

The Wildlife Management Planning Game: Instructions to Participants



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THE WILDLIFE MANAGEMENT PLANNING GAME:
INSTRUCTIONS TO PARTICIPANTS

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SUMMARY

The Wildlife Management Planning Game is a computer based management game that is focused upon the planning activities of the wildlife management agency of an eastern state. The plan is implemented on an annual basis and may be modified at the end of each year.

This report contains a brief introduction to simulation gaming and instructions for those playing the game. It is anticipated that all participants of the game will be provided a copy of this report.

In order to conduct the game, an Administrative Manual will also be necessary. A copy may be obtained from the Division of Forestry and Wildlife Resources, VPI & SU, along with a program deck and deck listing, as long as supplies last. The Administrative Manual provides operating information and instructions necessary for conducting the game.

TABLE OF CONTENTS

Introduction	1
Management Games as Training Devices	1
Instructions to Participants	2
Scenario	2
Budget Considerations	3
Land Acquisition	4
Law Enforcement	4
Stocking Activities	6
Foot Access	7
Vehicular Access	7
Closing and Seeding Old Logging Roads	7
Wildlife Clearings	8
Timber Sale Examination	8
Information and Education	9
Public Media	9
Educational Programs	10
Game Regulations	11
White-tailed Deer	15
Black Bear	16
Wild Turkey	16
Ruffed Grouse	17
Gray Squirrel	18
Cottontail Rabbit	18
Sample Problem	19

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INTRODUCTION

During the spring of 1971, a project was undertaken with the objective of constructing a unique simulation game that would be helpful in improving wildlife management planning. The game would be used primarily for in-service training of state game agency personnel and as a teaching aid in university courses. In addition, it could be used to familiarize those not acquainted with wildlife management planning with the significant decision variables of the system. Through the game, these people could become better acquainted with wildlife management planning and be able to understand and appreciate some of the unique problems involved.

The Wildlife Management Planning Game involves the planning processes of the wildlife management agency of an eastern state. The participant is placed in the position of a planner for a mountainous region. His primary responsibilities are scheduling management activities and setting hunting regulations. A five-year operating plan is formulated and then implemented on an annual basis. Each year, reports are issued that reflect public reaction to the planner's policies and provide information about man-days of hunting, population levels, estimates of legal and illegal harvests, and budget constraints for the following year. The planner is allowed to modify the operating plan after examination of the annual report if he feels changes are necessary or desirable. This process provides "on-the-job" learning experience by allowing the participant to see the results of his decisions at different points in time and, hopefully, of profiting from his mistakes.

MANAGEMENT GAMES AS TRAINING DEVICES

The management game is essentially a teaching device which facilitates direct individual participation in the decision-making process. Three ways that learning from games can occur include:¹

- (a) the common language and facts expressed in the model may be acquired.
- (b) an understanding of the processes simulated within the model may be gained, and
- (c) the relative trade-offs (costs, advantages and disadvantages) of different strategies and alternatives may be understood.

In a more general sense, the participant learns the importance of a systematic approach to establishing objectives, evaluating alternatives, and making decisions. He also learns of the frequent necessity of making decisions about

¹ Torgersen, Paul E. and Robert E. Taylor. The Urban Mass Transit Game VA-MTD-2 Technical Report, Phase 1-A. Instructions to Participants. Dept. of Industrial Engineering. VPI & SU, Blacksburg, VA.

an uncertain future. Gaming exercises are usually conducted in three periods²: (1) the pre-play briefing and description of the rules; (2) the play itself, and (3) the post-game critique of the decisions that were made and their consequences.

Game participants should fully realize that any simulation model is limited by the underlying assumptions. It must be remembered that the resulting output of a simulator is only an approximation to reality and not necessarily what happens in the real system. However, if used properly, simulation models can provide valuable insight into management systems by motivating the thought processes of the decision maker and allowing him immediate and direct control over many components of the system.

INSTRUCTIONS TO PARTICIPANTS

The Wildlife Management Planning Game is a computerized model of a hypothetical region with which the planner of a wildlife management agency might deal in an eastern state. The model has been structured in the form of a simulation game for inservice training and use in university courses. Although the assumptions of the model prevent it from exactly representing the real world, it should enable the player to gain valuable insight into the complexities and interrelationships of the wildlife resource system.

Scenario

Assume that you are a planner for the wildlife management agency of an eastern state. You are responsible for planning activities in the Black Mountain Game Management Region. The total area of the Region is 8,207 square miles. At present, there are 4,297 square miles of forest range in the Region of which 1,162 square miles are in public ownership, 1,721 square miles are privately owned and open to public hunting, and 1,404 square miles are privately owned and posted, preventing access by the general public. The terrain is mostly mountainous with some rolling hills and valleys. The population is almost entirely rural with a few small cities and many scattered towns and villages. The economy is supported mainly by agriculture, forestry, and light industry. The present population of the Region is estimated to be 593,500. It is expected that the population will remain fairly stable, with perhaps a slight increase over the next few years.

