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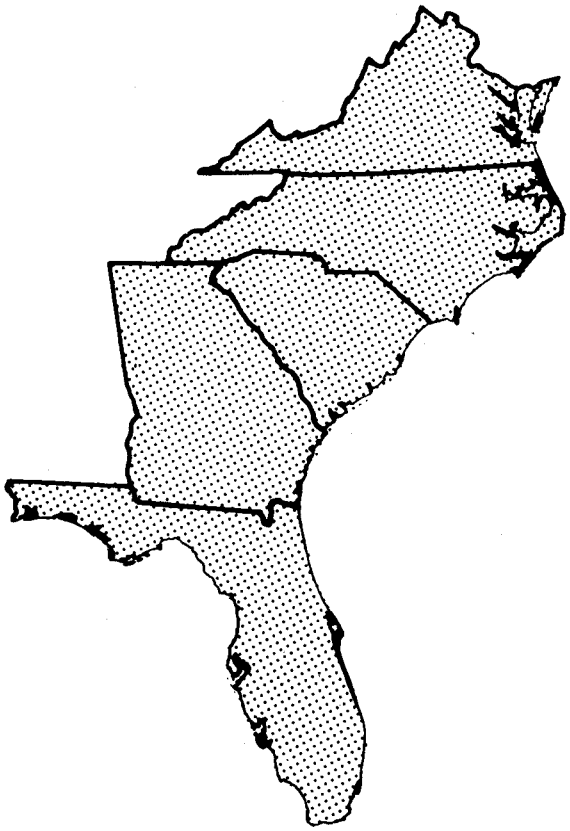
RECAL:

A Computer Program for Selecting Sample Days for Recreation Use Estimation

by D. L. Erickson, C. J. Liu, H. K. Cordell, and W. L. Chen



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A Computer Program for Selecting Sample Days for Recreation Use Estimation

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ABSTRACT.--Recreation Calendar (RECAL) is a computer program in PL/I for drawing a sample of days for estimating recreation use. With RECAL, a sampling period of any length may be chosen; simple random, stratified random, and factorial designs can be accommodated. The program randomly allocates days to strata and locations.

Federal and State land management agencies must regularly and reliably estimate visitor use of recreation areas under their control. Only in this way can funds be appropriately allocated among recreation areas and needs for expansion discovered. Various methods of data collection and analysis are employed, depending upon the sorts of information needed, but most methods require observation on a certain number of randomly selected days. This report describes a computer program for random selection of sampling days.

The program, called RECAL, is written in PL/I. The Appendix of this report contains a complete listing of RECAL. This program is designed to accommodate simple random sampling in which all days are treated alike, stratified random sampling in which high use days and low use days are placed in different strata, or factorial designs. The program can produce:

1. A Gregorian calendar for the sampling period desired.[2/]

2. A schedule of sample days by calendar day, day of the week, and site location.

3. The number and percentage of sample days allocated to each location and stratum.

Program Input

To use RECAL, two decisions must be made--the length of sampling period and the sampling design. The sampling period can be as long or short as desired, but it must be continuous.

[2/] The construction of the Gregorian calendar is based on formulas given by H. E. Licks, 1917, Recreations in mathematics. D. Van Nostrand Co., New York, 155 p.

In selecting the sampling design, strata and sampling intensity must be specified. Recreation use in RECAL may be conveniently divided into two strata: stratum A (heavy use days) and stratum B (light use days). A simple random sampling will be performed within each stratum according to the sampling intensity specified. A particular day chosen for sampling will then be randomly allocated to a sampling location.

Control Cards

One control card and one or more name cards are required. Each data field should be separated by one or more blank columns. Table 1 shows an example of the input cards required.

Field Number One is named START. It specifies the beginning of the sampling period by up to two-digit codings for month and day of the month, and a four-digit coding for the year, in that order. Each is separated from the others by either a comma or a blank.

Field Number Two, named END, specifies the ending date of the sampling period. It is coded the same as Field Number One.

Field Number Three, named LOC, specifies the total number of sampling locations.

Field Number Four, named LEVEL, defines the stratum or the level of use for the particular day of the week. In the program, the first day of the week is designated as Sunday and the last day as Saturday. Users should code the digit 0 to designate a heavy use day and the digit 1 a light use day. Days of the week are separated by commas and are coded in order. When simple random sampling design is desired, all days should be coded by 0's.

