr. Drake, Mr. Goddard, Mr. Hinderer, Mr. Kerr, Mr. Leopold (Secretary), Mr. Rush, Mr. Zachau.

Lands: Mr. Balthis, Mr. Chappell, Mr. Guthrie, Mr. Kinney, Mr. Pooler, Mr. Solkirk, Mr. Swift (Secretary).

Special Committees:

Economy: Mr. Andrews, Mr. Duffy, Mr. Guthrie (Secretary), Mr. Johnston, Mr. Peck, Mr. Willson, Mr. Woolsey.

Education and Publicity: Mr. Calkins, Mr. Mattoon, Mr. Rogers, Mr. Stewart, Mr. Swift, Mr. Zachau (Secretary).

Personnel and Inspection: Mr. Drake, (Secretary), Mr. Eldredge, Mr. Hall, Mr. Hinderer, Mr. Pooler.

Protection: Mr. Chappell, Mr. Goddard, Mr. Leopold, Mr. Rush, Mr. Solkirk, Mr. Smith (Secretary), Mr. Waha.

Trespass: Mr. Balthis, Mr. Douglas, Mr. Franklin, Mr. Kerr, Mr. Kiefer (Secretary), Mr. Kinney.

Entertainment: Mr. Eldredge, Mr. Smith, Mr. Zachau.

Roll of Attendance.

Forester Graves, Assistant Forester Adams, Forest Inspector Clapp, District Forester Ringland, Assistant District Foresters T. S. Woolsey, Jr., A. E. Waha, F. C. W. Pooler, A. S. Peck, John Kerr, Forest Examiner Robert Rogers, Assistant to the Solicitor Blake Franklin, District Fiscal Agent John J. Duffy, Forest Examiner G. A. Pearson, Forest Pathologist W. H. Long, Inspector of Grazing J. T. Jardine, District Engineer T. W. Norcross, Game Warden Frank Rush, Deputy Forest Supervisors A. H. Douglas, Aldo Leopold, Forest Supervisors F. E. Andrews, R. F. Balthis, H. G. Calkins, S. A. Chappell, W. M. Drake, I F. Eldredge, W. H. Goddard, John D. Guthrie, C. C. Hall, C. H. Hinderer, D. P. Johnston, Francis Kiefer, J. H. Kinney, R. J. Solkirk, S. G. Smith, T. R. Stewart, T. T. Swift, R. G. Willson, A. H. Zachau, W. R. Mattoon.

Addresses of Forester and District Forester.

Mr. Ringland: It is an unusual pleasure to me to call to order the first meeting of the Forest Supervisors of District 3. I know this will be a meeting of results for all of you have now had three years of experience to support your

non-productive where sawtimber is involved and we may retain the timberland of a general quality. The question of net revenue is not always the controlling feature but the actual amount of the quality of timber with due consideration to the local demands. In the administration of the non-productive districts the cost should, of course, be reduced to the lowest possible point and areas administered merely for fire protection and trespass. The principal points for consideration are: (1) determine the forest boundaries; (2) by establishing a good system of lookouts; (3) by the Rangers adopting definite systems for handling their work, such as free use areas and dates upon which to receive applications. Then there is another feature which annually causes us a large loss; that is, the administration of the Reclamation lands. I believe we should endeavor to have Congress provide for a separate administration or at least make separate reserves and they might be handled by the Forest Supervisor or put in a special man. Then again, a range law is something we need badly. We are holding lots of land purely because of the attitude of the stockmen. The range law would in that way remove lands not needed.

Cost of Poor Mounts to the Service

Mr. Leopold: An important point in connection with the practice of economy and efficiency is the quality of mounts of Forest officers. Of thirty-two Forest officers with whom I have worked, I figure that nine of them were well mounted;

fourteen had fair mounts; seven poor and two very poor mounts. By means of a tally made from the diaries of Forest officers on the Carson during October, I have figured that 5% of the official time of the officers of this Forest was lost on account of poor mounts. This tally was very conservative and probably the actual figure is nearer 15%.

It is, of course not reasonable to expect a new man in the Service to immediately provide himself with a good mount, but a careful review of the cases of thirty-two Forest officers with whom I have worked shows that during an average period of observation of 11 months only five men improved the quality of their mounts. The remaining 27 were at a standstill during this time. It would appear, therefore, that active efforts to stimulate the improvement of Forest officers' mounts are justifiable in so far as they could be exerted in a tactful way. I think that first of all the Supervisors should make it a point to maintain a first class mount themselves in order to furnish an example, and secondly, I think it reasonable to require Forest officers, who have served a considerable length of time, to improve their mounts in case their efficiency seems to be seriously affected. The fact that the quality of a man's mount is considered a factor in his officiency should also be impressed on the mind of Forest officers from time to time by suitable comments in News Letters and by tactful personal conversation.

The following resolution was later unanimously passed:

Resolved: That the Supervisor can and should require a Ranger to own and maintain in good condition a sufficient number of saddle and pack horses to promptly and efficiently handle his regular work.

Transportation on the Forest

Mr. Goddard: I have a government team on the Datil. There are nearly 3,000,000 acres on the Datil. The farthest ranger headquarters is about 150 miles and it is accessible by team and buggy. I find in going over the Forest that supplies and sometimes important equipment is needed at the stations and we can take them along with this team. If we did not, it would cost a great deal more to freight them out. I have under Transportation on the Forests a few figures on the difference between cost of transportation by team and auto. As I said a minute ago all stations on my Forest are accessible by team and all stations can be reached by auto. Once I made a trip to one ranger station by auto. It took us four hours to go and three hours and ten minutes to return, spent all the time required to do the necessary work also. If I had taken the team, it would have taken five days to have made the trip going and coming 150 miles. I want to present here a statement showing the relative cost of maintenance of team and automobile with respect to the efficiency of each.

prevent abuse and falsehood; second, that the weights given the field tests be materially reduced because the simplicity of this test does not justify its weight; and third, that these weights be transferred to the credit of the written test which should comprise (a) the full record of practical experience heretofore given in the application, (b) a full statement of Forest Service employment, (c) a full statement of the educational acquirements, and (d) the practical questions themselves; and fourth, that in rating the written test an exceptional weight be given the applicants record of employment in the Forest Service and his educational acquirements.

Whereas it is a fact that the Service has suffered somewhat in the past through the retention on the pay rolls of ineffectual new men because of the lack of a sufficiently long probationary period during which a new man's work might be observed, it is

Resolved: That the effort be made to obtain an extension of the probationary period for Assistant Forest Rangers to one year from date of appointment.

Mr. Leopold - It has been my experience that a considerable proportion of men listed from time to time on the eligible list are not qualified for the position of Forest Ranger. It is often necessary for Supervisors to appoint these men "Sight Unseen" and the cost of trying them out is always a very considerable one and has an important bearing

on the economy idea.

Of the nine men appointed from the eligible list on the Carson during the past season, two turned out to be good material; three fair, two poor; and two entirely hopeless. The cost of trying out the men who were eventually separated was $67.55. I figure that the amount of work done by them was more than offset by the demoralization of the force and the time spent in this office in instructing them. There were four men in all separated. I am of the opinion that the deficiencies of three of these men were so apparent that the Examiner at the time of the Rangers' examination could have readily determined the fact that they were undesirable and a loss of $[illegible]5 could thus have been saved this Forest.

Provided it could be arranged with the Civil Service Commission, I would recommend that each Examiner be required to keep a duplicate record of his entries in the Confidential Inquiry blank, and in addition, make a written statement of the basis for the opinions entered by him in this blank, giving the number of months of his personal knowledge of the man, or, if he has no such knowledge, he should state whether his opinions are based on the reliable opinions of other persons, the opinions of other Forest Officers, or merely his impression as Examiner. He should also state whether he considers the man to be Very Desirable, Undesirable or Apparently Desirable. These records should then be made available for Supervisors

for their consideration in choosing appointees.

Mr. Smith: We have had practically the same experience. I suggest that we make the examination harder.

Mr. Adams: It might be in order to say a few words about the Civil Service. Of course, it is more or less a waste of time to try out some men. As far as the Civil Service is concerned, however, we are appointing these men in one, two, three order. Outside of very exceptional cases we are bound to appoint the men certified. Mr. Smith's suggestion of making the examination harder I think is a good one. We should bear in mind how much the Civil Service is doing for us. Think for instance of the big advantage in the doing with political appointments.

Mr. Hinderer: I agree thoroughly that the highest efficiency in a corps of field men, particularly the Forest Ranger, is without doubt one of the most important problems which the administration of the National Forests presents at the present time.

I suggest that the weights given to the three subjects in the Civil Service examination for the position of Assistant Forest Ranger be changed as follows:

1st. That the candidate for this examination be required to submit on Form 1800 only the information relating to his age, residence, and the other information on Page 1 of the blank; the information concerning his physical condition; and the necessary vouchers by two disinterested persons who

The whole trend of recent developments in the organization of the Forest Service has thrust a class and volume of the work upon the Forest Rangers, which work is not going to tax the experience of a ranger, but it is going to tax the education and intolligence of the present crop to the last notch.

The ideal Forest Ranger should not be married. A wife and family decrease the efficiency of a Forest Ranger at least 20% in 75% of the cases. Experience is a minor consideration and, personally, I would rather have the intelligent candidate with absolutely no experience, than the manysided experienced chap with little or no intelligence. I know that the first named candidate will, with the proper encouragement, training and application, make a first class Forest Ranger in a year. I know the second named candidate, who has very little intelligence, will never make the type of ranger required in the Service.

Examinations for Promotion.

It was the sense of the meeting that at the present time it is deemed inadvisable to institute a sy tom of examinations for promotion.

Mr. Leopold, introducing the subject of the inadvisability of the proposed system of periodical or competitive examination for promotion said:

"The entire problem in this matter is a question

of whether or no such examinations would promote officiency. The attitude of a man toward an examination system and its effect on his work is not a theoretical matter but entirely a question of his personal equation, and the effect of an examination system on the Forest Service must be determined by considering it in connection with the personal equation of the average Forest officer.

I have tried to classify the Forest officers who have come under my observation as Good, Fair and Poor and tried to judge the attitude of each man in each class towards such a system as proposed. My figures would indicate that the proportion of good men who would profit is exceeded by the proportion who would quit or would be disgruntled and the reverse is indicated for men classes as fair and poor. In other words, I believe that our best men would not take well to the proposed system and the system would cost us more good men than it would improve either the the fair or poor men. The typical Forest Ranger of the efficient type is, in my opinion, a man who cares only for pratical results and who resents as a personal matter any attempt to measure his efficiency by his ability to put on paper the results of his work. I believe that this is the type that we want for Forest Rangers. There are, of course, exceptions both ways, but in the long run I do not believe that the system will work to advantage, besides a considerable cost would be entailed in the holding

of such examinations.