The Region supports good populations of game animals and provides many mandays of hunting recreation. Estimates of the number of hunters, total number of mandays hunted, and harvest for the major game species are summarized for last year as follows:

<u>Season</u>	<u>No. Hunters</u>	<u>Total Mandays Hunted</u>	<u>Harvest</u>
Firearms Deer	45,890	203,500	4,052
Archery Deer	11,680	61,000	98
Fall Turkey	19,620	113,000	2,500

² Torgersen, loc. cit.

Spring Gobbler	8,070	29,400	267
Bear	4,390	22,500	74
Grouse	16,520	61,000	35,000
Squirrel	55,560	440,000	600,000
Rabbit	43,030	270,000	300,000

It will be your job to prepare a five-year operating plan for the Region that will generate the maximum number of mandays of hunting (up to but not exceeding public demands) without inflicting excessive damage to wildlife populations or spending more than your budget. The operating plan will outline activities of land acquisition, providing hunter access, habitat improvement, stocking programs, law enforcement, coordination of wildlife management and forestry practices, public relations, and setting hunting regulations. You will be provided annual reports that summarize management activities and game regulations for the previous year; give estimates of the number of hunters, fall population, and harvest for major species; report on stocking and law enforcement programs and budget constraints for the next year; and indicate public reaction to agency policy. This information can be used to judge how well the operating plan meets the objectives. If you find from the annual report that the operating plan is not performing as expected, you may reconsider your decisions and modify the plan accordingly. Each year you will submit an implementation schedule that outlines the activities and regulations for that year. The scheduled activities and regulations will be carried out exactly as you specify. Decision forms for the five-year operating plan and the annual implementation schedule are illustrated in the sample problem.

A detailed discussion of budget considerations, management activities, and game regulations is now presented.

Budget Considerations

The planner is responsible for allocating only that portion of the total budget that is to be used for management activities. Primary sources of funds are federal allocations from the Pittman-Robertson Fund and Land and Water Conservation Fund, and state allocations from the sale of hunting licenses, sale-or-lease of products, and the State General Fund. Federal funds are allocated to the states on a formula basis. Allocations from the State General Fund are under legislative control. The player should bear this in mind. If public reaction to his policies is negative, he can expect allocations from the general fund to decrease since the legislature must answer directly to the people. Approximately 15% of the total budget comes from the State General Fund.

In formulating the five-year operating plan, the player should be aware that budget constraints for the second and subsequent years are unknown at present. It is suggested that budget constraints for the current year be used as guidelines when structuring the operating plan. It is possible that costs of management activities might increase at higher rates than the total budget. Certain programs may have to be deleted from the operating plan for this reason, even though the plan itself is quite satisfactory. The next year's budget and activity costs

will be provided in the annual report.

The budget to be allocated during the first year is \$802,500.00. Figure 1 presents the per unit costs of management activities during the first year. Any portion of the budget not spent during the fiscal year will be returned to the funding agency. One-half of the excess funds will be returned to the game agency with the next year's budget. Annual allocation reports outlining expenditures for the entire year must be prepared at the beginning of each year. Forms for submitting the report and detailed information about current budget constraints are provided in the sample problem.

Land Acquisition

Over the last 50 years an intensive land acquisition program has resulted in extensive holdings of public lands in the Region. Most of these lands are in National or State Forests. The acreage purchased has declined steadily for the past 15 years. Last year 1,950 acres were purchased. Rather than increasing the total acreage, recent purchases have attempted to fill gaps between and improve access to existing tracts. You will be provided information concerning the type and acreage of land available for purchase during the next year in the annual report. Land available for purchase is of two types; private accessible lands are open to public hunting and private posted lands are closed to the general public. You may purchase any number of acres of either type land available for purchase. For the current year, 3025 acres of private accessible and 2780 acres of private posted lands are available for purchase.

Law Enforcement

A certain segment of the public will violate game laws whenever an opportunity presents itself and some pursue a regular practice of poaching. The fear of arrest is the only practical means of reducing violations, and effective law enforcement is therefore essential to maintain huntable game populations. You may control the level of law enforcement by specifying the number of officers in the Region for any year. The number of officers relative to the total area of the Region should be a major consideration in determining the level of law enforcement. Last year 11 officers were on duty in the Region. It was generally felt that more officers were needed and that a majority of violations were undetected.

The annual report will provide estimates of the percent illegal kill (illegal kill expressed as a percentage of the legal harvest) for deer, bear, and turkey. These estimates can be used as an indication of the effectiveness of the law enforcement program.

Number of Officers	<u>Sq. Miles</u> Officer
4	2000
8	1000
12	667

Activity	Per Unit Cost
Land Acquisition (Per Acre)	\$
Private Accessible Lands	75.00
Private Posted Lands	75.00
Law Enforcement (Per Officer)	15,000.00
Turkey Stocking (Per Bird)	50.00
Foot Trails (Per Mile)	
Maintenance	50.00
Construction	1,250.00
Foot Bridges (Per Bridge)	
Maintenance	50.00
Construction	1,020.00
Vehicular Access (Per Mile)	
Maintenance	275.00
Construction	10,500.00
Closing Logging Roads (Per Mile)	
Maintenance	75.00
Construction	380.00
Wildlife Clearings (Per Clearing)	
Maintenance	75.00
Construction	380.00
Timber Sale Examination (Per day)	75.00
Information and Education	
Public Media	
Level 1	10,000.00
Level 2	25,000.00
Level 3	45,000.00
Education Program	
Level 1	15,000.00
Level 2	30,000.00
Level 3	48,000.00

Figure 1. Per Unit Costs of Management Activities during the First Year.

