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Effectiveness of Forestry Agency Personnel as Fire Prevention Contactors

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SUMMARY

A major responsibility of county forest rangers in North Carolina is fire prevention. Personal contact with the public is essential to the successful performance of this function. A survey of 50 North Carolina rangers revealed that the degree of success for each ranger was directly related to the specific effort put forth as a contactor.

Additional keywords: Most effective, least effective, contact, noncontact.

INTRODUCTION

The benefits of personal contact over impersonal contact for influencing others are well established. However, the results of either a single contact or a comprehensive program can vary widely. Many factors determine the outcome of contacting, but the characteristics of the contactor usually is the one most easily altered (Doolittle, Kootsher, Mercer, 1975; Doolittle 1979). This paper describes the results of a study to identify a successful contactor.

CONTACTORS

Contactors in this study were 50 county rangers with the North Carolina Division of Forest Resources. County rangers are responsible for numerous programs. including fire prevention. However, each ranger has great latitude in deciding how to fulfill responsibilities. We studied the rangers' working hours and compared results with the degree of success each was judged to achieve as a contactor. In this way, we hoped to get some idea of what distinguished the successful contactors.

VARIABLES

The dependent variable was each ranger's degree of success as a personal fire prevention contactor. We relied primarily on the frequency of wildfire in each ranger's county over a 5-year period. By dividing the number of fires in each county during the first 2 years into the number during the last 2 years, we computed a fire occurrence ratio. Our assumption was that the counties served by the more effective rangers would have lower ratios, and vice versa.

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We also looked at prevention effectiveness by employing a scale designed for use by contactor's supervisors. Scores on this scale are weakly associated with other effectiveness measures in test applications.

The independent variable was the way in which the ranger spent his workday. The Division of Forestry provided a detailed activity record of the 50 rangers for ten 8-hour workdays (randomly selected) during the spring 1978 fire season.

Daily activities were classified as follows:

1. Forest land management.
2. Pest control.
3. Fire control.
4. General information and education.
5. Paper work.
6. Internal operations.
7. Maintenance.
8. Travel.
9. Other.

Each activity was recorded as either "contact" or "noncontact" except paper work, internal operations, and maintenance, all of which were "noncontact." Also, some time could not be classified because of vague or ambiguous recording. The records also showed the number and identity of contactees and the purpose, place, initiator, and consequences of each contact.

RESULTS

The rangers utilized their time in many different ways (table 1). However, the means clearly show where most time was spent: Land management contacts, 19.9 percent; paperwork, 10.7 percent; maintenance, 9.3 percent; and noncontact land management, 8.6 percent. In fact both categories of land management (28.5 percent) and administration (26.5 percent) took more than half of the rangers' time during this 2-week period. Travel took another 14.4 percent.

When administrative tasks are deducted, the rangers spent 23.6 percent of their time in noncontact activities compared with 37.9 percent spent in contacting. Ranger "P" spent the least time contacting -5.8 percent or about 4½ hours-while Ranger "J" spent the most-73.7 percent or nearly 59 hours. An important question is whether a correlation exists between the time spent making contacts and fire prevention effectiveness. The product moment correlation coefficient (r) between hours spent in contact activities and fire prevention effectiveness as indicated by the supervisor scale scores was -0.23. Although this coefficient approaches significance at the .05 level of confidence, it is not in the expected direction'.

The same computation using the fire occurrence ratio as the indicator of effectiveness yielded an $r = -0.21$[2]. This coefficient is in the expected direction (the higher the ratio the less the effectiveness), but it is not significant. Computation of r for correlations between each category of contact activity and prevention effectiveness failed to produce any of greater value.

The final correlation examined was that between the two "measures" or indicators of prevention effectiveness. Although it went in the predicted direction, the correlation was not significant at the .05 level. (r = -0.15). One obvious problem with this scale is the large number of maximum scores (233.0) it produced.

Close examination of the fire occurrence ratios in table 1 reveals that occurrence declined in only six counties during the 5-year period: C, L, CC, FF, GG and QQ. At the other extreme, seven counties had at least a threefold increase: B, S, W, EE, JJ, RR, and XX (table 2).