It may be argued that by giving a heavy proportionato weight to a man's practical experience and ability in the rating of these examinations that the factor of varying ability to write a good examination may be overcome. This argument is, however, in my opinion, self-destructive, since not only is the personal factor of the examiner's judgment in giving the rating on practical experience introduced, but the rating of the written examination is correspondingly reduced to a point where its cost would become unjustifiable. My main point, however, is that our average efficient Ranger would resent personally the examination system."

Dual Authority on Forests, Chief Ranger vs. Deputy Supervisor.

Mr. Balthis: The subject of "Dual Authority on Forests Chief Ranger vs. Deputy Supervisor" is one which I believe has been commented upon more or less during the last few months.

The authority of a Deputy Supervisor and the authority of a Chief Ranger on a National Forest are vastly different under the present policy of the Service in that the Deputy Supervisor is an administrative man whereas the Chief Ranger should not be. As I understand the policy, it is not desired that the Supervisor and the Deputy Supervisor both be technical men.

From my experience I have found that two men do not have the same ideas regarding a great many phases of National Forest work. The Supervisor is responsible for all the work

RECORD GROUP 95

RECORDS OF THE FOREST SERVICE

RESEARCH COMPILATION FILE:

AUXILIARY SERVICES, WILDLIFE, 1928

Enclosure with RPL Personnel Aldo Leopold, 3-14-'28

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PROPOSED GAME SURVEY

To Be Conducted For

Sporting Arms & Ammunition Manufacturers' Institute

By

Aldo Leopold

NOT FOR PUBLICATION

PROPOSED GAME SURVEY

To Be Conducted For

Sporting Arms & Ammunition Manufacturers' Institute

By
Aldo Leopold

Preliminary Consultations

Before actually undertaking the survey or formulating final plans the following outstanding centres of information and leadership should be visited and consulted:

1. U.S. Biological Survey (and other Agricultural Bureaus). Check up on going work. Get bibliography. Ask for cooperation of field officers.

2. U.S. Forest Service. Arrange for cooperation of field officers.

3. Wildfowlers' League. See Phillips and Buckingham to coordinate survey with their work.

4. Quail Investigation, Visit Stoddard in field to learn about methods and results.

5. Grouse Investigation. Visit Allen at Cornell and possibly Grosse at Bowdoin to learn methods, results, and plans.

6. Pennsylvania Game Commission. See Phillips and Sutton. Preliminary study of field organization, methods, and plans.

7. Michigan School of Forestry and Conservation. Visit field work. (Plans already covered.)

Outline of Proposed Survey

Objective: The objective is to induce the sustained production of annual crops of wild game for recreational use.

Method: The method proposed is to determine by means of a national survey the forces which operate for or against the objective, which of them are the most important, which are the most susceptible of control, and how, when, and by whom control may be effected.

Elements: The survey must take account of these elements:

1. The species, the stock of dependable facts concerning its habits and the factors determining its productivity.
2. The land, the other crops raised on it, and the resultant environment for game.
3. The landowner, his skill, attitudes, and incentives.
4. The hunter.
5. The public, including the status of policies, legislation, and of official and other agencies exercising leadership in bringing the preceding elements into harmonious relationship.

The survey cannot cover all of the existing local combinations of these elements. It should therefore concentrate on the study of those combinations which are most prevalent, or which there is reason to believe can be most beneficially or easily moved.

Type situations: The combinations thus selected for special study may be called "type situations." For example: The quail situation in the closed States of Ohio and Iowa is a type situation. The small game situation in the heavily grazed dairy regions of the Lake States is another, and in the over-grazed Southwest a third. In each type a single cause usually accounts for unsatisfactory conditions, and a single demonstration that such cause is removable might suffice to remove it.

Procedure: The purpose is to find the shortest and soundest way to attain the objective, rather than to make a complete inventory of conditions.

The key to one type situation may be readily ascertained or may be known already. The key to another may be found only after years of research. One key may be a human attitude, another a parasite, another an economic condition.

The survey, therefore, can follow no standardized procedure. Each type situation presents a separate problem.

Where the key is known, the survey should not only find it, but plan the first move to use it.

Where the key is unknown or uncertain, the survey should not only ascertain that fact, but plan the first move to search for it.

At the conclusion of the survey, or even before, there should be available a specific list of jobs, and for

each job a specific plan of why, where, when, how, and by whom it can be undertaken. Such plans can then be compared for importance, timeliness, feasibility, and cost, and each taken up with the agency best able to execute it.

Policy: In conducting the survey and in planning the resultant jobs, the following policies should prevail:

(1) Publicity should be kept to a minimum until there are results and conclusions to promote.

(2) If the job concerns straightening out a human attitude, the local parties at interest should be led to find the solution for themselves rather than to have it handed to them.

(3) If the job concerns research, existing local institutions should be induced to perform it if they are or can be made competent, rather than to set up new agencies.

(4) If the job involves a choice between native or exotic game, the former should be preferred.

(5) If the job involves a choice between natural and artificial culture, the former should be preferred.

(6) If the job involves cooperation by state game departments, the availability of stable departments with regulatory powers should be assumed, and sample organic acts prepared to show how they are obtainable.

(7) If the job involves landowner relations (all of them will), the ideal to work toward is to set in operation in each region each of the following forms of game culture:

(a) Clubs raising game crops on lands owned or leased for the purpose and open only to members.

(b) Public shooting grounds.--Lands owned or leased by public agencies at public expense for regulated public use. There are at least three kinds:

1-Grounds owned and operated by the public. (Example: national and state forests.)

2-Grounds leased from private owners and operated by the public.

3-Shootings leased from private owners but game crops operated by the owner.

(Public as here used means Federal, State, county, or municipal agencies.)

(c) Toll grounds.---Private lands operated by the owner and open to the public at a price.

(d) Private grounds.---Lands operated by the owner for his own use.

Negatively stated, the ideal is to get away from the present prevalent condition, namely: No cultural measures and lands either posted or unproductive or both.

Factors of Productivity

The productivity of game constitutes an equilibrium between the breeding habits of the species and its environment. The breeding habits are constant, but the environment is a variable combination of the following factors, each of which must be weighed as to importance and means of control in each type situation:

Factors of Productivity	Means of Control
(A) Decimating factors	
1. Hunting	Laws, regulations, by-laws, of clubs.
2. Predators (vermin)	Hunting, trapping, poisoning, etc.
3. Starvation	Food planting, fire control, feeding.
4. Disease	No available technique.
5. Parasites	" " "

(B) Welfare factors

6. Food)
7. Water).....Food planting, fire control, water developments, modifications of agriculture, forestry, etc.
8. Coverts)

9. Special factors (salt, gravel, etc.)...Artificial provision.

Agencies

The following kinds of agencies may have to be consulted in the survey of each type situation, or may be a necessary party to the future execution of plans:

Private Agencies	Public Agencies
Granges (all farm organizations)	Universities and agricultural colleges
Conservation organizations	Extension service (county agents)
Sportsmen's associations	Biologists
Forestry associations	Forest schools
Natural history societies	Land economists
Civic bodies	
Shooting clubs	Conservation Departments
Game farmers	Game wardens
	Foresters
Lumbermen's associations	Commissioners
Stockmen's associations	Federal bureaus
Sporting publications	Biological Survey (including U.S. Game Wardens)
Consulting foresters	Forest Service
	Bureau Animal Industry
	Bureau Plant Industry
	Irrigation & Drainage Districts
	Museums, Parks, etc.

RECORD GROUP 95

RECORDS OF THE FOREST SERVICE

RESEARCH COMPILATION FILE:

DESCRIPTION AND RESOURCES - 1, APACHE NATIONAL FOREST, 1905 - 1910

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COMPILATION.

SUPPLEMENTARY GENERAL SILVICAL REPORT
APACHE NATIONAL FOREST
BY ALDO LEOPOLD

March 20, 1910.

SS
Apache - Studies
Silvical Report - 1910

District Forester,

Albuquerque, N. M.

Dear Sir:

I submit herewith the annual silvical report for this Forest. The data given are supplementary to Mr. Kobbe's report for 1909, and the topics discussed refer to pages of that report.

Mr. Kobbe's report is general in character, and his statements, as a rule, apply to general conditions. In this supplementary report I have endeavored to point out modifications of these statements in their particular application to this Forest, and also to add such new information about local conditions as has been gathered during the past year by Mr. Guthrie and myself.

Page 2, List of Species.

Add

30. Celtis mississippiensis reticulata - Hackberry

31. Quercus hypoleuca - Oak

32. Quercus undulata - Scrub Oak (called Live Oak).

33. Populus deltoidea occidentalis - Cottonwood.

34. Salix lasiolepis - White Willow (Pussy Willow).

35. Picea parryana - Blue Spruce, Water Spruce.

36. Cupressus glabra (?)

Doubtful Nos. 3, 12, 14, 19:

Page 5 - Yellow Pine Type

I have seen no cases of conversion of Yellow Pine into the Aspen type on this Forest, nor any killing fires making such conversion possible. Aspen sometimes occurs in moist glades in small groups where there are openings in overmature stands of Pine, but never forms more than an admixture.

Page 6 - Alpine or Composite Type

Species in order of abundance -

* 1. Douglas Fir

2. Yellow Pine

3. Engleman Spruce

4. White Fir

5. White Pine

6. Blue Spruce

7. Cork Fir.

* In order of quantity (M.B.M.) Yellow Pine probably heads the list.

Page 7 - Engleman Spruce

In at least two places this species occurs in pure stands of sufficient extent to constitute a type. On the Blue range

Twp. 3 N., R. 29 E., on the heads of Corduroy, Fish and Bear Wallow Creeks there are about 6 sections, and on the slopes of Mt. Baldy and Mt. Ord, T. 7 N., R. 26 E. and 26-1/2 E. about 12 sections. At least 75% of the former area was killed by the great fire of 1904.

Page 8 - Arizona Cypress.

Mr. Guthrie is of the opinion that this tree is Cupressus glabra. Glabra is the species found in the Tonto Basin and this tree appears to be of the same species. Specimens have been forwarded to Mr. Sudworth for indentification.

Deciduous type - page 11.

Species in order of abundance -

1. Cottonwood (Populus angustifolea)
2. " (" deltoidea occidentalis)
3. White Alder
4. Mexican Walnut
5. Arizona Sycamore
6. Box Elder
7. Willow
8. Leather-leaf Ash (Fraximus velutina)
9. Gambel Oak
10. Hackberry (Celtis Mississippiensis reticulata)
11. Quercus hypolenca

Note - Scattered Yellow Pine and Alligator Juniper are common in this type.

Page 12 - Silvics Yellow Pine

One tree near the mouth of South Fork of the Little Colorado is estimated to be 60" D. B. H. Another west of C. C. Ranger Station is of larger size, though not measured.

Page 13 - Tolerance of Yellow Pine

Young stands are benefitted by shade on the roots but not otherwise. They distinctly demand full light after attaining a height of 20 inches.

