

The Wildlife Management Planning Game: Administrative Manual



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THE WILDLIFE MANAGEMENT PLANNING GAME:
ADMINISTRATIVE MANUAL

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SUMMARY

This is the second part of a two-phase report dealing with the Wildlife Management Planning Game. The first part, "Instructions to Participants," contains an introduction to simulation gaming and describes the game itself. The primary purpose of this manual is to provide operating information for the game administrator. Copies of both manuals along with a program deck and deck listing may be acquired from the Division of Forestry and Wildlife Resources, VPI & SU, as long as supplies last.

The computer requirements include either FORTRAN IV or WATFIV Compiler capability. A run of the game for a single player requires 87 K bytes of storage. The compilation time required is 0.5 seconds and execution time is approximately 10.0 seconds for each player.

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INTRODUCTION

This manual has a twofold purpose: (1) to provide operating information for the game administrator, and (2) to provide documentation of the FORTRAN IV program which is the basis of the Wildlife Management Planning Game. It is assumed that the reader is already familiar with the manual entitled "Instructions to Participants." It provides the player with an introduction to computer simulation and describes the game itself.

The Wildlife Management Planning Game provides the participant with an opportunity to make decisions in an environment of complex relationships and uncertainties. Enthusiasm and motivation in the learning experience are enhanced when the player can view the future outcome of his policy decisions and revise them with the aid of his increased "experience." Players should be allowed opportunities for policy revision and reruns during the gaming session. This allows the player to fully interpret results and formulate policy variations in an effort to improve his plan. After each play of the game, group discussions should be encouraged so that the player can benefit from the experiences of fellow students.

The duties and responsibilities of the game administrator are summarized as follows:

1. Provide an area for conducting the session that is well-lighted and comfortable.
2. Distribute "Instructions to Participants," decision forms, and pencils to players.
3. After the players have read the instructions, answer any questions that might arise. It should be stressed that the output of any simulation model is an approximation to reality and not necessarily what actually happens in the real system.
4. Assign each player an identification number. This number will identify the Annual Reports printed by the computer.
5. Collect Annual Implementation Schedules for run number one. The player should retain all other forms.
6. Prepare data deck 2 for each player and make the computer run.
7. Distribute the Annual Reports to the players and conduct a group discussion of the results.

8. Allow the players to modify the Five-Year Operating Plan and submit the Annual Implementation Schedule for run 2.
9. Repeat steps 6, 7 and 8 for runs 2, 3, 4 and 5.
10. After the final play of the game, conduct a group discussion of the ramifications of management policies over the 5-year period.

PROGRAM DETAILS AND OPERATING INSTRUCTIONS

The program underlying the Wildlife Management Planning Game is written in FORTRAN IV. It consists of a controlling main program and 13 subroutines. A flow chart is presented in Figure 1 to illustrate the linkage between the main program and the subroutines. A complete program deck listing will aid in understanding the model. Variable definitions are contained throughout the program and are presented in the program segment where they first enter the model. A copy of the program deck listing may be obtained from the Division of Forestry and Wildlife Resources at Virginia Tech.

The Wildlife Management Planning Game was developed and tested at the Virginia Tech Computer Center on the IBM/370 computer. The program is written in FORTRAN IV, a general purpose programming language. The program requires two types of data decks for each player. A main program data card is also required for each play of the game. The order of the job control cards, program deck, main program data card, and player data decks as they enter the compiler is illustrated in Figure 2.

The overall operation of the game is shown in Figure 3. As can be seen in this figure, a large portion of the input for one particular run is produced from the previous run.

Main Program Data Card Format

A main program data card is required for each play of the game. It precedes the player data decks and is read by the main program. The following format is to be used when preparing this card.

Symbol	Format	Column	Meaning
NPLY	I5	1-5	The number of the current play.
N	I5	6-10	The number of players.
ISEED	I10	11-20	The seed for the random number generator (any odd 5 digit number.)

Be sure that all values punched on this card are right justified. A different ISEED should be randomly chosen before each play.