Several rather sharp differences appear between the two groups. First, the six rangers with low occurrence ratios received higher scores by their supervisors than the other seven received from theirs-223.6 to 196.3. Although this difference is not significant at the .05 level[3], it is amplified by two facts: (1) Four of the six "most effective" rangers received maximum scores from their supervisors as opposed to only two of the seven "least effective" rangers

[1] A value of 0.24 is required for significance at the .05 level.

[2] The deduction of travel time from the total time did little to change the correlation; r was computed to be -0.22.

[3] We used a "difference of means" test and computed the value oft with 11 degrees of freedom to analyze differences between the two groups of rangers (Blalock 1960).

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receiving the maximum; and (2) the lowest scale score among the 50 rangers (98.3) is included among the seven "least effective" rangers as indicated by occurrence ratios.

The "most effective" rangers spent an average of 43.3 hours (54.1 percent of 80) in contact activities compared with 28.5 hours (35.6 percent of 80) by the "least effective" rangers. This difference is significant at the .05 level ($t = 2.20$). Furthermore, the "most effective" rangers spent 5 times more than the "least effective" rangers in fire control contacts (8.5 percent or 6.8 hours versus 1.7 percent or 1.36 hours). In fact, this category is the only one in which the difference between the two groups is statistically significant at the .05 level. The "most effective" rangers each averaged 8.2 fire control contacts during the two weeks compared with the 2.0 average of the "least effective" rangers.

It can be theorized that the "most effective" rangers spent more time on fire control contacts simply because of a greater need in their counties than in counties served by the "least effective" rangers. In the 10 years preceeding the study the six "most effective" rangers' counties averaged 37 fires per year each; in the seven counties served by the "least effective" rangers, the average was 30 fires per county per year.

A majority of the "most effective" rangers' contacts were with local organizations-schools, women's clubs, rural fire departments, etc. The rangers' each averaged 17.3 such contacts during the 2 weeks compared with only 3.1 per ranger for the "least effective" group. (This difference is significant at the .05 level.) Neither group spent much time with other government employees, local businessmen, or other county residents.

Although the "most effective" rangers spent slightly more time in land management contacts than the "least effective" rangers (26.9 percent and 21.7 percent, respectively), the former spent considerably less time in noncontact land management activities (4.4 percent versus 12.2 percent; $t = -2.44$, $p<.025$). The time the "most effective" rangers spent in noncontact travel also was significantly less than that spent by the "least effective" rangers (2.4 percent versus 12.3 percent; $t = -2.83$, $p<.01$).

Differences between the two groups of rangers in the three administration categories (paper work, internal operation and maintenance) were not statistically significant at the .05 level. The relatively large mean for maintenance time (16.5 percent or 13.2 hours) for the "most effective" group was caused primarily by two rangers. (See table 2).

CONCLUSIONS

The most effective fire prevention contactors spent more time making contacts that were specifically related to the fire protection job. Furthermore, the one noncontact activity that took up most of the time of the "least effective" rangers was forest land management. These findings parallel those of an earlier preliminary study and suggest that some rangers are what might be called "people oriented," whereas others are more "forest oriented."

We thought that an item-by-item comparison of the two groups on the supervisor's scale might provide some evidence of a "people-versus-forest" orientation. However, the "most effective" and "least effective" groups received identical scores on ability to communicate, respect by contactees, tact, etc. There were slight differences on some items. For example, the "most effective" rangers seemed to have slightly more persistence, sense of responsibility, positive self-image, desire for self-improvement, desire for achievement, community involvement, and dependability than the "least effective" rangers. Yet none shed light on the orientation question.

Obviously, the search for attributes of effective fire prevention contactors must continue.

REFERENCES CITED

Blalock, Hubert M.
1960. Social statistics. 465 p. McGraw-Hill Book Co., New York.

Doolittle, M. L.
1979. A scale for rating fire prevention contactors. U.S. Dep. Agric. For. Serv. Res. Note SO-249, 2 p. South. For. Exp. Stn., New Orleans, La.