The tolerance of the species is greatly influenced by moisture. In very dry foothills or very wet benches the stand is open even during the Black Jack stage, but in the fresh moist soil of canyons dense stands are often maintained even beyond the Black Jack Stage. Such stands are very conspicuous at the foot of the Blue Range.

Page 13 - Growth of Yellow Pine.

I can not agree that variation in growth of Yellow Pine is caused mainly by altitude; on this Forest soil conditions appear to be the important factor, and altitude within the limits of the tree's local distribution does not necessarily have any effect on the size attained. At least the best specimens of pine on this Forest are found at the two opposite extremes of altitudinal range of the type, namely, on the edges of the deciduous type along the streams of the foothills; in glades and on south exposures on the edges of mountain plateaux, at elevations of about 7000' and 8800' respectively. These two figures cover the altitudinal range of the type, scattering groups descending in canyons to 6800' and on south-

east and northwest slopes of knolls ascending 9500'.

Of rate of growth little is known, but is fair to suppose that the sizes attained are more or less indicative of the rate of growth.

No causes of stunted stands of Pine at high altitudes are known, except where such a condition may be laid directly to rocky soil which during the summer is over-saturated. Such stands are common throughout the local range of the species.

Page 14 - Size of White Pine

On the Blue range and the south slope of White Mountain trees of 36" D. B. H. and 70' height are not infrequent. All the old trees are subject to sweep, and show signs of a high percentage of internal defect. Taper is very rapid.

Page 15 - All specimens so far identified are P. flexilis. The occurrence of strobiformus appears to be doubtful.

Page 14 - Size of Pinon

Two trees are the mouth of Hobson Canyon, Sec. 16, T. 8 N., R. 28 E.,

	D.B.H.	Height	Clear Length
1.	18"	60'	12'
2.	20"	60'	10'

Page 16 - Windfall in Pinon

The great drouth of 1899 - 1902 killed a large number of mature Pinons, especially in the denser stands. These are now almost invariably overturned by windfall, the roots rotting with extreme rapidity. About 50% of this dead material is now too rotten to be good firewood.

Page 16 - Seed of Pinon.

It can hardly be said that Pinon produces abundant yearly seed crops in this region. "Pinon Years" are said by resident observers to occur only every 3 - 4 years.

Page 16 - Size of Douglas Fir

The largest specimens of this tree occur as isolated specimens in the pure Spruce forest east of Corduroy Creek on the Blue Range, T. 3 N., R. 29 E. No trees have been measured but they certainly attain a D. B. H. of 60".

Page 18 - Cork-Bark Fir

This tree has not been observed to attain a diameter of more than 24". It has a very straight, clean, cylindrical bole and conical, rather open crown. Like Douglas Fir it is confined to moist canyons and north slopes, and probably resembles that species in its requirements for light and moisture and susceptibility to fire damage. The species comprises 1/2% of the stand of stulls on the Blue Range, and 1/10% of the stand of saw timber. It is more abundant around Mt. Baldy and the Escudilla. Its occurrence on the Sitgreaves is probably discussed in Mr. Adams' report on the 1909 Sitgreaves Reconnaissance.

Nothing is known of its reproduction, no seedlings having been observed on the Blue Range.

Page 19 - Engleman Spruce

In the pure Spruce forest, referred to on page 6, large trees exceeding 40" D. B. H. are common.

Taper on old trees is excessive, even in very dense stands, apparently due to a process of buttressing at the base which takes place after the tree has exceeded 30" D.B.H.

No sign of internal defect has been observed, even in very old large trees. It is undoubtedly the soundest commercial species on this Forest.

Blue Spruce (Picea parryana) is not treated in Mr. Kobbe's report. The fact of its occurrence in this region has been questioned, but after observing the species in the field, there can be no doubt of its identity, nor can it possibly be confused with Engleman Spruce. The color and division of the bark gives a certain means of distinction, while the form and habit of the two species are also different. The color of the foliage, however, can not be depended on. Both species exhibit the blue and green foliaged forms at all ages.

The Blue or "Water Spruce" is confined to moist canyons, seeps and banks of streams. It descends to almost 8600 feet and is most abundant at 9000 to 9300. It is a short branchy tree with seldom more than 10 feet clear length. 30" D. B. H. is not exceeded. Taper is very rapid. The wood is sound. Moisture controls its distribution. It is of course tolerant and growth is slow. Reproduction is good especially on mineral soil and in grassy places. Due to the character of sites on which it grows, no windfall is evident.

In the Blue Range this species affords no saw timber and comprises 1/2% of the stand of stulls. It also occurs on the top of the White Mountain and in the deeper canyons on

its slopes.

Page 20 - Junipers

The One-Seeded and Alligator Juniper can best be treated by a comparative discussion.

The former is generally excurrent, the several stems not exceeding 12" and seldom over 8". The latter has a short, very heavy, clear bole branching suddenly into a close, round, flat-topped crown. The diameter of one tree in Water Canyon is 52" (Sec. 33, T. 8 N., R. 29 E.) while on K. P. Mesa (Secs. 3 & 4, T. 2 N., R. 29 E.) the trees average 30", about 1 tree per acre. This open stand of large trees is typical of many mesas on this Forest. Similar stands are said to occur along Black River on the Addition.

The One-Seeded Juniper is a tree of low elevations, ranging from 6000, or lower (outside the Forest) to 7500', while the Alligator Juniper begins at 7000' and is abundant up to 8000'. On the south slopes of mountains in sheltered gravelly places it is even found at 8800' (knolls north and west of Norton Ranch, Sec. 23, T. 8 N., R. 27 E.) and on the south rim of the Blue Range on the Red Mountain Trail on Bear Hill at 8800' (Sec. 32, T. 4 N., R. 30 E.)

Both species prefer limey soils, being of inferior growth on pure Malpais, especially in the case of Alligator Juniper.

Reproduction of both species is dependent on survival of the seedlings from drouth. It is common to see reproduction of both species under mother-trees of the same species or under Pinon. In fact in many places Pinon reproduction is most common

under Juniper and vice versa. In rocky places the reproduction of monosperma is almost confined to the north sides of large rocks. (See Little Colorado Canyon, Sec. 17, T. 9 N., R. 29 E.)

Seedlings of monosperma are often browsed and trampled by cattle.

Monosperma grows very slowly. Two stumps counted near Springerville were aged as follows:

1. D. I. B. 12" - Age 275 years.

2. D. I. B. 13" - Age 275 years.

Page 21 - Cupressus Arizonica (?), See page 3.

Mr. Guthrie gives the following information on this tre

The maximum size is about 36" D.B.H. and 60' height. The bole is straight but tapering. The species is common in dense pure stands on North and west slopes from Gray's Peak, (S. line of T. 2 S.) southward. The best stand so far observed is in Dark Canyon on the Metcalf-Double Circle Trail. Distribution is controlled by moisture and the tree is confined to lime soils. It is hoped to identify this species with certainty (See page) and to learn more about it during the coming season.

Page 22 - Aspen.

On reaching a diameter of 12" this species is invariably attacked by a fungus whose fruiting bodies soon appear through the broken places of the outer bark. This early maturity will greatly decrease the commercial value of this species as a possible future source of pulpwood.

2 - Page 2 - Gambel Oak

Old hollow trees reach a diameter of 20" B.H. on the Stray Horse Divide. The species descends to 6900' (Little Colorado below Bigelow Crossing) becomes common at 7500' and ascends on south slopes of canyons in the Blue Range to 9000'. It is generally a shrub only, reaching tree size on this Forest on the headwaters of Nutrioso Creek, Blue River, and Eagle Creek. It is largest on the Campbell Blue River.

.Emory Oak - Quercus emoryi. This is the common "Live Oak" of the southern end of the Forest. I should identify this species as I. undulata. It is a small, crooked, branchy tree never exceeding 6" D.B.H. and 20' height. It is generally a shrub, and is confined to dry mesas and south slopes of mountains lying southward of the Blue Range and the Blue River-San Francisco Divide, forming thickets that are often almost inpentrable on horseback.

The mast of this tree is borne abundantly even on the smallest bushes, and affords valuable food for game and for hogs. The browse is the chief forage of cattle in winter.

2 - Arizona Sycamore - On the Blue River this tree is found as far up the river as the mouth of Grant Creek.

Leatherleaf Ash - Occurs on Blue River up as far as the mouth of Centrefire Creek.

Quercus hypolenca - Occurs on Blue River north to the first box above Baseline.

Hackberry - Occurs up the Blue as far as Stray Horse Creek.

Populus deltoidea occidentalis - North on the Blue, 1 mile above the mouth of K. P. Creek.

Prosopis juliflora - In Blue Canyon, 1 mile north of Baseline, and in the hills to foot of K. P. Mesa.

Condition of Reproduction on Cut-over land will be discussed in the report on brush burning about to be conducted.

Very truly yours,

(Sgd) Aldo Leopold

Forest Assistant.

Approved Apr. 9, 1910

(Sgd) Jno.D.Guthrie

Forest Supervisor.

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ANNUAL SILVICAL REPORT

FOR

THE APACHE NATIONAL FOREST

BY

Wm. H. Kobbe

FOREST ASSISTANT.

April 3, 19[illegible].

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Annual Silvical Report-Apache National Forest.
By W. H. Kobbe--Forest Assistant.

March 31, 1909.

1. The Forest.

The following list of trees includes all the species thus far observed within the Apache National Forest.

1. Western Yellow Pine (Pinus ponderosa)
2. Limber Pine (Pinus flexilis)
3. Mexican White Pine (Pinus strobiformis)
4. Pinon (Pinus edulis)
5. Douglas Fir (Pseudotsuga taxifolia)
6. White Fir (Abies concolor)
7. Arizona Cork Fir (Abies Arizonica)
8. Engelmann Spruce (Picea engelmanni)
9. Rocky Mountain Juniper (Juniperus scopulorum)
10. One-seed Juniper (Juniperus monosperma)
11. Alligator Juniper (Juniperus pachyphloea)
12. Arizona Cypress (Cupressus Arizonica)
13. Willow (Salix- probably several species)
14. Black Cottonwood (Populus trichoearpa)
15. Narrowleaf Cottonwood (Populus angustifolia)
16. Aspen (Populus tremuloides)
17. White Alder (Alnus rhombifolia)
18. Gambel Oak (Quercus gambelii)
19. Emory Oak (Quercus emoryi)
20. Arizona Sycamore) (Platanus wrightii)
21 Devils Claw (Acacia greggii)

22. Screwbean (Prosopis odorata)

23. Mesquite (Prosopis juliflora)

24. Palo Verde (Cercidium terreyanum)

25. New Mexican Locust (Robinia neo-mexicana)

26. Box elder (Acer negundo)

27. Leatherleaf Ash (Fraxinus velutina)

28. Mexican Walnut (Juglans rupestris)

29. Mexican Elder (Sambucus mexicana)

The Western Yellow Pine is locally known as Yellow Pine or simply Pine, the Limber Pine as White Pine and the Douglas Fir as Red Pine. The White Fir is known as Balsam. The Engelmann Spruce is called Spruce while the Rocky Mountain Juniper is known as Red Cedar, and the one-seed Juniper as Juniper. The Narrowleaf Cottonwood is here named Balm of Gilead while the Gambel and Emory Oaks are respectively known as Oak and Live Oak.