Number of Officers	<u>Sq. Miles</u> Officer
16	500
21	400
27	308
33	250
39	210
41	300

Stocking Activities

The only species that has been stocked in the Region during the past 10 years is wild turkey. Stocking programs have resulted in huntable turkey populations throughout most of the Region. However, there are still some areas that represent potentially good habitat that have no turkey populations. A description of these areas is presented and you may institute stocking programs on any area that you feel can support huntable populations.

All birds stocked are live-trapped from areas within the Region and released in late winter, prior to the spring breeding season. The annual report will provide a section that reflects the progress of stocked populations on each area. Any number of birds may be stocked during any year. If you feel that the population on an area has reached a huntable level you may open that area to hunting. When the season is opened on an area, the stocked population will be transferred to the huntable turkey population.

Area 1: Area 1 consists of 30,000 acres of public lands and 27,500 acres of adjoining private lands. Approximately 12,000 acres of the public lands have been cut during the past 10 years. The remainder is rated as fair habitat by game biologists. Much of the private lands has been logged during the last 15 years, but there are some blocks of mature timber remaining. The area affords easy hunter access and would be difficult to patrol.

Area 2: This area contains 42,500 acres of public lands. The terrain is mostly mountainous and access to a major portion of the area is limited. There are many sections covered by mature hardwood stands and some ridges are nearly pure pine. There is some abandoned farm land in the valleys. Approximately 22,700 acres of private lands border the area. Most of the private land is contained in mountain farms.

Area 3: Area 3 contains 21,750 acres of public land that is covered primarily by mature hardwood stands. The public land is almost completely surrounded by privately owned agricultural land. The private lands also contain some timbered areas and mountain pasture. Access to the area is limited to primary and secondary roads.

Area 4: This area contains 23,250 acres of public lands that are covered primarily by mature hardwoods. Approximately 45,000 acres of private lands are intermixed. About one-half of the private land is owned by the Otto Corporation and is open to public hunting. The Otto Corporation harvests timber by clearcutting large blocks, but several stands of mature timber remain at present. Much of the remaining private land is posted. About one-third of this land is in agriculture with the remainder in timber and mountain pasture.

Area 5: This area is located in the most heavily populated part of the Region and contains 21,500 acres of public lands. About 50% of this land has been logged over during the last 10 years. The remainder is covered by mixed hardwood and pine stands. Adjoining the area are 27,525 acres of King Timber Company holdings, open to public hunting and covered by young growth timber.

Foot Access

Foot trails and bridges provide access into isolated areas and allow hunters to escape the heavily hunted sections along main roads. Besides providing many mandays of quality hunting for those who enjoy solitude, the trails have become popular with backpackers and hikers. At present there are 200 miles of trails and 40 bridges in the Region. Foot bridges are constructed mainly to allow easy crossing of streams.

Due to heavy use, trails and bridges should be maintained annually so that necessary repairs are minimal. For all practical purposes, assume that existing trails or bridges not maintained during a given year are no longer useable. Construction of an additional 100 miles of foot trails and 25 foot bridges has been suggested by agency personnel. It is felt that this would help disperse hunters in several sections and provide a more uniform harvest of game over the Region.

Vehicular Access

No other activity has as much impact on mandays of hunting and harvest of game as vehicular access. Well maintained roads provide quick and easy access to public hunting areas. In addition to state primary and secondary roads through public hunting areas, there are 657 miles of all-weather access roads maintained by the game agency. These roads have a 16-foot right of way and are used heavily throughout the year. The roads must receive annual maintenance to remain useable. There are several areas in the Region where additional access roads are needed to provide hunters an opportunity to harvest increasing game populations. Agency personnel have suggested that 75 miles of additional access roads be constructed.

Closing and Seeding Old Logging Roads

Over the past 40 years, a large portion of the publicly owned land has been logged. Approximately 2000 miles of logging roads have been abandoned with no reclamation attempted. Many of these roads were poorly constructed and heavy use by 4-wheel drive vehicles has caused them to be badly rutted

and erosion has set in. Several years ago a program was instituted to close many of these old roads and grass seed was sown. This activity has served several useful purposes. In addition to preventing further erosion, the seeded roads provide food for wildlife, create edge-effect habitat, and provide easy foot access for hunters. To date 810 miles of old logging roads have been closed and seeded.

The roads must be disked and reseeded every 2 or 3 years or they become grown over with brush. For purposes of the game, it is assumed that they must be reseeded every two years to remain useful. One-half of the closed roads must be reseeded annually to maintain the current level of this activity for future years. A majority of the roads that are still open to vehicular travel are badly rutted or washed-out.

Wildlife Clearings

Wildlife clearings provide food for wildlife and create edge-effect habitat that benefits several game species. They are popular with hunters because they generally provide easy access and seem to attract game. Archery hunters are particularly fond of hunting wildlife clearings during early morning and evening hours. The clearings are usually 1 acre in size and must be disked and reseeded frequently to remain useful. For purposes of the game, it is assumed that they must be reseeded every 3 years to be of any value. One-third of the existing clearings must be disked and reseeded annually to maintain the current level of this activity for coming years.

