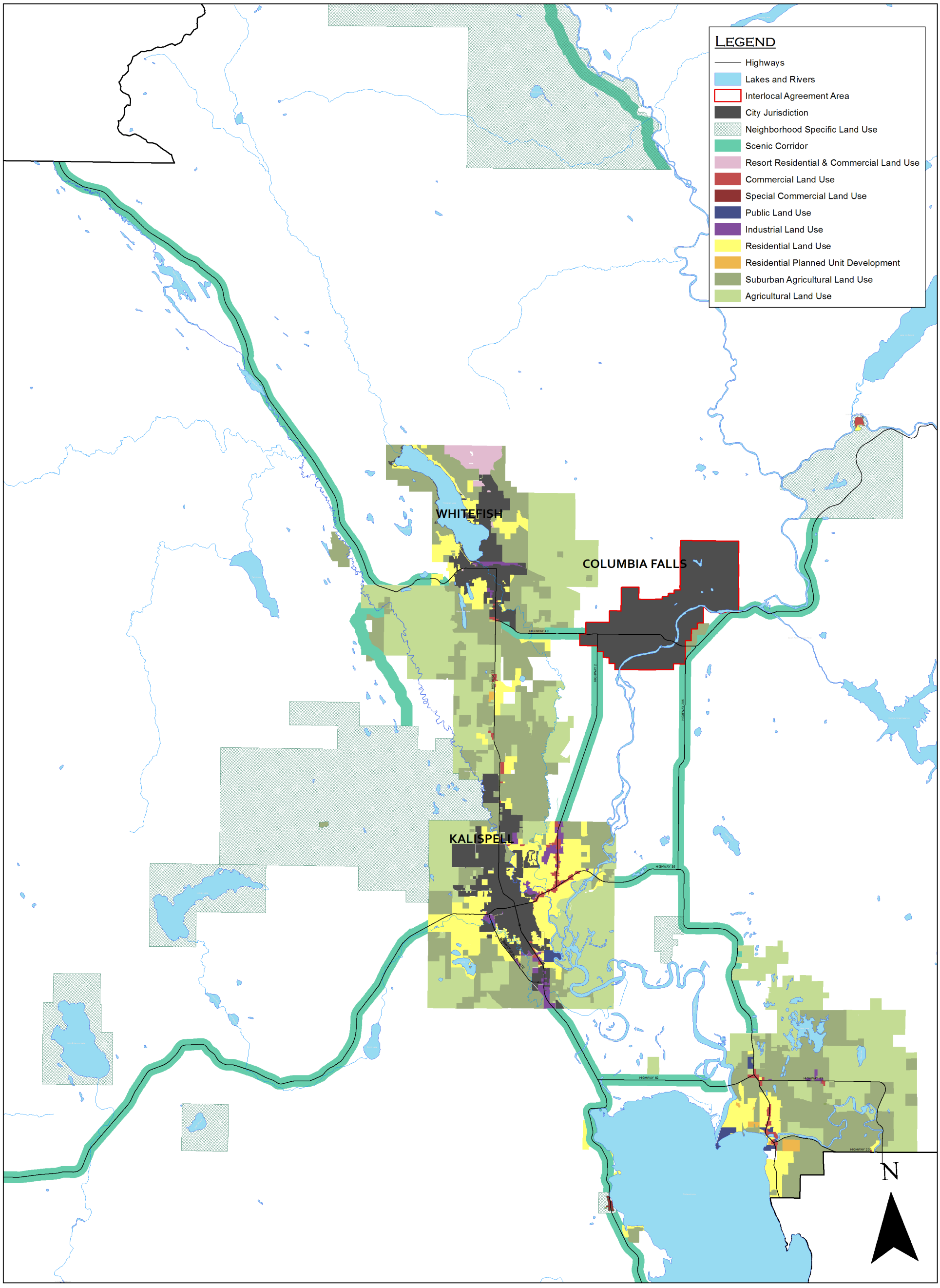
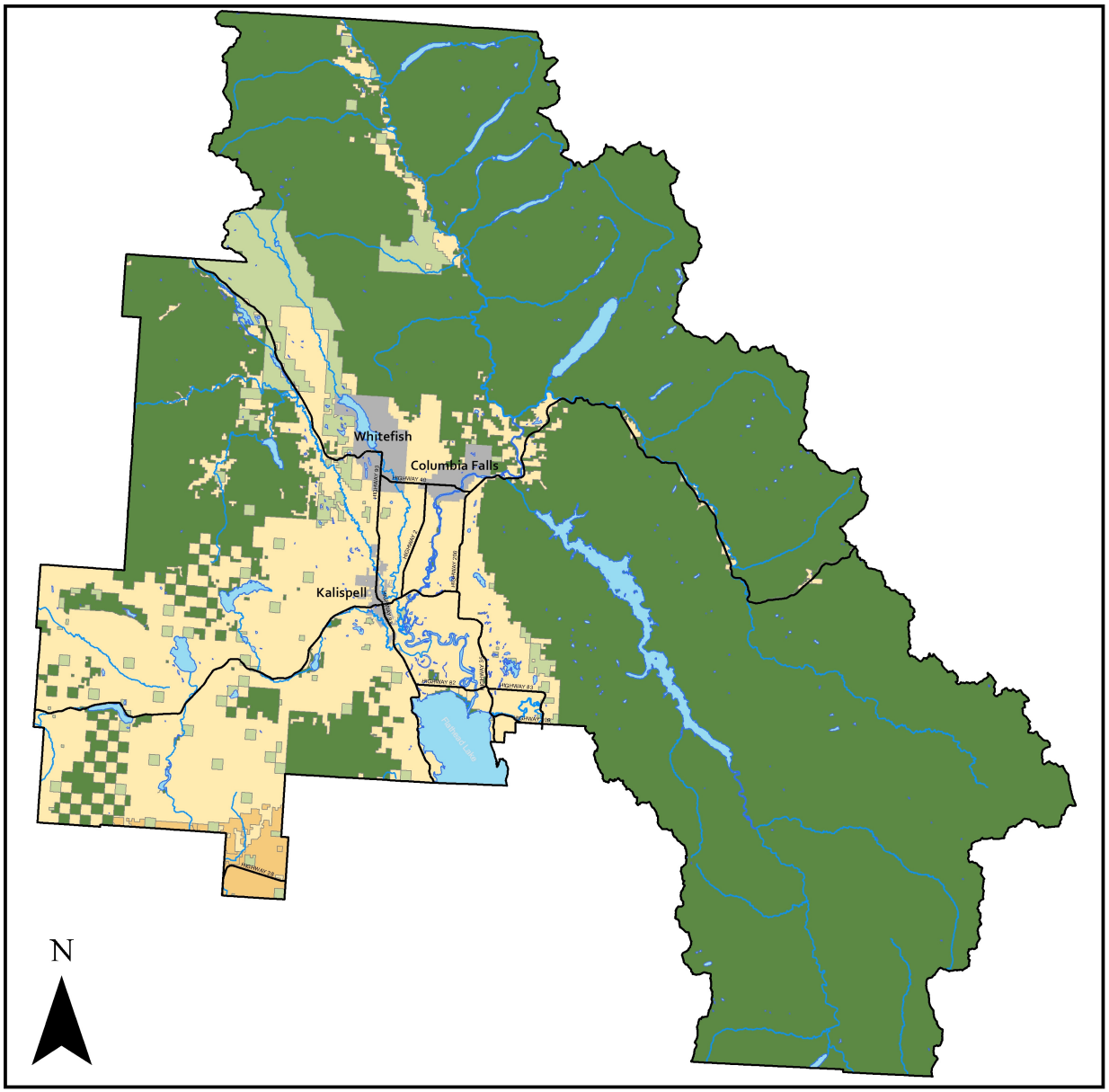
# FLATHEAD COUNTY DESIGNATED LAND USE MAP

## FLATHEAD COUNTY GROWTH POLICY

0 2 4 8 12 Miles






# MAP 2.1

# FLATHEAD LANDS

**FLATHEAD COUNTY GROWTH POLICY**

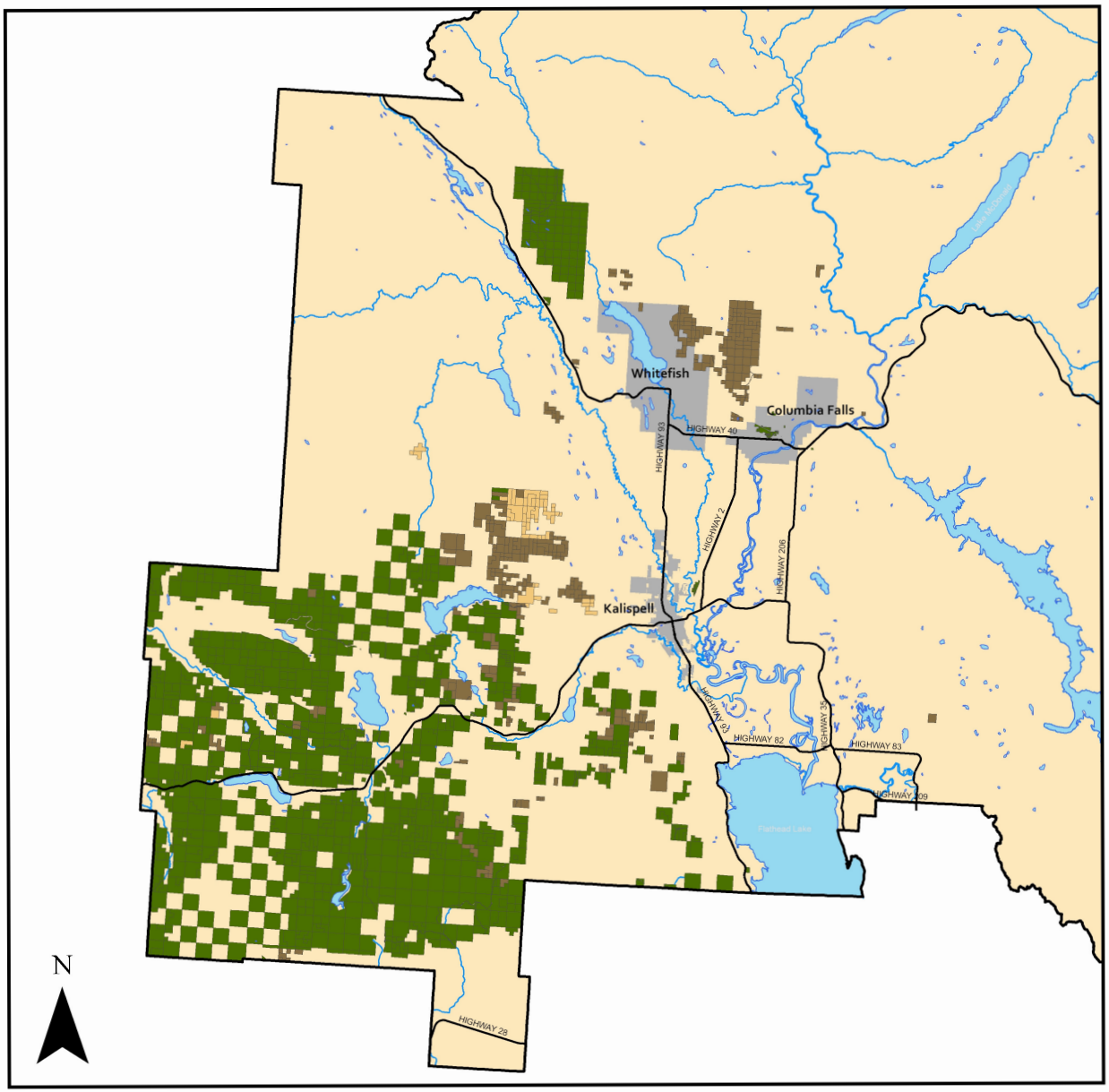
## LEGEND

- Lakes & rivers
- City Jurisdiction
- Federal land
- State land
- Tribal land
- Private land

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 5 10 20 30 Miles

SOURCE: FLATHEAD COUNTY GIS DEPARTMENT
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 2 - LAND USE




# MAP 2.2

# CORPORATE TIMBER LANDS

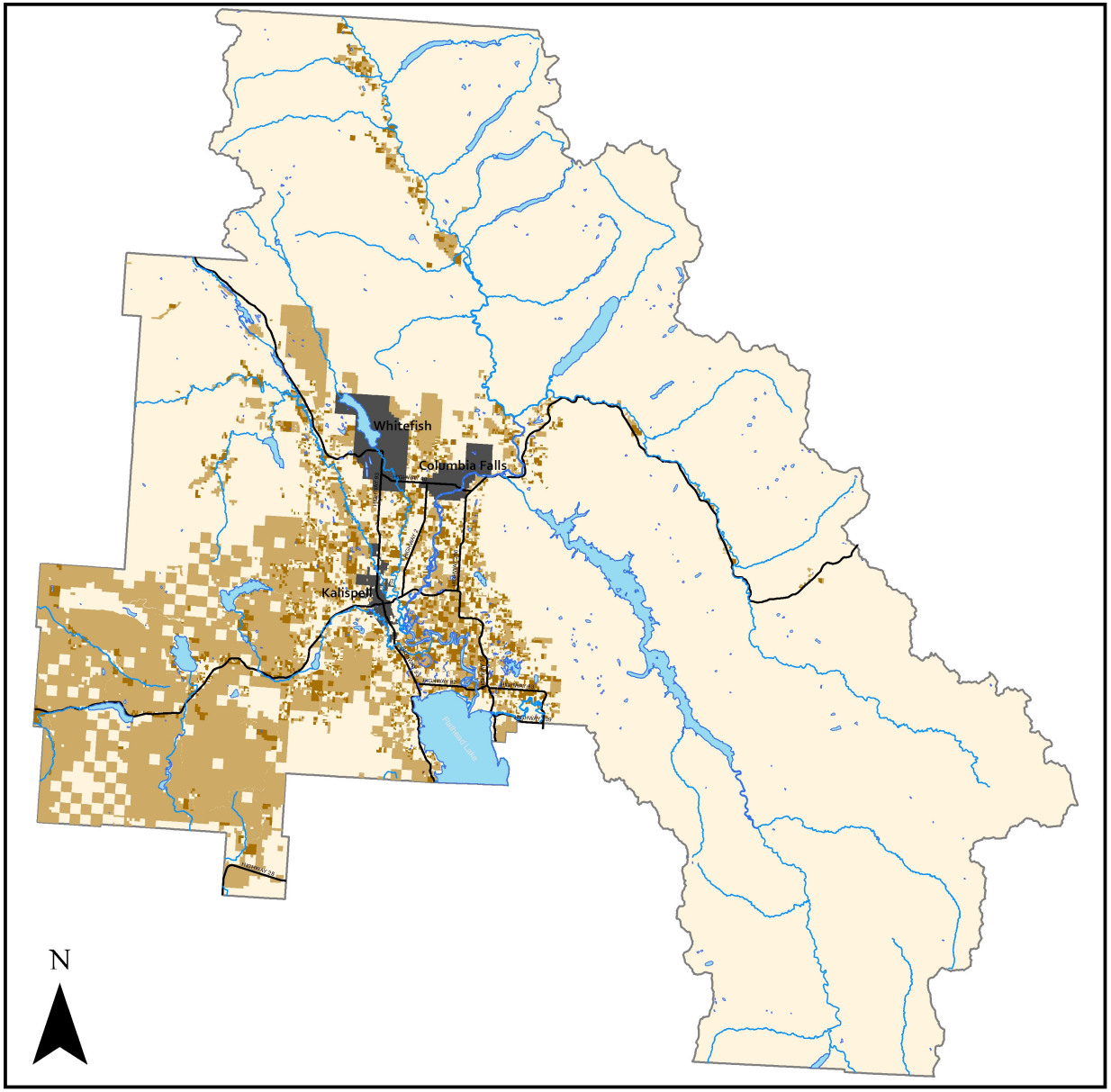
## FLATHEAD COUNTY GROWTH POLICY

### LEGEND

- Lakes & rivers
- City Jurisdiction
- F H Stoltze
- Plum Creek Timber
- Montana Forest Products

