

Appendix A: Sample log from the R statistical package demonstrating the use of Tobit Regression.

```
> {pkg <- select.list(sort(.packages(all.available = TRUE))) if(nchar(pkg))
  library(pkg, character.only=TRUE)}
> TobitModel <- survreg(Surv(DATA$BRTE, DATA$BRTE>0, type="left") ~
  DATA$NDVIDiff + DATA$Elev + DATA$rj2, dist="gaussian")
> summary(TobitModel)

Call:
survreg(formula = Surv(DATA$BRTE, DATA$BRTE > 0, type = "left") ~
  DATA$NDVIDiff + DATA$Elev + DATA$rj2, dist = "gaussian")

              Value Std. Error      z      p
(Intercept)  68.1873   14.46132  4.72 2.42e-06
DATA$NDVIDiff -155.1986  16.92518 -9.17 4.74e-20
DATA$Elev     -0.0271    0.00606 -4.47 7.75e-06
DATA$rj2      -0.2391    0.06966 -3.43 5.98e-04
Log(scale)    2.9470     0.05378 54.80 0.00e+00

Scale= 19.0

Gaussian distribution
Loglik(model)= -840.6   Loglik(intercept only)= -903
      Chisq= 124.84 on 3 degrees of freedom, p= 0
Number of Newton-Raphson Iterations: 4
n= 262

>
```

Appendix B: Erdas Imagine Algorithm for cloud and cloud-shadow detection. "RawB1" refers to band 1 of the raw imagery while "TasB3" refers to band 3 of the Tasseled-Cap transformation of the imagery.

For April:

```
CLOUDSNOW = if (RawB1 > 200 and RawB2 > 170 and RawB3 > 150 and  
RawB4 > 100 and RawB5 > 150 and RawB6 > 125)
```

```
SHADOW = if (TasB3 > 155 and RawB1 < 75 and RawB2 < 50 and RawB3  
< 40 and RawB4 < 25)
```

```
SNOW = if (RawB1 > 160 and RawB2 > 150 and RawB3 > 150 and RawB1  
>= RawB2 and RawB5 < 120 and RawB6 < 100 and RawB4 > RawB5)
```

```
CLOUDS = if ((CLOUDSNOW or SHADOW) Not SNOW)
```

For June:

```
CLOUDSNOW = if (RawB1 > 190 and RawB2 > 170 and RawB3 > 150 and  
RawB4 > 100 and RawB5 > 150 and RawB6 > 125)
```

```
SHADOW = if (TasB3 > 155 and RawB1 < 80 and RawB2 < 55 and RawB3  
< 50 and RawB4 < 35)
```

```
SNOW = if (RawB1 > 160 and RawB2 > 150 and RawB3 > 150 and RawB1  
>= RawB2 and RawB5 < 120 and RawB6 < 100 and RawB4 > RawB5)
```

```
CLOUDS = if ((CLOUDSNOW or SHADOW) Not SNOW)
```

Appendix C: Summaries for sampling plots. For plot type, T = training plot; A = assessment plot.