Data Deck 1 Format

Data deck 1 contains the exogenous variables or conditions that are not under the direct control of the player. These conditions are determined by the performance of the system during the previous play. When the computer program is run, the cards for data deck 1 are automatically

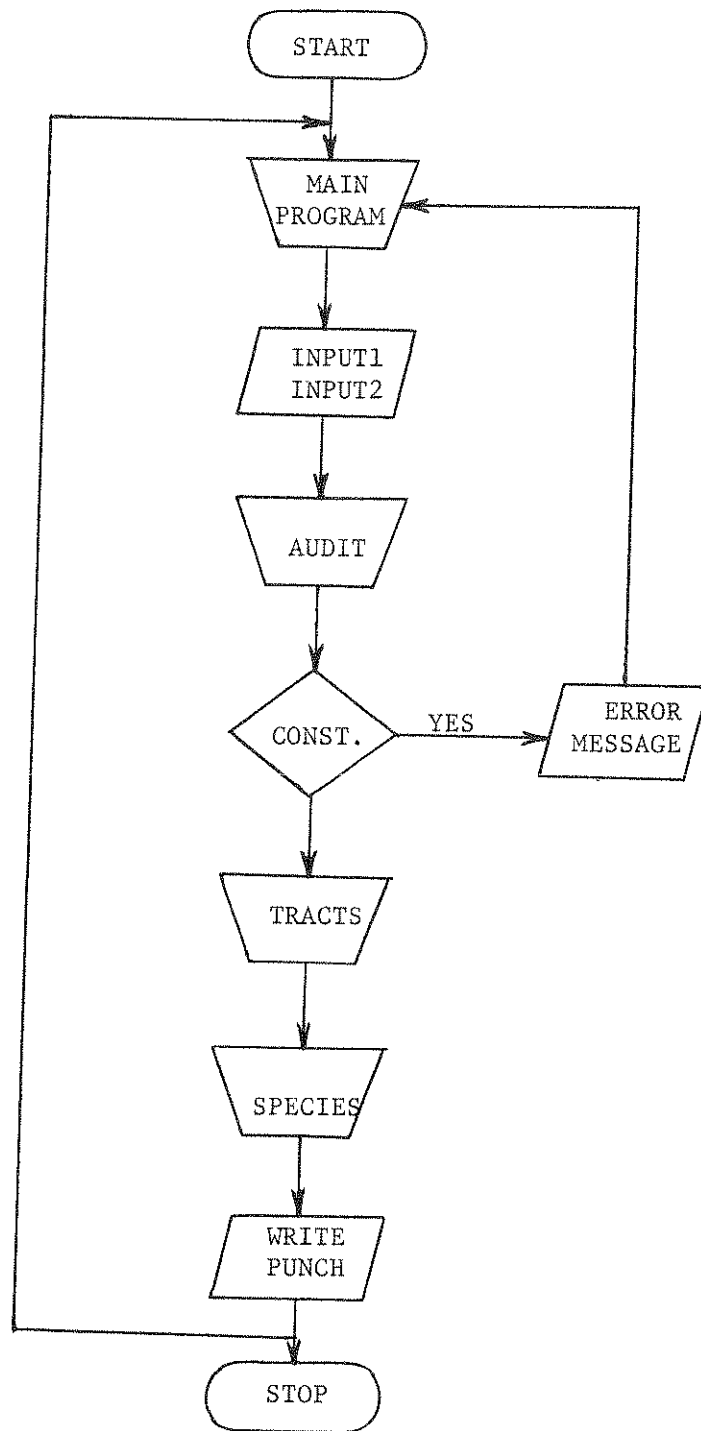


Figure 1. Flow chart showing linkage between main program and subroutines.