0 2.5 5 10 15 Miles

SOURCE: MONTANA CADASTRAL FRAMEWORK, FLATHEAD COUNTY PROPERTY OWNERSHIP
FILE PATH: S:\\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 2 - LAND USE




# MAP 2.3

# AGRICULTURAL LAND USE

**FLATHEAD COUNTY GROWTH POLICY**

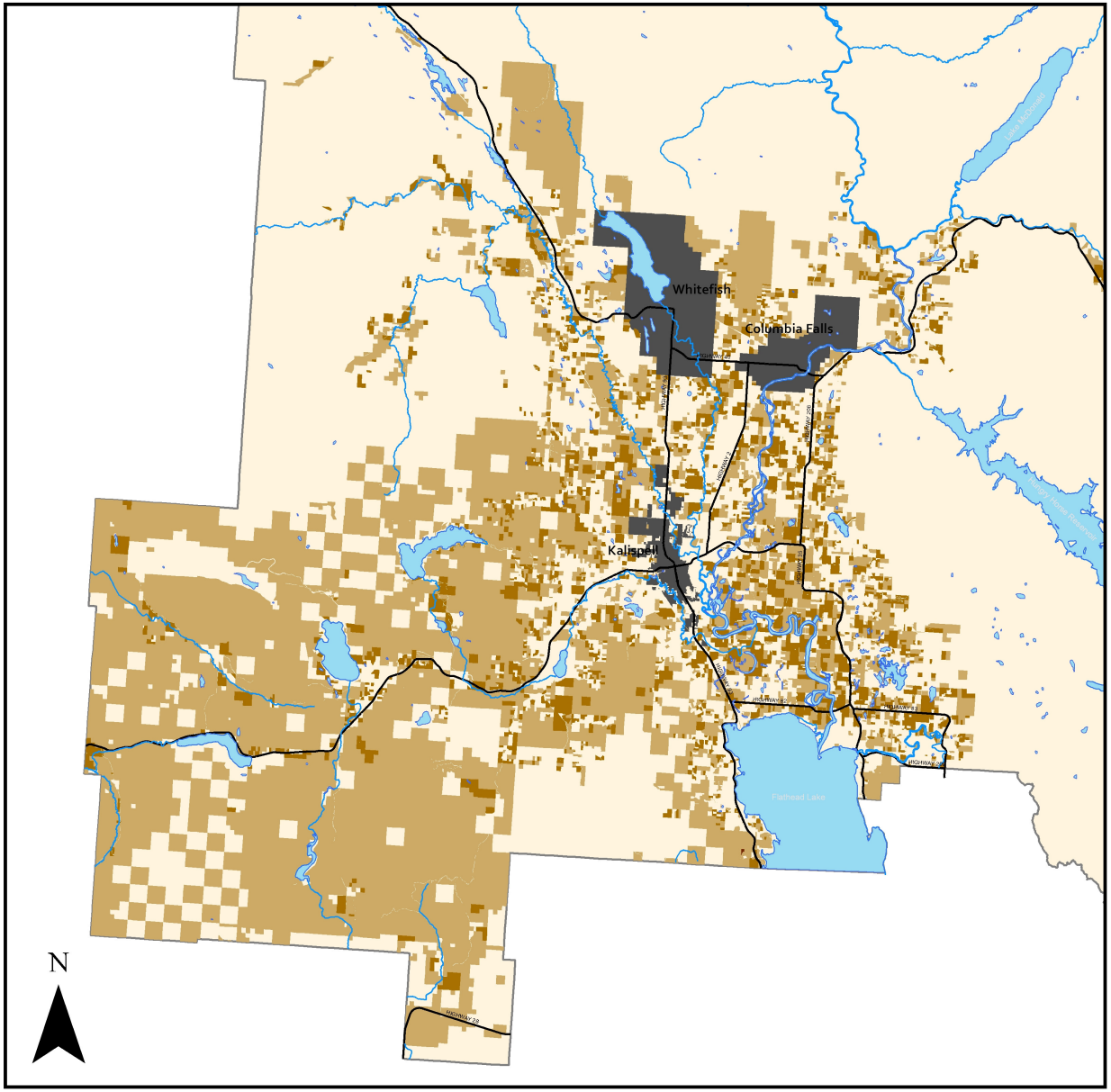
## LEGEND

- Lakes & rivers
- City Jurisdiction
- Farmstead Rural
- Agricultural Urban
- Agricultural Rural

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 5 10 20 30 Miles

SOURCE: MONTANA CADASTRAL FRAMEWORK, FLATHEAD COUNTY CAMA D
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GF




# MAP 2.3 (A)

# AGRICULTURAL LAND USE

**FLATHEAD COUNTY GROWTH POLICY**

## LEGEND

- Lakes & rivers
- City Jurisdiction
- Farmstead Rural
- Agricultural Urban
- Agricultural Rural

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

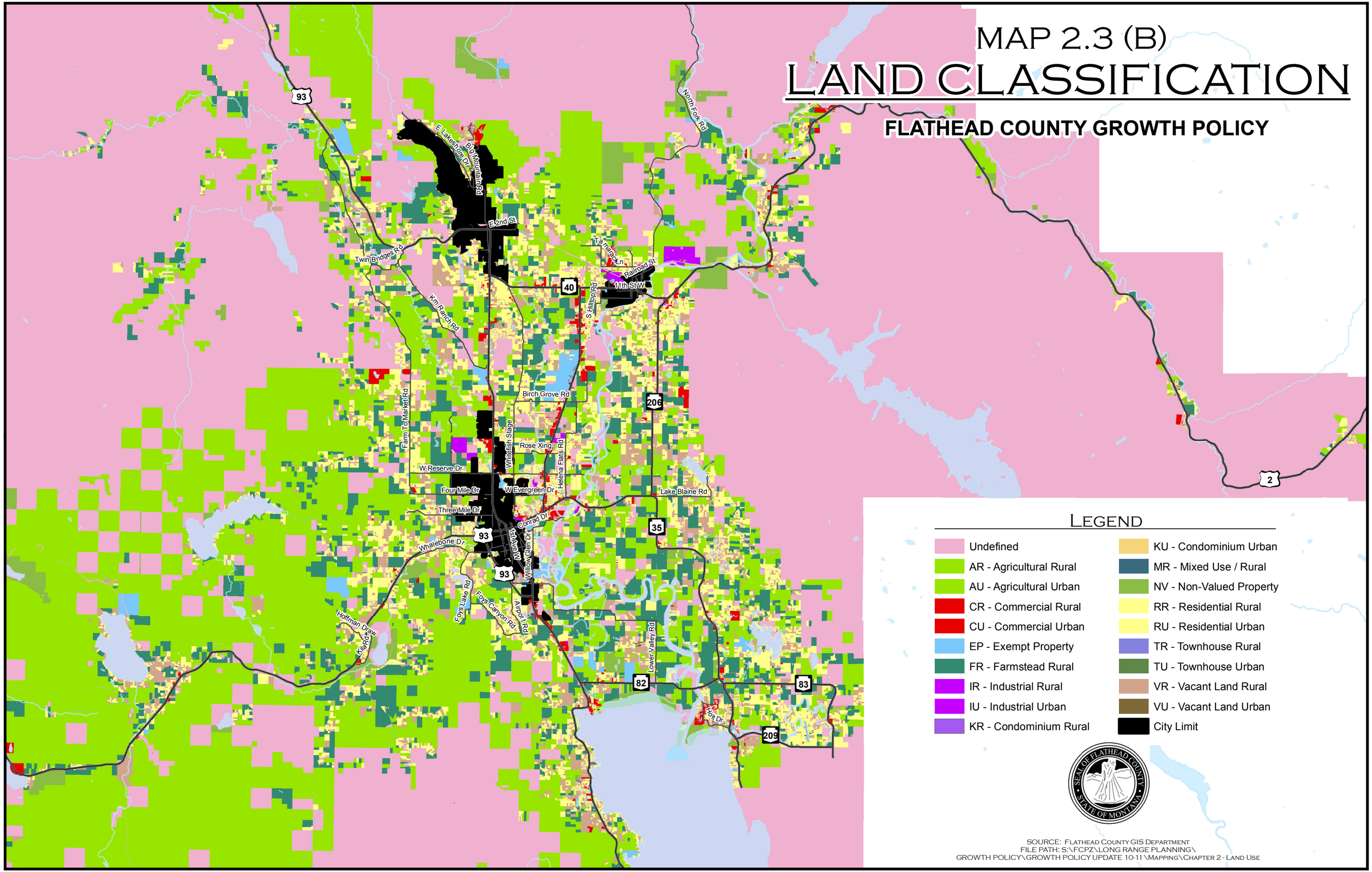
0 2.5 5 10 15 Miles

SOURCE: MONTANA CADASTRAL FRAMEWORK, FLATHEAD COUNTY CAMA D
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GF

# MAP 2.3 (B)

# LAND CLASSIFICATION

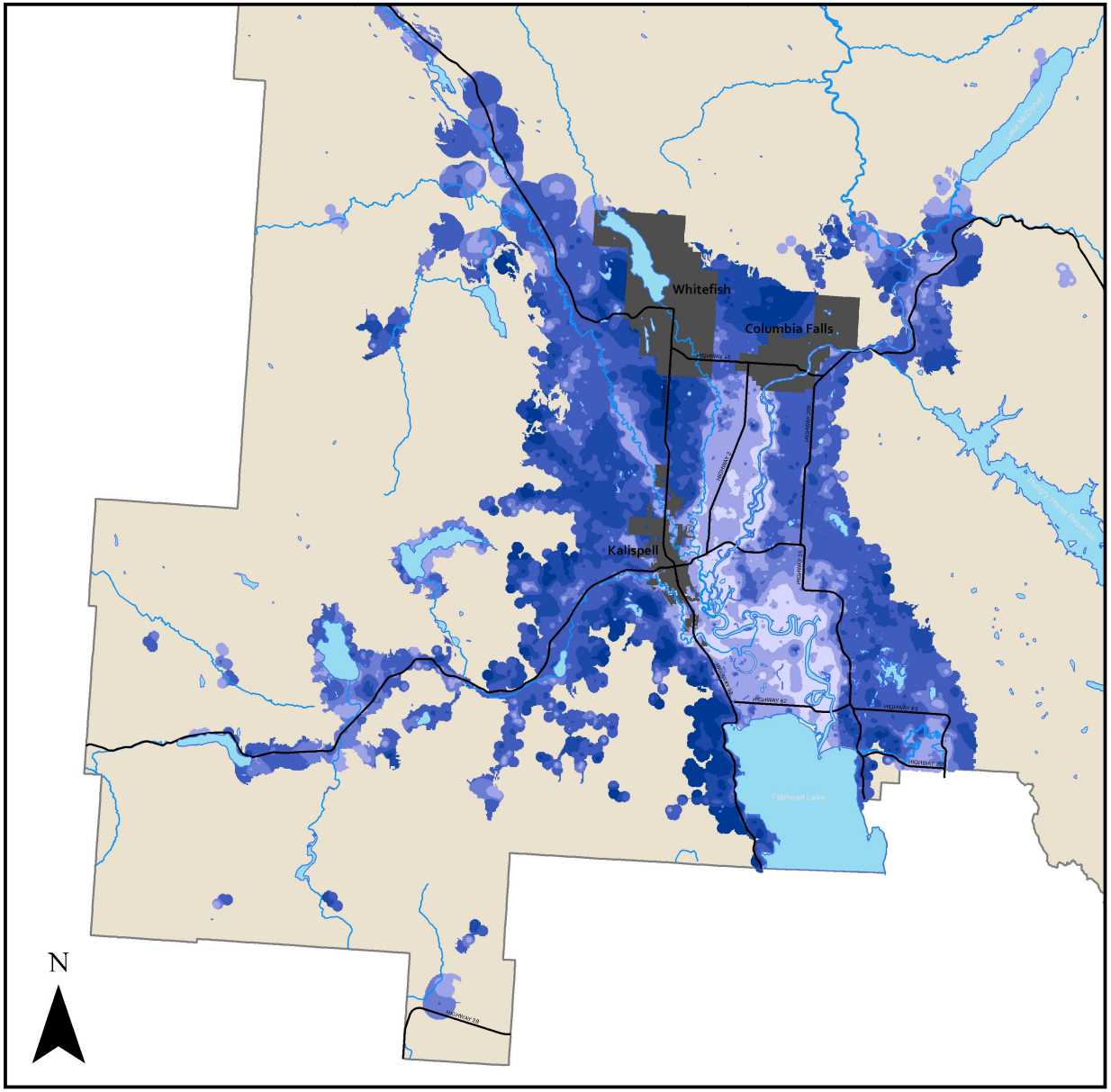
## FLATHEAD COUNTY GROWTH POLICY




## LEGEND

- Undefined
- AR - Agricultural Rural
- AU - Agricultural Urban
- CR - Commercial Rural
- CU - Commercial Urban
- EP - Exempt Property
- FR - Farmstead Rural
- IR - Industrial Rural
- IU - Industrial Urban
- KR - Condominium Rural
- KU - Condominium Urban
- MR - Mixed Use / Rural
- NV - Non-Valued Property
- RR - Residential Rural
- RU - Residential Urban
- TR - Townhouse Rural
- TU - Townhouse Urban
- VR - Vacant Land Rural
- VU - Vacant Land Urban
- City Limit

SOURCE: Flathead County GIS Department
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\
GROWTH POLICY\GROWTH POLICY UPDATE 10-11\Mapping\Chapter 2 - Land Use




# MAP 2.4

# GROUNDWATER

## FLATHEAD COUNTY GROWTH POLICY

**LEGEND**

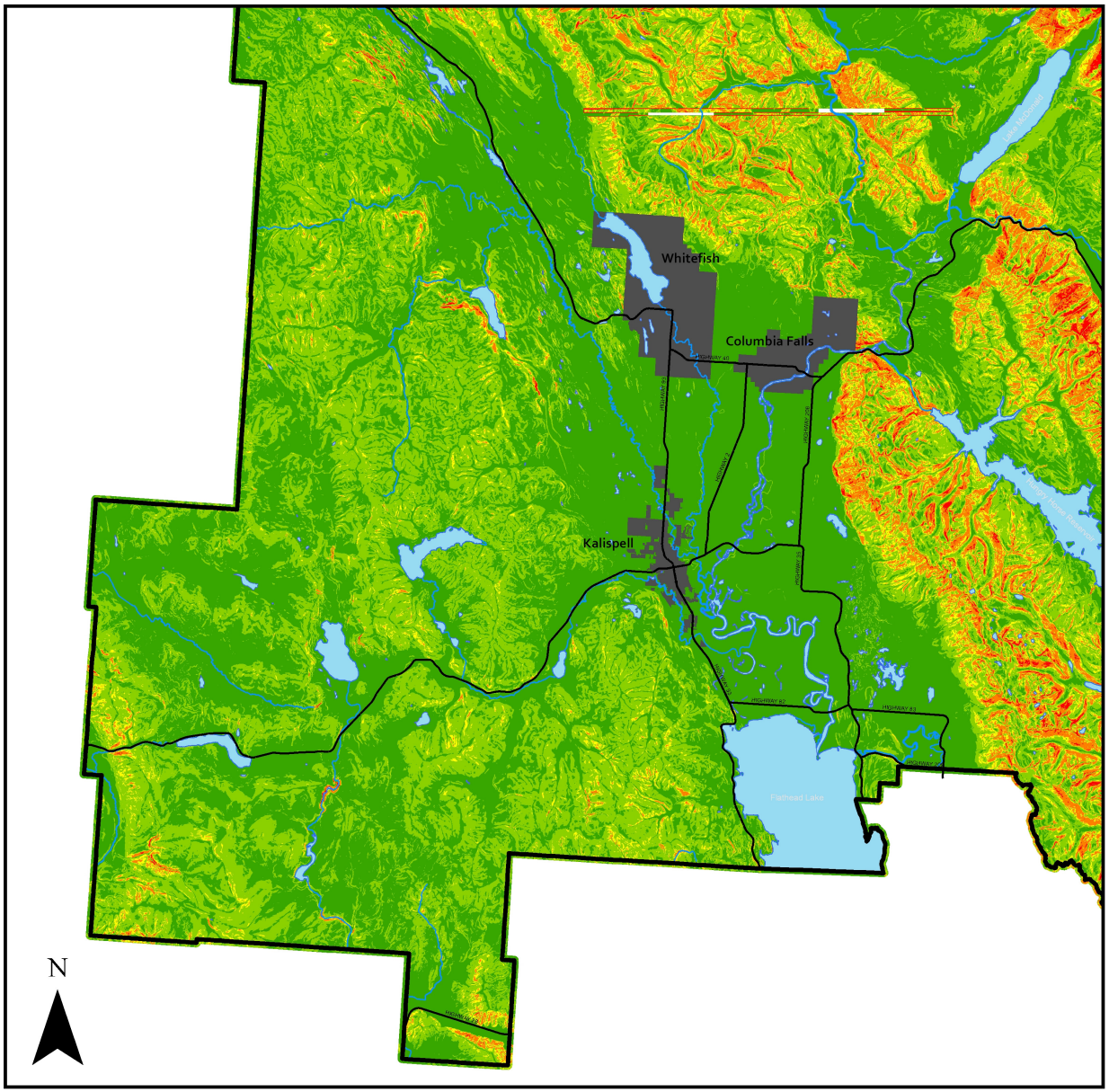
- Lakes & rivers
- City Jurisdiction

**Approximate Depth to Groundwater**

- 5
- 6 - 25
- 26 - 40
- 41 - 100
- 101 - 200
- 201 - 1000

0 2.5 5 10 15 Miles

SOURCE: CWI/MONTANA BUREAU OF MINES & GEOLOGY - NRIS DATABASE; COMPILATION/ANALYSIS COMPELTED BY THE FLATHEAD LAKERS
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 2 - LAND USE