Doolittle, M. L., M. H. Kootsher, and C. V. Mercer.
1975. Relationship of personnel characteristics to fire prevention effectiveness. U.S. Dep. Agric. For. Serv. Res. Note SO-191, 3 p. South. For. Exp. Stn., New Orleans, La.

Table 1. -Fire occurrence ratios, supervisor scale scores and time spent in various activities for fifty county rangers

Rangers	Fire occur. ratios	Supervisor scale scores	Contact activities (Percent of observation time)						
			Land mgmt.	Pest control	Fire control	I & E	Other	Travel	Sub-total
A	1.74	233.0	1.6		. . .		3.3	1.5	6.4
B	3.40	233.0	20.7		4.0		2.3	7.6	34.6
C	0.62	233.0	14.9		1.7			5.2	21.8
D	1.23	233.0	54.8		4.8	. . .		10.9	70.5
E	1.33	233.0	12.9		1.4	5.0	'1.3	5.9	26.5
F	1.49	204.0	13.3		4.7	. . .	1.3	10.9	30.2
G	1.39	213.6	20.1	1.2	5.2	4.8		10.7	42.0
H	1.79	233.0	16.3	0.6	1.0	5.3		2.1	25.3
I	1.13	233.0	11.0	. . .	2.1			4.5	17.6
J	1.28	98.7	9.5	3.8	30.4	. . .	7.6	22.4	73.7
K	2.24	233.0	16.7	10.9	6.7	1.9	5.6	7.6	49.4
L	0.67	223.1	17.0		22.7		12.6	13.4	65.7
M	2.09	197.1	32.1	. . . .	0.6	. . .	. . .	7.8	40.5
N	1.97	223.0	14.1	2.1	11.2	1.4	6.9	12.0	47.7
0	1.68	118.6	6.2	0.7	4.0	3.3		9.5	23.7
P	2.84	165.8	3.7	. . .				2.1	5.8
Q	2.57	207.0	7.1	6.8	. . .		. . .	5.0	la.9
R	1.47	233.0	7.0	0.2	1.6		2.4	4.6	15.8
S	4.38	164.6	25.2	a.2	5.2	1.5	. . .	12.8	52.9
T	1.53	214.1	7.4		5.3	1.3	0.9	3.2	18.1
U	1.25	174.1	38.9		. . . .			6.8	45.7
V	2.60	206.0	9.8		38.5	0.4	. . . .	a.9	57.6
W	3.23	98.3	34.5			2.6	1.1	9.5	47.7
X	1.35	177.1	30.7				7.4	a.3	46.4
Y	2.07	223.3	6.7		. . .			0.9	7.6
AA	1.54	212.8	a.5		8.0		.	3.9	20.4
BB	1.60	233.0	19.0		0.4			11.9	31.3
cc	0.88	186.6	37.8		a.4	4.2	'3.4	12.0	65.8
DD	1.86	154.9	17.0	1.8	0.4	2.6		5.2	27.0
EE	4.00	213.4	28.7					8.8	37.5
FF	0.29	233.0	31.4	. . .	. . .	. . .	.	14.3	45.7
GG	0.71	233.0	25.4	7.5	9.3	6.7	15.3	3.4	67.6
HH	1.36	196.9	16.5	1.2		25.6	1.2	9.4	53.9
II	1.43	193.6	22.8	. .	12.0	. . .		6.9	41.7
JJ	5.15	233.0	17.5		0.2	5.6	1.8	7.5	32.6
KK	1.95	214.1	21.3	.	3.6	4.8	. . .	14.5	44.2
LL	1.73	233.0	31 .o	. . .		4.9	0.9	4.9	41.7
MM	1.29	223.3	20.3	2.4	1.8	4.3	6.9	7.8	43.5
NN	2.39	186.3	29.7			2.0		4.7	36.4
0 0	1.21	223.3	21.9		. . .	4.4	. . . .	3.1	29.4
PP	1.07	223.3	a.7		5.9	1.1	16.5	15.7	47.9
QQ	0.47	233.0	34.6	. . .	a.9	4.3	. . .	10.1	57.9
RR	4.44	215.9	8.6	0.7	2.4	6.0	1.2	2.8	21.7
ss	1.12	197.0	26.6	1.2	4.9	. . .	3.7	12.5	48.9
TT	1.78	233.0	10.1		0.5	0.5		3.4	14.5
uu	1.94	214.2	30.0	'2.2	4.1	6.3		21.5	64.1
vv	2.05	233.0	25.2	2.8	6.0	2.3			36.3
ww	1.14	233.0	30.6	0.9	0.9	1.3		7.8	41.5
xx	3.33	215.7	16.9	.	0.4		. . . .	4.6	21.9
YY	1.68	233.0	1.2	. . . .			0.5	6.4	28.1
Means ($\bar{X}$)	1.88	208. 1	19.9	1.1	4.6	'2.3	2.1	7.9	37.9

