Appendix M – Population Growth Model

Spatial Growth Model

Spatial Growth Modeling is accomplished using a contractor developed ArcView extension and can be done at the parcel level, or by the use of any size-assigned grid cells. The Spatial Growth Model (SGM) may be constructed as a set of "nested" models moving from the County to the community and potentially the neighborhood level. The following steps are involved in the creation of an SGM, which will generate GIS maps for the growth study area by decade (or other preferred time step):

1. Determine the growth study area; ensure the data available spatially matches this region.

2. Determine the land available for growth with the study area. This process will create an initial "land bank" which can exclude areas such as those designated for open space, agriculture, riparian preserves, etc. (This land bank can be adjusted to meet the needs of different groups or values, and several land banks may be created to test different policies.) This creates a grid file in Arc View using Spatial Analyst. Land may be assigned as a "zoning" category specifying that the model, "assign this land sub-area to a particular type of growth."

3. Input the anticipated population growth rate, by housing type; including commercial and industrial allocations. A "Growth Calculator" has been developed to accomplish this in a Graphical User Interface (GUI) venue. This Growth Calculator allows the user to adjust the percentage of population assigned to different housing types (i.e., Single Family 35%, Multi-family 30%, Rural 25%, etc. – this may also be more specific zoning), as well as adding/deleting or changing these values/types for each scenario run. This also allows the user to calculate the amount of land required to accommodate different choices for each land use type, reflecting demand in term of total land, lot size, people per household, units/lot, etc.

4. Develop a set of "Growth Rules" (this can be specific zoning) by which this growing number of people and businesses will be housed and distributed. Conversely, growth rules can specify land *not to be developed.* For instance:
   - Place new multi-family within one mile of existing multifamily
   - Place new multi-family within 2 miles of existing commercial
   - Keep all low density (perhaps 1/2 acre or more…) 2 miles away from existing intersections
   - Cluster all development around nodes on a new/existing transportation corridor.
   - Notably, there may be <u>any number of rules</u>, and
   - <u>Each rule may be assigned a priority weight</u> in relation to the other rules used in that scenario "run" to reflect the values of the user.
   - The addition of rules will add to the "run times" of the model, however the output will reflect the complex aggregation of these rules.

These rules can be developed as a separate set for each type of land use being assessed in the model. These various rules sets can then be run consecutively in a comprehensive model run, letting each rule set allocate land based on available area and priority in the run. Essentially, this allows the user to assess various differences based on which types of development have priority. When a scenario is generating, once land is used up by one type of development, it becomes unavailable to any other land use type. The model also notifies the user if there is insufficient land to meet the demand of a particular rule set. There is no limit on the number of rules in rule set or the number of rule sets run for a given scenario.

5. Run the model; this will take anywhere from a few minutes to several hours, based on the number of rules used, the size of the land bank and the scale of the grid, lot or parcel resolution to be utilized.
    - The model will generate a grid for each rule, which can be displayed to show where the rule applied.
    - The resultant rule grids are then combined to create a Composite Suitability Grid. This grid is used to allocate growth for that particular rule set.
    - Finally, a grid is created for each time step and rule set. For example if there was a set of 4 rules for Single Family Growth growing in ten year intervals to 2050, the model would generate:
        i. 4 grids representing each rule
        ii. 1 Composite Suitability Grid
        iii. Grids that represent Single Family Growth 2010, Single Family Growth 2020, Single Family Growth 2030, Single Family Growth 2040 and Single Family Growth 2050
    - These sets of grids are created for each rule set run for a given Scenario. These grids can then be merged by land use type, year of growth, etc., to display different scenario data for assessment.

6. Rerun the model with different population, land bank and growth rule scenarios. This accommodates a variety of values and opinions regarding community growth options.

7. These scenarios may be overlaid or otherwise compared for similarities and differences.

Appendix N – Bradshaw-Harquahala Route Model

The following table is an estimate of the effect of the management decisions described in the Alternatives Chapter of this document on the vehicle route network. The table is simply a possible outcome based on a set of conditions that represents a way to compare alternatives and to estimate environmental impacts. ***This table is a tool for RMP level analysis and not an RMP decision.*** The methodology for estimating the percentage of open, closed and new routes in the planning area was derived by interpreting land use allocations and the specific prescriptions that come with these allocations and making an estimate of the effects on the route system. This table is only an estimate of possible foreseeable outcomes of how the range of alternatives could affect route designation scenarios. Since actual route designation is likely to take several years to complete, detailed route-by-route analysis was not done. Instead, the potential affect of alternative decisions on the overall vehicle route network is displayed as estimated percentages of open, closed, and new routes. It was felt by the planning team that this was the most informative way to convey the possible effects of management actions in the alternatives.

Table N-1. Route Models

Special Area Designations and Allocations	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E	
	mi	%	mi	%	mi	%	mi	%	mi	%
ACECs										
Total Routes	**0.0**		**2.0**	**0.09**	**189**	**8.44**	**299**	**13.35**	**166.0**	**7.41**
open	N/A	N/A	0.2	10	18.9	10	0.0	0	143.5	86
closed	N/A	N/A	1.8	90	170.1	90	299.0	100	22.5	14
new [2.]	N/A	N/A	0.0	0	0.0	0	0.0	0	0	0
subtotal open			0.2		18.9		0.0		143.5	
Areas Allocated to Maintain Wilderness Characteristics										
Total routes	**0**		**158.0**	**7.05**	**92.0**	**4.11**	**113.5**	**5.07**	**126.5**	**5.65**
open	N/A	N/A	47.4	30	9.2	10	0.0	0	35.0	28
closed	N/A	N/A	110.6	70	82.8	90	113.5	100	91.5	72
new [2.]	N/A	N/A	0.0	0	0.0	0	0.0	0	0	0
subtotal open			47.4		9.2		0.0		35.0	
SRMA										
Total routes	**0.0**		**667.0**	**29.78**	**664.0**	**29.64**	**277.0**	**12.37**	**1277.0**	**57.01**
open	0.0	100	653.7	98	630.8	95	249.3	90	1213.2	95
closed	0.0		28.3	2	64.8	5	155.1	10	63.9	5
new [2.]	0.0		7.1	0.5	13.0	1	31.0	2	26	2
subtotal open	0.0		660.7		643.8		280.3		1238.7	
ERMA										
Total routes	**0.0**		**1413.0**	**63.08**	**1295.0**	**57.81**	**1550.5**	**69.22**	**670.5**	**29.93**
open	0.0	100	1384.7	98	1230.3	95	1395.5	90	637.0	95
closed	0.0		28.3	2	64.8	5	155.1	10	33.5	5

Special Area Designations and Allocations	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E	
New [2.]	0.0		7.1	0.5	13.0	1	31.0	2	13.4	2
subtotal open	0.0		1391.8		1243.2		1426.5		650.4	
Total [1.]	2240.0		2240.0		2240.0		2240.0		2240.0	
Total open	**2240.0**		**2086.0**		**1889.2**		**1644.8**		**2028.6**	
Total closed	**0.0**		**168.9**		**382.4**		**722.6**		**211.4**	
Total new*	**0.0**		**14.1**		**25.9**		**62.0**		**39.0**	
Net Route Mi. Closed [3.]	**0.0**		**154.8**		**356.5**		**660.6**		**172.4**	
% Closed (of exist. 2240)	**0.0**		**6.9%**		**15.9%**		**29.5%**		**7.7%**	

1. Total routes in Bradshaw-Harquahala – 2,240 miles
Route total based on GPS route inventory data where complete and Arizona Land Resource Information System data where GPS data collection has not yet been collected. Total miles excludes state and county highways.

2. New routes (as % of total within management areas) developed to maintain connectivity of network as mitigation for closures for resource protection

3. Total closed, less new routes

The following lists explain some of the conditions that were considered in developing the percentages in the table of open, closed, and new routes:

Within SRMA/RMZ - Intent is to manage, at a higher level, specific activities and uses such as motorized/mechanized/equestrian use.