Field Number Five, named MODEL, specifies the particular sampling design to be used. Code 1 for simple random sampling, 2 for stratified random sampling, and 3 for factorial design.

Field Number Six is named INTEN. The coding of this field depends on the particular sampling design:

1. Simple random sampling--To indicate the sampling intensity, the user may choose to use either the sample size or the percentage of the population to be sampled. For example, a sampling intensity of 20 percent would be coded in INTEN as .20, while the sample size will be coded as an integer.

2. Stratified random sampling--Coding is the same as simple random sampling.

3. Factorial design--INTEN is coded by the total number of sample days as a negative integer variable (*e.g.*, -20). This number should be divisable by the number of sample locations since an equal number of observations is assumed for the factorial design.

Field Number Seven is named CALDR. If specified, the program will produce a Gregorian calendar of the years covering the sampling period. Code 1 if yes, 0 if no.

Field Number Eight is called NAME. If specified, the program will produce a listing of the names of the sampling locations. Code 1 if yes and 0 if no.

Field Number Nine is called HEAVY. This field allows the user to designate other known heavy use days (*e.g.*, national holidays, local festivals) not covered by Field Number Four. If no heavy use days occur during the specified sampling period, the user should code the field 0 (zero).

Name Cards

For inputing names, location names must be coded in quotation marks and separated by blanks (table 1). The name cards should follow the control card.

Heavy Use Cards

The specific dates of expected heavy use days should be coded on Heavy Use Cards that follow the Name Card in the input stream (table 1). Each expected heavy use day is coded by either a one- or two-digit number for the month and for the day of the month, and a four-digit number for the year, in that order. Two or more heavy use days are separated by blanks.

Program Output

The program uses a random number generator to select the sample days, and randomly allocates these days to different locations. An example of the RECAL program output is shown in table 2.

The program first prints out a summary of the sampling plan, which verifies the input specified on the control card. In this example, the user has chosen a stratified random sampling with a period starting on November 29, 1979, and ending on January 30, 1980. Stratum A defines the heavy use days and stratum B defines the light use days. The number of available sampling days for each stratum is printed and each stratum will be sampled at an intensity of 20 percent. There are six sampling locations. Based on the number of available days in each stratum, 4 heavy use days and 9 light use days were chosen. Each of these days were randomly allocated to one of the six locations.

The program then prints out a sampling schedule. In the sampling schedule, the sample days are listed sequentially by calendar date, day of the week, and location. Optionally, the name of the location can be printed.

Following the sampling schedule, a printout of the number and percentage of sample days allocated to the specified locations and to each stratum is given.

Table 1.--An example of input cards for RECAL

Control Card Format

Field Number	Field Name	Code	Explanation of Code
1	START	11,29,1979	Starting date is Nov. 29, 1979
2	END	1,30,1980	Ending date is Jan. 30, 1980
3	LOC	6	Six sampling locations
4	LEVEL	0,1,1,1,1,1,0	Heavy use days are Sun. and Sat. Light use days are Mon., Tues., Wed., Thurs., and Fri.
5	MODEL	2	Stratified random sampling
6	INTEN	.20	Sampling intensity is 20%
7	CALDR	0	No calendar printed
8	NAME	1	Print location names
9	HEAVY	1	One heavy use day specified

Control Card Image

11,29,1979 1,30,1980 6 0,1,1,1,1,1,0 2 .20 0 1 1

Name Card Images

'Road 23' 'Pine Ridge' 'Tunnel Ridge Road' 'CCC Camp'
'Koomer Ridge' 'Nada Tunnel'

Heavy Use Card Image

12,25,1979

Table 2.--An example of RECAL output

```
*******************************
*   SUMMARY OF SAMPLING PLAN   *
* FOR STRATIFIED RANDOM SAMPLE *
*******************************

  SAMPLING PERIOD:  NOV 29 1979-JAN 30 1980
  DEFINITION OF STRATA
            STRATUM A:  SUN SAT
            STRATUM B:  MON TUE WED THU FRI
            SAMPLING INTENSITY:  20.00%
            NO. OF DAYS IN STRATUM A:   19
            NO. OF DAYS IN STRATUM B:   44
            NO. OF SAMPLING LOCATIONS:  6

**************************************************
* SAMPLING SCHEDULE FOR NOV 29 1979 - JAN 30 1980 *
**************************************************
```