Plot Type	Plot Name	UTM zone 11 NAD27 Northing	UTM zone 11 NAD27 Easting	<i>Bromus tectorum</i> percent cover
T	020507a	4416652	341301	3.0
T	020507b	4435998	357538	7.0
T	020507c	4437034	353799	5.0
T	020507d	4437069	353907	25.0
T	020507e	4437883	351343	5.0
T	020507f	4438063	350380	3.0
T	020507g	4437056	348978	7.0
T	020507h	4436385	345280	2.0
T	020507i	4430413	334959	5.0
T	020507j	4406381	326764	0.0
T	020515a	4464616	391190	30.0
T	020515b	4478392	392581	50.0
T	020515c	4479977	391514	15.0
T	020515d	4485220	391654	80.0
T	020515e	4505232	412327	8.0
T	020515f	4505081	412134	75.0
T	020515g	4504890	412141	40.0
T	020515h	4504741	412213	8.0
T	020515i	4504469	416781	50.0
T	020515j	4504153	416707	25.0
T	020515k	4527763	424657	35.0
T	020515l	4538571	439246	0.0
T	020515m	4567818	442047	20.0
T	020515n	4567971	441031	25.0
T	020515o	4583084	450174	5.0
T	020515p	4603826	454829	0.0
T	020515q	4605720	455304	5.0
T	020515r	4502425	407186	0.0
T	020516a	4609496	454722	0.0
T	020516b	4608871	454735	5.0
T	020516c	4608956	454717	35.0
T	020516d	4609034	454713	0.0
T	020516e	4609735	454490	50.0
T	020516f	4609643	454412	0.0
T	020516g	4609608	454591	1.0
T	020516h	4613067	454517	0.0
T	020516i	4615181	456421	20.0
T	020516j	4615345	457280	0.0
T	020516k	4615323	457454	0.0
T	020516l	4616877	459468	0.0
T	020516m	4616886	459547	0.0
T	020516n	4616736	459459	0.0
T	020516o	4624927	463492	0.0
T	020516p	4624156	467982	0.0
T	020516q	4622842	461666	0.0
T	020516r	4622630	461804	0.0

Plot Type	Plot Name	UTM zone 11 NAD27 Northing	UTM zone 11 NAD27 Easting	<i>Bromus tectorum</i> percent cover
T	020516s	4622714	461686	0.0
T	020516u	4602683	454707	40.0
T	020516v	4592536	462339	30.0
T	020516w	4581868	473500	0.0
T	020516x	4581462	478139	12.0
T	020516y	4581472	485981	20.0
T	020516z	4580047	487035	3.0
T	020531a	4518090	439924	70.0
T	020531b	4517955	439979	2.0
T	020531c	4517890	439996	0.0
T	020531d	4512870	439564	95.0
T	020531e	4509196	440447	25.0
T	020531f	4504287	441885	0.0
T	020531g	4493626	445391	30.0
T	020531h	4491765	446166	7.0
T	020531i	4488607	448664	50.0
T	020531j	4488536	450483	40.0
T	020531k	4489233	452191	0.0
T	020531l	4489269	452081	30.0
T	020531m	4490373	454213	0.0
T	020531n	4490961	454052	50.0
T	020531o	4483772	448894	25.0
T	020531p	4479123	449404	0.0
T	020601a	4526243	476192	0.0
T	020601b	4526080	476280	0.0
T	020601c	4503193	606124	0.0
T	020601d	4501972	606616	0.0
T	020601e	4500512	606765	0.0
T	020601f	4500470	606690	0.0
T	020601g	4500111	607164	5.0
T	020601h	4498382	608192	7.0
T	020601i	4496120	607117	0.0
T	020601j	4491804	608170	5.0
T	020601k	4482126	608546	20.0
T	020601l	4471595	613692	1.0
T	020601m	4467210	613831	10.0
T	020601n	4457162	611728	1.0
T	020601o	4440721	604394	1.0
T	020601p	4440005	602753	5.0
T	020601q	4440929	598233	0.0
T	020601r	4444328	593964	0.0
T	020601s	4444598	590832	0.0
T	020601t	4445536	584209	45.0
T	020602a	4426750	580494	15.0
T	020602b	4426808	580195	0.0
T	020602c	4409596	579385	15.0
T	020602d	4403965	577406	0.0
T	020602e	4407748	571496	0.0
T	020602f	4409524	571478	0.0
T	020602g	4411669	571652	0.0