Factors that were considered:

1. Routes that meet Land Health Standards for erosion, desired plant communities, riparian management and other standards would generally be retained.
2. Routes consistent with management of the SRMA/RMZ intent would be retained. Areas allocated to day use recreation may have more looping route opportunities, while primitive areas may create more "cherry stem" spur route opportunities to maximize primitive recreation opportunities.
3. Spur routes for parking and camping would be designated open if no resource concerns exist.
4. New routes would be considered when needed to:
    - Mitigate routes not meeting Land Health Standard criteria.
    - Replace lost access opportunities
    - Enhance recreation opportunities
5. Utility Rights-of-Way would generally be left open to public use.
6. Access to private property would be generally left open to public use.
7. Routes to wildlife water catchments would generally be left open for public use.
8. Motorized routes that cause conflict with other land uses or resources would be mitigated or closed (per 43 CFR 8342.1)

Within ACEC - Intent is to limit activities that diminish the purpose of the ACEC.

Factors that were considered:

1. Routes that facilitate an increase in human activity that may be damaging, such as camping spur routes, may be closed.
2. Routes that are determined to fragment habitat would be closed or limits placed on their use.
3. "Through" routes compatible with management will be left open. Analysis would attempt to identify important connecting routes.
4. The ACEC allocation would generally prohibit building new routes unless required for management.
5. Utility Rights-of-Way may be closed to public use if determined that use of the route is incompatible with the ACEC's purpose.
6. Access to private property may be closed to public use, and a Right-of-Way grant required for access by property owners.
7. Routes to wildlife water catchments would generally be left open for public use.
8. Motorized routes that cause conflict with other land uses or resources would be mitigated or closed (per 43 CFR 8342.1)

Within areas allocated to maintain wilderness characteristics/Backcountry and Passage Zone - Intent is to manage generally for semi-primitive non-motorized and primitive experiences.

Factors that were considered:

1. Routes that facilitate an increase in motorized activity, such as vehicle camping spur routes and "through" routes with intensive motorized use, may be closed.
2. Routes incompatible with maintaining the primitive values, such as redundant routes and routes no longer needed for management or other land uses would be closed.
3. "Through" routes compatible with management would be left open. Analysis would attempt to identify important connecting routes.
4. New routes would generally be prohibited unless required for management.
5. Routes to wildlife water catchments would generally be left open for public use.
6. Utility Rights-of-Way would generally be left open to public use.
7. Access to private property may be closed to public use, and a Right-of-Way grant required for access by property owner.
8. Motorized routes that cause conflict with other land uses or resources would be mitigated or closed (per 43 CFR 8342.1)

Appendix O - Grazing Allotment Information

Allotment Name	Allotment Number	Permitted AUMs	Livestock Number	Livestock Type
AGUA FRIA NATIONAL MONUMENT				
Badger Spring Wash	06182	12	1	Cattle
Bluebell	06012	72	6	Cattle
Box Bar	06063	2447	206	Cattle
Cordes	06005	731	2470	Sheep
Cordes	06005	936	78	Cattle/Horse
Cosanti Ranch	06145	48	4	Cattle
Cross Y	06013	2790	250	Cattle
EZ Ranch	06045	972	81	Cattle
Horseshoe	06235	4572	381	Cattle
2Y	00048	216	18	Cattle
Sycamore	06169	696	58	Cattle/Horse
BRADSHAW-HARQUAHALA PLANNING AREA				
6Y Ranch Lease	05042	213	25	Cattle
A Bar V	05047	24	2	Cattle
Aguila	03000	5073	427	Cattle
Antelope Creek	06238	600	50	Cattle
Arrow Y (15)	00084	204	33	Cattle
Arrow Y (3)	00069	2151	339	Cattle
Auza	05032	84	7	Cattle
Beardsley Canal	06185	12	1	Cattle
Bialac	03008	Ephemeral		Cattle
Big Bug Creek	06143	108	9	Cattle
Big Rebel Mine	06066	36	3	Cattle
Black Canyon	06122	95	16	Horse
Bo Nine	06095	948	79	Cattle
Boulder Creek	06215	5040	600	Cattle
Box Canyon Ranch	05029	72	6	Cattle
Buckhorn	06243	924	175	Cattle/Horse
Buckhorn Creek	06150	72	6	Cattle
Bumble Bee	06161	2640	485	Cattle
Cactus Garden	03011	1098	104	Cattle
Carter-Herrera	03015	512	52	Cattle
Castle Hot Springs	06206	60	8	Cattle
Central Az Ranch Co	03014	2329	211	Cattle
Champie	06026	1100	195	Cattle
Chaparral Gulch	06065	408	34	Cattle
Clem	03017	1085	400	Cattle
Congress	03019	3242	614	Cattle
Congress-Sky Arrow	05014	108	52	Cattle

Allotment Name	Allotment Number	Permitted AUMs	Livestock Number	Livestock Type
Cooper Ranch	05013	2220	185	Cattle
Copper Mountain	06139	216	18	Cattle
Cottonwood Creek	06246	96	8	Cattle
Coughlin	05015	168	14	Cattle
Cross Mountain	03021	12	1	Cattle
Desert Hills	03025	365	39	Cattle
Desert Hills Lease	05016	432	36	Cattle
Dewey	06094	180	75	Goat
Douglas	03026	144	300	Cattle
Eagle Eye	03027	Ephemeral		Cattle
Echeverria	03029	713	60	Cattle
Effus	03030	1155	125	Cattle
Eleven L	06103	1962	244	Cattle/Horse
Flat Iron	03031	457	38	Cattle
Foraker	05017	180	15	Cattle
Forepaugh Cattle Co.	05012	888	74	Cattle
Galena Gulch	06201	432	36	Cattle
Garcia	03095	3150	350	Cattle/Sheep
Grantham Bros. Lease	05049	156	13	Cattle
Green Gulch	06229	12	1	Cattle
Hackberry Gulch	06057	60	5	Cattle
Hackberry Mine	06046	12	1	Cattle
Hassayampa River	06035	12	1	Cattle
Hassayampa River Ran	05008	732	61	Cattle
Heine	05023	24	2	Cattle
Hozoni	06223	1703	330	Cattle
Humboldt	06181	24	2	Cattle
Humbug	06245	101	111	Cattle/Horse
J V Bar	06222	1781	209	Cattle/Horse
Jesus Canyon	06227	1068	111	Cattle/Horse
Jones	03045	900	75	Cattle
Kennedy	03010	360	30	Cattle
Kirkland	05019	132	11	Cattle
Lockett	06109	60	5	Cattle
Los Caballeros	03052	939	103	Cattle/Horse
Lower Bo Nine	00095	60	5	Cattle
Mayer	06011	264	22	Cattle
Michael Lease	05033	516	52	Cattle
Minnehaha Creek	06021	60	5	Cattle
Moralez	05035	826	86	Cattle
Ohaco	03060	1476	150	Cattle
Osborne Spring Wash	06213	60	5	Cattle
Oso Ranch Allotment	05040	768	64	Cattle
Poland Junction	06135	276	23	Cattle
Quarter Circle J	05020	144	12	Cattle
R. and E. Park Lease	00085	144	33	Cattle

Allotment Name	Allotment Number	Permitted AUMs	Livestock Number	Livestock Type
Rafter Lazy W Ranch	05030	120	10	Cattle
Ridgeway-Kong	03071	120	10	Cattle
Rock Springs	06219	96	8	Cattle
Sky Arrow	03079	684	339	Cattle
Sprouse	03081	819	75	Cattle
Square M	05010	60	5	Cattle
Tee	06128	1728	144	Cattle
Texas Gulch	06048	48	4	Cattle
Thompson Lease	05004	144	12	Cattle
Three Canyon	06142	252	21	Cattle
Turner	03084	Ephemeral		Cattle
U Cross	06239	1667	248	Cattle
VX Ranch	06104	680	111	Cattle/Horse
W Diamond	05028	384	32	Cattle
Wagoner	06147	12	1	Cattle
West Wing Mountain	06056	Ephemeral		Cattle/Sheep
Whitehead	05048	288	24	Cattle
Yarber Wash	06027	156	13	Cattle

Appendix P - Conservation Measures for Fire, Fuel, and Air Quality

Conservation Measures for Fire Management Activities

Wildland Fire Suppression (FS)

The following Conservation Measures will be implemented during fire suppression operations, unless firefighter or public safety, or the protection of property, improvements, or natural resources, render them infeasible during a particular operation. Each Conservation Measure has been given an alphanumerical designation for organizational purposes (*e.g.*, FS-1). Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations will be documented by the Resource Advisor, and coordinated with the USFWS.