DATE		DAY	LOCATION	
NOV	29	THU	4	CCC CAMP
DEC	1	SAT	6	NADA TUNNEL
DEC	6	THU	4	CCC CAMP
DEC	20	THU	2	PINE RIDGE
DEC	22	SAT	5	KOOMER RIDGE
DEC	24	MON	6	NADA TUNNEL
JAN	2	WED	5	KOOMER RIDGE
JAN	4	FRI	6	NADA TUNNEL
JAN	10	THU	1	ROAD 23
JAN	17	THU	1	ROAD 23
JAN	20	SUN	1	ROAD 23
JAN	26	SAT	3	TUNNEL RIDGE ROAD
JAN	29	TUE	6	NADA TUNNEL

```
***********************************
* SAMPLING ALLOCATION BY LOCATION *
***********************************
```

LOCATION	SAMPLE SIZE	PERCENTAGE
1	3	23.08%
2	1	7.69%
3	1	7.69%
4	2	15.38%
5	2	15.38%
6	4	30.77%

```
***********************************
* SAMPLING ALLOCATION BY STRATUM *
***********************************
```

STRATUM	SAMPLE SIZE	PERCENTAGE
A	4	6.35%
B	9	14.29%

APPENDIX
Listing of Source Deck

```
ISAMPLE:PROCEDURE OPTIONS(MAIN);
DCL NAMES(ISITE) CHAR(20) CONTROLLED;
DCL DAYS(HVY,3) FIXED BIN CONTROLLED;
DCL (RAN,RATE,RAM) FLOAT BIN(31);
DCL SEED FLOAT(16);
DCL (START(3),END(3),TEST,T,ISITE,DET(7),SDAY(2),OPTION1,OPTION2,
    STOP(4),M,N,K,CURRENT_DAY,NN,TOTAL,IDAY(2),OPTION3,HVY,FLAG,
   I,J,CURRENT_MO,CURRENT_YR WK) FIXED BIN (31);
DCL  MO(12) FIXED BIN(31) INIT(31,28,31,30,31,30,31,31,30,31,30,31);
DCL  FWD(12) FIXED BIN(31) INIT(365,334,306,275,245,214
     ,184,153,122,92,61,31);
DCL  BWD(12) FIXED BIN(31) INIT(0,31,59,90,120,151,181,
    212,243,273,304,334);
DCL DAY(7) CHARACTER(3) INIT ('SUN','MON','TUE','WED','THU','FRI',
                              'SAT');
DCL MONTH(12) CHARACTER(3) INIT ('JAN','FEB','MAR','APR','MAY','JUN',
                                 'JUL','AUG','SEP','OCT','NOV','DEC');
DCL (WEEKEND,WEEKDAY)FLOAT(6);
DCL  (FIXED,MOD,SUM,PROD,ABS) BUILTIN;
DCL   LEAP ENTRY(FIXED BIN(31),FIXED BIN(31));
DCL  WEEK ENTRY(FIXED BIN(31),FIXED BIN(31),FIXED BIN(31));
DCL  RANDM ENTRY(FLOAT(16),FIXED BIN(31),FLOAT BIN(31));
GET LIST(START,END,ISITE,DET,OPTION3,RATE,OPTION1,OPTION2,HVY);
IF HVY > 0 THEN DO; ALLOCATE DAYS;
                    GET SKIP LIST(DAYS);
                    END;
ALLOCATE NAMES;
IF OPTION2=1 THEN DO;
                      GET SKIP LIST(NAMES);
                      END;
           ELSE NAMES='';
IF ((START(3)>END(3))|(START(3)=END(3)&START(1)>END(1)) |
   (START(3)=END(3)&START(1)=END(1)&START(2)>END(2)))
            THEN DO; PUT LIST('STARTING DATE IS GREATER THAN ENDING
                              DATE, JOB ABORTED'); STOP; END;
MO(2)=29; RAM=1.;
IF(START(1)>12 | START(2)>MO(START(1))  |
   END(1)>12 | END(2)>MO(END(1))) THEN
        DO; PUT LIST ('ERROR IN THE DATES SPECIFIED, JOB ABORTED');
            STOP; END;
IF ISITE<1 THEN DO;
            PUT LIST ('NOT ENOUGH LOCATION, JOB ABORTED');
            STOP; END;
IF SUM(DET)>7 THEN DO;
            PUT LIST ('ERROR IN THE LEVEL SPECIFIED, JOB ABORTED');