Last year there were 2000 "useful" wildlife clearings in the Region. This seems adequate although some game biologists feel that 50 additional clearings are needed in the southern part of the Region.

Timber Sale Examination

Insuring that timber harvests are conducted in a manner that results in minimal damage to wildlife populations is a major concern of the game agency. This activity is undertaken jointly with the U. S. Forest Service and the State Forestry Department. Timber sale examination involves on-the-site inspections of harvesting activities to prevent excessively large clearcuts, practices leading to erosion, and unnecessary damage to wildlife habitat. Present policy limits the size of clearcuts to 50 acres, and there must be a block of uncut timber of at least 50 acres between clearcuts. Other regulations control road construction, road reclamation after harvest, slash disposal, regeneration, and destruction of den trees. The agency also provides recommendations about these matters for harvests on private lands.

Last year the agency provided 105 mandays for timber sale examination activities. Over the last few years, 4000-5000 acres of timber have been cut annually on public lands, and approximately 15,500 acres of timber have been cut per year on private lands. It is expected that harvests will remain fairly constant for the next 5 years. It has been suggested that the current level of timber sale examination is not adequate to supervise harvests properly. There was some erosion reported on public lands last year and several private timber cutters requesting inspections and recommendations were not provided these services.

Information and Education

Information and education programs are designed to inform the public of agency activities and policies and provide a means of educating the people in situations where necessary management activities are unpopular. There are two distinct programs. The public media program is aimed at informing the people of agency activities and provides information that will aid hunters in planning their outings. The education program is designed to teach hunter safety classes to youngsters, provide personnel and materials for lectures to organizations, and train agency personnel.

A discussion of the possible activities of each program follows.

Public Media

Agency magazine: The magazine is published on a monthly basis by the game agency and many articles are contributed by agency personnel. The magazine contains information about agency activities, reports on success of current seasons and prospects for future seasons, general interest articles, and an editorial section that allows readers to express their thoughts.

Newsletter: A monthly newsletter is released to all newspapers in the Region. It contains information about current seasons, prospects for future seasons, and general interest articles. Harvest figures and population estimates are also provided when available.

Pamphlets: Low cost pamphlets are prepared by agency personnel containing information about agency activities, areas to hunt, hunting methods, and regulations. They are designed to aid the hunter in planning his outings. The pamphlets are distributed free of charge to the general public.

TV and radio programs: Two 5-minute radio programs are prepared for weekly release. The programs are primarily informative and tell the public of agency activities, areas to hunt, prospects for future seasons, and success of current seasons. Four 30-minute television programs are produced and released annually to stations in the Region. The programs can be used to document agency activities and policies, inform the public of timely situations, or may be aired live as called-in question-and-answer sessions.

You may choose from three levels of public media programs.

<u>Level</u>	<u>Activities in Program</u>
1.0	Magazine
2.0	Magazine, newsletter, and pamphlets
3.0	Magazine, newsletter, pamphlets, radio and TV

Indicate your choice by recording the level number in the proper place on the decision form.

Educational programs

Hunter safety classes: It is required by state law that hunter safety classes be presented annually in all secondary schools. The agency must provide materials and personnel to conduct the classes. Law enforcement officers are usually responsible for conducting classes at schools in the counties where they work.

Wildlife education classes: The agency is responsible for maintaining a film library and providing materials and personnel to present lectures on pertinent subjects to school classes, sportsmen's groups, conservation groups, and other interested organizations. The organization must make written application to the agency specifying the date and subject they wish to discuss.

Inservice training: Short courses are conducted primarily for agency personnel. The courses are designed to up-date management techniques, allow exchanges of ideas and philosophies, and prepare agency personnel to improve public relations.

You may choose from three levels of educational programs.

<u>Level</u>	<u>Activities in Program</u>
1.0	Hunter safety course
2.0	Hunter safety, and wildlife education course
3.0	Hunter safety, wildlife education, and inservice training courses

Last year the agency implemented level 2.0 of the public media program and level 1.0 of the educational program.

Game Regulations

Hunting regulations have a tremendous impact on total mandays of hunting and harvest of game populations. The public is sensitive to extreme changes in regulations and may be opposed to needed modifications. This should be kept in mind when structuring information and education programs. Your primary responsibilities regarding hunting regulations will be to set season lengths, type of season, and bag limits for the major game species. Weapon restrictions and use of dogs are controlled by local governmental bodies. State law prohibits Sunday hunting.

Season lengths will be selected from charts (Figures 2-5) containing the possible alternatives for each species. Corresponding to each season length there is a "weighted season length" represented by a number. Record the weighted season length for each species in the proper place on the decision forms. The charts for deer, squirrel, grouse, and rabbit should be self-explanatory. The charts for bear and turkey contain descriptive entries in the "Season Length" column and a series of columns headed by numbers indicating the number of weeks the bear season is concurrent with the deer season. The weighted season length for a particular season is the number found on that same line under the column that shows the concurrency of that season with the deer season. In all charts the

Season Length	Firearms Season	Archery Season
Closed	0	0
6 days	34	30
7 days	38	36
12 days	45	45
13 days	49	49
18 days	54	53
19 days	57	56
4 weeks	59	60
5 weeks	63	65
6 weeks	66	69
7 weeks	68	72
8 weeks	69	74
9 weeks	--	76
10 weeks	--	78
11 weeks	--	79
12 weeks	--	80
13 weeks	--	81
14 weeks	--	82

Figure 2. Weighted season length for white-tailed deer.