# MAP 2.5

# STEEP SLOPES

## FLATHEAD COUNTY GROWTH POLICY

**LEGEND**

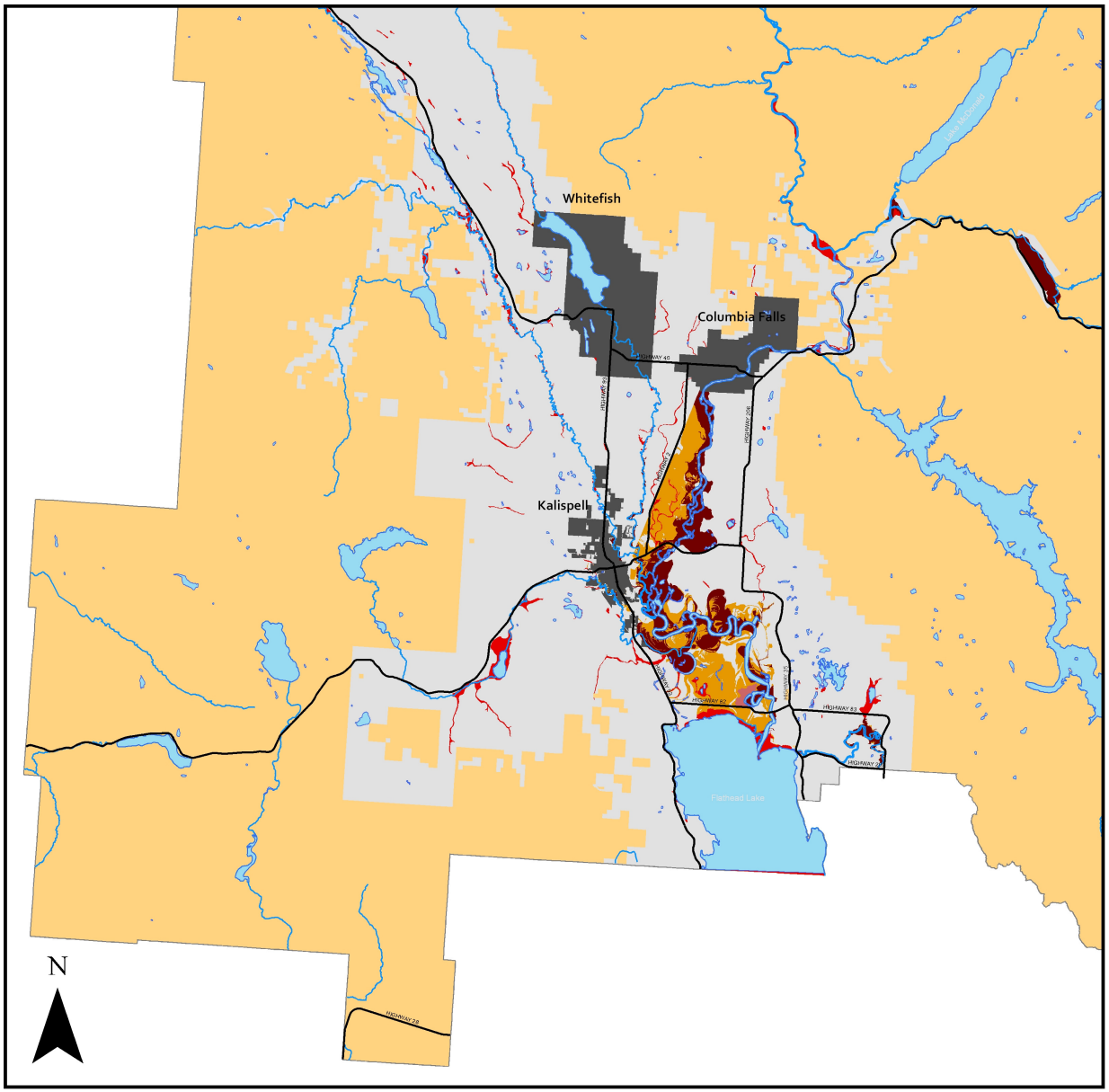
- Lakes & rivers
- City Jurisdiction

**Slope**

- Up to 12%
- Up to 25%
- Up to 30%
- Up to 40%
- Over 40%

0 2.5 5 10 15 Miles

SOURCE: FLATHEAD COUNTY GIS DEPARTMENT
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 2 - LAND USE




# MAP 2.6

# FLOODPLAIN

## FLATHEAD COUNTY GROWTH POLICY

### LEGEND

- Lakes & rivers
- City Jurisdiction

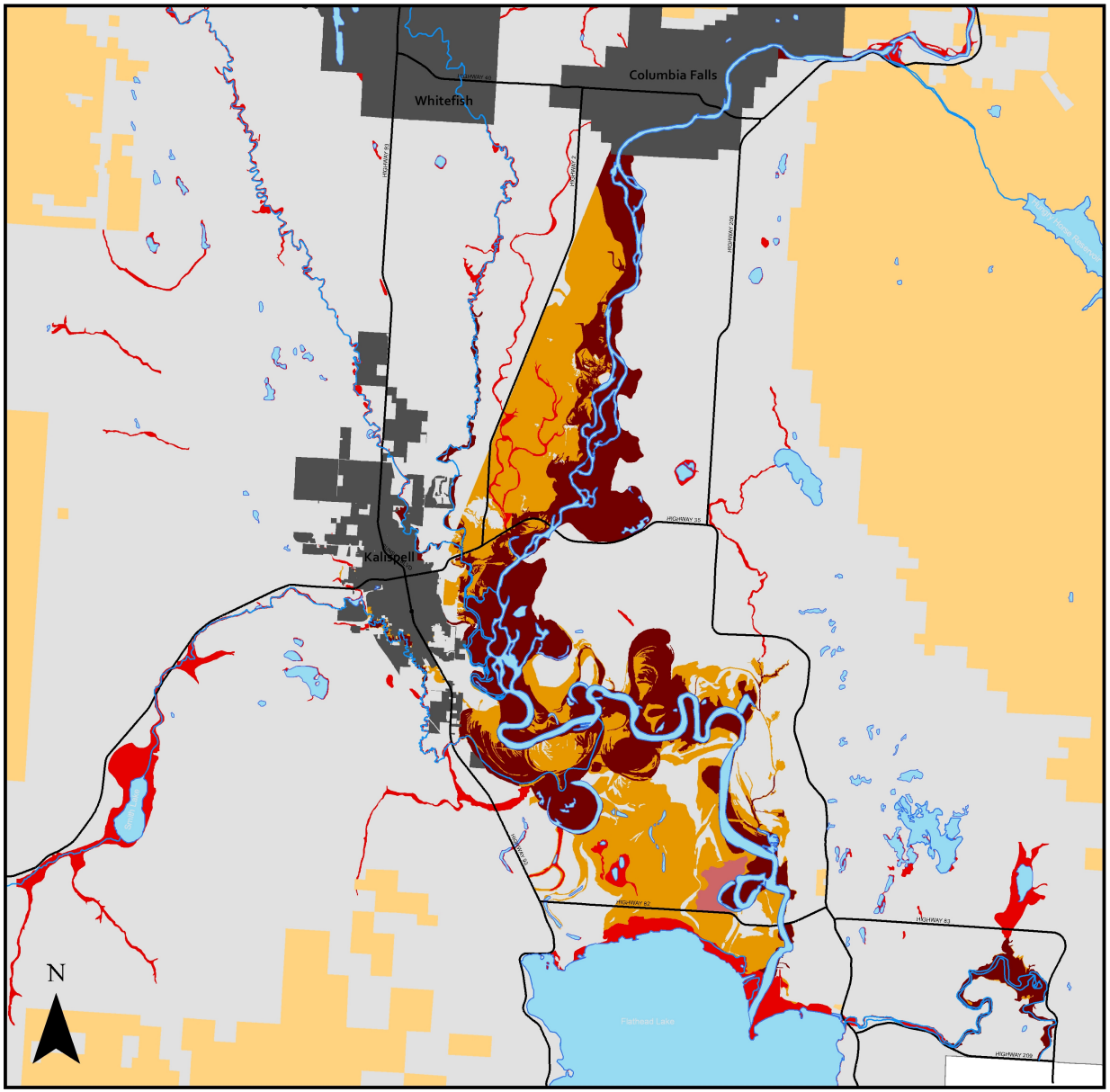
**Flood Zone**

- 100-Year Floodplain (base flood elevations determined)
- 100-Year Floodplain (no base flood elevation determined)
- 100-Year Floodplain (flood depths 1 to 3 feet)
- 500-Year Floodplain (areas of 0.2% annual chance flood)
- Flood hazards not determined, but possible
- Areas outside 500-Year Floodplain

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 2.5 5 10 15 Miles

SOURCE: FLATHEAD COUNTY GIS DEPARTMENT; FEMA FLOOD INSURANCE RATE MAPS
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 2 - LAND USE




# MAP 2.6 (A)

# FLOODPLAIN

## FLATHEAD COUNTY GROWTH POLICY

### LEGEND

- Lakes & rivers
- City Jurisdiction

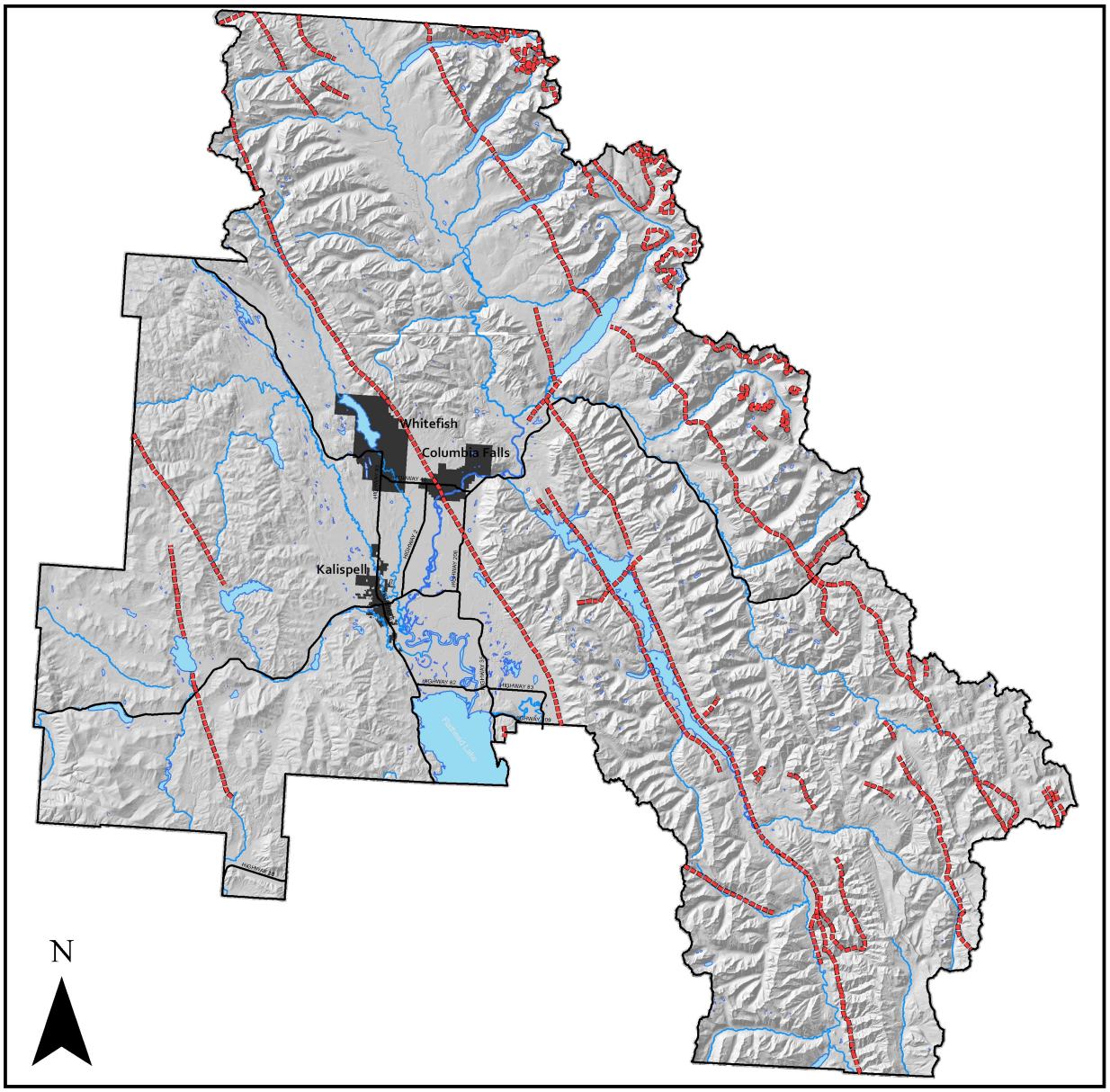
**Flood Zone**

- 100-Year Floodplain (base flood elevations determined)
- 100-Year Floodplain (no base flood elevation determined)
- 100-Year Floodplain (flood depths 1 to 3 feet)
- 500-Year Floodplain (areas of 0.2% annual chance flood)
- Flood hazards not determined, but possible
- Areas outside 500-Year Floodplain

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 1.5 3 6 9 Miles

SOURCE: FLATHEAD COUNTY GIS DEPARTMENT; FEMA FLOOD INSURANCE RATE MAPS
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 2 - LAND USE