FS-1 Protect known locations of habitat occupied by Federally listed species. Minimum Impact Suppression Tactics (M.I.S.T.) will be followed in all areas with known Federally protected species or habitat [Appendix U, *Interagency Standards for Fire and Aviation Operations 2003*, or updates].

FS-2 Resource Advisors will be designated to coordinate natural resource concerns, including Federally protected species. They will also serve as a field contact representative (FCR) responsible for coordination with the USFWS. Duties will include identifying protective measures endorsed by the Field Office Manager, and delivering these measures to the Incident Commander; surveying prospective campsites, aircraft landing and fueling sites; and performing other duties necessary to ensure adverse effects to Federally protected species and their habitats are minimized. On-the-ground monitors will be designated and used when fire suppression activities occur within identified occupied or suitable habitat for Federally protected species.

FS-3 All personnel on the fire (firefighters and support personnel) will be briefed and educated by Resource Advisors or designated supervisors about listed species and the importance of minimizing impacts to individuals and their habitats. All personnel will be informed of the conservation measures designed to minimize or eliminate take of the species present. This information is best identified in the incident objectives.

FS-4 Permanent road construction will not be permitted during fire suppression activities in habitat occupied by Federally protected species. Construction of temporary roads is approved only if necessary for safety or the protection of property or resources, including Federally protected species habitat. Temporary road construction should be coordinated with the USFWS, through the Resource Advisor.

FS-5 Crew camps, equipment staging areas, and aircraft landing and fueling areas should be located outside of listed species habitats, and preferably in locations that are disturbed. If camps must be located in listed species habitat, the Resource Advisor will be consulted to ensure habitat damage and other effects to listed species are minimized and documented. The Resource Advisor should also consider the potential for indirect effects to listed species or their habitat from the siting of camps and staging areas (*e.g.,* if an area is within the water flow pattern, there may be indirect effects to aquatic habitat or species located off-site).

FS-6 All fire management protocols to protect Federally protected species will be coordinated with local fire suppression agencies that conduct fire suppression on BLM-administered lands to ensure that the agency knows how to minimize impacts to Federally protected species in the area.

FS-7 The effectiveness of fire suppression activities and Conservation Measures for Federally protected species should be evaluated after a fire, when practical, and the results shared with the USFWS and AGFD. Revise future fire suppression plans and tactical applications as needed and as practical.

Fuels Treatments (prescribed burning and other fuels management) (FT)

The following Conservation Measures are mandatory when implementing wildland fire use, prescribed fires, and the proposed vegetation treatments (mechanical, chemical, biological):

FT-1 Biologists will be involved in the development of prescribed burn plans and vegetation treatment plans to minimize effects to Federally protected species and their habitats within, adjacent to, and downstream from proposed project sites. Biologists will consider the protection of seasonal and spatial needs of Federally protected species (*e.g*., avoiding or protecting important use areas or structures and maintaining adequate patches of key habitat components) during project planning and implementation.

FT-2 M.I.S.T. will be followed in all areas with known Federally protected species or habitats.

FT-3 Pre-project surveys and clearances (biological evaluations/assessments) for Federally protected species will be required for each project site before implementation. All applicable Conservation Measures will be applied to areas with unsurveyed suitable habitat for Federally protected species, until a survey has been conducted by qualified personnel to clear the area for the treatment activity.

FT-4 Use of motorized vehicles during prescribed burns or other fuels treatment activities in suitable or occupied habitat will be restricted, to the extent feasible, to existing roads, trails, washes, and temporary fuelbreaks or site-access routes. If off-road travel is deemed necessary, any cross-country travel paths will be surveyed prior to use and will be closed and rehabilitated after the prescribed burn or fuels treatment project is completed.

FT-5 As part of the mandatory fire briefing held prior to prescribed burning, all personnel (firefighters and support personnel) will be briefed and educated by Resource Advisors or designated supervisors about listed species and the importance of minimizing impacts to individuals and their habitats. All personnel will be informed of the Conservation Measures designed to minimize or eliminate take of the species present.

Rehabilitation and Restoration (RR)

RR-1 When rehabilitating important areas for Federally listed species that have been damaged by fire or other fuels treatments, the biologist will give careful consideration to minimizing short-term and long-term impacts. Someone who is familiar with fire impacts and the needs of the affected species will contribute to rehabilitation plan development. Appropriate timing of rehabilitation and spatial needs of Federally listed species will be addressed in rehabilitation plans.

RR-2 Seed from regionally native or sterile alien (non-native) species of grasses and herbaceous vegetation will be used in areas where reseeding is necessary following ground disturbance to stabilize soils and prevent erosion by both wind and water.

RR-3 Sediment traps or other erosion control methods will be used to reduce or eliminate influx of ash and sediment into aquatic systems.

RR-4 Use of motorized vehicles during rehabilitation or restoration activities in suitable or occupied habitat will be restricted, to the extent feasible, to existing roads, trails, or washes, and to temporary access roads or fuelbreaks created to enable the fire suppression, prescribed burn, or fuels treatment activities to occur. If off-road travel is deemed necessary, any cross-country travel paths will be surveyed prior to use and will be closed and rehabilitated after rehabilitation or restoration activities are completed.

RR-5 All temporary roads, vehicle tracks, skid trails, and off-road vehicle (ORV) trails resulting from fire suppression and the proposed fire management activities will be rehabilitated (water bars, etc.), and will be closed or made impassible for future use.

RR-6 Burned area emergency rehabilitation (BAER) activities and long-term restoration activities should be monitored, and the results provided to the USFWS and AGFD. Section 7 consultation for BAER activities will be conducted independently, if necessary.

RR-7 **(Recommended)** Develop public education plans that discourage or restrict fires and fire-prone recreation uses during high fire-risk periods. Develop brochures, signs, and other interpretive materials to educate recreationists about the ecological role of fires, and the potential dangers of accidental fires.

Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats (RA)

Wildland Fire Suppression and Rehabilitation

The following Conservation Measures will be implemented during fire suppression operations in riparian, wetland, or aquatic habitats, unless firefighter or public safety, or the protection of property, improvements, or natural resources, render them infeasible during a particular operation. Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations will be documented by the Resource Advisor, and coordinated with the USFWS. The BLM's 1987 policy statement on riparian area management defines a riparian area as "an area of land directly influenced by permanent water. It has visible vegetation or physical characteristics

reflective of permanent water influence. Lakeshores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil."

RA-1 During wildfire suppression, apply M.I.S.T. within riparian areas. Fire suppression actions in riparian areas should be prioritized to minimize damage to stands of native vegetation from wildfire or suppression operations. To the extent possible, retain large, downed woody materials and snags that are not a hazard to firefighters.

RA-2 Fire suppression and rehabilitation in riparian corridors will be coordinated with the Resource Advisor or qualified biologist approved by BLM.

RA-3 Site-specific implementation plans that include project areas with Federally protected aquatic or riparian-obligate species will specify fire management objectives and wildland fire suppression guidance, taking into account the special concerns related to these species.

RA-4 In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical, use wet firebreaks in sandy overflow channels rather than constructing firelines by hand or with heavy equipment.

RA-5 Construction or development of a crossing for motorized vehicles across a perennial stream will not be permitted, unless an established road already exists or where dry, intermittent sections occur.

RA-6 Avoid the use of fire retardants or chemical foams in riparian habitats or within 300 feet of aquatic habitats, particularly sites occupied by Federally protected species. Apply operational guidelines as stated in the *Interagency Standards for Fire and Fire Aviation Operations 2003 (or updates)*, "Environmental Guidelines for Delivery of Retardant or Foam Near Waterways," Chapter 8 (pp. 8-13 through 8-15).

RA-8 When using water from sources supporting Federally protected species, care must be taken to ensure adverse impacts to these species are minimized or prevented. Unused water from fire abatement activities will not be dumped in sites occupied by Federally protected aquatic species to avoid introducing non-native species, diseases, or parasites.