Season Length	Weeks Concurrent with Deer Season								
	0	1	2	3	4	5	6	7	8
Closed	0								
6 days	38	60							
7 days	43	65							
12 days	48	69	84						
13 days	52	73	88						
18 days	56	78	92	102					
19 days	59	80	95	104					
4 weeks	64	85	100	109	116				
5 weeks	70	91	106	115	122	128			
6 weeks	74	96	110	120	127	133	139		
7 weeks	79	101	115	125	132	138	145	151	
8 weeks	84	106	120	130	137	143	149	155	161
9 weeks	88	110	124	134	141	146	152	158	164
10 weeks	92	113	127	137	144	150	156	162	168
11 weeks	95	117	131	141	148	154	160	166	172
12 weeks	98	120	134	144	151	157	163	169	175
13 weeks	101	122	137	147	154	160	166	172	178
14 weeks	103	124	139	149	156	162	168	174	180

Figure 3. Weighted season length for black bear.

Weighted Season for Fall Turkey Season

Season Length	Weeks Concurrent with Deer Season								
	0	1	2	3	4	5	6	7	8
Closed	0								
6 days	25	41							
7 days	31	48							
12 days	39	56	69						
13 days	44	61	74						
18 days	50	67	78	89					
19 days	53	69	82	92					
4 weeks	58	75	87	97	105				
5 weeks	64	80	93	103	111	118			
6 weeks	69	85	98	108	116	123	129		
7 weeks	74	90	103	113	121	128	134	139	
8 weeks	77	94	107	117	125	132	138	143	148
11 weeks	81	98	111	121	129	136	142	147	152
12 weeks	84	101	114	124	132	139	145	150	155
13 weeks	86	103	116	126	134	141	147	152	157
14 weeks	88	105	118	128	136	143	149	154	159

Spring Gobbler Season

Season Length	N
Closed	0
6 days	52
7 days	62
12 days	72
13 days	85
18 days	93
19 days	97
4 weeks	106
5 weeks	115
6 weeks	120

Figure 4. Weighted season length for wild turkey.

Season Length	Grouse	Squirrel	Rabbit
Closed	0	0	0
1 week	76	91	70
2 weeks	101	117	93
3 weeks	121	135	114
4 weeks	136	151	133
5 weeks	149	166	149
6 weeks	162	179	163
7 weeks	174	192	177
8 weeks	184	203	189
9 weeks	194	211	200
10 weeks	204	218	212
11 weeks	214	226	224
12 weeks	224	234	233
13 weeks	232	242	240
14 weeks	240	250	247
15 weeks	247	255	252
16 weeks	252	260	256
17 weeks	257	265	261
18 weeks	261	268	264

Figure 5. Weighted season lengths for small game.

length of short seasons (three weeks or less) is expressed in days to reflect the importance of timing on these seasons. A six-day season represents a one-week season opening on Monday and closing the following Saturday, and a seven-day season represents a one-week season opening on a Saturday and closing the following Saturday. Similar interpretations apply for the two- and three-week seasons.

Detailed explanations of the type season and bag limit alternatives are presented in the following discussion of regulations applying to each species. Each alternative will be expressed as a number. Record the number corresponding to your choice on the decision forms.

White-tailed deer

The region supports a healthy, growing deer herd. Biologists estimate the fall population for the current year will be 42,000 animals and recommend that limited either-sex hunting be allowed in the near future. The firearms season has traditionally been bucks only for 12 days. A large portion of the public is opposed to shooting does. An any-deer day was considered two years ago, but rejected because of public opposition. Last year the legal harvest during the firearms season was 4,052 antlered bucks. The archery season was open for 4 weeks last year and an additional 98 animals were harvested. Deer of either sex were legal game.

The bag limit includes deer harvested in both the archery and firearms seasons. For example, a bag limit of 2 deer would mean that a hunter who bags 1 deer during the archery season would be allowed to kill 1 deer during the firearms season. The bag limit has been 1 deer per season since the Region was first opened to deer hunting.

You may choose from the following season types and bag limits for deer.

<u>Type firearms season</u>	<u>Code</u>
Bucks only	1
1 day either sex	2
2 days either sex	3
3 days either sex	4
1 week either sex	5
2 weeks either sex	6
<u>Type archery season</u>	<u>Code</u>
Bucks only	0
Either sex	1

<u>Bag limit</u>	<u>Code</u>
1 deer per season	1
1 deer per day, 2 per season	2
1 deer per day, 3 per season	3
1 deer per day, 4 per season	4
1 deer per day, 5 per season	5

Black bear

The Region contains enough rugged mountain terrain to support a hunt-able bear population. Game biologists estimate the fall population for the current year will be 750 animals. Last year 74 animals were harvested. The season lasted for 8 weeks and only adult bear (greater than 100 lbs. live weight) were legal game. The bag limit has traditionally been one bear per season. Approximately 50% of the harvest occurred during the two-week deer season. Many "die-hard" bear hunters feel that scheduling bear and deer seasons concurrently is unfair to them and demand that the seasons be non-concurrent. A conservation group mounted a drive to completely eliminate bear hunting in the state because of decreasing bear population in two neighboring states. There is no indication that the bear population in the Region is declining.