# MAP 2.7

# Geologic Fault Lines

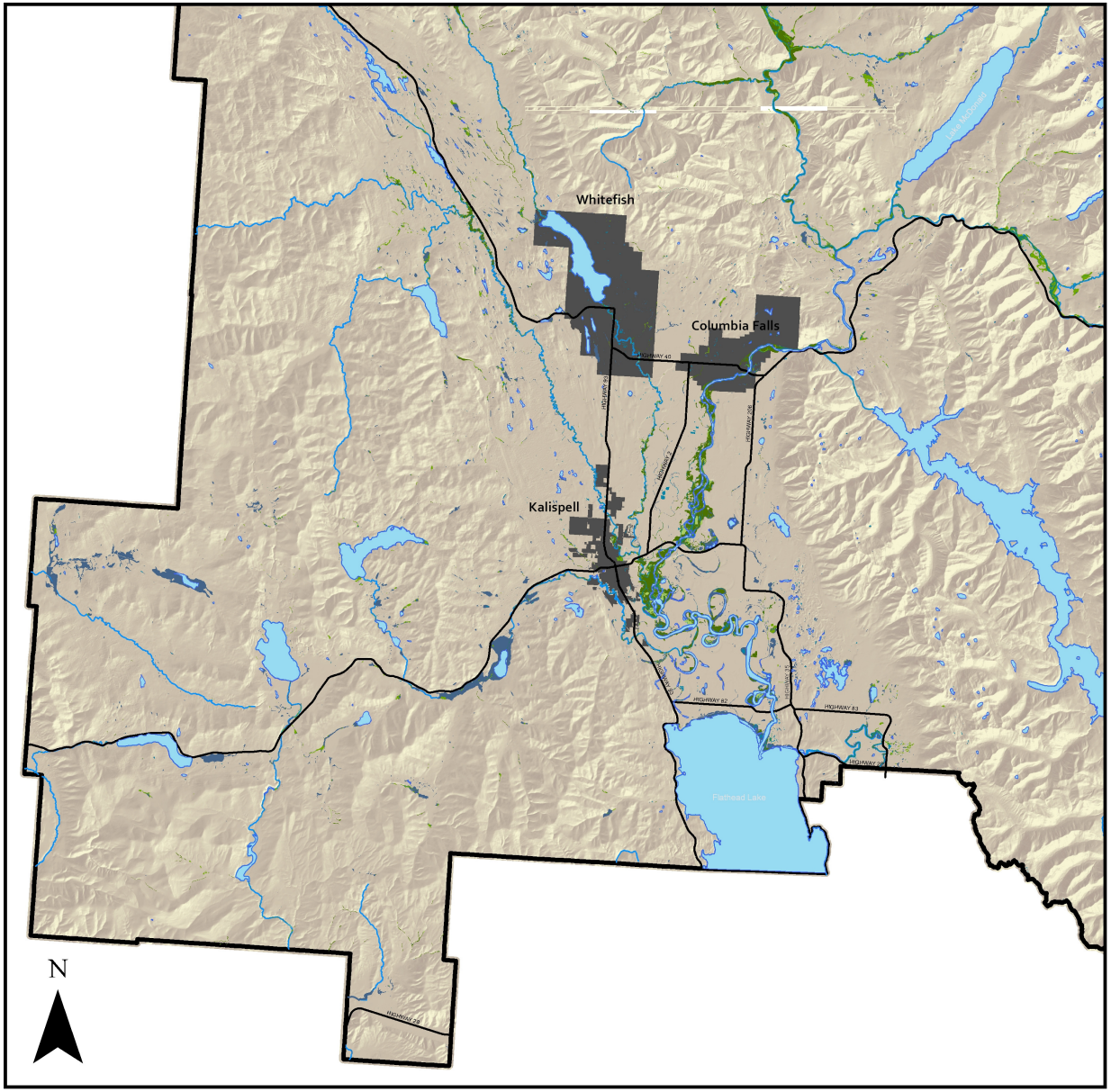
**FLATHEAD COUNTY GROWTH POLICY**

## Legend

- Geologic Fault Lines
- Lakes & rivers
- City Jurisdiction

0 5 10 20 30 Miles

SOURCE: Flathead County GIS Department
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 2 - LAND USE




# MAP 2.8

# WETLANDS

## FLATHEAD COUNTY GROWTH POLICY

LEGEND

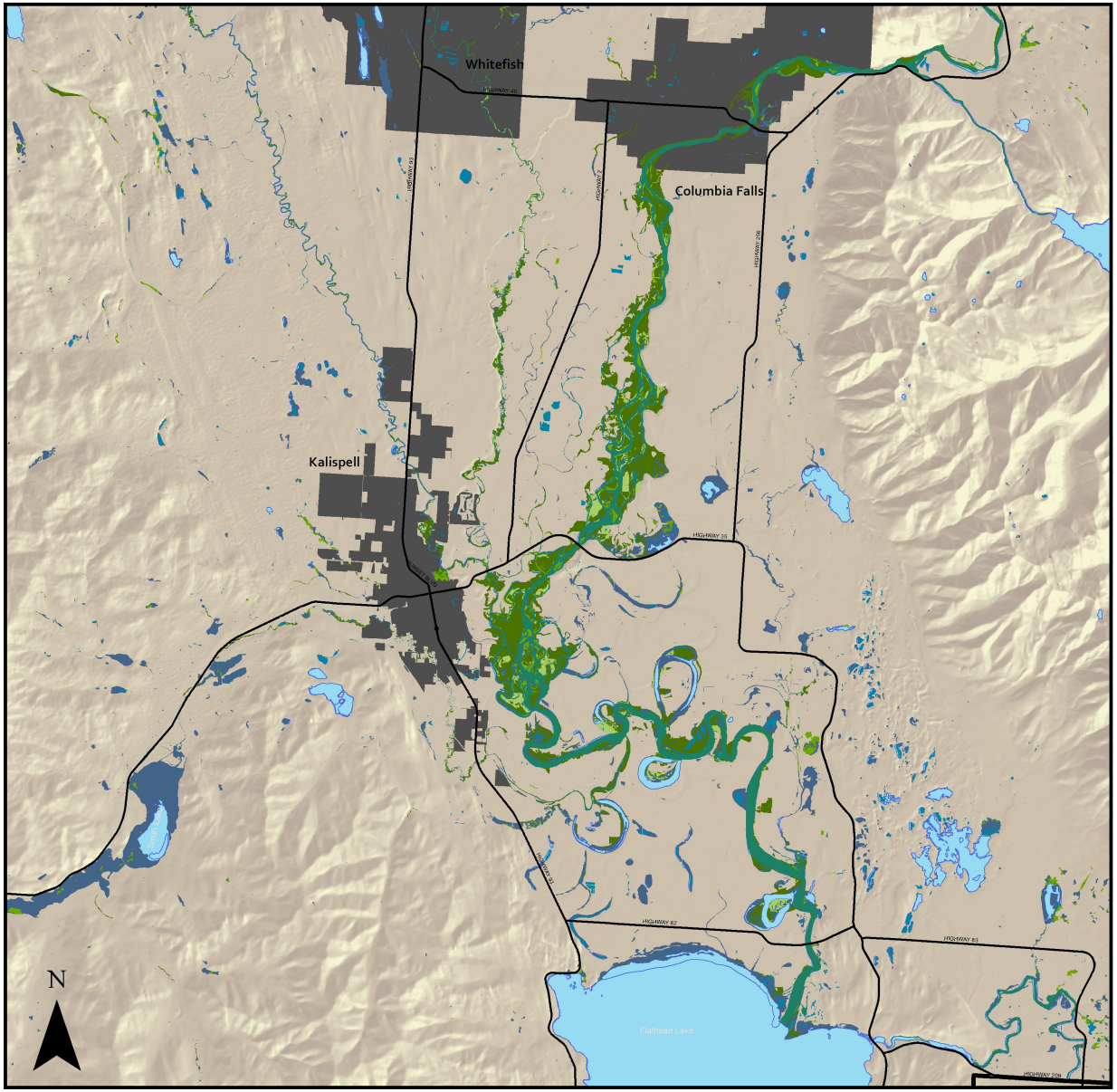
- Lakes & rivers
- City Jurisdiction

**Wetland Type**

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riparian Emergent
- Riparian Forested-Shrub
- Riverine

0 2.5 5 10 15 Miles

SOURCE: U.S. Fish & Wildlife Service, Montana National Heritage Program (MTNHP), National Wetlands Inventory (NWI) for Montana, 2011
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 2 - LAND USE




# MAP 2.8 (A)

# WETLANDS

## FLATHEAD COUNTY GROWTH POLICY

### LEGEND

- Lakes & rivers
- City Jurisdiction

**Wetland Type**

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riparian Emergent
- Riparian Forested-Shrub
- Riverine

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

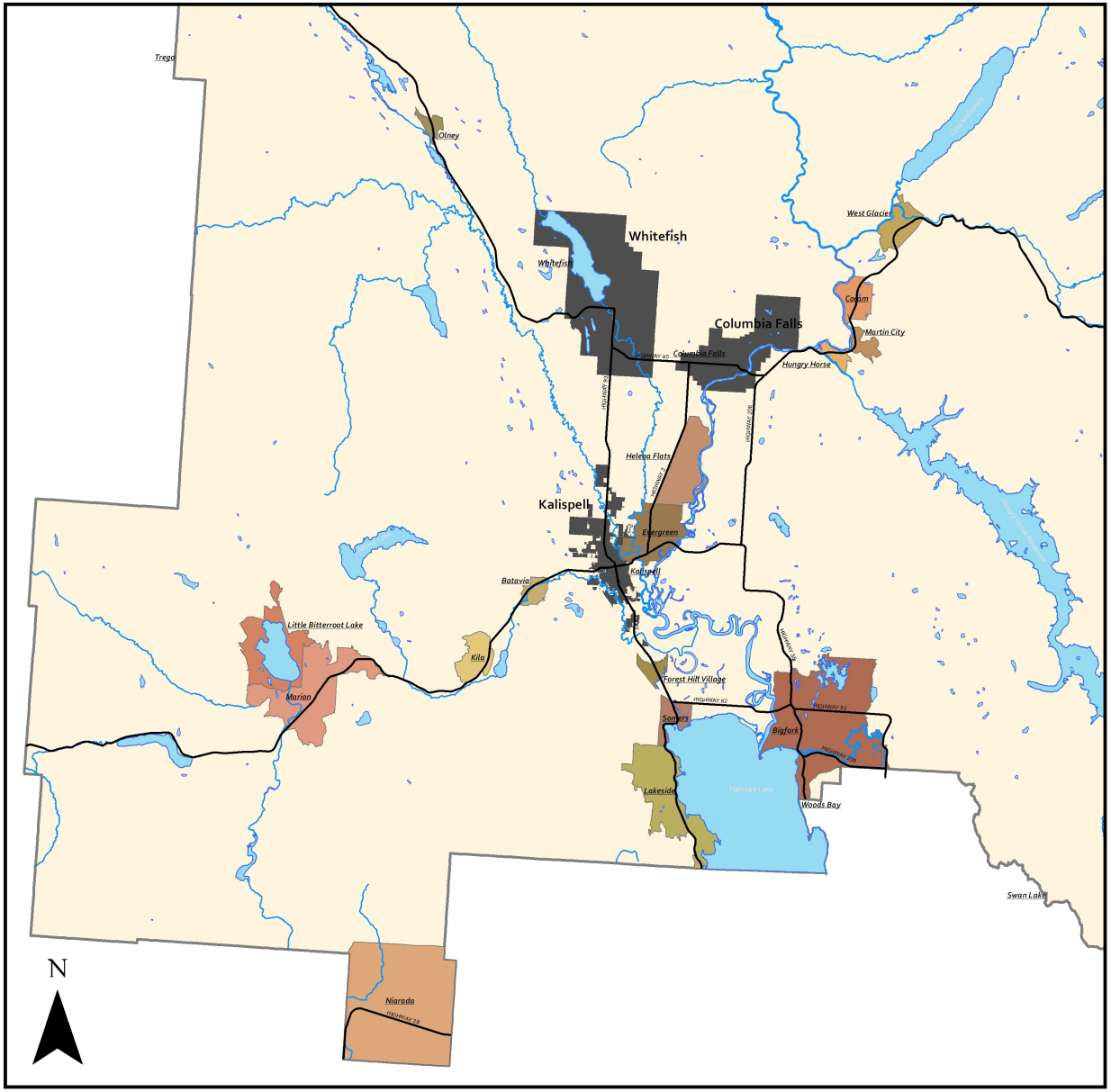
0 1.5 3 6 9 Miles

SOURCE: U.S. FISH & WILDLIFE SERVICE, MONTANA NATIONAL HERITAGE PROGRAM (MTNHP), NATIONAL WETLANDS INVENTORY (NWI) FOR MONTANA, 2011
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 2 - LAND USE

# MAP 3.1

# 2010 Census Designated Places

## FLATHEAD COUNTY GROWTH POLICY




LEGEND

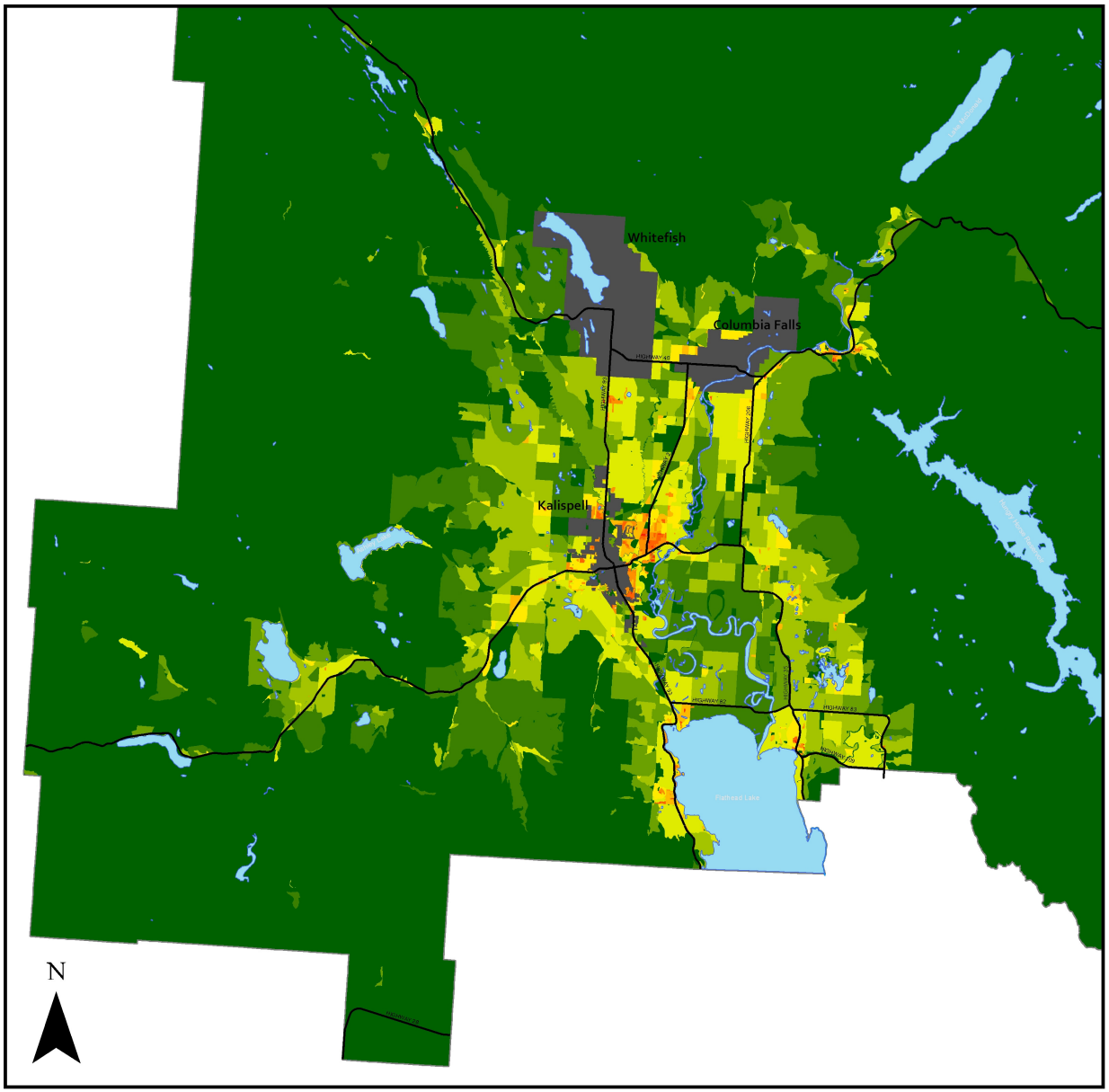
- Lakes & rivers
- City Jurisdiction

**2010 Census Designated Places**

- Batavia
- Bigfork
- Coram
- Evergreen
- Forest Hill Village
- Helena Flats
- Hungry Horse
- Kila
- Lakeside
- Little Bitterroot Lake
- Marion
- Martin City
- Niarada
- Olney
- Somers
- Swan Lake
- Trego
- West Glacier
- Woods Bay