The shrubs and very small trees would include Cowania mexicana, Fallugia paradoxa, the Barberry (Berberis fremonti) Wild Gooseberry, Raspberry, Sagebrush (Artemesia tridentata,) Manzanita (Arbutus Arizonica), Greasewood (Sarcobatus), Desert Willow (Chilopsis linearis), and Mesquite (Prosopis juliffora).

There are five principal types, the Yellow Pine type, the Alpine type, the foothill type, the Aspen type and the deciduous type.

The most extensive and important type commercially

is the Yellow Pine type consisting of practically pure stands of Pinus ponderosa.

This type covers the greatest portion of the Forest and is limited mainly by the unfavorable soil and climatic factors produced by too high or too low an altitude. It is therefore found at mid-altitudes between the foothill type of the lower arid slopes and the Alpine type of the higher ridges and peaks. Moisture and protection from the sun and drying winds are the factors which determine to the greatest extent the distribution of this type. It prefers, but is by no means confined to north exposures; shuns precipitous slopes; thrives best on deep soils, and is not found at the higher altitudes. It is, however, very moderate in its soil demands and is found growing on a great variety of soils. It will grow in shallow soils providing there is a sufficient amount of water and will thrive in dry soils providing the long root system of the trees are able to reach a moist sub-soil.

The Yellow Pine type forms in board feet approximately 67% of the timbered portion of the Forest.

The permanent distinguishing characteristics of the type are unmistakable and are apparent to even a casual observer unfamiliar with this region. It may be defined as pure Yellow Pine forest providing a slight admixture of scrubby Oak or Juniper is not considered to modify the character of the stand to such an extent that the use of the term "pure" becomes inapplicable. As a general rule the forests

forming this type are distinctly selection although occasionally even-aged stands are met with, particularly when young or middle aged.

Within this type the ground cover is generally either bunch grass or scrub Juniper and Oaks. Frequently there is a well-formed sward with Pinons, Juniper and Oaks growing beneath the Yellow Pines or within openings. This is especially true in those places where the foothill type modifies the one under discussion.

Owing to the open character of the intolerant Yellow Pine stands the formation of humus is impossible and it is rarely found within the type.

Reproduction of the Yellow Pine depends to a very great extent upon the physical characteristics of the area seeded. Regeneration is dependent upon the survival of the seedlings during the very early stages of their development rather than upon the ability of the seed to germinate. On southern exposures the sun and dry winds of the Spring preclude the survival of the young seedlings although the seed may germinate readily in such places. Early frosts may also prevent seedling growth on south slopes in that the soil is generally bare and offers no protection against frost. The scattering of brush on these slopes will indubitably so modify their physical condition that such environments will become favorable or at least endurable to seedling growth.

On north slopes seedlings have been observed in abundance and it is rarely the case that such exposures do not possess a great amount of reproduction. The moisture derived from

the melting snows in the spring is apparently what is most desired by the young trees, and furthermore, it is this factor which is lacking on the exposed southern slopes.

The Yellow Pine type is particularly stable and permanent and is converted or modified into other types only by influences of an exceptional and extrinsic character. These influences may be unusual external forces of an interfering nature which tend to disturb the normal ecological relations of the type and to cause its modification through encouraging other species to seek an unfair advantage in the struggle for supremacy. Such an extrinsic influence is fire which will convert in a surprisingly short time a distinct Yellow Pine type into an equally unmistakable Aspen type. Likewise the clearing of land by wasteful logging serves to encourage the usurpation of the soil by species which would ordinarily be prevented from seizing such areas by the mere presence of the tree members of the original type. Thus the foothill type will frequently encroach upon Yellow Pine territory where areas near the lower limits of Pine growth have been cut down. On the other hand the type under discussion has been observed to acquire territory held by other plant societies. Many of the open grass covered parks in this region, are under favorable circumstances, being encroached upon by the Yellow Pine but the process is exceedingly gradual and is deserving of encouragement through proper silviculture management.

In marking the Yellow Pine for cutting every effort has been made to encourage the spread of the type, to improve

its quality and to give it all possible aid in its competition with commercially inferior types. The general thrift of the stand is enhanced by the removal of the defective and overmature trees, which as an aid to the dissemination of the species, numerous seed trees are maintained in those places where conditions are such that their preservation will result in the greatest good.

The Alpine type as it name denotes, is found only at the higher elevations and is composed of such species as Limber Pine (Pinus flexilis), Mexican White Pine (Pinus strobiformis), Douglas Fir (Pseudotsuga taxifolia), White Fir (Abies concolor), Engelmann Spruce (Picea engelmanni) and Arizona Cork Fir (Abies Arizonica)..

These species have adapted themselves to conditions that would prove most unfavorable to the growth of other trees. They withstand the exposure of high altitudes and demand a wet mineral soil. The Douglas Fir seeks the higher elevations on account of the humidity of the air and soil of the mountain tops and shuns even slightly dry situations. It reaches its best development in the excessively humid coast regions, of Oregon and Washington, and in order to approach such conditions in the southwest, it is naturally confined to those places where Alpine conditions exist.

Likewise the White Fir prefers moist soils but not to the extent of the Douglas Fir.

The Limber Pine will grow in drier soils but is distinct-

ly an Alpine species, and unlike the Spruces and Firs is very intolerent.

The Alpine type forms in board feet probably 20% of the Forest.

The composition in species of this type has already been discussed but no general statements concerning their ages can be made. The type is nearly always composed of many age classes but it frequently happens that individual groups of a single species are even aged. The Engelmann Spruce for example is often seen growing in dense even-aged clumps and in some places might be considered as characterizing a distinct type.

As the Alpine type is composed almost without exception of very tolerant species the stands are very dense and therefore, in a condition to produce and maintain a great quantity of humus upon the forest floor.

The moisture, shade and snow rapidly transform the litter into true humus which in places has been accumulating for centuries.

This type with the exception of the Limber and Mexican White Pines he produces itself on the moist soils beneath the shade of the mature trees and owing to their great tolerance the seedlings survive with but very little light. Some of the species germinate best on the mineral soil and for this reason are the first to seed up the openings. Such for example is the Engelmann Spruce, whose seedlings dislike the organic soils formed by the accumulation of humus.

This type is neither as permanent nor uniform as the

Yellow Pine type but is similar in that it is immediately modified by extrinsic forces and altered within a comparatively short period to the Aspen type. The competition within the type itself is very keen but owing to its peculiar habitat it is comparatively safe from interference by the types occupying lower altitudes. Its principal competitor is the Aspen type with which it can very well hold its own owing to the extreme intolerance of the Aspens. Although the latter will respond more vigorously to exterior aid the Alpine species will, ultimately regain the areas thus temporarily appropriated.

In the silvicultural management of the Alpine type Engelmann Spruce and Douglas Fir should be favored above the other species forming the type. It is probable also that the Arizona Cork Fir is deserving of management favorable to its improvement as further investigation may prove it to be a valuable species.

The foothill type is confined to the lower and drier slopes and is of considerable extent. It is composed of Pinon (Pinus edulis),Rocky Mountain Juniper (Juniper Scopulorum), One-seed Juniper (Juniperus monosperma), and Alligator Juniper (Juniperus pachyphloea),with occasionally clumps of Arizona Cypress (Cypressus Arizonica), Emory or Gambel Oaks (Quercus emoryi or gambelii).

This type prefers the dry slopes of mesas and similar locations and thrives on poor soils far below the limit of Yellow Pine growth. The species forming this type avoid

the moisture and cold of the higher slopes although the Pinon is sometimes found at considerable elevation.

The foothill type forms in board feet 10% of the Forest, although areally comparable with the Yellow Pine type.

This type is locally known as "scrub cedar" which expresses very well its characteristic appearance. As a general rule the trees are scattered but in places they are so dense that it is difficult to ride a horse through them.

Some of the Junipers forming this type are several hundred years old and the Alligator Juniper probably reaches an age in some cases exceeding three centuries.

There is no opportunity for the formation of humus within this type and when present at all the ground cover consists of different species of grasses.

The reproduction of the type is prolific under favorable conditions and the Junipers depend to a very great extent upon animals and birds for the dissemination of their heavy berry-like fruits. During years of abundant seed production, young seedlings may be found well distributed providing the areas are not overgrazed. The regeneration of this type is probably influenced to a greater extent by grazing than by any other factor.

This is a permanent type and although it is advisable in certain locations to convert it into the Yellow Pine type the operation is very slow and often fails. Planting experiments may solve this problem.

The foothill type, although commercially unimportant ex-

cepting as a fuel and post supply, forestally is deserving of considerable attention as it will thrive where other species refuse to grow and is of great value as a protective cover in watershed problems. Its silvicultural treatment should be such as to prevent any destruction of the forest cover and to provide for an ultimate replacement in the openings created by former cutting. For these reasons only dead material is now permitted to be taken.

The Aspen type is composed of pure stands of Populus ~~xx~~ tremuloides and owing to its preference for moist soils is found within the same environment as the Alpine type at the higher altitudes. It is most common on north slopes in wet mineral soils and evidently avoids the humus soils formed within the Alpine type. It is found on high flats providing the soil carries sufficient moisture.

It forms probably 2% of the Forest.

This type possesses a most striking appearance and is at once discernible from its light foliage and whitish boles. It is particularly conspicuous in its surroundings of sombre hued conifers.

The Aspen is a short-lived species and comparatively no very old stands exist. Fifty to sixty years is probably old for this tree. Owing to its intolerance and light foliage the ground cover generally consists of grass, while there is seldom more than a very scanty humus within this type.

This species is a most prolific seed producer and owing to the extreme buoyance of its fruits is disseminated far and wide by the wind. The seeds germinate very quickly and show

a preferance for moist mineral soils.

The presence of this type is more an indication of its prolific seed production and dissemination rather than its ability to cope with its associates of the Alpine type and ultimately it invariably succumbs to its slower growing but more tolerant coniferous rivals.

The silvicultural management of this type is of importance forestally in that it may be used rapidly to bring about forest conditions on burns and other denuded areas which would otherwise remain exposed for many years. It may be made to serve as a nurse for commerically more valuable species and in places a thick growth of Aspen prevents erosion and protects the mountain sides.

The deciduous type is of little importance and is confined exclusively to the borders of water courses and the bottoms of moist canons. It demands a great amount of soil moisture and, following the streams, extends through the foothill and Yellow Pine types far into the mountains.