You may choose from the following alternatives for type season and bag limit.

<u>Type Season</u>	<u>Code</u>
Adult bear only (100 lbs. live weight)	1
Any bear	2

<u>Bag limit</u>	<u>Code</u>
1 per season	1
1 per day, 2 per season	2
1 per day, 3 per season	3
1 per day, 4 per season	4
1 per day, 5 per season	5

Wild Turkey

Due to stocking programs over the last 20 years, huntable turkey populations now exist in most parts of the Region. It is estimated that the current fall population will be 12,750 birds. Last year the fall season was 6 weeks long, 2 weeks concurrent with deer season. Birds of either sex were legal game and the bag limit was two. The legal harvest was 2,500 birds. The spring gobbler season was 19 days long and 267 gobblers were harvested. The bag limit for the spring

season was three gobblers. Birds killed during the fall season are counted in the spring limit. For example, if a hunter kills one turkey in the fall season, he may legally kill two gobblers in the spring.

You may choose from the following alternatives for type season and bag limit.

<u>Type fall season</u>	<u>Code</u>
Either sex	0
Bearded gobblers only	1

<u>Fall bag limit</u>	<u>Code</u>
1 per season	1
1 per day, 2 per season	2
1 per day, 3 per season	3
1 per day, 4 per season	4
1 per day, 5 per season	5

<u>Spring bag limit (bearded gobblers only)</u>	<u>Code</u>
1 per season	1
1 per day, 2 per season	2
1 per day, 3 per season	3
1 per day, 4 per season	4
1 per day, 5 per season	5

Ruffed grouse

The grouse population of the Region fluctuates somewhat from year to year. Last year it was estimated that 35,000 birds were harvested during the 12-week season. The bag limit was 3 per day, and 15 per season. You may choose the bag limit from the following alternatives.

<u>Bag limit</u>	<u>Code</u>
2 per day, 10 per season	1
3 per day, 15 per season	2
3 per day	3
4 per day, 20 per season	4
4 per day	5

5 per day, 25 per season 6

5 per day 7

Gray squirrel

Squirrel is the most popular game species in the Region. Last year the season opened in mid-September and ran for 16 weeks. This provided many additional mandays of hunting over the traditional November opening date. Game biologists insist that no significant damage was inflicted on the squirrel population by the early season and predict a good fall population (2,000,000) for the current year. The bag limit was 6 per day, 75 per season, and an estimated 600,000 squirrels were harvested. There was some negative public reaction to the early season opening. Many had reservations about shooting lactating females, some expressed dissatisfaction over shooting animals infested with warbles, and others thought it was too hot.

The following alternatives are presented for setting type season and bag limit for squirrel.

<u>Type season</u>	<u>Code</u>
September opening	0
October or later opening	1
<u>Bag limit</u>	<u>Code</u>
5 per day, 40 per season	1
5 per day, 50 per season	2
6 per day, 60 per season	3
6 per day, 75 per season	4
8 per day, 80 per season	5
8 per day, 100 per season	6

Cottontail rabbit

The cottontail rabbit is second only to squirrel in popularity among hunters. It is estimated that 300,000 rabbits were harvested last year. The season was 10 weeks long and the bag limit was 6 per day, 75 per season. You may choose the bag limit for rabbit from the following alternatives:

<u>Bag limit</u>	<u>Code</u>
5 per day, 50 per season	1
5 per day, 60 per season	2
6 per day, 60 per season	3

<u>Bag limit</u>	<u>Code</u>
6 per day, 75 per season	4
8 per day, 80 per season	5
8 per day, 100 per season	6

SAMPLE PROBLEM

A sample run of the Wildlife Management Planning Game is presented to illustrate operation of the game. The five-year operating plan and annual implementation schedule, annual budget allocation report, and annual report for the first year are included.

Management Activities Form

Activity	Level for Year				
	1	2	3	4	5
Land Acquisition (Acres)					
Private Accessible Lands	1,000	1,000	1,000	1,000	1,000
Private Posted Lands	1,200	1,200	1,200	1,200	1,200
Law Enforcement (No. officers)	15	16	17	18	19
Turkey Stocking (No. birds)					
Area 1	20	20	20	0	0
Area 2	0	0	0	0	0
Area 3	25	25	25	25	0
Area 4	30	30	30	0	0
Area 5	0	0	0	0	0
Foot Trails (Miles)					
Maintenance	200	205	210	215	220
Construction	5	5	5	5	5
Foot Bridges (No.)					
Maintenance	40	42	44	46	48
Construction	2	2	2	2	2
Vehicular Access (Miles)					
Maintenance	657	663	668	668	668
Construction	6	5	5	0	0
Closing Logging Roads (Miles)					
Maintenance	405	405	405	405	405
Construction	0	0	0	0	0
Wildlife Clearings (No.)					
Maintenance	666	666	666	666	666
Construction	0	0	0	0	0
Timber Sale Exam. (Days)	110	115	120	125	125
Information and Ed. (Level)					
Public Media	2.0	2.0	2.0	2.0	2.0
Education Program	2.0	2.0	2.0	2.0	2.0