0 2.5 5 10 15 Miles

SOURCE: 2010 U.S. Bureau of the Census TIGER/Line File - MT Census Places with Population Data
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 3 - DEMOGRAPHICS & HOUSING




# MAP 3.2

# 2010 Population Per Square Mile

## FLATHEAD COUNTY GROWTH POLICY

**Legend**

- Lakes & rivers
- City Jurisdiction

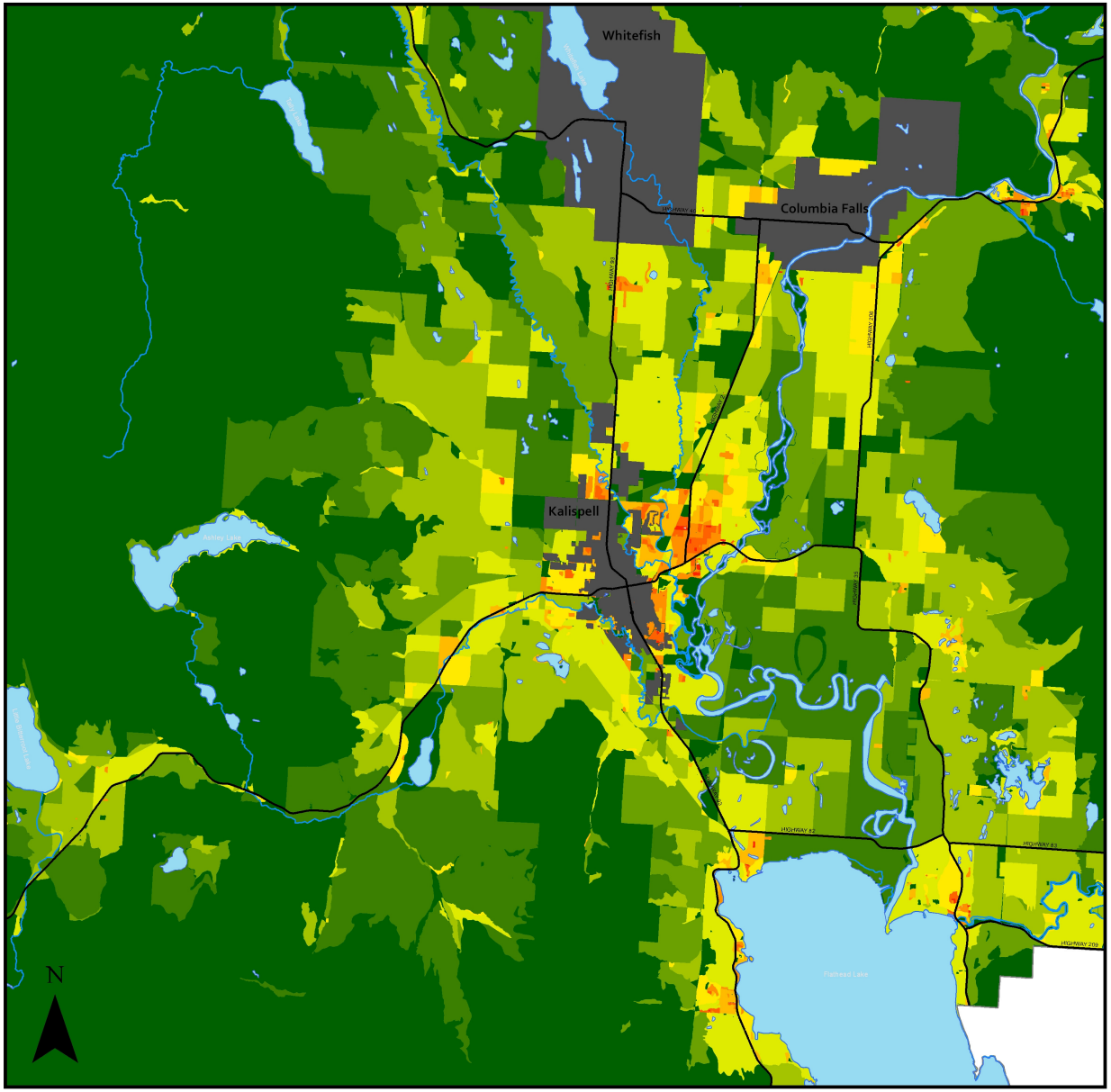
**Population Density (per square mile)**

- 0-10
- 11-25
- 26-50
- 51-100
- 101-250
- 251-500
- 501-1000
- 1001-2500
- 2501-5000
- Greater than 5000

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 2.5 5 10 15 Miles

SOURCE: 2010 U.S. Bureau of the Census TIGER/Line File - MT Census Blocks with Population Data
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 3 - DEMOGRAPHICS & HOUSING




# MAP 3.2 (A)

# 2010 Population Per Square Mile

## FLATHEAD COUNTY GROWTH POLICY

**Legend**

- Lakes & rivers
- City Jurisdiction

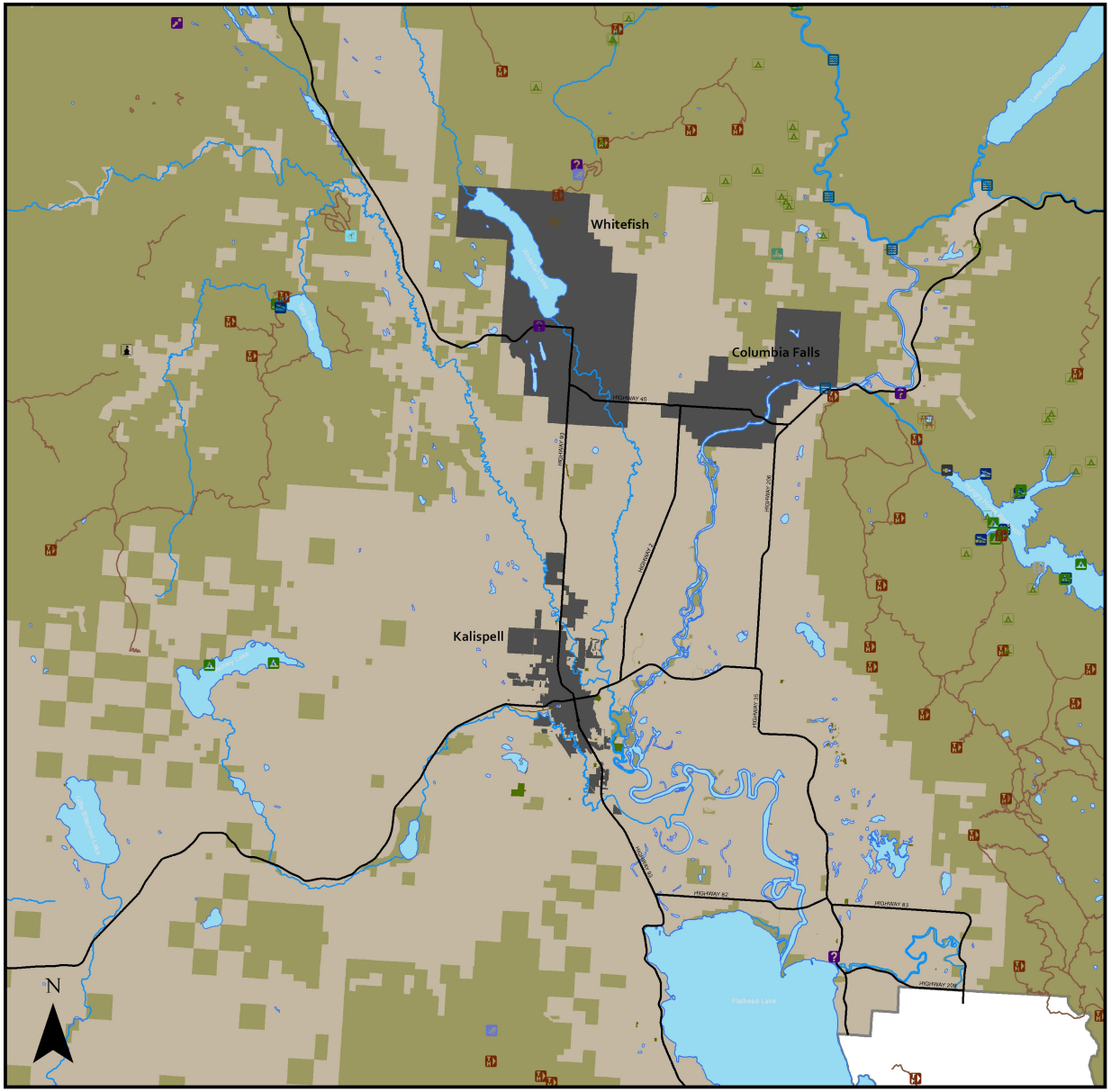
**Population Density (per square mile)**

- 0-10
- 11-25
- 26-50
- 51-100
- 101-250
- 251-500
- 501-1000
- 1001-2500
- 2501-5000
- Greater than 5000

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 1.5 3 6 9 Miles

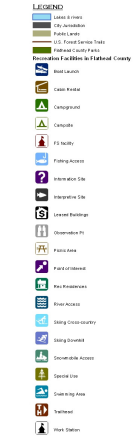
SOURCE: 2010 U.S. Bureau of the Census TIGER/Line File - MT Census Blocks with
FILE PATH: S:\PCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLIC




# MAP 4.1

# Existing Park & Recreation Sites

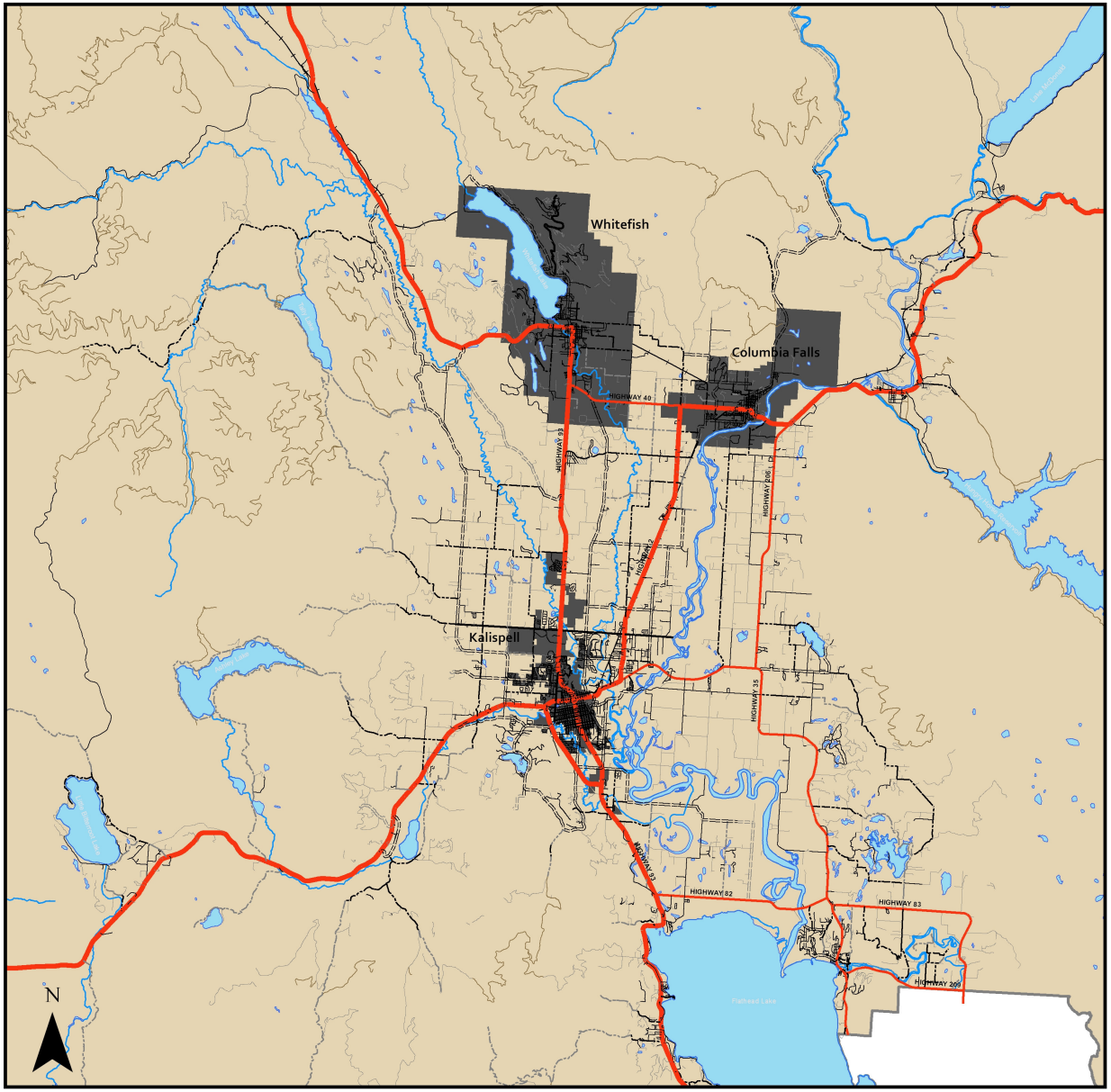
## FLATHEAD COUNTY GROWTH POLICY




SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 1.5 3 6 9 Miles

SOURCE: FLATHEAD COUNTY GIS DEPARTMENT
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 4 - PARKS & RECREATION




# MAP 6.1

# TRANSPORTATION NETWORK

## FLATHEAD COUNTY GROWTH POLICY

**LEGEND**

- Lakes & rivers
- City Jurisdiction
- Railroad

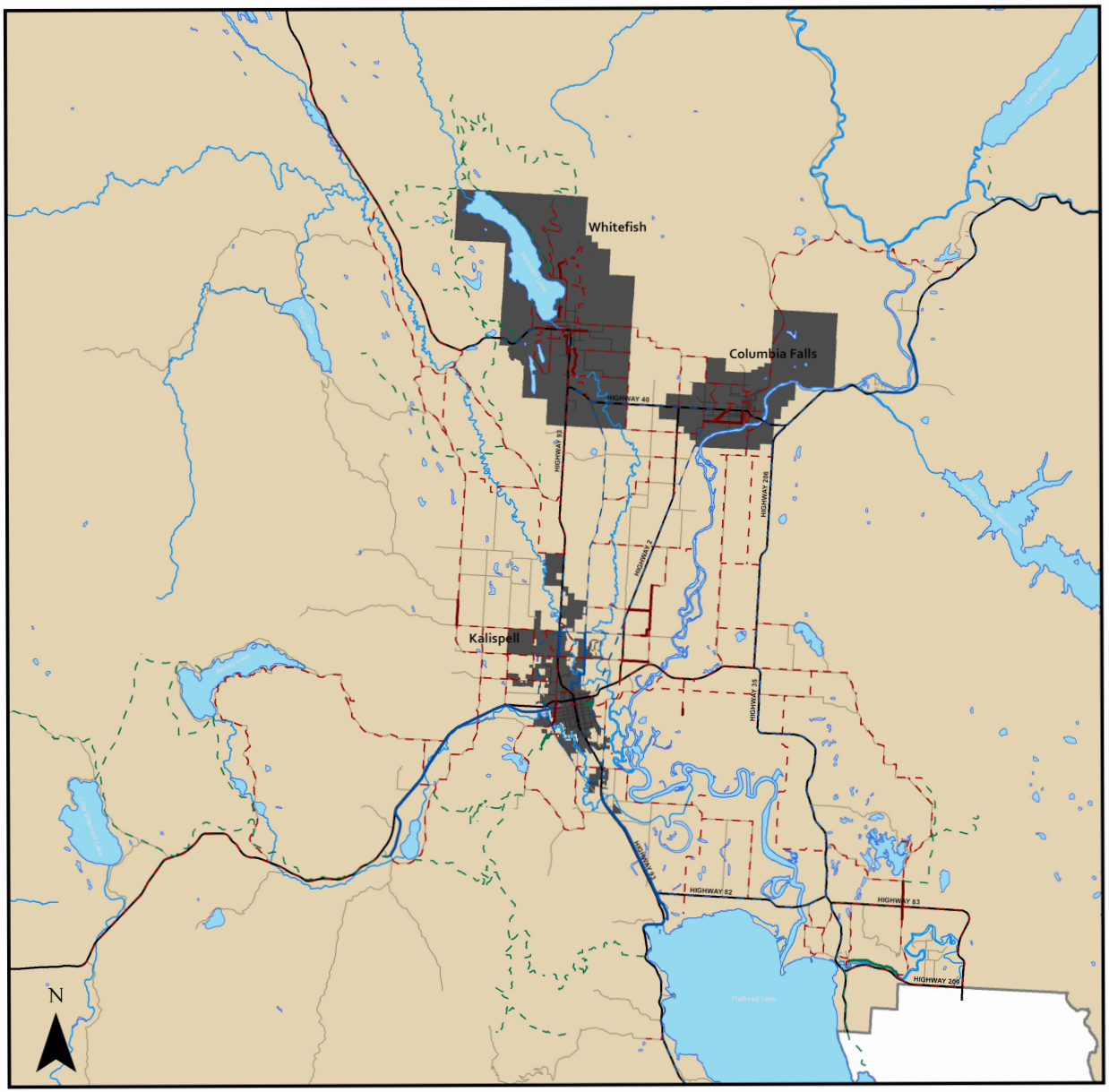
**Road Classification & Type**

- US HIGHWAY, PAVED
- MT HIGHWAY, PAVED
- MAJOR ARTERIAL, PAVED
- MINOR ARTERIAL, PAVED
- MINOR ARTERIAL, GRAVEL
- COLLECTOR, PAVED
- COLLECTOR, GRAVEL
- FS ROAD, PAVED
- FS ROAD, GRAVEL
- ROAD, PAVED
- ROAD, GRAVEL