            STOP; END;
IF OPTION3=1 THEN IF ( SUM(DET)¬=0) THEN DO;
            PUT LIST(' ERROR IN THE LEVEL SPECIFIED; JOB ABORTED');
            STOP; END;
IF (OPTION3=3 & MOD(RATE,ISITE)¬=0) THEN DO;
            PUT LIST(' ERROR IN THE INTENSITY SPECIFIED; JOB ABORTED');
            STOP; END;
IF OPTION1=0 THEN GO TO SA;
PUT  EDIT((100)'*')(PAGE,A);
```

```
DO I=1 TO END(3)-START(3)+1;
 PUT SKIP(10);
 PUT EDIT (START(3)+I-1) (COL(34),F(4));
 DO J=1 TO 4;
  PUT SKIP(3);
  SELECT;
   WHEN(J=1) PUT LIST('        JANUARY                    FEBRUARY',
    '          MARCH');
   WHEN(J=2) PUT LIST('        APRIL                      MAY',
    '          JUNE');
   WHEN(J=3) PUT LIST('        JULY                       AUGUST',
    '          SEPTEMBER');
   WHEN(J=4) PUT LIST('        OCTOBER                    NOVEMBER',
    '          DECEMBER');
 END;
  PUT SKIP LIST('  S  M  T  W  T  F  S      S  M  T  W  T  F  S',
     '    S  M  T  W  T  F  S');
  CALL LEAP(START(3)+I-1,T);
  PUT SKIP;
  DO M=1 TO 3;
   IF M+3*(J-1)>2 THEN CALL WEEK(START(3)+I-1,BWD(M+3*(J-1))+T+1,WK);
                  ELSE CALL WEEK(START(3)+I-1,BWD(M+3*(J-1))+1,WK);
   IF WK=0 THEN WK=WK+7;
   STOP(M)=8-WK;
   DO N=1 TO STOP(M);
   PUT SKIP(0) EDIT(N)(X((M-1)*25+(WK-1)*3+(N-1)*3),F(3)); END;
  END;
  IF T¬=0 THEN MO(2)=29; ELSE MO(2)=28;
  DO K=1 TO 5;
  PUT SKIP;
  DO M=1 TO 3;
   STOP(M)=STOP(M)+7; NN=0;
   IF STOP(M)<MO(M+3*(J-1)) THEN DO; DO N=STOP(M)-6 TO STOP(M);
                             PUT SKIP(0) EDIT(N)(COL(1+(M-1)*25+NN*3)
                                    ,F(3)); NN=NN+1;  END; END;
                  ELSE IF STOP(M)-6<=MO(M+3*(J-1))
                       THEN DO; DO N=STOP(M)-6 TO MO(M+3*(J-1));
                            PUT SKIP(0) EDIT(N)(COL(1+(M-1)*25+NN*3)
                                    ,F(3)); NN=NN+1;  END; END;
     END;
   END;
  END;
 END;
SA: MO(2)=28;
TOTAL=(END(3)-START(3)+1)*366;
BEGIN;
 DCL (SAMPLE_DAY(2,TOTAL,7),SITE(ISITE)) FIXED BIN (31);
 IF START(1)<=2 THEN TOTAL=BWD(START(1))+START(2);
                ELSE DO; CALL LEAP(START(3),T);
                         TOTAL=BWD(START(1))+START(2)+T;
                         END;
 CALL WEEK(START(3),TOTAL,WK);
 IF WK=0 THEN WK=WK+7;
 CURRENT_DAY=START(2); CURRENT_MO=START(1); CURRENT_YR=START(3);
```

```
IDAY=1; TOTAL=0; SAMPLE_DAY(*,*,6)=0;
DO WHILE ((CURRENT_YR<END(3)) | ((CURRENT_YR=END(3)) &
         (CURRENT_MO<END(1))) | ((CURRENT_YR=END(3)) &
         (CURRENT_MO=END(1)) & (CURRENT_DAY<=END(2))));
  TOTAL=TOTAL+1;
   FLAG=0;
   IF HVY=0 THEN GO TO NOR;
            ELSE DO;
                 DO I=1 TO HVY;
                 IF CURRENT_YR=DAYS(I,3) & CURRENT_MO=DAYS(I,1)
                    & CURRENT_DAY=DAYS(I,2) THEN DO;