Plot Type	Plot Name	UTM zone 11 NAD27 Northing	UTM zone 11 NAD27 Easting	<i>Bromus tectorum</i> percent cover
T	020602h	4412368	571008	0.0
T	020602i	4412451	570894	1.0
T	020602j	4411473	570456	0.0
T	020602k	4409224	568465	0.0
T	020602l	4409216	568363	0.0
T	020602m	4401030	565168	0.0
T	020602n	4400346	562275	10.0
T	020602o	4400026	562610	0.0
T	020602p	4391308	565259	0.0
T	020602q	4408831	533547	60.0
T	020602r	4408379	534702	30.0
T	020602s	4408404	534830	50.0
T	020602t	4408578	534883	35.0
T	020602u	4408559	534841	98.0
T	020602v	4408602	534531	15.0
T	020602w	4408628	534113	45.0
T	020602x	4408868	533175	10.0
T	020602y	4396573	522540	8.0
T	020603a	4373125	425584	0.0
T	020603b	4373239	425634	15.0
T	020603c	4373352	425656	35.0
T	020612a	4412636	350786	1.0
T	020612b	4411821	350805	0.0
T	020612c	4414787	357763	0.0
T	020612d	4415081	357731	30.0
T	020612e	4427616	379091	1.0
T	020612f	4430280	376355	7.0
T	020612g	4452659	389352	7.0
T	020612h	4452701	389409	5.0
T	020612i	4452003	390603	20.0
T	020612j	4452063	390650	4.0
T	020612k	4451981	390570	60.0
T	020612l	4427152	405887	10.0
T	020612m	4440169	399365	15.0
T	020612n	4435082	422424	0.0
T	020612o	4434732	422264	5.0
T	020612p	4434482	422294	15.0
T	020613	4442391	418470	10.0
T	020613a	4433225	421687	10.0
T	020613b	4432128	421315	0.0
T	020613c	4432105	421538	20.0
T	020613d	4432519	421049	50.0
T	020613e	4435317	422553	0.0
T	020613f	4436078	422687	8.0
T	020613g	4436887	422173	20.0
T	020613h	4436750	422104	17.0
T	020613i	4438037	421276	5.0
T	020613j	4439084	419767	25.0
T	020613k	4439612	417377	5.0
T	020613l	4448139	423588	35.0

Plot Type	Plot Name	UTM zone 11 NAD27 Northing	UTM zone 11 NAD27 Easting	<i>Bromus tectorum</i> percent cover
T	020613m	4449574	425721	20.0
T	020613n	4451473	428673	50.0
T	020613o	4452431	430924	20.0
T	020613p	4452204	431004	15.0
T	020613q	4452494	432499	0.0
T	020613r	4451204	433415	0.0
T	020613s	4443953	443095	20.0
T	020613t	4443835	458365	8.0
T	020613u	4443770	458446	50.0
T	020617a	4515251	320644	0.0
T	020617b	4515237	320866	0.0
T	020617c	4514310	320928	10.0
T	020617d	4514974	323245	4.0
T	020617e	4514915	323175	3.0
T	020617f	4515923	325693	10.0
T	020617g	4517246	331864	7.0
T	020617h	4516354	335514	1.0
T	020617i	4516872	344685	6.0
T	020617j	4520551	349346	15.0
T	020617k	4528069	363935	5.0
T	020617l	4528114	364408	15.0
T	020617m	4527136	371403	5.0
T	020617n	4527576	377499	7.0
T	020617o	4534224	384116	7.0
T	020617p	4537120	383780	0.0
T	020617q	4541189	383092	12.0
T	020617r	4541349	383169	1.0
T	020617s	4541251	382922	0.0
T	020617t	4547554	381587	8.0
T	020618a	4561484	385078	10.0
T	020618b	4561861	384978	12.0
T	020618c	4572358	393552	17.0
T	020618d	4582016	394492	35.0
T	020618e	4582009	394312	18.0
T	020618f	4598786	385828	0.0
T	020618g	4602503	382822	0.0
T	020618i	4613249	376762	4.0
T	020618j	4621320	373180	35.0
T	020618k	4633801	368955	25.0
T	020618l	4633856	368671	40.0
T	020618m	4633764	368532	1.0
T	020618o	4636392	368665	30.0
T	020618p	4636398	368749	35.0
T	020618q	4636355	368942	20.0
T	020618r	4643677	365569	60.0
T	020618s	4616309	375561	30.0
T	020618t	4616338	375669	25.0
T	020618u	4612840	377730	15.0
T	020620a	4549591	484208	0.0
T	020620b	4552509	491989	15.0