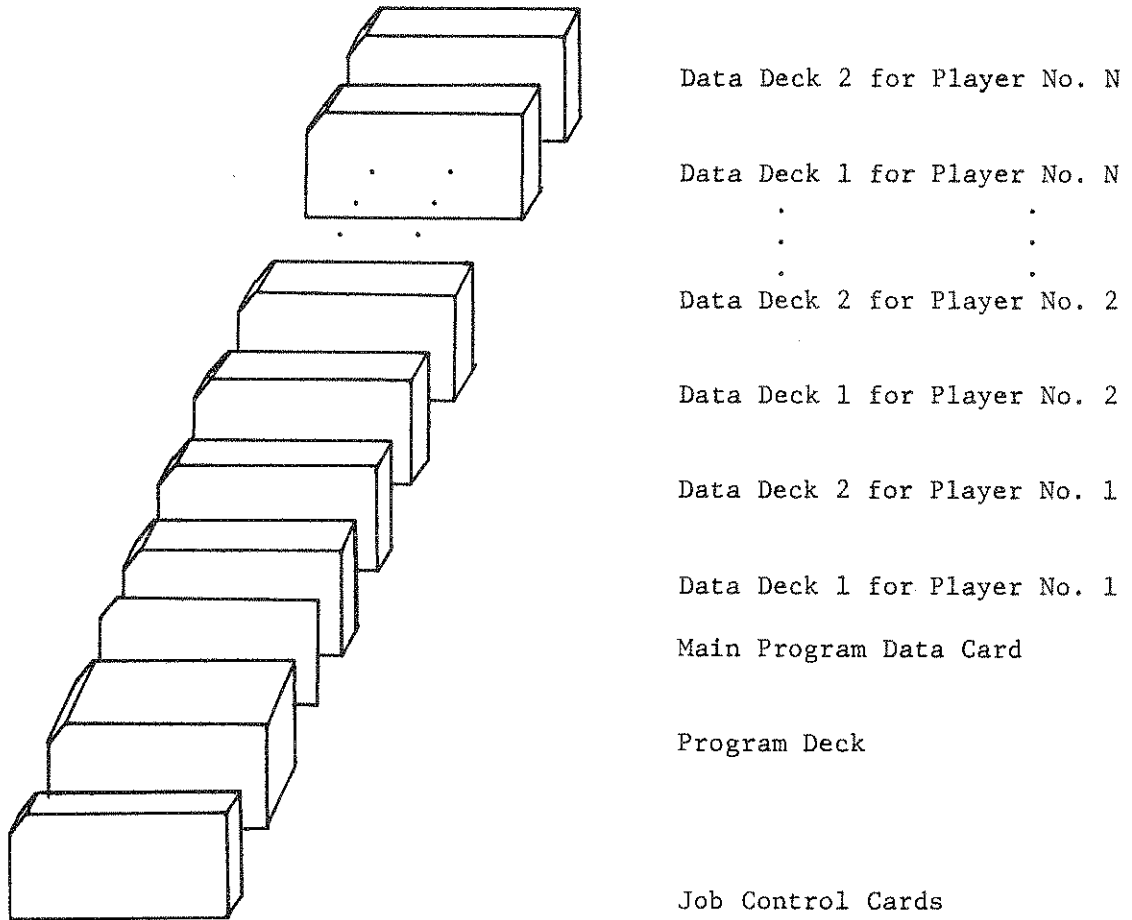


Figure 2. Card input order for the Wildlife Management Planning Game.

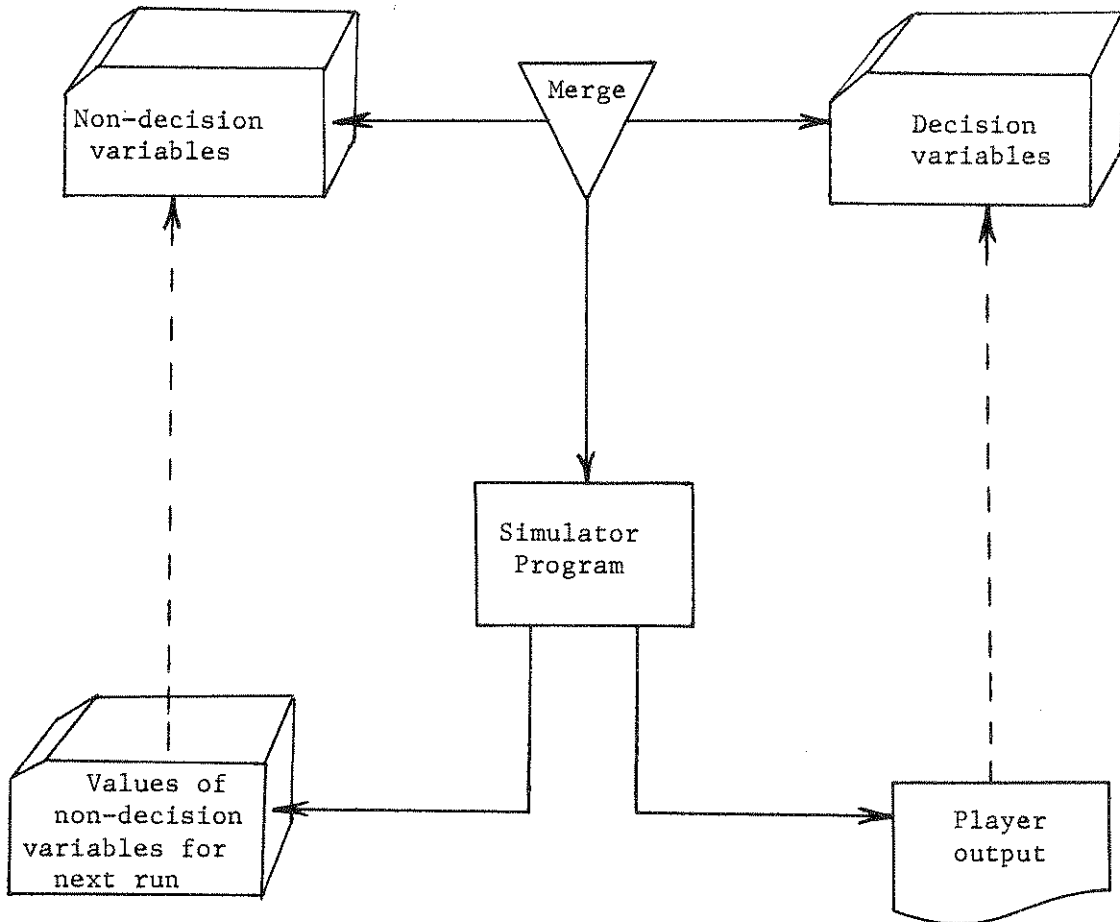


Figure 3. Overview of the operation of the Wildlife Management Planning Game.