                   FLAG=1;
                  SAMPLE_DAY(1,IDAY(1),1)=CURRENT_MO;
                  SAMPLE_DAY(1,IDAY(1),2)=CURRENT_DAY;
                  SAMPLE_DAY(1,IDAY(1),3)=CURRENT_YR;
                  SAMPLE_DAY(1,IDAY(1),4)=WK;
                  SAMPLE_DAY(1,IDAY(1),7)=TOTAL;
                  IDAY(1)=IDAY(1)+1; WK=WK+1;
                  GO TO NOR;
                  END;
                 END;
                END;
 NOR: IF FLAG¬=1 THEN DO;
   SAMPLE_DAY(DET(WK)+1,IDAY(DET(WK)+1),1)=CURRENT_MO;
   SAMPLE_DAY(DET(WK)+1,IDAY(DET(WK)+1),2)=CURRENT_DAY;
   SAMPLE_DAY(DET(WK)+1,IDAY(DET(WK)+1),3)=CURRENT_YR;
   SAMPLE_DAY(DET(WK)+1,IDAY(DET(WK)+1),4)=WK;
   SAMPLE_DAY(DET(WK)+1,IDAY(DET(WK)+1),7)=TOTAL;
   IDAY(DET(WK)+1)=IDAY(DET(WK)+1)+1; WK=WK+1;
   END;
   IF WK>7 THEN WK=1;
   CALL LEAP(CURRENT_YR,T);
   IF T=1 THEN MO(2)=29;
          ELSE MO(2)=28;
   CURRENT_DAY=CURRENT_DAY+1;
   IF CURRENT_DAY>MO(CURRENT_MO) THEN DO;
                                 CURRENT_DAY=1;
                                 CURRENT_MO=CURRENT_MO+1;
                                 IF CURRENT_MO>12 THEN DO;
                                            CURRENT_MO=1;
                                            CURRENT_YR=CURRENT_YR+1;
                                            END;
                                      END;
 END;
IDAY=IDAY-1; SITE=0;
IF OPTION3=2 THEN DO; IF RATE>1 THEN
                                SDAY=RATE/TOTAL*IDAY+.5;
                                ELSE SDAY=RATE*IDAY+.5;
                                END;
IF OPTION3=1 THEN  DO; IF RATE<1 THEN J=RATE*TOTAL+.5;
                                 ELSE J=RATE;
                                 END;
IF OPTION3=3 THEN SDAY=RATE/2;
IF(SDAY(1)>IDAY(1) | SDAY(2)>IDAY(2)) THEN DO;
```

```
        PUT LIST(' MAXIMUM NO. OF SAMPLE DAYS EXCEEDED, JOB ABORTED');
        STOP;
        END;
 SEED=2*(START(3)*1000+START(2)*100+START(1)*10)+11;
 IF OPTION3=1 THEN DO;
                   SDAY=0;
                   DO I=1 TO J;
              RB:  CALL RANDM(SEED,1,RAN);
                   IF RAN>IDAY(1)*RAM/TOTAL THEN N=2; ELSE N=1;
                   CALL RANDM(SEED,1,RAN);
                   K=RAN*IDAY(N)+1;
                   IF SAMPLE_DAY(N,K,6)=1 THEN GO TO RB;
                                          ELSE SAMPLE_DAY(N,K,6)=1;
                              CALL RANDM(SEED,1,RAN);
                              SDAY(N)=SDAY(N)+1;
                              SAMPLE_DAY(N,K,5)=ISITE*RAN+1.;
                                DO M=1 TO ISITE;
                                IF SAMPLE_DAY(N,K,5)=M THEN
                                                SITE(M)=SITE(M)+1;
                                 END;
                   END;
                 END;
                ELSE DO;