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 1.5 3 6 9 Miles

SOURCE: FLATHEAD COUNTY GIS DEPARTMENT
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 6 - TRANSPORTATION




# MAP 6.2

# Bike & Pedestrian Paths Network

## FLATHEAD COUNTY GROWTH POLICY

### Legend

- Lakes & rivers
- City Jurisdiction
- Major Roads

**Proposed Trails**

- Arterial
- Connector
- Recreational

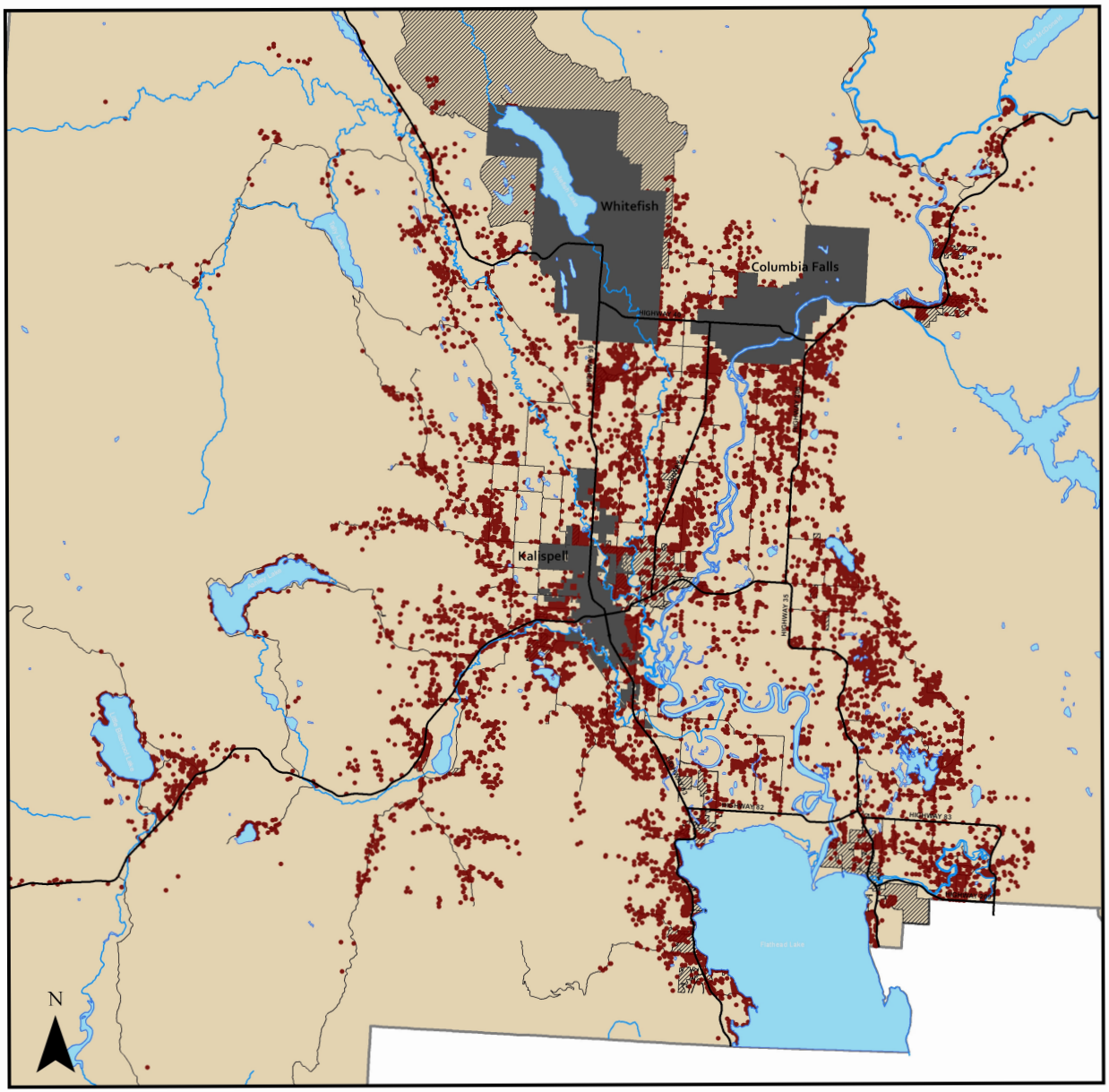
**Existing Trails**

- Arterial
- Connector
- Recreational

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 1.5 3 6 9 Miles

SOURCE: Flathead County GIS Department
FILE PATH: S:\FCPZ\Long Range Planning\Growth Policy\Growth Policy Update 10-11\Mapping\Chapter 6 - Transportation




# MAP 7.1

## EXISTING SEPTIC SYSTEMS

### FLATHEAD COUNTY GROWTH POLICY

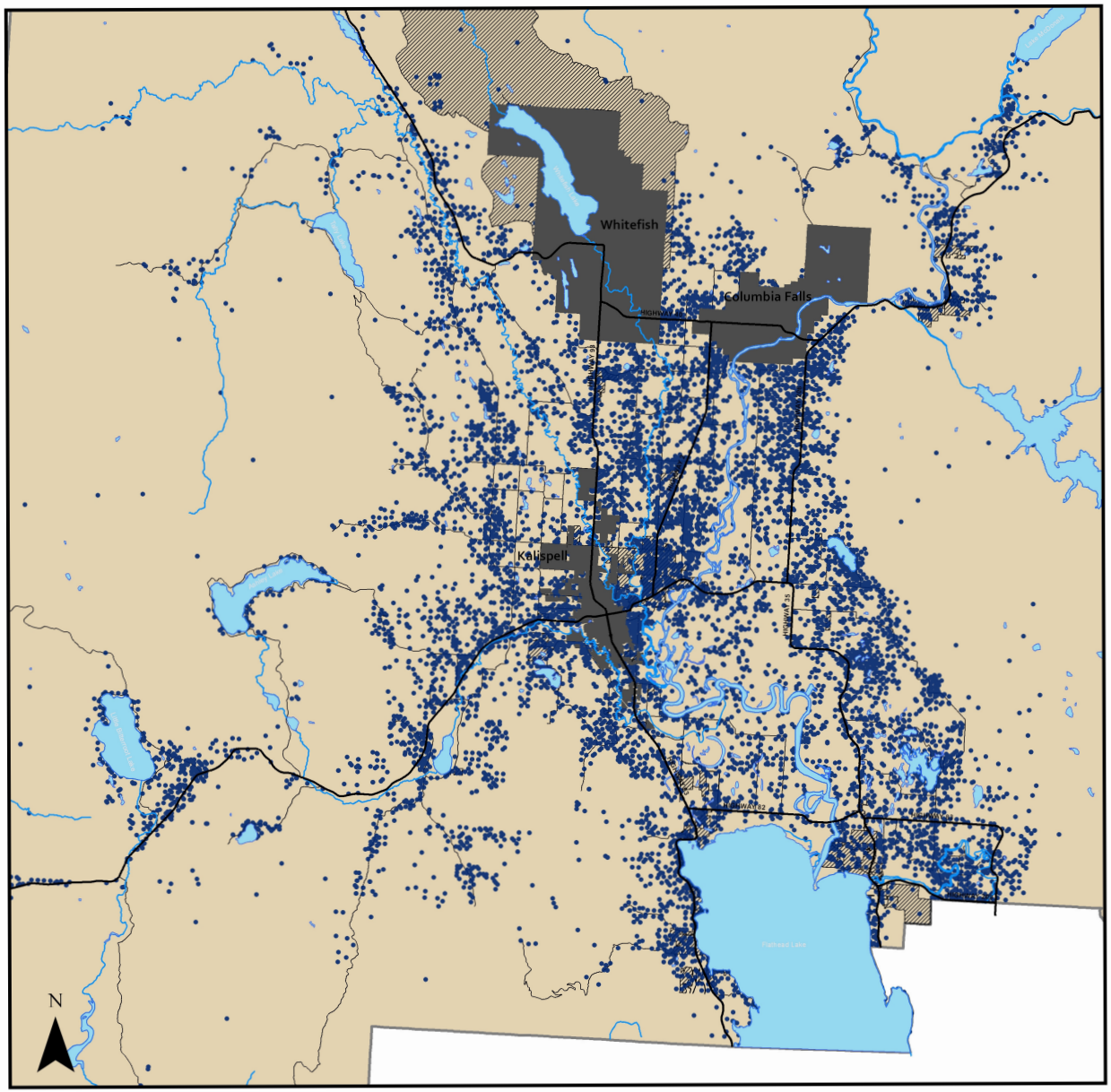
**LEGEND**

- Lakes & rivers
- City Jurisdiction
- Existing Septic Systems
- Public Water & Sewer District Boundaries

SEAL OF FLATHEAD COUNTY · STATE OF MONTANA

0 1.5 3 6 9 Miles

SOURCE: FLATHEAD COUNTY GIS DEPARTMENT; 2010 U.S. BUREAU OF THE CENSUS TIGER/LINE FILE - MT CENSUS BLOCKS
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 7 - PUBLIC FACILITIES & SERVICES




# MAP 7.2

## Existing Wells

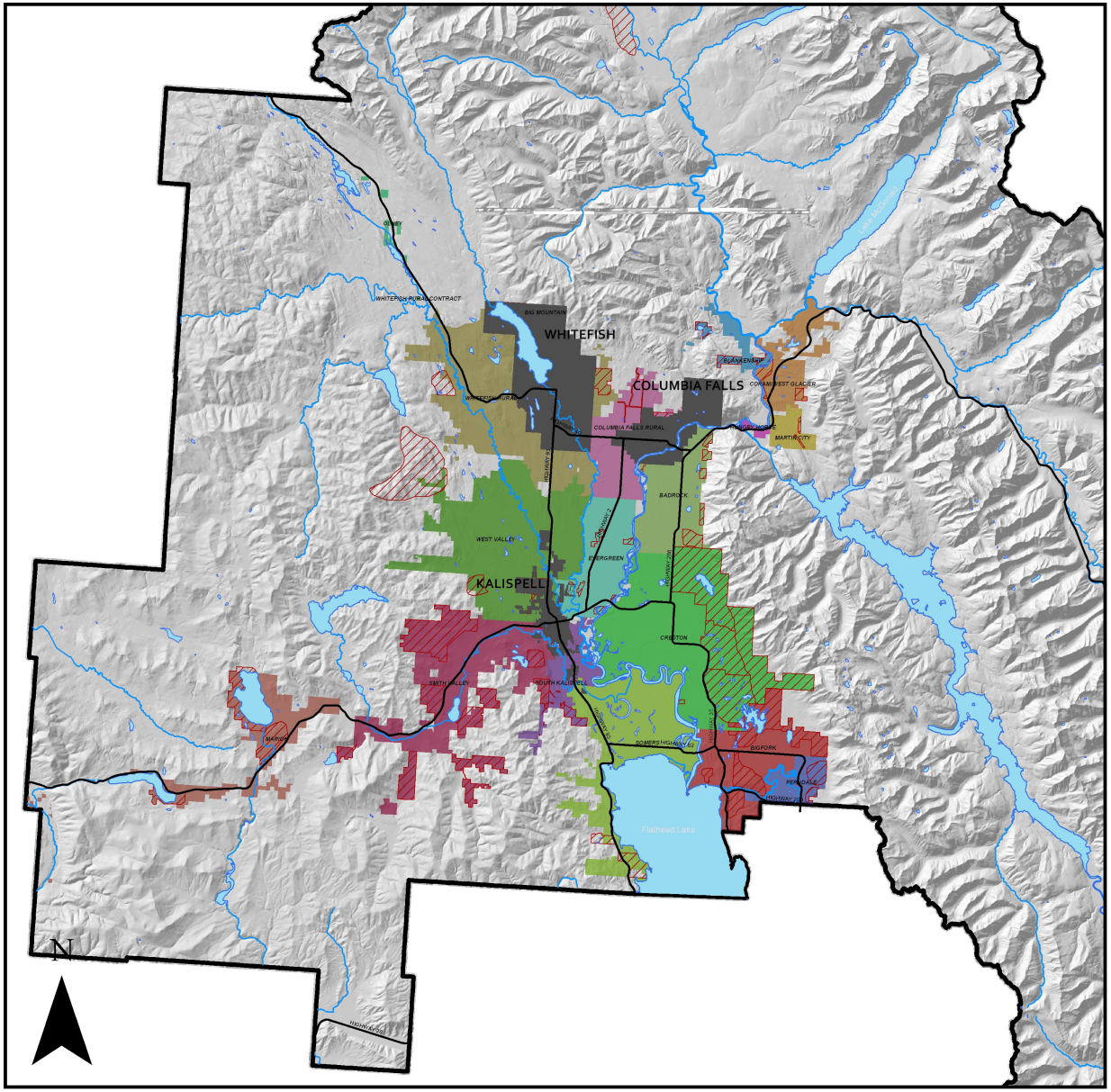
### FLATHEAD COUNTY GROWTH POLICY

**Legend**

- Lakes & rivers
- City Jurisdiction
- Existing Private Wells
- Public Water & Sewer District Boundaries

0 1.5 3 6 9 Miles

SOURCE: 2011 Well Data - Groundwater Information Center (GWIC), MT Bureau of Mines & Geology; 2010 U.S. Bureau of the Census TIGER/Line File - MT Census Blocks
File Path: S:\FCPZ\Long Range Planning\Growth Policy\Growth Policy Update 10-11\Mapping\Chapter 7 - Public Facilities & Services