punched by the machine. The initial exogenous data are the same for all players, and copies of data deck 1 are provided for the first play of the game.

The following description of the 19 cards in data deck 1 is presented to facilitate understanding of the model. The format for each variable is given as it is punched by subroutine PUNCH.

Card	Symbol	Format	Column	Meaning
1	BUDGET	F20.0	1-20	The total budget allocations for next year.
2	C(I)	9F8.2	1-72	The cost of activity I for next year where I = 1 through 9
3	C(I)	9F8.2	1-72	The cost of activity I for next year where I = 10 through 18.
4	C(I)	2F8.2	1-16	The cost of activity I for next year where I = 19 and 20.
5	BUCK	F10.0	1-10	The pre-fawning season buck population for next year.
	DOE	F10.0	11-20	The pre-fawning season doe population for next year.
	FAWN	F10.0	21-30	The pre-fawning season fawn population for next year.
	DGSI	F10.6	31-40	The percent success 1 year ago for gun deer hunters.
	DGS2	F10.6	41-50	The percent success 2 years ago for gun deer hunters.
	DBS1	F10.6	51-60	The percent success 1 year ago for bow deer hunters.
	DBS2	F10.6	61-70	The percent success 2 years ago for bow deer hunters.
6	DEG(I)	F15.10	1-60	The effect of timber sale examination I years ago on mandays of deer gun hunting where I = 1 through 4.
7	DEB(I)	F15.0	1-60	The effect of timber sale examination I years ago on mandays of bow deer hunting where I = 1 through 4.

Card	Symbol	Format	Column	Meaning
8	BEG(I)	F15.10	1-60	The effect of timber sale examination I years ago on mandays of bear hunting where I = 1 through 4.
9	GEG(I)	F15.10	1-60	The effect of timber sale examination I years ago on mandays of grouse hunting where I = 1 through 4.
10	REG(I)	F15.10	1-60	The effect of timber sale examination I years ago on mandays of grouse hunting where I = 1 through 4.
11	SEG(I)	F15.10	1-60	The effect of timber sale examination I years ago on mandays of squirrel hunting where I = 1 through 4.
12	DUMF(I)	F15.10	1-60	The effect of timber sale examination I years ago on mandays of fall turkey hunting where I = 1 through 4.
13	DUMS(I)	F15.10	1-60	The effect of timber sale examination I years ago on mandays of spring gobbler hunting where I = 1 through 4.
14	BEAR	F10.0	1-10	The number of adult and yearling bear leaving hibernation.
	BSI	F10.6	11-20	The percent success of bear hunters 1 year ago.
	BS2	F10.6	21-30	The percent success of bear hunters 2 years ago.
	GROUSE	F10.0	31-40	The spring grouse population.
	GSI	F10.6	41-50	The percent success of grouse hunters 1 year ago.
	GS2	F10.6	51-60	The percent success of grouse hunters 2 years ago.

Card	Symbol	Format	Column	Meaning
15	SQURL	F10.0	1-10	The spring squirrel population.
	SSI	F10.6	11-20	The percent success of squirrel hunters 1 year ago.
	SS2	F10.6	21-30	The percent success of squirrel hunters 2 years ago.
	RABIT	F10.0	31-40	The spring rabbit population.
	RSI	F10.6	41-50	The percent success of rabbit hunters 1 year ago.
	RS2	F10.6	51-60	The percent success of rabbit hunters 2 years ago.
16	TSBP	F10.0	1-10	The spring turkey population.
	PFSI	F10.6	11-20	The percent success of fall turkey hunters 1 year ago.
	PFS2	F10.6	21-30	The percent success of fall turkey hunters 2 years ago.
	PSSI	F10.6	31-40	The percent success of spring gobbler hunters 1 year ago.
	PSS2	F10.6	41-50	The percent success of spring gobbler hunters 2 years ago.
17	PALAND	F10.0	1-10	The acres of public accessible lands available for purchase next year.
	PPLAND	F10.0	11-20	The acres of private posted lands available for purchase next year.
	A(1)	F10.0	21-30	The acres of public owned lands at the end of this year.
	A(2)	F10.0	31-40	The acres of private accessible lands at the end of this year.
	A(3)	F10.0	41-50	The acres of private posted lands at the end of this year.
18	TSPOP(I)	F10.0	1-50	The spring turkey population on stocked area (I) where I=1 through 4.
19	AM(I)	F10.0	1-50	The maximum values of maintenance activities for next year.