Game Regulations Form

Season	Weighted Season Length for Year					Type Season for Year					Bag Limit for Year				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Firearms Deer	45	45	45	45	45	2	2	2	2	2	1	1	1	1	1
Archery Deer	60	60	60	60	60	1	1	1	1	1	--	--	--	--	--
Fall Turkey	98	98	98	98	98	0	0	0	0	0	2	2	2	2	2
Spring Gobbler	97	97	97	97	97	--	--	--	--	--	3	3	3	3	3
Black Bear	120	120	120	120	120	1	1	1	1	1	1	1	1	1	1
Ruffed Grouse	224	224	224	224	224	--	--	--	--	--	2	2	2	2	2
Gray Squirrel	260	260	260	260	260	0	0	0	0	0	1	1	1	1	1
Cottontail Rabbit	233	233	233	233	233	--	--	--	--	--	1	1	1	1	1

Management Activities Form

Activity	Level	Per Unit Cost	Total Cost
Land Acquisition (Acres)			
Private Accessible Lands	1,000	\$ 75.00	\$ 75,000.00
Private Posted Lands	1,200	75.00	90,000.00
Law Enforcement (No. officers)	15	15,000.00	225,000.00
Turkey Stocking (No. birds)			
Area 1	20	50.00	1,000.00
Area 2	0	50.00	
Area 3	25	50.00	1,250.00
Area 4	30	50.00	1,500.00
Area 5	0	50.00	
Foot Trails (Miles)			
Maintenance	200	50.00	10,000.00
Construction	5	1250.00	6,250.00
Foot Bridges (No.)			
Maintenance	40	50.00	2,000.00
Construction	2	1,020.00	2,040.00
Vehicular Access (Miles)			
Maintenance	657	275.00	180,675.00
Construction	6	10,500.00	63,000.00
Closing Logging Roads (Miles)			
Maintenance	405	75.00	30,375.00
Construction	0	380.00	
Wildlife Clearings (No.)			
Maintenance	666	75.00	49,950.00
Construction	0	380.00	
Timber Sale Exam. (Days)	110	75.00	8,250.00
Information and Ed. (Level)			
Public Media	2.0	25,000.00	25,000.00
Education Program	2.0	30,000.00	30,000.00

Game Regulations Form

Season	Weighted Season Length	Type Season	Bag Limit
Firearms Deer	45	2	1
Archery Deer	60	1	--
Fall Turkey	98	0	2
Spring Gobbler	97	--	3
Black Bear	120	1	1
Ruffed Grouse	224	--	2
Gray Squirrel	260	0	1
Cottontail Rabbit	233	--	1

Seasons for Turkey on Stocked Areas

<u>Area</u>	<u>Season Code*</u>
1	<u>0</u>
2	<u>0</u>
3	<u>0</u>
4	<u>0</u>
5	<u>0</u>
<u>*Season</u>	<u>Code</u>
Closed	0
Open	1

Player No. 1
 Year 1

Annual Budget Allocation Report

Activity	Total Expenditures
Land Acquisition	\$ 165,000.00
Law Enforcement	225,000.00
Turkey Stocking	3,750.00
Foot Trails	16,250.00
Foot Bridges	4,040.00
Vehicular Access	243,675.00
Closing Logging Roads	30,375.00
Wildlife Clearings	49,950.00
Timber Sale Exam.	8,250.00
Information and Ed.	55,000.00
Total Expenditures	\$ 801,290.00
Allowable Budget	\$ 802,500.00
Surplus Fund*	1,210.00

** WILDLIFE MANAGEMENT PLANNING GAME **

* ANNUAL REPORT *

PLAYER NUMBER 1

RUN 1

MANAGEMENT ACTIVITY REPORT

ACTIVITY CODE	LEVEL	COST/UNIT
EXISTING FOOT TRAILS	200.	50.00
NEW FOOT TRAILS	5.	1250.00
EXISTING FOOT BRIDGES	40.	50.00
NEW FOOT BRIDGES	2.	1020.00
EXISTING ACCESS ROADS	657.	275.00
NEW ACCESS ROADS	6.	10500.00
EXISTING SEEDED ROADS	810.	75.00
NEW SEEDED ROADS	0.	380.00
EXISTING WILDLIFE CLEARINGS	1998.	75.00
NEW WILDLIFE CLEARINGS	0.	380.00
TIMBER SALE EXAMINATION	110.	75.00
PUBLIC MEDIA PROGRAM	2.	25000.00
EDUCATION PROGRAM	2.	30000.00

LAW ENFORCEMENT

NO. OF OFFICERS	15	COST/OFFICER	15000.00
ESTIMATED ILLEGAL KILL			
SPECIES	(PER CENT OF LEGAL HARVEST)		
DEER	0.25		
BEAR	0.13		
TURKEY	0.13		

TURKEY STOCKING PROGRAM

AREA	NO. STOCKED LAST YEAR	ESTIMATED SPRING POP.	SEASON CODE
1	20.	13.	0
2	0.	0.	0
3	25.	24.	0
4	30.	37.	0
5	0.	0.	0

LAND ACQUISITION REPORT

OWNERSHIP CLASS	ACRES PURCHASED	COST/ACRE
PRIVATE ACCESSIBLE	1000.	75.00
PRIVATE POSTED	1200.	75.00

PRESENT OWNERSHIP PATTERN:

OWNERSHIP CLASS	ACRES
PUBLIC	746083.
PRIVATE ACCESSIBLE	1094705.
PRIVATE POSTED	905426.