This type forms probably but 1% or less of the Forest.

Its location along water courses will distinguish it and, like the Aspen type its appearance is distinctive in its surroundings of coniferous species.

The deciduous type is composed of Willow (Salix), Black-Cottonwood (Populus trichoearpa), White Alder (Alnus rhombifolia) Arizona Sycamore (Platanus wrightii), Mexican Walnut Jugans rupestris), Mexican Elder (Sambucus mexicana), and occasionally Rocky Mountain Juniper (Juniperus scopulorum). The last generally occurs as isolated specimens in the canon

bottoms or in sheltered places along the streams.

The species forming the deciduous type are all short-lived with the exception of Juniperus scopulorum, which like its generic associates is of very slow growth and long life. As a general rule all age classes are represented in what is in this region a hydrophytic society.

Reproduction in this type is limited to the favorable soil conditions existing within the limited areas deriving their soil moisture from direct contact with water. Most of the species under consideration produce seed prolifically which although carried long distances by the wind ultimately reach soils uncongenial to their requirements. If the case is otherwise it is purely fortuitous and the chances are greatly against the seeds alighting on the favorable soils controlled by the mother trees.

The diciduous type is but little interferred with by other types of plant societies owing to its preference for soils containing an amount of water precluding the survival of other species.

2. Silvics of Each Species

Western Yellow Pine (Pinus ponderosa).

This species does not reach its best development in this region and the diameter at breast height seldom exceeds 40'. Large trees may be over 150 feet in height but usually about 100 feet is the average.

The crown is long, open, often rounded and formed of very larges branches upturned at their ends. The branches

are frequently separated by a considerable distance causing the crown to be columnar.

The bole is very cylindrical and possesses but little taper.

The root system is exceedingly long and seeks water at great depths in dry soils. They are also of considerable lateral extent and are only injured by fires of great severity. The tree is windfirm.

This species grows on a great variety of soils and in this region prefers north slopes.

It is very intolerant and demands a large amount of light especially after 15 years old. Young stands are often dense and the seedlings evidently benefit from a considerable amount of shade.

Variation in growth in this species is caused by altitude rather than the occurence of the tree in other types as it forms a distinct type in itself. At the altitudinal limit of its range the trees are stunted and show very slow development.

The tree apparently remains sound to an age limit of 300 years under favorable conditions. The frequency of defect in this region is generally due to shallow soil, drying out, fire scars or injury from lightning.

The merchantable size for this region is not under 15 - 20 inches and the trees possibly 80 - 100 years old.

Good seed years are frequent or occur at least every 3-5 years although in a forest some of the trees are always producing cones. One middle-age Yellow Pine was known to produce

26 bushels of cones.

The seed generally lie over during the winter and germinate early in spring. The fresh soil of north slopes is preferred by the seedlings.

This species is but little effected by wind or frost but suffers from lightning to a remarkable extent. In some places probably one tree in ten shows a lightning scar.

Thus far no insect enemies have been observed as attacking this species on the Apache but further investigation is necessary.

There are certain areas within the Yellow Pine type which show the effect of grazing in that the reproduction is not what it should be or is entirely lacking. There is no doubt as to the harmful effects of overgrazing within this type, particularly on south slopes.

Animals and birds, especially squirrels and Pinon jays play an important part in the dissemination of the seeds of the Yellow Pine, but of course can not be depended upon to bring about a regeneration of any particular area.

No sample plots have yet been established on the Apache National Forest within this type or any other.

The Limber Pine (Pinus flexilis), is a tree of the higher altitudes and as far as observed seldom exceeds 20 inches in diameter with a height of about 30 feet. It is probable, however, that in many cases these figures are exceeded.

The crown is rounded, spreading and flat. The top and lower branches are long while the intermediate ones are shorter, often giving the general shape of an hour-glass to,the tree.

The crown of young trees is more spire-shaped and is made up of distinct whorls of branches.

The bole is often short and thick with more taper than the Yellow Pine.

Very little is known concerning the root system of this tree but it is probably shallow like that of the Bristlecone Pine.

It apparently grows on a variety of soils but prefers the moist mineral soil of the higher altitudes.

The Limber Pine is very intolerant; probably not as much as the Yellow Pine but it evidently requires full light.

This species is probably about middle aged when 80 years old and probably remains sound until 150 years old.

Seeds produced only moderately and are wingless. Reproduction is generally scanty, especially at the higher altitudes where seed are produced intermittently and in small quantities.

The root system of the Limber Pine is probably quite susceptible to damage from fires.

The Mexican White Pine (Pinus strobiformis), is closely related to the Limber Pine and doubtless many of the statements concerning the latter apply equally well to the former. As yet there has been no opportunity to study the silvics of strobiformis.

The Pinon (Pinus edulis), seldom exceeds 25 feet in height and 15 inches in diameter. The majority of the Pinons in this region are smaller than these figures.

The bole is generally short, rarely straight and supports a wide, flat crown made up of short crooked branches. The young trees are very symmetrical and quite different from the old. Their crowns are more rounded and often pyramidal.

The root system is probably deep and the species is certainly windfirm.

Endures very great aridity with high temperature, little humidity and slight precipitation. Prefers the low arid slopes of the foothills.

The Pinon can thrive on the most arid soils and endures long periods of drouth. It is extremely intolerant and demands full and intense light.

It reaches a great age, and 200 - 250 years does not mark the limit of its longevity.

Produces seed abundantly every year which fall near the parent trees. The reproduction is generally very scattering and is best on exposed soils.

The Pinon is exceedingly hardy and withstands severe winds and other natural destructive agencies.

The young trees possess a pyramidal crown which becomes flattened as they grow older.

The boles are cylindrical and have a very slight taper.

The Douglas Fir of this region prefers the moist north slopes and at the higher elevations seeks the shelter of canons and protected hillsides.

Will grow on a great variety of soils but is dependent

upon atmospheric and soil humidity for good development.

It is moderately tolerant and will thrive in the forests of Yellow Pine. It is not as tolerant as its associates of the Alpine type, and becomes less shade enduring as it grows older.

It is not used here commercially but probably remains sound until 175 or more years old.

The Douglas Fir is a prolific seed producer but the reproduction thus far observed in this region has been very scanty Within the Alpine type it probably establishes a dense stand of seedlings in favorable localities on moist minderal soil.

The older trees withstand fires well but unfortunately suffer greatly from windshake which is exhibited by a great portion of thme in this region on severe wind storms.

The White Fir (Abies concolor), of this region seldom exceeds 25-30 inches in diameter and 80-90 feet in height, generally less.

The crown is heavy, conical and rounded at the top while the bole is slightly tapering. In young trees the crown extends to the ground and is symmetrical and pointed.

In this vicinity the White Fir is an Alpine species prefering moist soil but is less particular in its moisture demands than its associates.

This species is extremely tolerant and will endure more shade than its associates except Engelmann Spruce.

Although living to a great age the trees probably seldom exceed 200 years in age and remain sound possibly until 150 years old.

It produces seed fairly abundantly which germinate on beds of greatly different character. Seed years every 2-3 years but apparently of a low rate of germination and reproduction is frequently lacking for this reason. Soil moisture is essential for the thrift of the seedlings.

The White Fir is as defective in this region as the Douglas Fir and old trees are nearly always doty and wind shaken.

Arizona Cork Fir (Abies Arizonica). This little known species occurs within the Alpine type of this region quite commonly and in many places it may be seen in dense pure stands. It is deserving of further study and report and probably should be considered as a separate type. Mr. Martin states that he has seen a pure stand of this species covering about a square mile of territory and if such is the case it is much more abundant here than in the San Francisco Mountains where the type specimens were secured. At the first opportunity a thorough study will be made of this species and an attempt made to secure definite silvical data concerning this form of Abies.

It is used frequently in this locality for telegraph poles.

Engelmann Spruce (Picea engelmanni). This Spruce is commonly 50-80 feet in height with a diameter of 16-30 inches.

The crown is narrow and pyramidal with a length varying with the density of the stand. In dense stands the crown is very short while in open ones it approaches and sometimes almost reaches the ground.

The bole is very tapering, especially when developed in the open.

The root system is of fair lateral extent although extremely shallow. For this reason the species is especially liable to windfall and its roots are easily damaged by ground fires. Since the Engelmann Spruce requires a great amount of soil moisture the roots are somewhat protected from fire by the damp earth in which they grow.

This Spruce occurs only at the higher altitudes and its distribution is limited by soil moisture more than by any other one factor. It will grow on very shallow soils and in rocky situations providing there is a sufficient amount of soil moisture present.

It is an extremely shade-enduring species and is indubitably the most tolerant tree of this region, for which reason it thrives in exceedingly close stands.

Very long-lived, reaching an age of over 350 years. No information is available concerning the age limit at which it still remains sound.

A prolific seed producer.

A moist mineral seed bed is necessary for the establishment of good reproduction. As in other localities the abundance of seedlings in this region is probably not great.

The injury to this species from windfall is frequent and care must be exercised in cutting to avoid creating openings of too great extent. No cutting has, however, been made of Engelmann Spruce on the Apache National Forest.

Rocky Mountain Juniper (Juniperus scopulorum). This is a tree of from 15-30 feet in height with a diameter of from 8 to 15 inches.

In this vicinity it varies greatly in form, sometimes being low and rounded while in sheltered places it has an excurrent stem and is of the true tree form. One specimen was observed here growing in a small canon. It was about 30 feet high with slender pendulous branches and a decided weeping appearance.

The root system is doubtless of considerable depth.

It grows on open hill-sides as well as in sheltered canons, and on dry soils as well as in moist.

The canon specimens apparently endure a small amount of shade.

This tree generally occurs very scatteringly and often as isolated specimens.

No further information can be given concerning this species but a study of its silvics and life history will be made in the future.

One-seed Juniper (Juniperus monosperma). A tree 10-25 feet high with a diameter of 5 to 12 inches. Commonly with a rounded crown formed from the short deliquescent stem.

The root system is deep and the species is windfirm.

Prefers the dry lower slopes of the foothill type and will withstand drouth and a great daily range in temperature.

Evidently very intolerant and thrives best in full sunlight.

Seeding is prolific but for some reason reproduction is scattering and not abundant.

Of very slow growth and great age,. probably reaching an age of 300 years or more.

Little is known concerning the silvics of this Juniper.

Alligator Juniper (Juniperus pachyphloea). The same statements apply to this species that were made in discussing monosperma excepting that pachyphloea grows to a much larger size and possesses a larger bole. They are closely associated and grow side by side within the semi-xerophytic foothill type.

Arizona Cypress (Cupressus Arizonica) The Arizona Cypress is from 20 to 35 feet high with a trunk 15 to 30 inches in diameter supporting a pyramidal or sometimes rounded crown.

The root system is probably moderately deep.

This species prefers north slopes, probably thrives best in slightly moist soils and is often found in pure stands.