Plot Type	Plot Name	UTM zone 11 NAD27 Northing	UTM zone 11 NAD27 Easting	<i>Bromus tectorum</i> percent cover
T	020620c	4554860	498699	20.0
T	020620d	4555761	501622	40.0
T	020620e	4561793	516028	1.0
T	020620f	4561524	518499	15.0
T	020620g	4563599	524445	13.0
T	020620h	4567909	526954	15.0
T	020620i	4574858	527791	3.0
T	020620j	4579240	529320	2.0
T	020620k	4584223	528870	9.0
T	020620l	4593770	530516	1.0
T	020620m	4596155	540889	0.0
T	020620n	4596356	540847	3.0
T	020620o	4603458	549705	50.0
T	020620p	4564114	582531	1.0
T	020621a	4597467	597563	0.0
T	020621b	4598807	597451	0.0
T	020621c	4615150	602331	0.0
T	020621d	4624274	608441	0.0
T	020621e	4625020	607493	0.0
T	020621f	4625072	607745	0.0
T	020621g	4626510	606467	0.0
T	020621h	4626895	606626	0.0
T	020621i	4626969	606595	0.0
T	020621j	4629687	607794	1.0
T	020621k	4633588	607242	0.0
T	020621l	4637635	609032	20.0
T	020621m	4640992	611249	0.0
T	020621n	4641074	611974	35.0
T	020621o1	4644653	619762	0.0
T	020621o2	4648500	624461	0.0
T	020621p	4648686	624499	1.0
T	020621q	4603760	623764	0.0
T	020621r	4603895	623833	0.0
T	020621s	4634153	629456	0.0
T	020621t	4633547	629122	0.0
T	020621u	4631232	627225	0.0
T	020621v	4630084	627074	0.0
T	020621w	4628728	626587	0.0
T	020621x	4625422	627131	0.0
T	030603a	4490655	498536	0.0
T	030603b	4468757	502746	0.0
T	030603c	4470005	498430	0.0
T	030603d	4458012	492578	1.0
T	030603e	4458188	492292	20.0
T	030603f	4447061	492346	50.0
T	030603g	4428728	482789	20.0
T	030603h	4421563	473477	0.0
T	030603i	4418034	470926	4.0
T	030603j	4384751	475716	0.0
T	030603k	4348715	392811	0.0

Plot Type	Plot Name	UTM zone 11 NAD27 Northing	UTM zone 11 NAD27 Easting	<i>Bromus tectorum</i> percent cover
T	030603l	4348676	392554	0.0
T	030605a	4541985	459515	30.0
T	030605b	4540889	456059	0.0
T	030605c	4540919	456460	0.0
T	030605d	4534709	465548	0.0
T	030605e	4534605	465636	0.0
T	030605f	4535477	481509	0.0
T	030605g	4452755	459810	0.0
T	030609a	4486059	517526	25.0
T	030609b	4487228	549490	50.0
T	030609c	4482171	552865	25.0
T	030609d	4474620	559251	20.0
T	030609e	4477138	560898	0.0
T	030609e2	4512969	552485	10.0
T	030609f	4519425	417298	60.0
T	030609g	4519314	417589	40.0
A	030701a	4361134	534773	0.0
A	030701b	4300996	517982	0.0
A	030701c	4301898	506841	0.0
A	030701d	4303994	482863	2.0
A	030701e	4272142	484539	0.0
A	030701f	4255315	483356	0.0
A	030702a	4240846	528833	0.1
A	030702b	4275023	546962	0.0
A	030702c	4335089	556687	0.0
A	030702d	4328099	574602	0.0
A	030702e	4338633	581559	0.0
A	030702f	4376669	559679	0.0
A	030709a	4449347	434849	0.0
A	030709b	4422031	424861	2.0
A	030709c	4417094	415482	10.0
A	030709d	4443869	456578	65.0
A	030709e	4477608	482591	3.0
A	030709f	4528469	510007	5.0
A	030709g	4499002	478436	6.0
A	030709h	4509463	458894	20.0
A	030714a	4565468	515839	5.0
A	030714b	4562753	527631	1.0
A	030714c	4562445	599992	0.0
A	030714d	4627166	625975	0.0
A	030714e	4617882	625282	5.0
A	030715a	4633800	602168	0.0
A	030715b	4605941	559601	15.0
A	030722a	4348998	409954	4.0
A	030722b	4383189	487032	25.0
A	030722c	4390083	516617	0.1
A	030722d	4381487	579049	7.0
A	030722e	4383896	591893	0.0
A	030722f	4404508	597240	40.0
A	030723a	4407626	572432	5.0