# MAP 7.3

# Fire Districts

## FLATHEAD COUNTY GROWTH POLICY

LEGEND

- Lakes & rivers
- City Jurisdiction
- Fire District Priority Areas

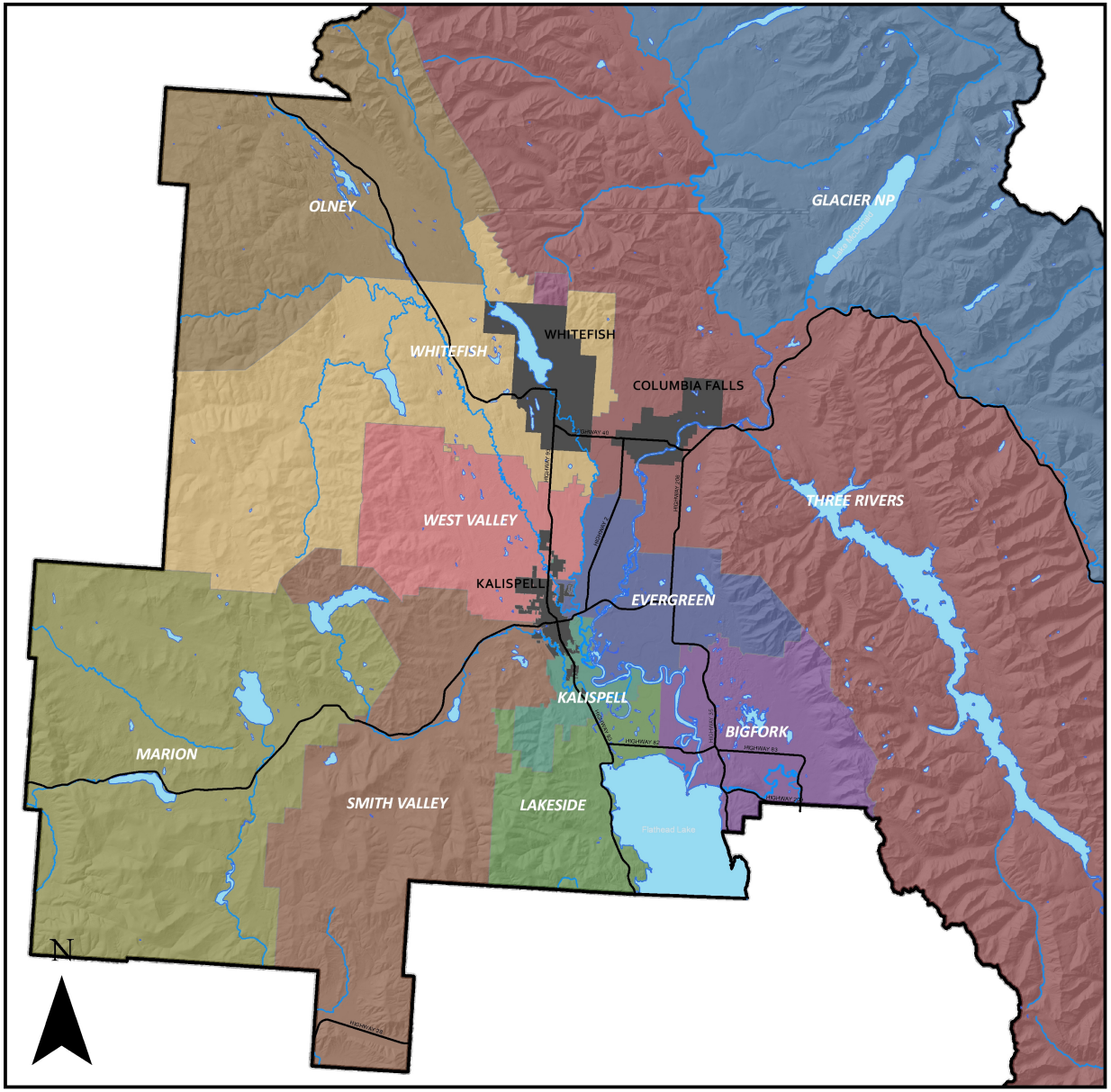
**Fire Districts**

- BADROCK
- BIG MOUNTAIN
- BIGFORK
- BLANKENSHIP
- COLUMBIA FALLS RURAL
- CORAM/WEST GLACIER
- CRESTON
- EVERGREEN
- FERNDALE
- HUNGRY HORSE
- MARION
- MARTIN CITY
- OLNEY
- SMITH VALLEY
- SOMERS
- SOUTH KALISPELL
- WEST VALLEY
- WHITEFISH RURAL
- WHITEFISH RURAL CONTRACT

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 2.5 5 10 15 Miles

SOURCE: FLATHEAD COUNTY GIS DEPARTMENT
FILE PATH: S:\PCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 7 - PUBLIC FACILITIES AND SERVICES




# MAP 7.4

# Emergency Response Districts

## FLATHEAD COUNTY GROWTH POLICY

LEGEND

- Lakes & rivers
- City Jurisdiction

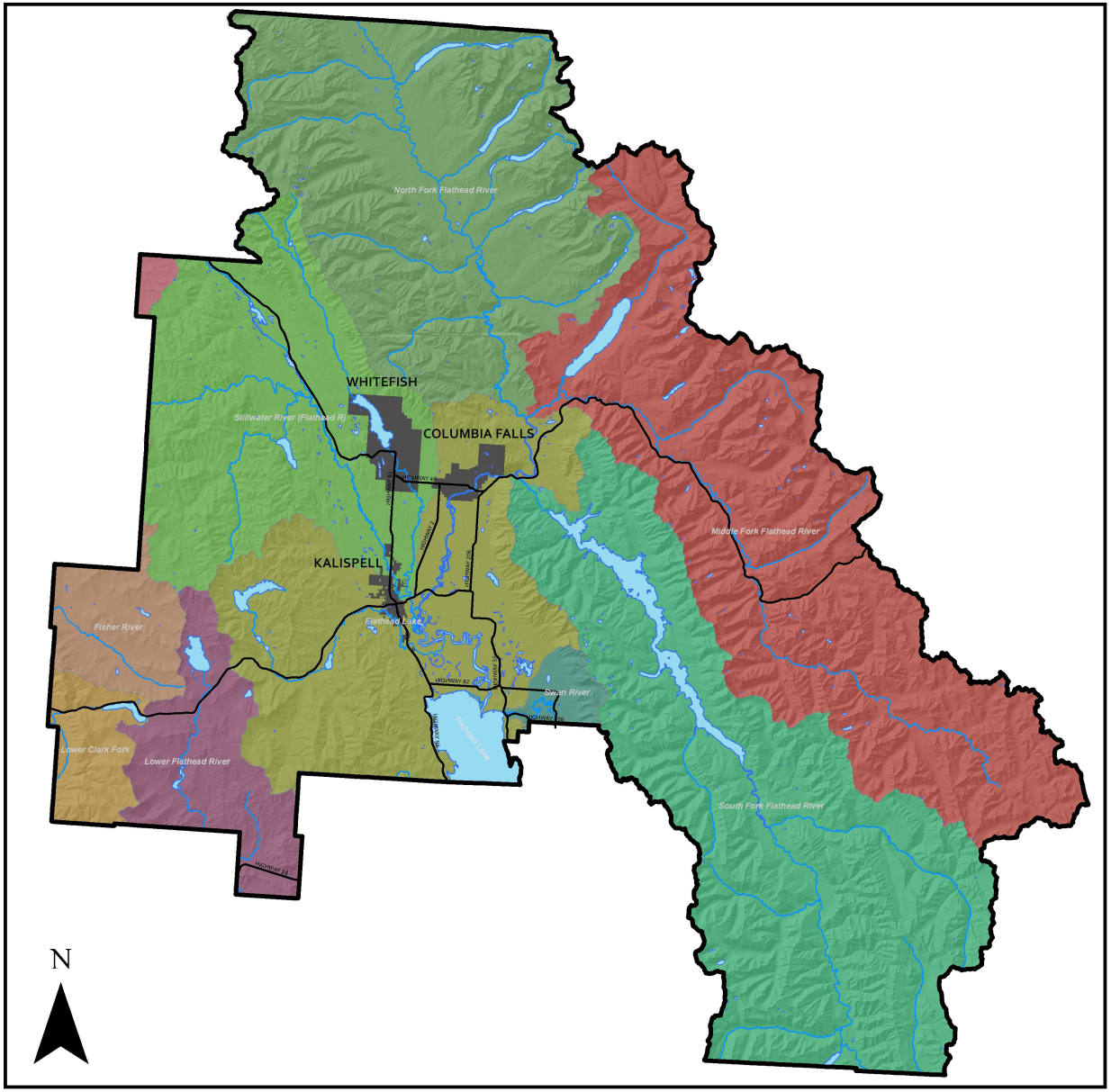
**Emergency Response District**

- BIG MOUNTAIN
- BIGFORK
- EVERGREEN
- GLACIER NP
- KALISPELL
- LAKESIDE
- MARION
- OLNEY
- SMITH VALLEY
- THREE RIVERS
- WEST VALLEY
- WHITEFISH

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 2.5 5 10 15 Miles

SOURCE: FLATHEAD COUNTY OFFICE OF EMERGENCY SERVICES; EMSORI_FLATHEADCOUNTY12211
FILE PATH: S:\LFCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 7 - PUBLIC FACILITIES AND SERVICES




# MAP 8.1

# FLATHEAD WATERSHED

## FLATHEAD COUNTY GROWTH POLICY

**LEGEND**

- Lakes & rivers
- City Jurisdiction

**Watershed Sub-Basin**

- Cut Bank Creek
- Fisher River
- Flathead Lake
- Lower Clark Fork
- Lower Flathead River
- Middle Fork Flathead River
- North Fork Flathead River
- South Fork Flathead River
- Stillwater River (Flathead River)
- Swan River
- Upper Kootenai River

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

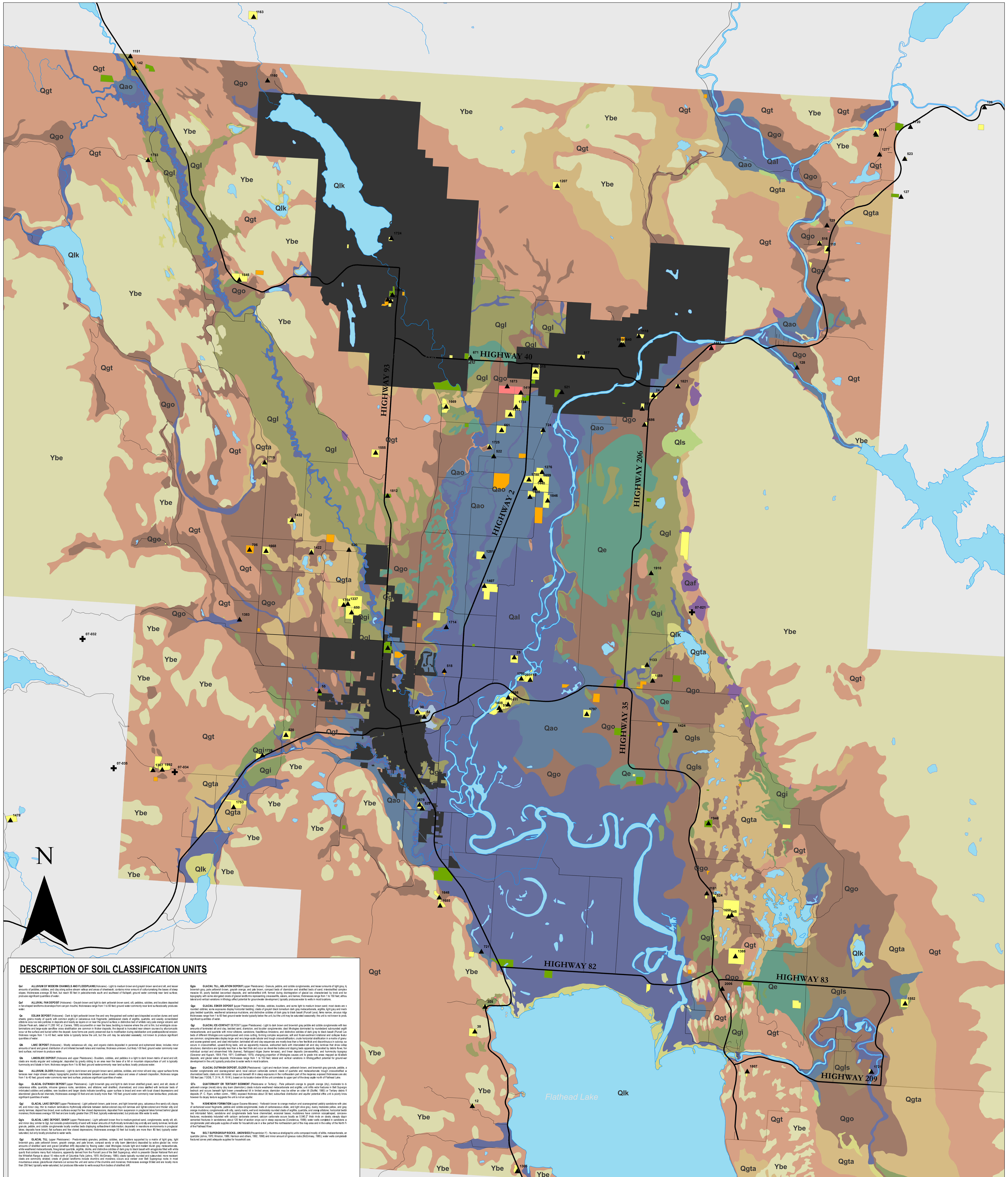
0 2.5 5 10 15 Miles

SOURCE: MONTANA SUBBASIN HYDROLOGIC UNITS, MONTANA NATURAL RESOURCES CONSERVATION SERVICE (NRCS)
FILE PATH: S:\PCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 8 - NATURAL RESOURCES

# MAP 9.1

# GRAVEL RESOURCES MAP

## FLATHEAD COUNTY GROWTH POLICY




## DESCRIPTION OF SOIL CLASSIFICATION UNITS

**Qal** **ALLUVIUM OF MODERN CHANNELS AND FLOODPLAINS** (Holocene) - Light to medium brown and grayish brown sand and silt, and lesser amounts of pebbles, cobbles, and clay along active stream valleys and areas of sheetwash; contains minor amount of colluviumalong the bases of steep slopes; thicknesses average 30 feet, but reach 90 feet in paleochannels south and southeast of Kalispell; ground water commonly near land surface; produces significant quantities of water.

**Qaf** **ALLUVIAL FAN DEPOSIT** (Holocene) - Grayish brown and light to dark yellowish brown sand, silt, pebbles, cobbles, and boulders deposited in fan-shaped landforms downslope from canyon mouths; thicknesses range from 1 to 60 feet; ground water commonly near land surface;locally produces water.

**Qe** **EOLIAN DEPOSIT** (Holocene) - Dark to light yellowish brown fine and very fine-grained well sorted sand deposited as eolian dunes and sand sheets; grains mostly of quartz with common argillic or calcareous rock fragments; pebble-sized clasts of argillite, quartzite, and weakly consolidated siltstone occur as rare particles in deposits and locally as layers on or near the ground surface; a distinctive bed of whiteto very pale orange volcanic ash (Glacier Peak ash, dated at 11,200 14C yr; Carrara, 1995) occurswithin or near the base; bedding is massive where the unit is thin, but wind-ripple cross-laminations and large-scale sandflow cross stratification are common in thicker deposits; the deposit is truncated near stream courses by alluvium;soils occur at the surface and buried within the deposit; dune forms are poorly preserved due to modification during stabilization and post-depositional erosion; thickness ranges from 1 to 40 feet; water table is typically below the unit, but the unit may be saturated seasonally; not known to produce significant quantities of water.

**Qlk** **LAKE DEPOSIT** (Holocene) - Mostly calcareous silt, clay, and organic debris deposited in perennial and ephemeral lakes; includes minor amounts of sand and gravel; distribution of unit inferred beneath lakes and marshes; thickness unknown, but likely 1-30 feet; ground water commonly near land surface; not known to produce water.

**Qls** **LANDSLIDE DEPOSIT** (Holocene and upper Pleistocene) - Boulders, cobbles, and pebbles in a light to dark brown matrix of sand and silt; clasts are mostly angular and subangular; deposited by gravity sliding to an area near the base of a hill or mountain slope;surface of unit is typically hummocky and lobate in form; thickness ranges from 1 to 80 feet; ground watercommonly near land surface; locally produces water.