Data Deck 2 Format

Data deck 2 contains the endogenous or decision variables controlled by the player. A complete description of each of the 9 cards contained in data deck 2 is presented to aid in preparation of the cards. The data for this deck can be coded directly from the Annual Implementation Schedule. The format for the data contained in this deck is designed to prevent problems of right justification. Be sure to punch a decimal point for all real numbers. Integer values will have to be right justified if the field occupies more spaces than the number. An example of a code sheet for the sample problem found in "Instructions to Participants" is presented in Figure 4.

Card	Symbol	Format	Column	Meaning
1	BUYPAL	F20.0	1-20	The acres of private accessible land purchased.
	BUYPPL	F20.0	21-40	The acres of private posted land purchased.
	NLAW	I10	41-50	The number of law enforcement officers.
2	TSTOCK(1)	5F10.0	1-50	The number of turkeys stocked on Area (I) where I = 1 through 5.
3	A(4)	F10.0	1-10	The miles of existing foot trails that receive annual maintenance.
	A(5)	F10.0	11-20	The miles of new foot trails constructed.
	A(6)	F10.0	21-30	The number of foot bridges that receive annual maintenance.
	A(7)	F10.0	31-40	The number of new foot bridges constructed.
	A(8)	F10.0	41-50	The miles of access roads that receive annual maintenance.
	A(9)	F10.0	51-60	The miles of new access roads constructed.
	A(10)	F10.0	61-70	The miles of logging roads that are reseeded.

Card	Symbol	Format	Column	Meaning
4	A(11)	F10.0	1-10	The miles of logging roads closed and seeded.
	A(12)	F10.0	11-20	The number of wildlife clearings that are disked and reseeded.
	A(13)	F10.0	21-30	The number of new wildlife clearings constructed.
	A(14)	F10.0	31-40	The mandays of timber sale examination.
	A(15)	F10.0	41-50	The level of the public media program.
	A(16)	F10.0	51-60	The level of the educational program.
5	DGN	F10.0	1-10	The weighted season length for the firearms deer season.
	LAWD	I10	11-20	The type firearms deer season.
	IBAGD	I10	21-30	The bag limit for deer.
	DBN	F10.0	31-40	The weighted season length for the archery deer season.
	LAWDB	I10	41-50	The type archery deer season.
6	TFN	F10.0	1-10	The weighted season length for the fall turkey season.
	LAWTF	I10	11-20	The type fall turkey season.
	IBAGTF	I10	21-30	The bag limit for the fall turkey season.
	TSN	F10.0	31-40	The weighted season length for the spring gobbler season.
	IBAGTS	I10	41-50	The bag limit for the spring gobbler season.
7	BN	F10.0	1-10	The weighted season length for the bear season.

Card	Symbol	Format	Column	Meaning
	LAWB	I10	11-20	The type bear season.
	IBAGB	I10	21-30	The bag limit for bear.
	GN	F10.0	31-40	The weighted season length for grouse.
	IBAGG	I10	41-50	The bag limit for grouse.
8	SN	F10.0	1-10	The weighted season length for squirrel.
	LAWS	I10	11-20	The type squirrel season.
	IBAGS	I10	21-30	The bag limit for squirrel.
	RN	F10.0	31-40	The weighted season length for rabbit.
	IBAGR	I10	41-50	The bag limit for rabbit.
9	IOPNTS(I)	5I5	1-25	The code for season openings on Area (I) stocked with turkey where I = 1 through 5.

IBM

FORTRAN Coding Form

PROGRAM PROGRAMMER	DATE	RENCING INSTRUCTIONS	GRAPHIC PUNCH	PAGE OF	CARD ELECTRO NUMBER
<i>Data Deck 2 for year No. 1</i>					
<i>Player No. 1</i>					

STATEMENT NUMBER	CONT	FORTRAN STATEMENT		IDENTIFICATION SEQUENCE
1	2	3	4	5
1		1000.0		
2		20.0		
3		200.0		
4		0		
5		45.0		
6		98.0		
7		120.0		
8		160.0		
9		0		
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* A reference code for IBM Electro 888157. It is available for purchasing statement from this form.

** Number of forms per pad may vary slightly