RA-9 If water is drafted from a stock tank or other body of water for fire suppression, it will not be refilled with water from another tank, lakes, or other water sources that may support non-native fishes, bullfrogs, crayfish, or salamanders.

RA-10 Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

Fuels Treatments (prescribed fire; mechanical, chemical, and biological treatments)

The following Conservation Measures are mandatory when implementing wildland fire use, prescribed fires, and the proposed vegetation treatments (mechanical, chemical, biological) within riparian, wetland, or aquatic habitats.

RA-12 All Conservation Measures for wildland fire suppression (**RA-1 to RA-11, Section 2.1**) also apply to fuels treatment activities (prescribed fire; mechanical, chemical, and biological treatments) in riparian, wetland, and aquatic habitats.

RA-13 Fire management treatments within or adjacent to riparian and aquatic habitats will be designed to provide long-term benefits to aquatic and riparian resources by reducing threats associated with dewatering and surface disturbance, or by improving the condition of the watershed and enhancing watershed function.

RA-14 For priority fire/fuels management areas (*e.g*., WUIs) with Federally protected species or designated critical habitat downstream, BLM biologists and other resource specialists, as appropriate, in coordination with USFWS and AGFD, will determine:

A) The number of acres and the number of projects or phases of projects to occur within one watershed per year.

B) An appropriately-sized buffer adjacent to perennial streams in order to minimize soil and ash from entering the stream.

C) Where livestock grazing occurs in areas that have been burned, specialists will determine when grazing can be resumed. Such deferments from grazing will only occur when necessary to protect streams from increased ash or sediment flow into streams[1].

If agreement cannot be reached or treatment will not meet fuel reduction objectives, BLM will re-initiate consultation. Our authority to make these types of changes is in the regulations at 43 CFR 4110.3-3(b).

Species Specific Conservation Measures

In addition to the general Conservation Measures listed in **Sections 1.0** and **2.0**, the following species-specific Conservation Measures will be applied during wildfire suppression to the extent possible, and will be required during fuels treatment activities (wildland fire use, prescribed fire, vegetation treatments). Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations will be documented by the Resource Advisor, and coordinated with the USFWS.

Birds

California brown pelican (FE)

BP-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

Southwestern willow flycatcher (FE)

WF-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

WF-2 Except where fires are active in occupied habitat, minimize unnecessary low-level helicopter flights during the breeding season (April 1 – September 30). Approach bucket dip sites at a 90-degree direction to rivers to minimize flight time over the river corridor and occupied riparian habitats. Locate landing sites for helicopters at least ¼ mile from occupied sites to avoid impacts to willow flycatchers and their habitat.

WF-3 Minimize use of chainsaws or bulldozers to construct firelines through occupied or suitable habitat except where necessary to reduce the overall acreage of occupied habitat or other important habitat areas that would otherwise be burned.

WF-4 Implement activities to reduce hazardous fuels or improve riparian habitats (prescribed burning or vegetation treatments) within occupied or unsurveyed suitable habitat for southwestern willow flycatchers only during the non-breeding season (October 1 to March 31).

WF-5 Avoid developing access roads that would result in fragmentation or a reduction in habitat quality. Close and rehabilitate all roads that were necessary for project implementation (see **RR-5**).

WF-6 Prescribed burning will only be allowed within ½ mile of occupied or unsurveyed suitable habitat when weather conditions allow smoke to disperse away from the habitat when birds may be present (breeding season of April 1 – September 30).

WF-7 Vegetation treatment projects adjacent to occupied or unsurveyed suitable habitat will only be conducted when willow flycatchers are not present (October 1 – March 31).

Bald eagle (FT)

BE-1 No human activity within ½ mile of known bald eagle nest sites between December 1 and June 30.

BE-2 No tree cutting within ¼ mile of known nest trees.

BE-3 No human activity within ¼ mile of known bald eagle winter roost areas between October 15 and April 15.

BE-4 No tree cutting within the area immediately around winter roost sites as determined by BLM biologists.

BE-5 No helicopter or aircraft activity or aerial retardant application within ½ mile of bald eagle nest sites between December 1 and June 30 or winter roost sites between October 15 and April 15.

BE-6 Conduct prescribed burn activities outside of nesting season in a manner to ensure nest and winter roost sites are more than ½ mile from downwind smoke effects.

BE-7 Provide reasonable protective measures so fire prescription or fuels treatment will not consume dominant, large trees as identified by the Resource Advisor or qualified biologist approved by BLM within ½ mile of known nests and roosts of bald eagles Pre-treatment efforts should

provide reasonable protection of identified nesting and roosting trees (see Conservation Measure FT-4).

Yellow-billed cuckoo (FC)

YC-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

Fish

The following Conservation Measure will be implemented for all Federally protected fish species that may be affected by the Proposed Action during fire suppression to the extent possible, and are mandatory for wildland fire use, prescribed fire, and vegetation treatment activities:

FI-1 BLM will cooperate with other agencies to develop emergency protocols to decrease the impacts of fire suppression and fuels treatment activities on Federally listed fish species. Emergency protocols will include appropriate agency contacts, a list of facilities that can hold fish, sources of equipment needed (e.g., sampling gear, trucks) and how to address human health and safety issues.

In addition to implementing **FI-1**, the following species-specific Conservation Measures will also apply:

Desert pupfish (FE, CH)

DP-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats for occupied reaches and critical habitat.

DP-2 Conduct prescribed burns such that no more than one-half of the watershed of each desert pupfish site is burned in a two-year period (excluding buffers to the streams and/or spring habitats) and repeat treatments at greater than two-year intervals.

DP-3 Monitor, where practical, for fish kill immediately following the first runoff event after prescribed fires in watersheds containing desert pupfish.

DP-4 When considering which creek crossings to use for fire management activities, avoid crossings that are known to be occupied by desert pupfish.

Gila topminnow (FE)

GT-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

GT-2 Conduct prescribed burns such that no more than one-half of the watershed of each gila topminnow natural or reintroduction site is burned in a two-year period (excluding buffers to the streams and/or spring habitats) and repeat treatments at greater than two-year intervals.

GT-3 Monitor for fish kill, where practical, immediately following the first runoff event after prescribed fires in the watersheds containing gila topminnows.

GT-4 When considering which creek crossings to use for fire management activities, avoid crossings that are known to be occupied by Gila topminnow, when possible.

GT-5 Develop mitigation plans in coordination with the USFWS for each fuels management project (prescribed fire vegetation treatments) that may adversely affect the gila topminnow. Mitigation plans for prescribed fire will limit to the extent practicable the possibility that fire would spread to riparian habitats. Mitigation plans will be approved by the USFWS.

GT-6 Cooperate with the USFWS and AGFD to identify site-specific measures, such as prescribed fires in grassland vegetation types to improve watershed conditions (*e.g.*, in the Cienega Creek watershed), to protect populations of gila topminnow from other resource program impacts.

Gila chub (PE, Proposed CH)

GC-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats for occupied reaches and proposed critical habitat.

GC-2 When considering which creek crossings to use for fire management activities, avoid crossings that are known to be occupied by Gila chub, when possible.

GC-3 Cooperate with the USFWS and AGFD to identify site-specific measures, such as prescribed fires in grassland vegetation types to improve watershed conditions (*e.g.*, in the Cienega Creek watershed), to protect populations of gila chub from other resource program impacts.

Flowering Plants

The following Conservation Measures for known locations and unsurveyed habitat of all Federally protected plant species within the planning area will be implemented during fire suppression to the extent possible, and are mandatory for wildland fire use, prescribed fire, and vegetation treatment activities:

PL-1 Known locations and potential habitat for plant populations will be mapped to facilitate planning for wildland fire use, prescribed fires, and vegetation treatments, and to ensure protection of these populations during fire suppression.

PL-2 BLM will coordinate with FWS to delineate buffer areas around plant populations prior to prescribed fire and vegetation treatment activities. BLM will coordinate with USFWS during any emergency response and wildland fire use activities to ensure protection of plant populations from fire and fire suppression activities.