A very tolerant species as is evidenced by the density of the stands.

Produces seed prolifically and in this region reproduction is abundant.

Seed and seedlings evidently prefer moderately moist mineral soils.

Longevity probably great - at least 175 years.

Aspen (Populus tremuloides). This tree is 30 feet high and from 6 to 12 inches in diameter surmounted by a

rounded crown which is short and terminal in dense stands and more enlongated in forests of lesser density.

The root system is not very deep and the species is subject to windfall under certain conditions.

Extremely intolerant of shade and takes advantage of its rapid growth to overcome suppression. Demands unbroken light throughout life.

Very short lived, 40 years being old for the species.

It remains vigorous till old age, however.

This species is extremely prolific in its production of wind-disseminated seed and sows large areas yearly.

The seed germinate quickly and regeneration is soon established on moist mineral soils. A slight admixture of humus, however, does not discourage or retard germination.

This species suffers from fire to a considerable extent but its remarkable recuperative powers soon enable it to regain the lost areas.

White Alder (Alnus rhombifolia).. This member of the deciduous type is generally a small tree in this region from 20-40 feet high and 8 - 12 inches in diameter. The crown is rounded and open.

This tree is confined to the very moist soils along water courses and does not occur at the highest altitudes.

Species quite tolerant and often forms dense thickets along the streams.

It produces abundant seed which germinate most successfully in the wet gravel or sandy soils adjacent to streams.

Gambel Oak (Quercus gambelii). This species is widely

distributed and often associated with the foothill and Yellow Pine types.

It is 20 to 30 feet high and often a foot in diameter.

The crown is rather narrow and rounded at the top.

The root system possesses a long tap root, which is comparatively safe from injury by fire and which anchors the tree firmly in the soil.

Gambel Oak grows on moderately dry soil and is able to obtain an adequate water supply by means of its long roots.

It is fairly tolerant only and becomes less shade enduring with advancing years.

It is not used commercially in this vicinity except for fence posts.

Produces a moderate amount of seed but reproduction has not been observed to be common excepting by coppice. The old stumps and roots invariably give rise to a remarkable number of coppice shoots which form dense thickets more or less circular in outline.

The Acorns are probably more or less disseminated by the smaller rodents and birds.

It is an excellent browse for stock during the winter and the slight damage from this cause is probably not worthy of notice, as it may be considered one of the uses of an otherwise inferior tree.

The Emory Oak (Quercus emoryi) has not been silvically studied on this Forest but many of the statements made concerning Quercus gambelii undoubtedly apply equally well to this

very similar species.

The Arizona Sycamore (Platanus wrightii) deserves mention as being the most common deciduous tree of this region.

It reaches a height of 60 to 70 feet with a trunk sometimes several feet in diameter and always deliquescent.

Grows only along streams and in moist canons.

Will not endure shade during any period of its life.

Reproduction fairly common on wet gravely soils.

The silvics of several unimportant species has not been discussed in the previous paragraphs owing to the present lack of definite knowledge concerning their life histories. Further work on these forms will be necessary before a creditable description of their silvicultural characteristics can be made. These investigations will be carried forward as rapidly as other work will permit.

3. Condition of Reproduction on Cut-over Land.

The timber sales on this Forest have been for the purpose of supplying material to several small portable sawmills which furnish lumber to the local market. These sales have necessarily been limited to class A and B and have not exceeded forty thousand feet in one sale nor amounted to two hundred thousand feet in any one year. The Apache Lumber Company, operating one of these mills has made several purchases of timber of from ten to forty thousand feet. Another mill (Burgess & Love) which is even smaller buys a few thousand feet

of timber from time to time.

In all these small sales the method of cutting has, from the nature of the stand consisted of selection fellings and in some instances thinings.

The use of a diameter limit in these sales would not prove an advantage as the stands are very carefully marked and have a high percentage of overmature and defective trees. The latter represent many trees which are of a lesser diameter than any limit which would prove advisable to establish for the overmature class.

Rather than confine the residual stand to the mere seed trees spared in the cutting the attempt has been made to leave a much larger proportion of the original stand which method will necessarily lead to the establishment of a new crop with greater assurance than could be expected of even the maximum number of "seed-trees". Furthermore this method of conservative management permits of additional cutting on the same area from time to time depending upon the development of the stand.

In this way reproduction is not only more certain than in the seed-tree method, but the area is never left in such a depleted state that a reasonable amount of additional cutting in the near future need be feared.

The small cuttings made on the Apache Forest have all been located within the Yellow Pine type, the characteristics of which were fully described in the first pages of this report.

The cordwood sales are confined to the foothill type and dead material only is permitted to be utilized. The greatest care ought to be exercised to avoid opening up stands of this char-

acter where they serve as a protective cover on watersheds, especially as the establishment of reproduction is not always assured.

Formerly all brush on the areas of the timber sales was piled for burning but lately, the method of scattering has been substituted, especially on south exposures and in other places where reproduction requires artificial encouragement.

In some cases where the danger from fire is slight it may prove beneficial to allow the brush piles to remain without burning and to thus secure a certain amount of soil protection and ultimately organic fertilization through the decomposition of these piles.

No special studies have been made of the reproduction on the areas under discussion and no figures can therefore be furnished. Careful observation, however, show regenerative conditions to be most satisfactory and reproduction prolific. On many areas an over-crowded condition results from the density of the reproduction and in a few years certain young stands will benefit from a thinning.

This reproduction is of Yellow Pine.

Rather than depend upon reproduction following cutting although it doubtless will, the idea has been to select those areas for logging which already possess young trees in sufficient numbers to assure a future stand without the necessity of depending upon the more or less doubtfull.recuperative ability of the logged forest.

Reproduction in cuttings located on south slopes is not satisfactory either before or following the logging and as already pointed out in a previous paragraph, is caused by

lack of moisture and protection. The scattering of brush on such areas will certainly tend to solve the problem;to what extent remains to be seen. Such an experiment is being conducted on the small area of the Alpine administrative sale. As it has been impracticable to submit photographic examples of the silvicultural subjects treated of in this paper, it may be well to call attention to certain photographs now in the Service collection which illustrate certain forestal conditions of this region.

No. 66698 shows the possible development of the Pinon and is an illustration of the foothill type if it were not for the lack of the Junipers.

The true foothill type is also more scrubby and scattering.

No. 68290 is an excellent illustration of the Yellow Pine type and the character of the stand and the ground cover can be clearly seen.

No. 10935 illustrates to some extent the Aspen type except that it is not sufficiently pure or dense to show it to advantage.

No. 57701 is a photograph of the Cactus type which is a plant society of rather more botanical than silvicultural interest.

(Sgd) Wm. H. Kobbe

Forest Assistant.

Approved April 3, 1909.

(Sgd) Jno. D. Guthrie

Acting Supervisor.

CLIFTON ADDITION
TO THE BLACK MESA FOREST RESERVE, ARIZONA

By W. H. B. Kent

Forest Agent, Forest Service

Location

This proposed addition to the Black Mesa Reserve is located in Graham County, Territory of Arizona, between the White Mountain Indian Reservation of Arizona, and the Gila Forest Reserve of New Mexico. It is most easily reached by way of the town of Clifton. Clifton is connected by railroad with the Southern Pacific at Lordsburg, N. Mex.

Area

The tract is not surveyed, so the exact area can not be given. It is approximately 368,640 acres.

Topography

The topography, as will be seen from the photographs, is extremely rough. There is no well-defined mountain range but rather a chaotic mass of very precipitous and rocky hills. They fall naturally into four groups, culminating in one or more comparatively high peaks, and separated from each other by narrow mesas traversed by narrow and deep canyons.

FILE COPY
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Apache

CLIFTON ADDITION

TO THE

~~BLACK MESA~~ FOREST RESERVE

ARIZONA

By

W. H. B. KENT

Forest Agent, Forest service

1905

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TO THE BLACK MESA FOREST RESERVE, ARIZONA

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The group north of the San Francisco River and east of Blue River consists, on the outskirts, of rather long slopes becoming precipitous as they approach the dominating peak, Bullard Peak. The group west of Blue River and north of Pigeon Creek presents much the same characteristics. From Slinger Peak narrow canyons radiate in all directions. The group south and east of the San Francisco River consists of more rounded hills though precipitous slopes abound, especially along the canyons. The group between Eagle Creek and the San Francisco River, and south of Pigeon Creek is excessively rough and broken. From Greys Peak, deep, narrow canyons radiate in all directions.

Throughout the region malpais and trap are the predominant surface rocks. Between two beds of this igneous rock there is a strata of limestone frequently exposed. In the southern portion granite often outcrops prominently.

There are practically no true valleys in an agricultural sense, the streams, usually intermittent, flowing through narrow, rocky canyons, often true-box canyons. In the larger of these canyons, notably those of the Blue and San Francisco rivers, bars of sand and gravel of a few acres extent offer a rather precarious agricultural foothold, as they are very frequently washed away by the floods and new ones formed elsewhere.

The soil throughout the area is shallow, dry, and excessively rocky, and, on many of the more precipitous slopes, entirely lacking.

Climate

The climate of this section is the usual arid one of the mid-altitude southwest interior. The southern end, running down toward the Gila Valley, is very dry and warm, while the northern end has these features considerably tempered by the altitude and proximity to the high ranges farther north. There are no weather observation stations with complete records near enough to give accurate statistics in regard to the temperature and precipitation. As near as it can be determined from the incomplete records the average annual precipitation is about 10 inches, being slightly higher in the northern portion and lower in the southern. Snow at Clifton is very rare, while on the higher peaks at the north it is common during the winter.

The average annual temperature will run from about 60°F. at the south end to 54° at the north end. At Clifton frost is uncommon, while at the northern end it is usually continuous during the winter months. In summer a temperature of 105° is common at Clifton. The prevailing winds are from the west.

The Forest

Before the field examination was finished there came a season of the heaviest precipitation and most disastrous floods this region had ever known, making travel impossible. Hence, the type map is a very rough one, and does not show as much as is desirable.

Around Bullard Peak, in the northeast corner of the addition, there is an area of scattering Bull pine, running about

2,000 board feet to the acre. It is confined largely to the north slopes,and in favorable situations is reproducing fairly well. Pine Basin, west of Sliger peak, is a hummocky basin containing about two million board feet of Bull Pine. The severe drought of the past few years has injured this considerably. Bark beetles are at work here to a very considerable extent. The reproduction of the bull pine here is rather poor. Around Greys Peak there was formerly quite a little bull pine, and some white fir and red fir, but this has been largely cut out for the mines. It is reproducing fairly well, but unless the goats are kept out it has very little chance of succeeding. Practically, all of the canyons radiating from the principal peaks contain scattering bull pine, especially on the southern wall. The canyon bottoms support the usual scattering deciduous growth of this region, such as sycamore, cottonwood, hackberry, Mexican walnut, ash, locust, alder, willow, and oak.