 DO I=1 TO 2;
  DO J=1 TO SDAY(I);
RA:CALL RANDM(SEED,1,RAN);
   K=RAN*IDAY(I)+1;
   IF SAMPLE_DAY(I,K,6)=1 THEN GO TO RA; ELSE SAMPLE_DAY(I,K,6)=1;
   IF OPTION3=3 THEN SAMPLE_DAY(I,K,5)=MOD(J+(I-1)*SDAY(1),ISITE)+1;
                ELSE DO;
   CALL RANDM(SEED,1,RAN);
   SAMPLE_DAY(I,K,5)=ISITE*RAN+1;
   END;
   DO M=1 TO ISITE;
    IF SAMPLE_DAY(I,K,5)=M THEN SITE(M)=SITE(M)+1;
   END;
  END;
 END;
 END;
 PUT SKIP EDIT((34)'*')(PAGE,X(14),A);
 PUT SKIP EDIT('*','*')(X(14),A,X(32),A);
 PUT SKIP LIST('              *    SUMMARY OF SAMPLING PLAN    *');
 IF OPTION3=1 THEN
 PUT SKIP LIST('              *    FOR SIMPLE RANDOM SAMPLE    *');
 IF OPTION3=2 THEN
 PUT SKIP LIST('              *  FOR STRATIFIED RANDOM SAMPLE  *');
 IF OPTION3=3 THEN
 PUT SKIP LIST('              *      FOR FACTORIAL DESIGN      *');
 PUT SKIP EDIT('*','*')(X(14),A,X(32),A);
 PUT SKIP EDIT((34)'*')(X(14),A);
 PUT SKIP(5) EDIT('  SAMPLING PERIOD:',MONTH(START(1)),START(2),
                START(3),'-',MONTH(END(1)),END(2),END(3))
                 (COL(16),A,A(3),F(3),F(5),A,A(3),F(3),F(5));
 PUT SKIP(2) ('                 DEFINTION OF STRATA');
```

```
PUT SKIP(2) EDIT ('STRATUM A:')(COL(27),A);
K=0;
DO I=1 TO 7;
  IF DET(I)=0 THEN DO; PUT EDIT(DAY(I))(COL(38+K*4),A(3));
                       K=K+1;
                       END;
END;
PUT SKIP(2) EDIT ('STRATUM B:')(COL(27),A);
K=0;
DO I = 1 TO 7;
   IF DET(I)=1 THEN DO; PUT EDIT(DAY(I))(COL(38+K*4),A(3));
                        K=K+1;
                        END;
END;
IF RATE>1 THEN
                 PUT SKIP(2) EDIT('  SAMPLING INTENSITY:',
                                 RATE*100./TOTAL,'%')
                                  (COL(25),A,F(6,2),A);
             ELSE
              PUT SKIP(2) EDIT('  SAMPLING INTENSITY:',RATE*100.,'%')
                              (COL(25),A,F(6,2),A);
PUT SKIP(2)EDIT('  NO. OF DAYS IN STRATUM A:',IDAY(1))(COL(25),A,F(5));
PUT SKIP(2)EDIT('  NO. OF DAYS IN STRATUM B:',IDAY(2))(COL(25),A,F(5));
 PUT SKIP(2)EDIT('  NO. OF SAMPLING LOCATIONS:',ISITE)(COL(25),A,F(3));
 PUT PAGE EDIT ((53)'*')(X(14),A);
 PUT SKIP EDIT('*','*')(X(14),A,X(51),A);
 PUT SKIP EDIT('*  SAMPLING SCHEDULE FOR',MONTH(START(1)),START(2),
                 START(3),' - ',MONTH(END(1)),END(2),END(3),'*')
      (COL(15),A,X(1),A(3),F(3),F(5),A,A(3),F(3),F(5),X(2),A);
    PUT SKIP EDIT('*','*')(X(14),A,X(51),A);
    PUT SKIP EDIT((53)'*')(X(14),A);
 IF OPTION2=0 THEN PUT SKIP(5) EDIT('DATE      DAY     LOCATION')
                                  (COL(18),A);
    ELSE PUT SKIP(5)EDIT('DATE      DAY          LOCATION')
                                  (COL(18),A);
PUT SKIP EDIT((45)'-')(X(14),A);
 PUT SKIP(2);
 DO I=1 TO TOTAL;
  DO J=1 TO 2;
    DO K= 1 TO IDAY(J);