PL-3 During fire suppression, wildland fire use, and prescribed fire in habitat occupied by Federally protected plant species, no staging of equipment or personnel will be permitted within 100 meters of identified individuals or populations, nor will off-road vehicles be allowed within the 100-meter buffer area, unless necessary for firefighter or public safety or the protection of property, improvements, or other resources (see **FS-7**). One of the primary threats to many of these plant species is trampling/crushing from personnel and vehicles.

PL-4 No prescribed burning will be implemented within 100 meters of identified locations or unsurveyed suitable habitat for Federally protected and sensitive plant populations unless specifically designed to maintain or improve the existing population.

There are no additional species-specific conservation measures for the following Federally protected plant species: **Pima Pineapple Cactus** (*Coryphantha scheeri* var. *robustispina*), **Siler Pincushion Cactus**

(*Pediocactus sileri*), **Acuña Cactus** (*Echinomastus erectocentrus* var. *acunensis*), **Fickeisen Plains Cactus** (*Pediocactus peeblesianus* var. *fickeiseniae*).

[1]The Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook, Exhibit 4-2, BLM supplemental guidance, page 5 of 9 (http://fire.r9.fws.gov/ifcc/ESR/handbook/) establishes the following policy for livestock exclusion following burns:

Exclusion of livestock is critical for the recovery of burned vegetation or establishment and maintenance of new seedings and use of these areas should not be permitted until the vegetation recovers or is established. Both re-vegetated and, burned but not re-vegetated areas, will be closed to livestock grazing for at least two growing seasons following the season in which the wildfire occurred to promote recovery of burned perennial plants and/or facilitate the establishment of seeded species. Livestock permittees must be informed of the closure early during the plan preparation process, and livestock closures will be made a condition or term on the grazing license or permit through the issuance of grazing decision (see 43 CFR 4160). Livestock closures for less than two growing seasons may be justified on a case-by-case basis based on sound resource data and experience. Livestock management following seedling establishment and/ or burned area recovery should maintain both non-native and/or native species to meet land use (including Standards for Rangeland Health and Guidelines for Grazing Management) or activity plan objectives.

Appendix Q-1. Riparian Functional Condition – Agua Fria National Monument

Definitions								
Conditions:	*PFC = Proper Functioning Condition*				*Trends:*	*UP = Upward Trend*		*NA = Not Applicable*
	FAR = Functioning At Risk					*NAT = No Apparent Trend*		
	NF = Non-Functioning					*DWN = Downward Trend*		
AGUA FRIA NATIONAL MONUMENT								
Stream	***Segment #***	***BLM (miles)***	***Other (miles)***	***Total (miles)***	***Condition***	***Trend***	***Miles per Condition/Trend***	***Year Evaluated***
Agua Fria River	*1-H*	*0.40*	*1.60*	*2.00*	*PFC*	*NA*	*0.40*	*2000*
	1-I	*2.20*	*0.20*	*2.40*	*PFC*	*NA*	*2.20*	*2000*
	1-J	*2.60*	*0.00*	*2.60*	*FAR*	*UP*	*2.60*	*2000*
	1-K	*2.10*	*0.40*	*2.50*	*PFC*	*NA*	*2.10*	*2000*
	1-L	*2.00*	*0.00*	*2.00*	*PFC*	*NA*	*2.00*	*1998*
	1-M	*3.00*	*0.00*	*3.00*	*FAR*	*UP*	*3.00*	*1998*
	1-N	*3.30*	*0.60*	*3.90*	*FAR*	*UP*	*3.30*	*1998*
	1-O	*2.40*	*0.00*	*2.40*	*FAR*	*NAT*	*2.40*	*1999*
	1-P	*2.40*	*0.30*	*2.70*	*FAR*	*NAT*	*2.40*	*200 4*
	Stream Total	***20.40***	***3.10***	***23.50***		***Total PFC/NA***	***6.70***	
						Total FAR/UP	***8.90***	
						Total FAR/NAT	***4.80***	
Ash Creek	*72-A*	*0.70*	*1.10*	*1.80*	*PFC*	*NA*	*0.70*	*2003*
	72-B	*0.90*	*0.00*	*0.90*	*PFC*	*NA*	*0.90*	*2003*
	Stream Total	***1.60***	***1.10***	***2.70***		***Total PFC/NA***	***1.60***	
Badger Springs Wash	*41-A*	***1.76***	***0.00***	***1.76***	***FAR***	***UP***	***1.76***	*2002*
Big Bug Creek	*45-A*	***0.83***	***0.00***	***0.83***	***FAR***	***UP***	***0.83***	*1995*

Bishop Creek	*42-A*	***2.00***	***0.00***	***2.00***	***PFC***	***NA***	***2.00***	*1998*
Dry Creek	*77-A*	***0.80***	***0.00***	***0.80***	***FAR***	***DWN***	***0.80***	*2003*
Indian Creek	*44-A*	*2.10*	*0.00*	*2.10*	*FAR*	*DWN*	*2.10*	*2003*
	44-B	*4.00*	*0.00*	*4.00*	*FAR*	*NAT*	*4.00*	*2003*
	Stream Total	***6.10***	***0.00***	***6.10***		***Total FAR/DWN***	***2.10***	
						Total FAR/NAT	***4.00***	
Indian Creek Tributary	*84-A*	***0.40***	***0.00***	***0.40***	***PFC***	***NA***	***0.40***	*1999*
Larry Creek	*79-A*	***1.00***	***0.00***	***1.00***	***PFC***	***NA***	***1.00***	*2003*
Larry Creek Tributary	*8-A*	***0.60***	***0.00***	***0.60***	***PFC***	***NA***	***0.60***	*1998*
Little Ash Creek	*73-A*	*1.40*	*0.00*	*1.40*	*FAR*	*DWN*	*1.40*	*2003*
	73-B	*0.40*	*0.60*	*1.00*	*PFC*	*NA*	*0.40*	*2000*
	Stream Total	***1.80***	***0.60***	***2.40***		***Total FAR/DWN***	***1.40***	
						Total PFC/NA	***0.40***	
Lousy Canyon	*78-A*	***1.80***	***0.00***	***1.80***	***PFC***	***NA***	***1.80***	*2002*
Silver Creek	*43-A*	*1.00*	*0.00*	*1.00*	*FAR*	*UP*	*1.00*	*1998*
	43-B	*2.00*	*0.00*	*2.00*	*PFC*	*NA*	*2.00*	*1998*
	43-C	*2.00*	*0.00*	*2.00*	*FAR*	*UP*	*2.00*	*1998*
	Stream Total	***5.00***	***0.00***	***5.00***		***Total FAR/UP***	***3.00***	
						Total PFC/NA	***2.00***	
Sycamore Creek	*46-A*	*1.90*	*0.70*	*2.60*	*FAR*	*UP*	*1.90*	*2000*
	46-B	*0.60*	*0.00*	*0.60*	*PFC*	*NA*	*0.60*	*2003*
	46-C	*1.20*	*2.00*	*3.20*	*PFC*	*NA*	*1.20*	*2003*
	Stream Total	***3.70***	***2.70***	***6.40***		***Total PFC/NA***	***1.80***	
						Total FAR/UP	***1.90***	

Overall Total for AFNM	***BLM***	***Other***	***Total***	***PFC/NA***	***FAR/UP***	***FAR/NAT***	***FAR/DWN***	***NF***
	47.79	***7.50***	***55.29***	***18.30***	***16.39***	***8.80***	***4.30***	***0.00***

Appendix Q-2. Riparian Functional Condition – Bradshaw-Harquahala

Definitions				
Conditions:	*PFC = Proper Functioning Condition*	*Trends:*	*UP = Upward Trend*	*NA = Not Applicable*
	FAR = Functioning At Risk		*NAT = No Apparent Trend*	
	NF = Non-Functioning		*DWN = Downward Trend*	