In the bull pine areas mentioned above, all open places and for a considerable distance outside, support quite a dense growth of shrubby live oak. This is an excellent soil protector and is not so dense as to interfere with the reproduction of the timber species.

Throughout the tract pinon and juniper play an important part. They form the only forest cover on considerable areas, or grow indiscriminately in mixture with the bull pine and oak. This pinon and juniper forest formerly covered the entire southern portion of the proposed addition, but has been entirely cut away along the south line for fuel for the adjacent towns. In the northern portion the reproduction is excellent for these species, but in the south is very poor.

The presence of goats on this addition is very detriment al to the forest. Many instances were noted where they had destroyed the scanty bull pine reproduction, and they have totally killed out the shrub oak over large areas. The juniper also has suffered severely from them. The oak is a positive necessity, if bull pine reproduction is to take place, as the rapid drying out of the soil following the removal of the cover makes germination of the seeds almost impossible.

The Forest as a Protection Cover

The chief economical value of the forests of this addition is protective. The present forest cover, however, is totally inadequate. It is a region of short, precipitous, rocky slopes, and the soil dries rapidly and bakes hard when exposed to the sun. When precipitation does occur in this region it frequently comes as electrical storms of short duration but of appalling severity. Because of lack of forest cover, this is delivered immediately to t he canyons, and in a very short time, the canyons of the Blue and San Francisco are full from wall to wall and often 15 feet deep.

In December,1904, and January, 1905, floods destroyed fully 75 per cent of the little farms along the San Francisco and Blue, washed away the northern end of the town of Clifton, and damaged the plant of the Arizona Copper Company to the extent of $50,000. In December of 1905 occurred another even worse flood, which completed the ruin of the agricultural land along the rivers, and damaged the Arizona Copper Company plant to the estimated extent of $500,000. In these floods the greater

proportion of the water, of course, comes from the upper portions of the Blue and San Francisco Rivers, within the Black Mesa and Gila Forest Reserves. The principal damage, however, is usually done by the first rush of high water, which comes from this proposed addition. The upper portions of these rivers have a much better forest cover to hold back the water, and also much of the precipitation comes as snow. Considering the very considerable area of steep, rocky hills drained by these rivers, and the narrow, crooked, box-like character of their canyons, a period of severe precipitation will doubtless always cause floods, to some extent, but their severity can be very materially mitigated by a proper forest cover.

With a view of preserving the present inadequate cover, and its natural extension if possible, the grazing and cutting should be handled carefully and conservatively. Natural regeneration of the timber species can hardly be hoped for except where the soil is protected by the hardier, drought-standing species, such as the shrubby live oak, juniper, etc. For this reason the cover of this nature should be carefully protected. Goats, which are particularly destructive to the oak and have already killed out large areas, should be excluded. The cutting of anything, except dead, in the juniper and pinon forest, and of any live trees along the immediate banks of the streams should be forbidden.

Industries

The industries of this region are mining, stock raising, and wood cutting. The mining district immediately south of this

addition centering around the camps of Metcalf, Morenci, and Clifton is the second largest copper producing district in the United States. The Arizona Copper Company,at Clifton,is the third largest individual producer, while the Detroit Company,at Morenci, and the Shannon Company, at Clifton, come close behind. The ore bodies are enormous, and profitable operations will doubtless be carried on here indefinitely. Very little mining is going on within the proposed boundary of this addition, though it it of course quite possible that some of the prospects may develop into large mines. The mining industry is in no way dependent upon the proposed addition. They ship in their timber and use coal for fuel.

On the addition itself, the raising of cattle and goats is the principal industry. These people are entirely dependent upon the grass and water of this tract. There are at present about 15,000 cattle, worth $180,000; 1,500 horses, worth $22,500; and 10,000 goats, worth $35,000 on the addition.

The industry of wood cutting to supply the adjacent mining camps with fuel, and carried on by Mexicans, is, of course, entirely dependent on this addition. It is mentioned at some length under "Lumbering".

Settlements

There are but one or two sections of surveyed land within this proposed addition, and no entries on them, so an alienated land table can not be given. Settlement within the boundary is confined to t he very scattering ranches of the stockmen, and a few agricultural claims in the bottom of the Eagle

Blue, and San Francisco canyons. Many, if not most of these latter, have been washed away by the disastrous floods of the last two years.

The towns of Clifton, Morenci, and Metcalf, directly south of the tract, have populations of 4,300, 3,500, and 1,000, respectively, supported entirely by the mining industry.

Roads and Railroads

The three mining towns, Clifton, Morenci, and Metcalf at the southern end of this addition, are connected with each other, and with the Southern Pacific by railroads. A railroad has been surveyed from Clifton up the San Francisco River into New Mexico, and north to Durango, Colo., but it is impossible to state when construction will begin. The ostensible object of this road is to connect the copper camps of southern Arizona with the coal fields of northern New Mexico by a direct route.

A wagon road runs from Morenci to Eagle Creek, one from Metcalf north to beyond Grays Peak, and one from Clifton up the San Francisco and Blue rivers. This latter road was destroyed by the floods of January 1905, was rebuilt during the summer, and has now been totally destroyed by the floods of December, 1905 and it is considered doubtful if it is again rebuilt for many years to come. Rather poor trails make all portions of the tract accessible on horseback.

Lumbering

Greys Peak, which formerly supported probably as good a forest growth as Pine Basin, has been nearly all cut over to supply mining timbers for the nearby mines. The cuttings, however, are reproducing slightly, and if goats are kept out may reforest in time. In Pine Basin, west of Sligers Peak, there have been a few corral and house logs and quite a few stulls cut. The stulls, however, were not taken out as it was discovered, after they were cut, that the haul to Clifton would be too expensive. A good many cottonwoods and sycamores in the San Francisco bottom have been cut for stulls and hauled into Clifton. It is doubtful if the timber in the northern portion of this addition can be handled as the haul is too expensive. However, if the cutting of pinon and juniper is forbidden, and it should be, then there will be a rise in the price of fuel, and the tops and lops of the timber can probably be put in Clifton at a slight profit. In this case, much of this merchantable timber, and also that farther north in the present boundary of the Black Mesa Reserve, can be handled.

A very serious matter in this addition is the inroads being made upon the juniper and pinon forest for fuel for the adjacent mining towns. This is cut by Mexicans at the most convenient points and packed into the towns. They entirely strip the area over which they cut. The extreme southern portion of this addition formerly supported a fairly good growth of juniper, but this has been entirely cut away, and there is absolutely no reproduction. A very reasonable estimate of the amount of fuel

used in the three towns of Clifton, Morenci, and Metcalf would be 12,000 cords per year, all of which comes from this addition. At an average of 1-1/2 cords per acre, it will be seen that it takes 800 acres a year to supply these towns with fuel. The disastrous effect of this stripping the land is mentioned under "Forest as Protection Cover".

Cordwood is retailed in Clifton at about $7 per cord, as the Mexicans cut it, which would amount to about $9 for a standard cord. In Clifton bull pine lumber shipped from Alamogordo, N. Mex., is retailed at $32.50 per M., red fir from the Pacific coast at $40 per M. Some pine has been shipped in from east Texas, but it comes green usually, warps badly, and but little of it is handled.

Grazing

There are at present about 15,000 head of cattle, 10,000 head of goats, and 1,500 head of horses on this addition. With the exception of the herd of about 4,000 owned by the Double Circles Company, the cattle are divided up among small owners scattered throughout the area. Aside from this one company it is doubtful if any one party owns over 500 head. The horses are the saddle stock incidental to t he cattle business, there being no one actually engaged in the horse business.

No winter feeding is done here. In case of severe snow storms, which occasionally occur on the high altitudes of the northern portion, the cattle do very well for a short time on the leaves of the shrub live oak. When not overgrazed, this is an

excellent grass region, and if the present overcrowding of the range is abandoned it will probably recover very rapidly. The goats are owned in bands up to a 1,000 head, and are scattered nearly all over the proposed addition. The great quantities of shrub-live-oak browse make this an excellent goat country. There are large areas on which the only cover is this live oak, and in these areas the goats are very destructive. They strip the foliage from the bushes, usually causing their death, and this is followed by a rapid drying out of the soil, making reproduction of the timber trees impossible. This feature is mentioned at length under "The Forest as a Protection Cover".

Goats should certainly be excluded from this area, just as they already are from the adjoining portion of the Black Mesa Reserve. To exclude them all immediately would work an unwarrantable hardship on the owners. It is recommended that for the first season, whatever goats found on the addition be permitted to remain during that year, and then that a reduction of 20 per cent of the original total be made each year. This will give the goat men ample opportunity to either sell out without loss, or to seek a new location. It is recommended that the present number of cattle and horses be permitted to remain the entire year.

Fire

Owing to the very sparse litter, fires are uncommon. Occasionally, however, slight ground fires do occur, and these do

great damage to the scanty reproduction. More care on the part of herders and campers and the vigilance of the forest officers will make these even rarer.

Sentiment

There are four classes of people who are directly concerned in this proposed addition, namely, the cattlemen, goat men, mining companies, and the people living in the mining camps immediately south of the tract.

The cattlemen are strongly in favor of the addition. A petition setting forth their position is included in this report. Their attitude, of course, is due principally to hope of relief from the goats. The extent and value of their interests are mentioned under "Industries". Probably at the request of the cattlemen, the Arizona legislature has passed a resolution asking for the creation of this addition.

The goat men being under the impression that they will be excluded from the reserve are, of course, strongly opposed to it. A petition setting forth their desires in the matter is on file at the Forest Service. As the goats certainly should be excluded, and it is so recommended in this report, the goat owners can hardly be expected to change their attitude.

The mining companies will heartily approve of any steps that may assist in controlling the disastrous floods of this region. The damage caused to them from this source is mentioned under "Forest as Protection Cover".

A strong protest may be expected from the people living in the towns of Clifton, Morenci, and Metcalf, if the recommendation

in this report to forbid the cutting of pinon and juniper is adopted. This will raise the price of wood in these towns. However, there seems to be no alternative.

Recommendation

It is recommended that the addition to the Black Mesa Forest Reserve described in this report be created, with boundary as shown on the accompanying map.

Administration

This addition should be created and its administration taken up at as early a date as possible. Being an addition to an old and well-established reserve, there will be little difficulty in taking the matter up at once. There should be two rangers, one west of the Blue and San Francisco rivers and one east of those streams. It is almost necessary that these rangers be able to speak the Mexican language, as the principal feature of the work here at first will be dealing with the Mexican wood cutters.

It is earnestly recommended that the following rules be observed on this addition:

1. That the present number of cattle and horses be permitted to remain during the entire year.

2. That the goats found here when the addition is created be permitted to remain during the first year and after that be reduced 20 per cent each year, that is, 20 per cent of

the original total. Due notice should be given at the beginning that such action will be taken.