'Total may not equal exactly 100% because of rounding.

Non-contact activities (Percentofobservationtime)										Un-classified time (%)	Total observ. time (%)[1]
Land mgmt.	Pest control	Fire control	I&E	Other	Travel	Paper work	Internal operation	Maint-enance	Sub-total		
			....	10.2		...		75.8	93.6		100
11.2			....	7.6	...	38.0	1.1	...	57.9	7.5	100
8.0			....	10.5	6.3	3.6		42.3	70.7	7.5	100
			....	10.2	0.5	15.9		3.1	29.7		100
			....	3.2	....	18.9		11.9	34.0	39.5	100
0.5			....	4.4	6.7	33.6	'8.2		53.4	16.4	100
			....	8.2	5.8	24.5	8.9		47.4	10.6	100
			....	6.5		6.0	26.0	14.1	52.6	22.1	100
			....	3.4	....	9.7	36.0	11.5	60.6	21.8	100
...	....		....	5.0	0.2	3.5	12.9	3.5	25.1	1.2	100
7.9	1.7		....	9.4		1.7	6.7	13.9	41.3	9.3	100
...		3.9	....	7.9		9.2	3.9	5.3	30.2	4.1	100
8.0		...	....	9.1	1.9	20.5	2.3	4.6	46.4	13.1	100
6.9		5.2	....	6.0	6.8	23.4	6.9		55.2	...	100
4.7		18.6	....	10.9	3.3	10.9	10.9	1'2.6	71.9	4.4	100
36.1			....	8.8	20.0	13.5		15.7	94.1	....	100
29.2			....	7.0	12.3	6.4			54.9	26.2	100
28.8			....	7.2	16.2	13.5	3.1	4.9	73.7	10.5	100
18.1			....	6.2	9.3	3.5	10.1		47.2	...	100
6.4			....	8.1	9.8	15.3	8.0	23.5	71.1	10.8	100
13.4			....	10.7	2.5	14.3	....	13.4	54.3		100
2.t		4.5	....	11.3	2.6	...	4.5		25.0	17.4	100
10.2			1.1	7.5	11.2	3.9	6.0	1'2.6	52.5		100
9.9	0.6		....	5.5	6.3	4.1	...	21.8	48.2	5.4	100
34.1			....	9.8	11.8	27.3	9.3		92.3		100
			....	0.6	2.6	8.7	4.1	10.7	26.7	52.9	100
25.2			....	4.4	12.1	9.1	2.4		53.2	15.4	100
9.6			....	7.9	4.0	6.0	2.3		29.8	4.5	100
12.0			....	9.6	6.6	6.0	12.0	18.0	64.2	8.8	100
3.3			....	6.6	6.4	15.5	21.3	0.9	54.0	8.5	100
			....	5.7	0.7			47.9	54.3		100
			....	8.0	3.7	7.1	11.8	.	30.6	1.9	100
5.0			....	1.3	11.9	11.0	16.9		46.1	...	100
		3.6	9.0		11.4	0.4	...	6.9	31.3	27.0	100
13.6			2.0	'8.6	15.9	1.8	3.6	21.8	67.3		100
4.8		7.2	....	6.0	3.6	12.0		...	33.6	22.2	100
13.3		0.5	2.2	7.7	8.5	4.9	'ii	4.3	48.6	9.7	100
2.4			....	8.1	5.3	17.5	...	2.2	35.5	20.9	100
11.9			2.0	6.5	10.8	13.3	5.6		50.1	13.5	100
10.7		...	....	9.8	3.7	22.0	6.5	17.8	70.5		100
6.8		6.3	....	8.3	7.4	19.9			48.7	'3.3	100
9.1			....	6.3		6.5	13.4	'3.3	38.6	3.4	100
6.7			....	1.1	25.1	7.7	3.9		44.5	33.8	100
		'2.3	....	5.3	0.4	4.5	5.9	11.1	29.5	21.6	100
'3.8			....	4.4	10.9	7.5	27.6	18.4	72.6	12.9	100
11.3			....	7.6	10.6		5.0	1.1	35.6	0.3	100
			....	8.5	1.1	7.9	0.8	8.5	26.8	36.9	100
			....	9.1	3.5	5.2			17.8	40.7	100
22.2			....	5.4	18.3	9.6		...	55.5	22.6	100
22.3	6.0		....	9.8	6.8	8.9	...	2.0	55.8	16.1	100
8.6	0.2	1.0	0.3	7.0	6.5	10.7	6.5	9.3	50.1	12.1	100