BRADSHAW-HARQUAHALA PLANNING AREA								
Stream	***Segment #***	***BLM (miles)***	***Other (miles)***	***Total (miles)***	***Condition***	***Trend***	***Miles per Condition/ Trend***	***Year Evaluated***
Agua Fria River	*1-D*	*1.54*	*0.62*	*2.16*	*PFC*	*NA*	*1.54*	*1997*
	1-E	*0.85*	*0.65*	*1.50*	*FAR*	*NAT*	*0.85*	*1997*
	1-F	*0.77*	*0.50*	*1.27*	*FAR*	*NAT*	*0.77*	*1997*
	1-G	*2.65*	*0.00*	*2.65*	*PFC*	*NA*	*2.65*	*1997*
	1-Q	*0.60*	*0.00*	*0.60*	*FAR*	*UP*	*0.60*	*1995*
	Stream Total	***6.41***	***1.77***	***8.18***				
						Total PFC/NA	***4.19***	
						Total FAR/UP	***0.60***	
						Total FAR/NAT	***1.62***	
Antelope Creek	*9-A*	***1.90***	***0.00***	***1.90***	***FAR***	***UP***	***1.90***	*2000*
Antelope Creek	*67-A*	*2.00*	*0.60*	*2.60*	*FAR*	*NAT*	*2.00*	*2004*
	67-B	*0.70*	*0.10*	*0.80*	*PFC*	*NA*	*0.70*	*2004*

	67-C	*1.00*	*0.80*	*1.80*	*PFC*	*NA*	*1.00*	*2004*
	Stream Total	***3.70***	***1.50***	***5.20***		***Total PFC/NA***	***1.70***	
						Total FAR/NAT	***2.00***	
Arrastre Creek	*16-A*	*0.20*	*1.10*	*1.30*	*FAR*	*DWN*	*0.20*	*2001*
	16-B	*0.70*	*0.10*	*0.80*	*FAR*	*DWN*	*0.70*	*2001*
	16-C	*1.60*	*3.50*	*5.10*	*PFC*	*NA*	*1.60*	*2004*
	Stream Total	***2.50***	***4.70***	***7.20***		***Total PFC/NA***	***1.60***	
						Total FAR/DWN	***0.90***	
Banty Creek	*27-A*	*1.20*	*1.30*	*2.50*	*PFC*	*NA*	*1.20*	*1998*
	27-B	*2.40*	*1.80*	*4.20*	*PFC*	*NA*	*2.40*	*1998*
	27-C	*2.00*	*1.20*	*3.20*	*FAR*	*NAT*	*2.00*	*2004*
	Stream Total	***5.60***	***4.30***	***9.90***		***Total PFC/NA***	***3.60***	
						Total FAR/NAT	***2.00***	
Big Bug Creek	*45-C*	***1.00***	***1.00***	***2.00***	***NF***	***NA***	***1.00***	*1998*
Bitter Creek	*22-A*	***1.85***	***0.00***	***1.85***	***FAR***	***DWN***	***1.85***	*2000*
Black Canyon Creek	*2-A*	*1.04*	*0.00*	*1.04*	*PFC*	*NA*	*1.04*	*2000*
	2-B	*1.40*	*0.00*	*1.40*	*FAR*	*NAT*	*1.40*	*1997*
	2-C	*1.35*	*0.15*	*1.50*	*FAR*	*DWN*	*1.35*	*1997*
	2-D	*1.96*	*0.00*	*1.96*	*FAR*	*NAT*	*1.96*	*1997*
	2-E	*1.54*	*0.00*	*1.54*	*FAR*	*NAT*	*1.54*	*1997*
	2-F	*2.80*	*0.00*	*2.80*	*FAR*	*NAT*	*2.80*	*1997*
	2-G	*0.72*	*0.00*	*0.72*	*FAR*	*NAT*	*0.72*	*1997*

	2-H	*1.92*	*0.00*	*1.92*	*FAR*	*NAT*	*1.92*	*1997*
	2-I	*1.11*	*0.12*	*1.23*	*FAR*	*NAT*	*1.11*	*1997*
	2-J	*0.85*	*0.00*	*0.85*	*FAR*	*NAT*	*0.85*	*1997*
	Stream Total	***14.69***	***0.27***	***14.96***		***Total PFC/NA***	***1.04***	
						Total FAR/NAT	***12.30***	
						Total FAR/DWN	***1.35***	
Boulder Creek	*34-B*	*1.50*	*1.90*	*3.40*	*PFC*	*NA*	*1.50*	*1998*
	34-C	*4.50*	*3.00*	*7.50*	*PFC*	*NA*	*4.50*	*1998*
	34-D	*1.40*	*1.40*	*2.80*	*PFC*	*NA*	*1.40*	*1998*
	Stream Total	***7.40***	***6.30***	***13.70***		***Total PFC/NA***	***7.40***	
Brown's Canyon	*3-A*	***0.40***	***0.00***	***0.40***	***FAR***	***DWN***	***0.40***	*2000*
Buckhorn Spring	*24-A*	***0.40***	***0.00***	***0.40***	***PFC***	***NA***	***0.40***	*2003*
Bumble Bee Creek	*6-A*	*0.54*	*0.00*	*0.54*	*FAR*	*NAT*	*0.54*	*1998*
	6-D	*0.62*	*0.00*	*0.62*	*FAR*	*NAT*	*0.62*	*2002*
	Stream Total	***1.16***	***0.00***	***1.16***		***Total FAR/NAT***	***1.16***	
Buzzard Roost Creek	*25-A*	***0.60***	***0.00***	***0.60***	***PFC***	***NA***	***0.60***	*1998*
Castle Creek	*4-A*	*0.81*	*0.00*	*0.81*	*FAR*	*NAT*	*0.81*	*2000*
	4-B	*0.81*	*0.00*	*0.81*	*FAR*	*NAT*	*0.81*	*1998*
	4-C	*1.02*	*0.00*	*1.02*	*FAR*	*NAT*	*1.02*	*1998*
	Stream Total	***2.64***	***0.00***	***2.64***		***Total FAR/NAT***	***2.64***	
Cherry Creek	*18-B*	*0.15*	*0.20*	*0.35*	*PFC*	*NA*	*0.15*	*1998*
	18-C	*0.10*	*0.70*	*0.80*	*FAR*	*UP*	*0.10*	*1998*

	Stream Total	***0.25***	***0.90***	***1.15***		***Total PFC/NA***	***0.15***	
						Total FAR/UP	***0.10***	
Cottonwood Creek	*15-A*	*0.60*	*0.15*	*0.75*	*PFC*	*NA*	*0.60*	*2003*
	15-B	*1.10*	*3.70*	*4.80*	*FAR*	*NAT*	*1.10*	*2003*
	15-C	*0.80*	*0.20*	*1.00*	*FAR*	*NAT*	*0.80*	*2003*
	Stream Total	***2.50***	***4.05***	***6.55***		***Total PFC/NA***	***0.60***	
						Total FAR/NAT	***1.90***	
Cottonwood Gulch	*38-B*	***0.82***	***0.17***	***0.99***	***FAR***	***NAT***	***0.82***	*1998*
Cow Creek	*83-A*	***0.40***	***0.80***	***1.20***	***FAR***	***NAT***	***0.40***	*2000*
East Antelope Creek	*68-B*	***0.90***	***1.40***	***2.30***	***PFC***	***NA***	***0.90***	*2004*
French Gulch	*69-A*	***1.30***	***0.00***	***1.30***	***FAR***	***UP***	***1.30***	*1998*
Galena Gulch	*47-A*	***0.80***	***0.00***	***0.80***	***FAR***	***NAT***	***0.80***	*1998*
Hassayampa River	*14-C*	*0.70*	*0.00*	*0.70*	*FAR*	*NAT*	*0.70*	*2004*
	14-D	*0.60*	*0.80*	*1.40*	*FAR*	*NAT*	*0.60*	*2004*
	14-E	*1.50*	*1.90*	*3.40*	*NF*	*NA*	*1.50*	*2004*
	14-F	*1.70*	*1.80*	*3.50*	*FAR*	*NAT*	*1.70*	*1995*
	14-G	*1.90*	*0.00*	*1.90*	*PFC*	*NA*	*1.90*	*1995*
	14-H	*5.10*	*0.20*	*5.30*	*FAR*	*UP*	*5.10*	*2004*
	14-I	*1.20*	*0.00*	*1.20*	*PFC*	*NA*	*1.20*	*2001*
	14-J	*0.00*	*1.40*	*1.40*	*PFC*	*NA*	*0.00*	*2001*
	14-K	*2.60*	*0.90*	*3.50*	*PFC*	*NA*	*2.60*	*2001*