LAND AVAILABLE FOR PURCHASE NEXT YEAR:

	ACRES
PRIVATE ACCESSIBLE	8287.
PRIVATE POSTED	6752.

SPECIES POPULATION SUMMARY

SPECIES	ESTIMATED FALL POPULATION	HARVEST
DEER, GUN		
BUCK	10301.	4301.
DOE	17938.	922.
FAWN	12362.	729.
TOTAL	40601.	5952.
DEER, BOW		
BUCK		27.
DOE		47.
FAWN		32.
TOTAL		105.
TURKEY		
FALL	11757.	2589.
SPRING		403.
BEAR		
ADULT	615.	62.
CUB	117.	0.
TOTAL	732.	62.
GROUSE	194243.	31891.
SQUIRREL	2285835.	696001.
RABBIT	587904.	295409.

HUNTING REGULATION SUMMARY

SEASON	TYPE SEASON	BAG LIMIT	SEASON LENGTH
DEER, GUN	2	1	45.
DEER, BOW	1		60.
TURKEY, FALL	0	2	98.
TURKEY, SPRING		3	97.
BEAR	1	1	120.
GROUSE		2	224.
SQUIRREL	0	1	260.
RABBIT		1	233.

MAN-DAYS OF HUNTING

SEASON	NO. OF HUNTERS	MAN-DAYS
DEER, BOW	11988.	62870.
DEER, GUN	47708.	233003.
TURKEY, FALL	19561.	113408.
TURKEY, SPRING	8190.	31095.
BEAR	4392.	22666.
GROUSE	16439.	61760.
SQUIRREL	55550.	446161.
RABBIT	42814.	271781.

PUBLIC REACTION TO MANAGEMENT POLICIES

THE PUBLIC HAS EXPRESSED CONCERN OVER TIMBER CUTTING PRACTICES IN THE REGION. HUNTERS ARE OPPOSED TO ANY CUTTING THAT LEADS TO HABITAT DAMAGE. ENVIRONMENTAL GROUPS ARE UPSET BECAUSE OF EROSION AND DESTRUCTION OF SCENIC AREAS. IN ALL, 3675. LETTERS OR CALLS WERE RECEIVED CONCERNING THIS MATTER.

SEVERAL PETITIONS HAVE BEEN RECEIVED FROM SPORTSMANS GROUPS ENCOURAGING THAT THE ARCHERY SEASON BE LENGTHENED. GAME BIOLOGISTS FEEL THAT A LONGER ARCHERY SEASON WOULD HAVE LITTLE, IF ANY, ADDITIONAL IMPACT ON THE DEER POPULATION.

BEAR HUNTERS FEEL THAT DEER AND BEAR SEASONS SHOULD NOT BE SCHEDULED CONCURRENTLY. 2393. COMPLAINTS OR LETTERS WERE RECEIVED ABOUT THIS MATTER.

THE OPENING OF SQUIRREL SEASON IN SEPTEMBER HAS BEEN CRITICIZED BY THE PUBLIC. MANY OBJECT TO SHOOTING LACTATING FEMALES OR ANIMALS INFECTED WITH WARBLER.

5568. LETTERS ABOUT THIS MATTER WERE RECEIVED.

FINANCIAL REPORT

THIS YEARS ALLOWABLE BUDGET:	802500.00
THIS YEARS TOTAL EXPENDITURES:	801290.00
THIS YEARS SURPLUS FUNDS:	1210.00
NEXT YEARS ALLOWABLE BUDGET:	824599.10

NEXT YEARS MANAGEMENT ACTIVITY COSTS

ACTIVITY	COST PER UNIT
LAND ACQUISITION	77.25
LAW ENFORCEMENT	15374.99
TURKEY STOCKING	51.60
FOOT TRAILS (MAIN.)	51.50
FOOT TRAILS (CONST.)	1291.25
FOOT BRIDGES (MAIN.)	51.15
FOOT BRIDGES (CONST.)	1050.60
ACCESS ROADS (MAIN.)	284.90
ACCESS ROADS (CONST.)	10888.50
RESEEDING CLOSED ROADS	77.25
CLOSING AND SEEDING OLD ROADS	391.02
RESEEDING WILDLIFE CLEARINGS	77.25
CONSTRUCTION OF NEW WILDLIFE CLEARINGS	391.40
TIMBER SALE EXAMINATION	77.25
PUBLIC MEDIA 1	10300.00
PUBLIC MEDIA 2	25749.99
PUBLIC MEDIA 3	46349.98
ED. PROGRAM 1	15449.99
ED. PROGRAM 2	30869.98
ED. PROGRAM 3	48362.96