Table 2.—*Fire* occurrence ratios. *supervisor scale* scores *and time spent* in *various activities* for six "effectwe" rangers

Rangers	Fire occur. ratios	Supervisor scale scores	Contact actwities (Percent of observation time)						
			Land mgmt.	Pest control	Fire control	I & E	Other	Travel	Sub-total
Effective									
C	0.62	2330	14.9		1.7			5.2	21.8
L	0.67	233.1	17.0		22.7		12.6	13.4	65.7
c c	0.88	1866	37.8		8.4	4.2	3.4	12.0	65.8
FF	0.29	233.0	31.4	....	...	....	....	14.3	45 7
G G	071	233.0	25.4	7.5	9.3	6.7	15.3	3.4	67 6
QQ	0.47	233.0	346	....	8.9	4.3		10.1	57.9
X	0.61	2236	26.9	1.2	8.5	2.5	'5.2'	9.7	54.1
Ineffective									
B	3.40	233.0	20.7		4.0		2.3	7.6	34.6
S	4.38	164.8	25.2	'8.2	5.2	1.5		12.8	52.9
W	3.23	98.3	34.5			2.6	1.1	9.5	47.7
EE	4.00	213.4	28.7		....	,,,,		8.8	37.5
J J	5.15	233.0	17.5	....	0.2	5.6	1.8	7.5	32.6
R R	4.44	215.9	86	0.7	2.4	6.0	1.2	2.8	21.7
XX	3.33	215.7	16.9	...	0.4		...	4.6	21.9
X	3.99	196.3	21 7	1.3	1.7	'ii	0.9	7.7	35.6

[1]Total may not equal exactly 100% because of rounding

and seven "ineffective" rangers

Non-contact activities (Percent of observation time)									Un-classified time (%)	Total observ time (%)[1]
Land mgmt.	Pest control	Fire control	I & E	Other	Travel	Paper work	Internal operation	Maint-enance	Sub-total		
Effective										
8.0		...		10.5	6.3	3.6	...	42.3	70.7	7.5	100
		3.9		7.9	...	9.2	3.9	5.32	30.2	4.1	100
9.6				7.9	4.0	6.0	2.3	....	29.8	4.5	100
....				5.7	0.7			47.9	54.3	...	100
9.1				6.38.0	3.7	6.57.1	13.4 11.8	3.3	30.6 38.6	1.9 3.4	100 100
4.4		0.6		7.7	2.4	5.4	5.2	16.5	42.4	3.6	100
Ineffective										
11.2				7.6	....	38.0	1.1		57.9	7.5	100
18.1			...		9.3	3.5	10.1	....			100
10.2			1.1	6.27.3	11.2	3.9	6.0	12.6	47.2 52.5		100
3.3			....		6.4	15.5	21.3	0.9	54.0	8.5	100
13.6			2.0	6.68.6	15.9	1.8	3.6	21.8	67.3	....	100
6.7			...	1.1	25.1	7.7	3.9		44.5	33.8	100
22.0			0.4	6.15.4	18.3	9.6	...	....		22.6	100
12.2					12.3	11.4	6.6	5.0	55.5 54.1	10.3	100