3. That the cutting of living juniper, pinon, and oak be forbidden, and that the cutting of living trees of any species along the watercourses be forbidden.

Due notice of these rules should be published in Clifton and Morenci as soon as the addition is created.

The greatest danger from timber trespass will be in the very rough hills of the southern portion of the tract, and, at first, this danger will be very considerable.

Benton P. O. Graham Co., Ariz.

January 28, 1905

Chief Bureau of Forestry

Washington D. C.

The undersigned, settlers, farmers and stockmen, residing within the watershed of the San Francisco River, Blue River, and tributaries in above county and territory, having been informed, that there is a proposition to extend the southern boundary of the Black Mesa Reserve, and that the raisers of goats in this vicinity have entered or intend to enter a protest against such action, we would respectfully assure the Department, that the majority of the settlers here--in fact all but those who are interested in goats--are heartily in favor of such extension of the Forest Reserve, which has proved already in its present dimensions a decided benefit, as regards the renewal of the grass sod, and the fresh starting of undergrowth, capable to hold the snow and moisture for use during the summer's drought, which is so essential, not merely for this locality, but also for the replenishing of the larger streams all over the southwest, which are fed by the numerous springs and creeks heading here.

If against the general benefit, accruing to settlers for perhaps 1,000 miles along those streams, is to be balanced the probable injury, which might incidentally be done to local interests by the contemplated extension--then we would submit the following facts for your consideration:

The only interests here, which possibly could be injured, are as stated, the goatraisers, if they should be compelled to move the goats.

Now-there are here about twenty persons owning or controlling about 7,000 head of goats - value about $25,000

Value of improvements about 2,500

Taxes paid by them last year, about 400

Employed by them about 10 persons-average wages $20 per month

Only one cultivates land - about 5 acres.

On the other side.--If the reserve is not extended, all cattle and horses in this region, who have not already died or been removed, will be crowded or starved out by the goats within two years, if the destruction of range and underbrush, and the consequent drying up of the springs continues.

There are about 9,000 head of cattle-value-$125,000
and about 1,000 " " horses " 20,000

controlled and owned by about 22 persons.

Value of improvements, at least $8,000

Taxes paid by them last year, about 2,500

Employed by them about 60 men, av. wages $30 per month.

One-half of them cultivate more or less land aggregating about 150 acres. To this may be added, that many small farmers, who depend mostly on those cattlemen for support, will have to leave with them, and further--that it seems only a question of four or five years, when after driving the cattlemen out, the goat raisers will, by overstocking the range, starve each other out, and will have to remove anyhow, leaving behind them a desert.

A comparison of the values of the interests probably injured, with the value of the interests benefitted or saved by

the extension of the reserve will make the result self-evident, even if the fact is not taken in consideration, that the cattlemen have been the pioneers, who have opened the country to civilization, some of them having lived and worked here for 15-20 years, while only within the last five years the goats have come in.

Very respectfully,

J. H. T. Cosper
Geo. Balke
Hugh McKeen
Joe Fritz
Chris. Fritz
Fred. Fritz
E. Johnston
T. L. Stockton
S. A. Medlin
L. M. Ross
Rufus Mephew
Geo. Morgan
Bill Morgan
Adam Sliger
Robert Phillips
Magie Smith

RECORD GROUP 95

RECORDS OF THE FOREST SERVICE

RECORDS OF THE DIVISION OF WILDLIFE MANAGEMENT:

W - MANAGEMENT, REGION 3, ANNUAL REPORTS, 1915 - 1921

W-Management R-3
Annual Report, 1920

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 3

FOREST SERVICE
JUL 9 1921
REFERRED TO
GRAZING

ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO:
G
(Allowances
Permits for 1922)

GAS AND ELECTRIC BUILDING
ALBUQUERQUE, NEW MEXICO

June 30, 1921.

U. S. F. S. RECEIVED
GRAZING
Office of the Chief
JUL 9 - 1921

The Forester,

Washington, D. C.

Dear Sir:

Reference is made to Mr. Barnes' letter of June 4:

After discussion in this office it is felt that we are already in possession of quite accurate information concerning the range of grizzly bears in this District. It is felt that very little would be gained by postponing this reply until the annual grazing working plans are submitted this coming fall. Consequently the information desired is being furnished herewith for the use of Dr. C. Hart Merriam.

A scattered remnant of the grizzly bear tribe may probably still be found in the following localities:

Sangre de Cristo range of mountains extending from the Colorado line down through the Carson and Santa Fe National Forests.

Sycamore Canyon region southwest of Flagstaff, Arizona on Coconino and Tusayan National Forests.

The Blue Mountain range, Baldy, Rose Peak, Middle Mountain and Eagle Creek on the Apache National Forest, south of Springerville, Arizona.

A limited region in the Mogollon mountains mostly east and south of Mogollon, New Mexico, Gila National Forest.

Black range, Gila National Forest, northeast of Silver City, New Mexico.

In addition to the above regions where it is reasonably sure that a few grizzlies still may be found reports have come in within recent years from the following regions:

West Clear Creek Canyon, 60 miles south of Flagstaff, Arizona, on Coconino National Forest -- probably all gone.

The Forester

Near the "Rim" northeast of Payson, Ariz.; and in the Mazatzal Range west of Roosevelt, Ariz. - both in the Tonto National Forest.

Mt. Taylor, west of Albuquerque, New Mexico, Manzano National Forest.

Animas Division of the Coronado National Forest in the extreme southwestern corner of New Mexico.

It is believed that the grizzlies are probably gone from both of the last two mentioned localities. The reports from the Animas Division of the Coronado National Forest probably referred to a drift of bears from Old Mexico.

Should we secure further information along this line we will forward it to you. It is thought that the Biological Survey might very likely have some additional data where grizzlies have been recently noted by some of their trappers or hunters.

Very truly yours,

FRANK C. W. POOLER, District Forester,

By , Acting.

VALUE OF BIG GAME KILLED

NATIONAL FORESTS OF NEW MEXICO

1915 - 1916

Year	*No. Reported Killed	Dressed Weight Each	Dressed Weight Total	Estimated Value per lb.	Meat Value	Raw Hide Value Each	Raw Hide Value Total	***Recreational Value Av. Expenditure per tril	Recreational Value Total Successful trips	Total Value per Year	
Deer											
1915	656	**100#	65,600#	15¢	$9,840.00	$1.00	$656.00	$50.00	$32,800.00	$43,296.00	
1916	618	100#	61,180#	20¢	12,236.00	1.00	618.00	60.00	39,360.00	52,214.00	
Total	1294		126,780#		22,076.00		1,274.00	110.00	72,160.00	95,510.00	
Average	637		63,390#		11,038.00		637.00	55.00	36,080.00		$47,750.00
Turkey											
1915	580	10#	5,800#	20¢	$1,160.00			$10.00	$5,800.00	$6,960.00	
1916	549	10#	5,490#	30¢	1,647.00			12.00	6,588.00	8,235.00	
Total	1129		11,290#		2,807.00				12,388.00	15,195.00	
Average	564		5,645#		1,403.00				6,194.00		7,547.00

Total Value of Big Game Killed per Year - ****$55,297.00

VALUE OF BIG GAME KILLED

NATIONAL FORESTS OF ARIZONA

1915 - 1916

Deer											
1915	1063	**90#	95,670#	15¢	$14,350.00	$1.00	$1,063.00	$50.00	$53,150.00	$68,563.00	
1916	827	90#	74,430#	20¢	14,886.00	1.00	827.00	60.00	49,620.00	65,333.00	
Total	1890		170,100#		29,236.00		1,890.00	110.00	102,770.00	133,896.00	
Average	945		85,050#		14,618.00		945.00	55.00	51,385.00		66,948.00
Turkey											
1915	562	10#	5,620#	20¢	$1,124.00			$10.00	$5,620.00	$6,744.00	
1916	344	10#	3,440#	30¢	1,032.00			12,00	4,128.00	5,160.00	
Total	906		9,060#		2,156.00				9,748.00	11,904.00	
Average	453		4,530#		1,073.00				4,874.00		5,952.00

Total Value of Big Game Killed per Year - ****$72,800.00

Explanation of Estimates

* Figures on number killed taken from compiled annual reports of Forest Officers. These figures in general include only game known to them as legally killed. It is estimated that at least 25% might be added for game illegally killed.

** The average blacktail (supposedly buck) will dress 150#; whitetail 90#; the figures used take into consideration the relative abundance of the species and the probable proportion of does illegally killed, and are conservative.

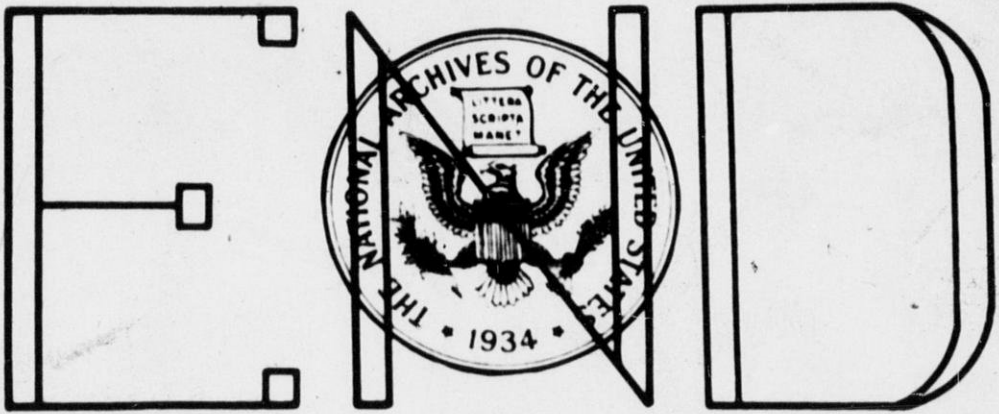
*** The recreational value of a deer is considered to be the price in money and time which the average man spends to procure it. At 1917 prices the sum was estimated to be as follows: 100 miles transportation @ 10¢ per mile, $10.00; provisions, $10.00; equipment, $10.00; license (average), $2,00; 5 days time @ $5,00 per day, $25.00; total, about $60.00. Most turkeys are killed in connection with deer hunts, so that the relatively low arbitrary value of $12.00 has been used. It should be noted that the figures do not include value of recreation to unsuccessful hunters, for which 100% might conservatively be added.

****It would hardly be justifiable to capitalize the value per year at a certain rate of interest because under present conditions (a) it is not a sustaining resource due to illegal killing and loss by predatory animals; (b) it is a gross figure. A net figure cannot be derived because calculation of costs of administering big game would involve an unknown proportion of the unknown amounts spent on predatory animal work and law enforcement by both official and unofficial agencies. It should be noted however that the annual value for each state is over 5 times as great as the amount spent annually by the State Game Department.

Compiled by

Aldo Leopold

U. S. Forest Service, 10/1/17.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