Plot Type	Plot Name	UTM zone 11 NAD27 Northing	UTM zone 11 NAD27 Easting	<i>Bromus tectorum</i> percent cover
A	030723b	4448474	569268	0.0
A	030723c	4518411	565460	0.0
A	030723d	4501505	548671	35.0
A	030723e	4487478	541776	1.0
A	030723f	4458439	527329	1.0
A	030724a	4571043	441226	30.0
A	030724b	4587760	344458	10.0
A	030724c	4596493	355345	12.0
A	030724d	4597226	378368	8.0
A	030724e	4598524	378592	15.0
A	030724f	4607425	421875	2.0
A	030724g	4616895	410880	25.0
A	030724h	4636635	441477	25.0
A	030724i	4630850	440360	6.0
A	030724j	4613707	435501	65.0
A	030729a	4314101	383240	0.0
A	030729b	4308267	381916	0.0
A	030729c	4286826	372297	1.0
A	030729d	4267280	376978	0.0
A	030729e	4265155	385526	0.0
A	030729f	4277172	405242	4.0
A	030729g	4290228	415676	6.0
A	030729h	4286333	418982	8.0
A	030729i	4245392	459007	0.0
A	030729j	4244848	458526	0.0
A	030730a	4280362	455249	0.0
A	030730b	4321890	463018	0.0
A	030730d	4343076	432903	0.0
A	030730e	4344442	306948	0.1
A	030730f	4338776	308448	0.0
A	030801a	4322532	325020	0.1
A	030801b	4322697	325240	0.0
A	030801c	4295873	317477	0.0
A	030801d	4256039	332941	0.0
A	030801e	4254857	323662	3.0
A	030801f	4301656	296787	0.0
A	030807a	4381987	321889	0.0
A	030807b	4379923	327667	0.0
A	030807c	4413346	335804	0.0
A	030807d	4414447	339195	1.0
A	030807e	4472534	338231	2.0

Appendix D: Contents of accompanying disks. GIS data is often spread among several files; only the primary files are listed here. All GIS data is projected in UTM zone 11, NAD27.

Product Data CD:

brte	Estimated <i>B. tectorum</i> cover in ArcGRID format, actually consisting of two folders named “brte” and “info”.
brte.lyr	ArcGIS 8.2 layer file containing the legend for the grid. The source may need to be reset when this file is loaded.
plots-training.shp	Point shape file for training data collected on site. All vegetation data is for percent ground cover.
plots-accuracy.shp	Point shape file for accuracy assessment data collected on site and attributed with the estimated percent cover for <i>B. tectorum</i> . All vegetation data is for percent ground cover.
MapArea.shp	A polygon shape file outlining the mapping area.
Cultivated.shp	A polygon shape file for the areas masked as cultivated fields.
Urban.shp	A polygon shape file for the areas masked as human habitated.
Clouds.shp	A polygon shape file for the areas masked as clouds or cloud shadows.
Water.shp	A polygon shape file for the water body areas reset to zero <i>B. tectorum</i> cover.
Report-1text.pdf	Text portion of this report.
Report-2tf.pdf	Tables and figures of this report.
Report-3app.pdf	Appendices of this report.

Modeling Data DVD (limited distribution):

ave_june.img	Average pixel brightness of June imagery, ERDAS Imagine format.
elev.img	Elevation in meters, ERDAS Imagine format.
ndvi_diff.img	NDVI difference phonological variable, ERDAS Imagine format.
raw_aprmay.img	Early-season imagery, ERDAS Imagine format.
raw_june.img	Late-season imagery, ERDAS Imagine format.