	14-L	*0.55*	*1.45*	*2.00*	*PFC*	*NA*	*0.55*	*2001*
	14-M	*0.40*	*0.00*	*0.40*	*FAR*	*NAT*	*0.40*	*2001*
	14-N	*0.50*	*0.00*	*0.50*	*PFC*	*NA*	*0.50*	*2001*
	Stream Total	***16.75***	***8.45***	***25.20***		***Total PFC/NA***	***6.75***	
						Total FAR/UP	***5.10***	
						Total FAR/NAT	***3.40***	
						Total NF/NA	***1.50***	
Humbug Creek	*30-B*	*1.50*	*0.47*	*1.97*	*FAR*	*DWN*	*1.50*	*2000*
	30-C	*1.20*	*0.00*	*1.20*	*PFC*	*NA*	*1.20*	*1997*
	30-D	*0.61*	*1.82*	*2.43*	*FAR*	*UP*	*0.61*	*1997*
	30-E	*1.20*	*0.00*	*1.20*	*FAR*	*DWN*	*1.20*	*2004*
	30-F	*2.20*	*0.70*	*2.90*	*FAR*	*DWN*	*2.20*	*2004*
	30-H	*0.70*	*3.30*	*4.00*	*FAR*	*NAT*	*0.70*	*1997*
	30-I	*2.20*	*0.30*	*2.50*	*PFC*	*NA*	*2.20*	*1997*
	Stream Total	***9.61***	***6.59***	***16.20***		***Total PFC/NA***	***3.40***	
						Total FAR/UP	***0.61***	
						Total FAR/NAT	***0.70***	
						Total FAR/DWN	***4.90***	
Minnehaha Creek	*17-B*	***0.60***	***0.55***	***1.15***	***FAR***	***NAT***	***0.60***	*2000*
Oak Creek	*19-A*	*0.75*	*1.00*	*1.75*	*PFC*	*NA*	*0.75*	*1998*
	19-B	*0.79*	*0.00*	*0.79*	*PFC*	*NA*	*0.79*	*1998*
	19-C	*0.65*	*1.65*	*2.30*	*FAR*	*UP*	*0.65*	*2004*
	19-D	*1.30*	*0.00*	*1.30*	*FAR*	*UP*	*1.30*	*2004*
	19-E	*0.20*	*0.50*	*0.70*	*FA*	*UP*	*0.20*	*2004*

					R			
	Stream Total	**3.69**	**3.15**	**6.84**		**Total PFC/NA**	**1.54**	
						Total FAR/UP	**2.15**	
S. Fork Spring Creek	*21-A*	**0.20**	**0.50**	**0.70**	**FAR**	**NAT**	**0.20**	*1999*
Spring Creek	*20-A*	*0.25*	*2.25*	*2.50*	*FAR*	*NAT*	*0.25*	*1999*
	20-B	*0.60*	*2.00*	*2.60*	*FAR*	*UP*	*0.60*	*1999*
	20-D	*0.90*	*0.00*	*0.90*	*FAR*	*NAT*	*0.90*	*2003*
	Stream Total	**2.15**	**4.25**	**6.40**		**Total FAR/UP**	**0.60**	
						Total FAR/NAT	**1.55**	
Tiger Canyon	*66-A*	**0.70**	**0.00**	**0.70**	**FAR**	**NAT**	**0.70**	*1998*
Tule Creek	*10-E*	**1.27**	**0.00**	**1.27**	**PFC**	**NA**	**1.27**	*2000*
Weaver Creek	*70-B*	**0.40**	**0.80**	**1.20**	**FAR**	**NAT**	**0.40**	*1999*
Overall Totals for Bradshaw-Harquahala	**BLM**	**Other**	**Total**	**PFC/NA**	**FAR/UP**	**FAR/NAT**	**FAR/DWN**	**NF**
	92.59	**51.45**	**144.04**	**35.14**	**12.36**	**33.19**	**9.40**	**2.50**

Appendix R - Lands Management

LANDS AVAILABLE FOR EXCHANGE ONLY

Township	Range	Section	Aliquot	Acreage	Total
12 N	**05 W**	09	Lots 3-4 W½SE¼	164.20 80.00	
12 N	**05 W**	16	Lots 1-4 NW¼NE¼, NE¼NW¼, SE¼SW¼, SW¼SE¼	331.44	
12 N	**5 W**	22	Lots 3-4 S½ SW¼NE¼, S½NW¼	513.81	
11 N	**5 W**	21	Unpatented land in Sec. 21 delineated in segregation survey approved 08/23/1939)		
11 N	**04 W**	1	Lot 1 SE¼NE¼, SE¼	240.36	
11 N	**04 W**	11	Lots 3-6 Inclusive (Plus portions of MS 4659 A & B) W½NE¼, NW¼, E½SW¼, NW¼SE¼		
11 N	**04 W**	12	Lots 1-13 NE¼NW¼ (Plus portions of MS 1323 B and MS 4659 A & B		
11 N	**04 W**	13	Lots 1-8 SE¼NE¼, SE¼ (Plus portions of unpatented MS parcels)	195.66 200.00	**395.66**
11 N	**04 W**	14	Lots 1-4	34.88	**34.88**
11 N	**04 W**	22	Lots 5, 6, 11, 12	166.86	**166.86**
11 N	**04 W**	23	Lots 1-9 NE¼SE¼, S½SE¼	302.01 120.00	**422.01**
11 N	**04 W**	24	Lots 1-4, 7, 8, 9 (Plus unpatented MS) NE¼, SW¼SW¼, SE¼SE¼	233.58 200.00	**433.58**
11 N	**04 W**	25	Lot 4 SW¼NW¼, W½SW¼	 174.05	**175.05**
11 N	**04 W**	26	Lots 1-3 NE¼, NW¼NW¼, SW¼SW¼, E½SW¼, SE¼	99.66 480.00	**579.66**
11 N	**04 W**	27	Lots 1-3, 5, 6 SE¼NE¼, SW¼NW¼, S½	191.14 400.00	**591.14**
11 N	**04 W**	28	Lots 7, 8, 13	120.26	**126.26**
11 N	**04 W**	36	W½W½	160	**160.00**
11 N	**03 W**	06	Lots 3-7 SE¼NW¼, E½SW¼	188.21 120.00	**308.21**

11 N	**03 W**	07	Lots1-4 E½W½ (Excluding Patent 31583)	308.42	**308.42**
11 N	**03 W**	18	Lots 1-4 E½W½	149.12 160.00	**309.12**
10 N	**06 W**	10	NW¼NE¼, S½NE¼, NE¼NW¼, S½NW¼, S½ (Less ME patents and patent 73778)	240.00	**350.00**
10 N	**06 W**	11	Lots 2-4 inclusive SW¼NW¼, W½SE¼NW¼		**130.50**
10 N	**06 W**	15	Lots 1-4 inclusive W½E½, W½ (Less Mineral Entry patents/patented lands)		
10 N	**06 W**	16	Lots 1-2, 4-7 Inclusive S½NE¼ (Less ME patents) SE¼SW¼	295.12	**295.12**
10 N	**06 W**	22	Lots 1-4 (Less ME patents) NW¼ (Less ME patents) S½ (Less ME patents)	480.00	**480.00**
10 N	**06 W**	23	Lots 2-3, 9-19 Inclusive, 21 Portions of MS 2901 S½SE¼	463.64	**463.64**
10 N	**06 W**	24	W½NW¼, SW¼ (Less ME patent/patent 453373)	220.00	**220.00**
10 N	**07 W**	18	S½NE¼, SE¼	240.00	**240.00**
03 N	**12 W**	16	ALL	640.00	**640.00**

LANDS AVAILABLE FOR DISPOSAL

Township	Range	Section	Aliquot	Acreage	
14 N	**01 W**	28	NE¼NE¼	40.00	**40.00**
14 N	**01 W**	31	Lots 17, 18, 21, 22, 23, 25, 26	29.48	**29.48**
14 N	**01 W**	33	W½W½NW¼	40.00	**40.00**
14 N	**03 W**	31	Lots 6, 7	83.94	**83.94**
14 N	**04 W**	25	SW¼NE¼, NW¼SE¼	80.00	**80.00**
14 N	**04 W**	35	SW¼	160.00	**160.00**
13 N	**04 W**	1	Lots 1-6 SW¼NE¼, SE¼NW¼, E½SW¼, NW¼SE¼,S½SE¼	227.23 280.00	**507.23**
13 N	**04 W**	12	ALL	640.00	**640.00**
13 N	**04 W**	13	Lots 1 – 19 SW¼SW¼, E½SE¼	554.62 120.00	**674.62**
13 N	**04 W**	24	ALL	640.00	**640.00**