       IF SAMPLE_DAY(J,K,7)>I THEN GO TO IJ;
       IF SAMPLE_DAY(J,K,7)=I & SAMPLE_DAY(J,K,6)=1
                                  THEN DO;
                                  PUT SKIP(1);
                                  PUT EDIT(MONTH(SAMPLE_DAY(J,K,1)),
                                           SAMPLE_DAY(J,K,2),
                                           DAY(SAMPLE_DAY(J,K,4)),
                                           SAMPLE_DAY(J,K,5),
                                           NAMES(SAMPLE_DAY(J,K,5)))
                        (COL(16),A(5),F(2),X(5),A(8),F(3),X(3),A(20));
                                  GO TO KK;
                                  END;
     END;
IJ:END;
```

```
 KK:END;
  PUT PAGE EDIT((37)'*')(X(14),A);
  PUT SKIP EDIT('*','*')(X(14),A,X(35),A);
  PUT SKIP LIST('              *  SAMPLING ALLOCATION BY LOCATION  *');
  PUT SKIP EDIT('*','*')(X(14),A,X(35),A);
  PUT SKIP EDIT((37)'*')(X(14),A);
  PUT SKIP(5) EDIT ('  LOCATION  SAMPLE SIZE  PERCENTAGE')
                  (COL(14) A);
 PUT SKIP EDIT((36)'-')(X(14),A);
  DO I=1 TO ISITE;
  PUT SKIP(2) EDIT(I,SITE(I),SITE(I)*100.*RAM/SUM(SDAY),'%')
                  (COL(17),F(3),F(12),F(13,2),A);
  END;
  PUT PAGE EDIT ((36)'*')(X(14),A);
  PUT SKIP EDIT ('*','*')(X(14),A,X(34),A);
 PUT SKIP LIST('              *  SAMPLING ALLOCATION BY STRATUM  *');
 PUT SKIP EDIT('*','*')(X(14),A,X(34),A);
 PUT SKIP EDIT((36)'*')(X(14),A);
 PUT SKIP(5) EDIT ('STRATUM   SAMPLE SIZE  PERCENTAGE')
                 (COL(16),A);
 PUT SKIP EDIT((36)'-')(X(14),A);
 PUT SKIP(2) EDIT('   A',SDAY(1),SDAY(1)*100.*RAM/TOTAL,'%')
                (COL(16),A,F(12),F(13,2),A);
 PUT SKIP(2) EDIT('   B',SDAY(2),SDAY(2)*100.*RAM/TOTAL,'%')
                (COL(16),A,F(12),F(13,2),A);
 END;
 END ISAMPLE;
*PROCESS,A,X,AG,FLOW;
 LEAP:PROCEDURE(TEST,N) ;
 DCL (TEST, N) FIXED BIN(31);
  IF MOD(TEST,4)¬=0 THEN  N=0;
                   ELSE IF(MOD(TEST,100)=0 & MOD(TEST,400)¬=0)
                          THEN N=0;
                          ELSE N=1;
  RETURN;
  END LEAP;
*PROCESS,A,X,AG,FLOW;
 WEEK:PROCEDURE(X,Y,Z) ;
  DCL (X,Y) FIXED BIN(31),Z FIXED BIN (31);
   Z=MOD((X+Y+FIXED((X-1)/4)-FIXED((X-1)/100)+FIXED((X-1)/400)),7);
   RETURN;
  END WEEK;
*PROCESS,A,X,AG,FLOW;
 RANDM:PROCEDURE(DSEED,N,R);
 DCL (N,I)FIXED BIN(31),R FLOAT BIN(31);
 DCL (DSEED,D2P31M,D2P31) FLOAT(16);
 (NOFIXEDOVERFLOW): D2P31M=2147483647.; D2P31=2147483648.;
   DSEED=MOD(16807.*DSEED,D2P31M); R=DSEED/D2P31;  RETURN;
 END RANDM;
```

The Forest Service, U.S. Department of Agriculture, is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives—as directed by Congress—to provide increasingly greater service to a growing Nation.

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