13 N	**04 W**	25	ALL	640.00	**640.00**
13 N	**04 W**	26	ALL Less the following: 02-80-0009 02-80-0007 02-84-0031 02-80-0008		
13 N	**04 W**	27	ALL	640.00	**640.00**
13 N	**04 W**	28	ALL	640.00	**640.00**
13 N	**04 W**	33	N½	320.00	**320.00**
11 N	**03 W**	04	SW¼SE¼	40	**40.00**
11 N	**03 W**	08	Lots 2-3, 5-7, 9, 11 SW¼SE¼ Portion of unpatented mineral surveys	107.16 40.00 ~80.00	**227.16**
11 N	**03 W**	17	Unpatented Mineral Survey	~20.00	**~20.00**
11 N	**03 W**	18	Portions of unpatented mineral survey	~ 5.00	**~ 5.00**
10 N	**04 W**	11	E½SE¼ (Less mineral survey 4323/Patent 1133466)		**139.339**
10 N	**04 W**	12	W½SW¼ (Less mineral survey 4323/Patent 1133466)		
10 N	**04 W**	16	NE¼NE¼	40.00	**40.00**
12 N	**03 W**	31	Lots 6 & 7, N½SE¼	171.60	171.60
12 N	**03 W**	32	Lots 3 & 4, N½SW¼	169.08	169.08
08 N	**07 W**	01	Lots 1-4 S½	206.24 320.00	**526.24**
08 N	**07 W**	10	S½SE¼	80.00	**80.00**
08 N	**07 W**	11	S½SW¼, SW¼SE¼	120.00	**120.00**
08 N	**07 W**	14	NW¼NE¼, NW¼, N½SW¼	280.00	**280.00**
08 N	**07 W**	15	NE¼, E½SE¼	240.00	**240.00**
07 N	**07 W**	16	ALL	640.00	**640.00**
07 N	**07 W**	33	NW¼	160.00	**160.00**
07 N	**06 W**	17	S½NW¼SW¼, N½SW¼SW¼	40.00	**40.00**
07 N	**06 W**	18	SE¼NE¼SE¼, NE¼SE¼SE¼	20.00	**20.00**
07 N	**06 W**	27	N½, SW¼, NE¼SE¼, W½SE¼	600.00	**600.00**
07 N	**06 W**	34	N½NW¼	80.00	**80.00**
07 N	**02 E**	15	NE¼NE¼, W½NE¼, SE¼	280.00	**280.00**
07 N	**02 E**	26	S½NW¼NE¼, NE¼NW¼	60.00	**60.00**
07 N	**02 E**	27	Lots 1, 16, 33, 42-45, 47, 49-50, 52-53, 56-58, 61-63, 65-67 W½E½NE¼	50.51 40.00	**90.51**
07 N	**02 E**	34	W½NW¼NE¼, E½NE¼NW¼	40.00	**40.00**
06 N	**03 E**	35	E½NW¼SE¼NW¼		
06 N	**04 W**	01	SE¼	160.00	**160.00**
06 N	**04 W**	12	NE¼	160.00	**160.00**
06 N	**04 W**	14	Lot 2	23.46	**63.46**

			SE¼SE¼	40.00	
06 N	**04 W**	23	NW¼NE¼	40.00	**40.00**
06 N	**04 E**	01	S½SW¼		
06 N	**04 E**	11	NE¼ (less MS 4334)		
06 N	**04 E**	12	NW¼ (less MS 4334)		
05 N	**03 E**	01	SE¼NE¼	40.00	**40.00**
05 N	**04 E**	06	SW¼NE¼	40.00	**40.00**
05 N	**01 E**	28	SW¼NE¼	40.00	**40.00**
05 N	**01 E**	29	E½E½	160.00	**160.00**
05 N	**01 E**	30	S½NE¼NE¼, SE¼NE¼	60.00	**60.00**
05 N	**01 W**	13	Lot 16	66.10	**66.10**
05 N	**01 W**	14	Lot 11	39.04	**39.04**
05 N	**01 W**	15	Lot 11	54.64	**54.64**
04 N	**1 E**	06	Lots 8, 18-21 Inclusive, 29-31 Inclusive, SW¼NE¼, E½SE¼NW¼, E½NE¼SW¼, NE¼SE¼SW¼, NW¼SE¼	39.44 130.00	**169.44**
04 N	**1 E**	07	Lots 5, 25 E½W½	10.00 160.00	**170.00**
04 N	**1 E**	12	W½W½SW¼NW¼	10.00	**10.00**
04 N	**1 E**	23	W½NW¼NW¼SE¼, N½SW¼NW¼SE¼	10.00	**10.00**
04 N	**2 W**	07	Lots 1-2	76.50	**76.50**
04 N	**1 W**	24	NW¼NW¼, S½NW¼, NW¼SW¼	160.00	**160.00**
04 N	**11W**	30	NE¼, NW¼SE¼	200.00	**200.00**
04 N	**11W**	32	N½SE¼, S½S½	240.00	**240.00**
03 N	**11 W**	02	Lots 1-4 Inclusive S½N½, S½	160.56 480.00	**640.56**
03 N	**10 W**	08	ALL	640.00	**640.00**
03 N	**09 W**	31	Lots 1-2 E½NW¼	76.45 80.00	**156.45**
03 N	**06 W**	13	Lots 4-5, 7 E½NE¼, N½SE¼ Identified disposal lands are those that lie east of right-of-way boundary AZA-23351 (centerline questionable)	Approx. 320.00	**Approx.** **320.00**
03 N	**06 W**	24	Lots 1, 4, 5 E½SE¼		
03 N	**05 W**	14	NE¼, E½SE¼	240.00	**240.00**
03 N	**05 W**	17	Lots 2-3, 8	240.45	**240.45**
03 N	**05 W**	18	Lots 1-3 Inclusive, 5-8 Inclusive, 11 NE¼NE¼, W½NE¼, E½NW¼	350.29 200.00	**550.29**
03 N	**05 W**	19	Lot 7	27.73	**27.73**
03 N	**05 W**	22	ALL	640.00	**640.00**
03 N	**05 W**	23	S½	320.00	**320.00**
03 N	**05 W**	25	ALL	640.00	**640.00**

03 N	**05 W**	26	W½	320.00	**320.00**
03 N	**05 W**	27	ALL	640.00	**640.00**
03 N	**05 W**	34	W½	320.00	**320.00**
03 N	**05 W**	35	W½	320.00	**320.00**
02 N	**01 W**	13	SW¼SE½	40.00	**40.00**
02 N	**01 W**	24	NW¼NE¼	40.00	**40.00**
02 N	**01 W**	25	W½NE¼NW¼NE¼, NW¼NE¼NE¼, SW¼NW¼NE¼	25.00	**25.00**
02 N	**05 W**	36	N½N½SW¼, S½NW¼SW¼, SW¼NE¼SW¼, SW¼SW¼, W½SE¼SW¼	130.00	**130.00**
02 N	**07 W**	17	W½NW¼	80.00	**80.00**
01 N	**03 W**	03	S½SE¼SW¼	20.00	**20.00**
01 N	**03 W**	07	W½NE¼, E½NW¼	160.00	**160.00**
01 N	**04 W**	01	Lots 1-4 Inclusive S½N½	160.64 160.00	**320.64**
01 N	**04 W**	11	SE¼SW¼, SE¼	200.00	**200.00**
01 N	**04 W**	12	ALL	640.00	**640.00**
01 N	**04 W**	13	NE¼NE¼, E½NW¼NE¼, SW¼NW¼NE¼, NE¼NW¼, N½N½SE¼NW¼	120.00	**120.00**
01 N	**04 W**	14	N½NE¼	80.00	**80.00**