**Qao** **ALLUVIUM, OLDER** (Holocene) - Light to dark brown and grayish brown sand, pebbles, cobbles, and minor silt and clay; upper surface forms terraces near major stream valleys; topographic position intermediate between active stream valleys and areas of outwash deposition; thickness ranges from 1 to 40 feet; ground water commonly near land surface; produces significant quantities of water.

**Qgo** **GLACIAL OUTWASH DEPOSIT** (upper Pleistocene) - Light brownish gray and light to dark brown stratified gravel, sand, and silt; clasts of calcareous siltite, quartzite, intrusive igneous rocks, sandstone, and siltstone; well stratified, channelized, and cross statified with lenticular beds of imbricated cobbles and pebbles; rare boulders and larger clasts indicate ice-rafting; upper surface is broad and even with local closed depressions and abandoned glacio-fluvial channels; thicknesses average 50 feet and are locally more than 140 feet; ground water commonly near landsurface; produces significant quantities of water.

**Qgl** **GLACIAL LAKE DEPOSIT** (upper Pleistocene) - Light yellowish brown, pale brown, and light brownish gray, calcareous fine sandy silt, clayey silt, and minor clay; thin to medium laminations rhythmically alternate between darker-colored clay-rich laminae and lighter-colored and thicker silty and sandy laminae; deposit has broad, even surfaces except for few closed depressions; deposited from suspension in proglacial lakes formed behind glacial moraines; thicknesses average 100 feet and are locally greater than 270 feet; typically water-saturated, but produces little water to wells.

**Qgls** **GLACIAL LAKE DEPOSIT, SANDY** (upper Pleistocene) - Light yellowish brown fine to medium-grained sand, conglomerate, sandy silt, silt, and minor clay; similar to Qgl, but consists predominantly of sand with lesser amounts of rhythmically laminated clay and silty and sandy laminae; lenticular granule, pebble, and cobble conglomerate locally overlies beds displaying soft-sediment deformation; deposited in nearshore environments in pro-glacial lakes; deposits have broad, flat surfaces and few closed depressions; thicknesses average 50 feet but locally are more than 150 feet; typically water-saturated, but only locally productive to water wells.

**Qgt** **GLACIAL TILL** (upper Pleistocene) - Predominately granules, pebbles, cobbles, and boulders supported by a matrix of light gray, light brownish gray, pale yellowish brown, grayish orange, and pale brown, compact sandy or silty loam (diamicton) deposited by active glacial ice; minor amounts of stratified sand and gravel (stratified drift) deposited by flowing water; clast lithologies include light and medium bluish gray metacarbonate, white weathered metacarbonate, fine-grained quartzite, argillite, diorite, and distinctive cobbles of dark gray to black basalt with amygdules filled with white quartz that contains many fluid inclusions, apparently derived from the Purcell Lava of the Belt Supergroup, which is presentin Glacier National Park and the Whitefish Range to about 10 miles north of Columbia Falls (Johns, 1970; McGimsey, 1985); clasts typically rounded and subounded; more resistant clasts are commonly striated; crests of glacial landforms include drumlins and moraines; occurs as a veneer over Belt Supergroup rocks in most mountainous areas; glaciofluvial channels cut across the unit and some of the drumlins and moraines; thicknesses average 90 feet and are locally more than 250 feet; typically water-saturated, but produces little water to wells except from bodies of stratified drift.

**Qgta** **GLACIAL TILL, ABLATION DEPOSIT** (upper Pleistocene) - Granule, pebble, and cobble conglomerate, and lesser amounts of light gray, li brownish gray, pale yellowish brown, grayish orange, and pale brown, compact beds of diamicton and stratified beds of sand; interstratified complex massive till, poorly bedded ice-contact deposits, and well-stratified drift; formed during disintegration of glacial ice; characterized by knob and ke topography with some elongated crests of glacial landforms representing crevasse-fills, eskers, and kames; thicknesses range from 1 to 150 feet; althou lateral and vertical variations in lithology affect potential for ground-water development, typically produces water to wells in most locations.

**Qge** **GLACIAL ESKER DEPOSIT** (upper Pleistocene) - Pebbles, cobbles, boulders, and some light to medium brown sand; most clasts are v rounded cobbles; some exposures display horizontal bedding; clasts of grayish black tomedium dark gray metacarbonate, argillite, light gray and medi gray bedded quartzite, weathered calcareous mudstone, and distinctive cobbles of dark gray to black basalt (Purcell Lava); forms narrow, sinuous ridge thicknesses range from 1 to 60 feet; ground-water levels typically below the unit, but the unit may be saturated seasonally; the unit is not known to produ significant quantities of water.

**Qgi** **GLACIAL ICE-CONTACT** DEPOSIT (upper Pleistocene) - Light to dark brown and brownish gray pebble and cobble conglomerate with less amounts of laminated silt and clay, bedded sand, diamicton, and boulder conglomerate; clast lithologies dominated by roundedand subrounded argilli metacarbonate, and quartzite with minor siltstone, sandstone, fossiliferous limestone, and distinctive cobbles of dark gray to black basalt (Purcell Lav beds of different lithologies are superimposed and cross cutting, forming complex sequences; soft and frozen-sediment rotational and collapse featu are common; conglomerates display large- and very large-scale tabular and trough cross-stratification, crude horizontal stratification in a matrix of granu and coarse-grained sand, and clast imbrication; laminated silt and clay sequences are mostly less than a few feet thick and discontinuous in outcrop; sa occurs in cross-stratified, upward-fining beds, and as apparently massive, well-sorted beds with intercalated silt and clay laminae that show collap structures; diamictons are typically less than a few feet thick and occur as sheet-like bodies and dipping beds apparently deposited by debris flows; for individual conical and stream-lined hills (kames), flat-topped ridges (kame terraces), and linear deposits (crevasse-fills), and hummocky topograp (Gravenor and Kupsch, 1959; Flint, 1971; Goldthwait, 1975); changing proportion of lithologies causes unit to grade into areas mapped as till ablati deposits, and glacial esker deposits; thicknesses range from 1 to 150 feet; lateral and vertical variations in lithologyaffect potential for ground-wa development in the unit; typically productive to water wells in most locations.

**Qgoo** **GLACIAL OUTWASH DEPOSIT, OLDER** (Pleistocene) - Light and medium brown, yellowish brown, and brownish gray granule, pebble, a boulder conglomerate and coarse-grained sand; local calcium carbonate cement; clasts of quartzite and metacarbonate; trough cross-stratified a channelized beds; clasts are imbricated; crops out beneath till in steep exposures in the northeastern part of the maparea; exposed thicknesses are abo 100 feet (sec 7 DDB, T. 31 N., R. 19 W.); based on its location below till the unit correlates to upper part of the deep aquifer north of Flathead Lake.

**QTs** **QUATERNARY OR TERTIARY SEDIMENT** (Pleistocene or Tertiary) - Pale yellowish orange to grayish orange (dry), moderate to d yellowish orange (moist) stony clay loam (diamicton); clasts include weathered metacarbonate and argillite; unit infills wide fractures in Belt Supergro bedrock and occurs beneath light brown unweathered till in limited areas; diamicton may be either an older till (Stoffel, 1980) or Tertiary debris f deposits (P. C. Ryan, written comm., 1999); exposed thickness about 30 feet; subsurface distribution and aquifer potential ofthe unit is poorly know however its clayey texture suggests the unit is not an aquifer.

**Tk** **KISHENEHN FORMATION** (upper Eocene-Miocene) - Yellowish brown to orange medium and coarse-grained pebbly sandstone with piec of carbonized wood fragments, pebble and cobble conglomerate, beds of carbonaceous shale, and light olive gray, dusky moderate yellow, and gray orange mudstone; conglomerate with silty, sandy matrix, well and moderately rounded clasts of argillite, quartzite, and orange siltstone; horizontal beddi and imbricated fabric; sandstone and conglomerate beds have channelized, erosional bases; mudstones have common scoop-shaped, concave- fractures; moderately indurated with calcium carbonate cement; calcium carbonate occurs locally as 0.04-0.2" thick rinds on clasts; steeply dippi cemented fractures in sandstones; about 120 feet of section crops out in steep exposures (Constenius, 1988); water wells completed in sandstone a conglomerate yield adequate supplies of water for household use in a few partsof the northeastern part of the map area and in the valley of the North F of the Flathead River.

**Ybe** **BELT SUPERGROUP ROCKS , UNDIVIDED** (Precambrian Y) - Numerous stratigraphic units composed mostly of siltite, metacarbonate, an quartzite (Johns, 1970; Winston, 1986; Harrison and others, 1992, 1998) and minor amount of igneous rocks (McGimsey, 1985); water wells completed i fractured zones yield adequate supplies for household use.

## TABLE - MDEQ OPEN CUT PERMITS

| Permit Number | Operator | Mine Status |
|---|---|---|
| 110 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 111 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1118 | COLUMBIA FALLS INDUSTRIAL PARK | ACTIVE |
| 1119 | COLUMBIA FALLS INDUSTRIAL PARK | ACTIVE |
| 112 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1125 | CLARK ED A | ACTIVE |
| 1133 | CRESTON TOPSOIL | ACTIVE |
| 114 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1147 | DEPARTMENT OF NATURAL RESOURCES STILLWATER UNIT | ACTIVE |
| 1148 | DEPARTMENT OF NATURAL RESOURCES STILLWATER UNIT | ACTIVE |
| 115 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1151 | DEPARTMENT OF NATURAL RESOURCES STILLWATER UNIT | ACTIVE |
| 1152 | DEPARTMENT OF NATURAL RESOURCES STILLWATER UNIT | ACTIVE |
| 1160 | DEPARTMENT OF NATURAL RESOURCES STILLWATER UNIT | ACTIVE |
| 1161 | DEPARTMENT OF NATURAL RESOURCES STILLWATER UNIT | ACTIVE |
| 1162 | DEPARTMENT OF NATURAL RESOURCES STILLWATER UNIT | ACTIVE |
| 1163 | DEPARTMENT OF NATURAL RESOURCES STILLWATER UNIT | ACTIVE |
| 1164 | DEPARTMENT OF NATURAL RESOURCES STILLWATER UNIT | ACTIVE |
| 1181 | ESLICK PAUL | INACTIVE |
| 12 | ANDERSON LLOYD K | ACTIVE |
| 1207 | FH STOLTZE LAND AND LUMBER COMPANY | ACTIVE |
| 126 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 127 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1276 | GOOSE BAY EQUIPMENT INC | ACTIVE |
| 1277 | GOOSE BAY EQUIPMENT INC | ACTIVE |
| 128 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1281 | GLACIER HORSE RANCH LLC | INACTIVE |
| 129 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1298 | GRIZZLY LOGGING AND LUMBER LLC DBA GRIZZLY GRAVEL PRODUCTS | ACTIVE |
| 13 | WAGONERS SAND AND GRAVEL | ACTIVE |
| 130 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1305 | HANSON NEIL | ACTIVE |
| 1315 | HAMILTON HOWARD D | ACTIVE |
| 1320 | HANSON NORMAN K | ACTIVE |
| 1321 | HANSON NORMAN K | INACTIVE |
| 1337 | HELENA SAND AND GRAVEL INC | ACTIVE |
| 1383 | KELLER LES | ACTIVE |
| 1387 | KLEMPEL JOE AND RON | ACTIVE |
| 1388 | KLEMPEL JOE AND RON | ACTIVE |
| 1407 | KNIFE RIVER | ACTIVE |
| 1408 | KNIFE RIVER | ACTIVE |
| 1410 | KNIFE RIVER | ACTIVE |
| 1411 | KNIFE RIVER | ACTIVE |
| 1416 | KNIFE RIVER | ACTIVE |
| 142 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1422 | KRUEGER GARY | ACTIVE |
| 1424 | LEIGHTY BROS CONSTRUCTION LLC | ACTIVE |
| 1432 | LHC INC | ACTIVE |
| 1440 | LASALLE SAND AND GRAVEL | ACTIVE |
| 1478 | MANY LAKES EAST | ACTIVE |
| 1494 | MURPHYS EXCAVATING INC | ACTIVE |
| 1520 | OLSEN RUSSELL | ACTIVE |
| 1527 | PLUM CREEK TIMBERLANDS LP | ACTIVE |
| 1552 | POTTS LYLE | INACTIVE |
| 1555 | PUMCO INC | ACTIVE |
| 1559 | RIVERSIDE CONTRACTING INC | ACTIVE |
| 1640 | RUSSELL KIMBERLY J | INACTIVE |
| 1645 | SCHELLINGER CONSTRUCTION COMPANY | ACTIVE |
| 1648 | SCHELLINGER CONSTRUCTION COMPANY | ACTIVE |
| 1650 | SCHELLINGER CONSTRUCTION COMPANY | ACTIVE |
| 1658 | SCHELLINGER CONSTRUCTION COMPANY | ACTIVE |
| 1659 | SCHELLINGER CONSTRUCTION COMPANY | ACTIVE |
| 1661 | SCHELLINGER CONSTRUCTION COMPANY | INACTIVE |
| 1668 | SCHELLINGER CONSTRUCTION COMPANY | ACTIVE |
| 1669 | SCHELLINGER CONSTRUCTION COMPANY | ACTIVE |
| 1679 | SCHLEGEL AND SONS CONTRACTOR INC | ACTIVE |
| 1685 | SPOKLIE GRANT | ACTIVE |
| 1686 | SPOKLIE GRANT | ACTIVE |
| 1713 | SPOKLIE ROBERT | ACTIVE |
| 1714 | STREET ROBIN | ACTIVE |
| 1717 | SILVERTIP PROPERTIES | ACTIVE |
| 1719 | STUPAK JAMES | ACTIVE |
| 1720 | STW PARTNERSHIP | ACTIVE |
| 1721 | SUDAN INC | ACTIVE |
| 1724 | SWIFT CREEK CABINS LLC | ACTIVE |
| 1725 | SCHWARZ CONSTRUCTION | ACTIVE |
| 1726 | CHARLAND STEVE R | ACTIVE |
| 1731 | TUNGSTEN HOLDINGS INC | ACTIVE |
| 1733 | TAMARACK HOLDINGS LLC | ACTIVE |
| 1734 | THORNBERRY RONALD AND ESTHER | ACTIVE |
| 1743 | TIMBERLINE READY MIX | ACTIVE |
| 1753 | TURNER WAYNE | ACTIVE |
| 1754 | TUTVEDT BRUCE | ACTIVE |
| 1757 | US FISH AND WILDLIFE SERVICE | ACTIVE |
| 1769 | WAGAR JOE | ACTIVE |
| 1783 | WOODRING ERIC | ACTIVE |
| 1788 | WHITE ROCK AGGREGATE LLC | ACTIVE |
| 1797 | WAGONERS SAND AND GRAVEL | ACTIVE |
| 1798 | WAGONERS SAND AND GRAVEL | ACTIVE |
| 1807 | SCHELLINGER CONSTRUCTION COMPANY | WITHDRAWN |
| 1812 | SCHELLINGER CONSTRUCTION COMPANY | INACTIVE |
| 1821 | PLUM CREEK TIMBERLANDS LP | DENIED |
| 1846 | WHITE ROCK AGGREGATE LLC | ACTIVE |
| 1873 | KNIFE RIVER | PENDING |
| 1886 | JTL GROUP INC - KALISPELL | INACTIVE |
| 1910 | WILKE LAURENCE G | DENIED |
| 1946 | SCHELLINGER CONSTRUCTION COMPANY | ACTIVE |
| 1991 | DEPARTMENT OF TRANSPORTATION | ACTIVE |
| 1992 | GRIZZLY LOGGING AND LUMBER LLC DBA GRIZZLY GRAVEL PRODUCTS | ACTIVE |
| 2 | PACK AND COMPANY | INACTIVE |
| 2006 | ESLICK PAUL | PENDING |
| 2031 | WAGONERS SAND AND GRAVEL | ACTIVE |
| 24 | DOANE DON | ACTIVE |
| 25 | ROBINSON SAND AND GRAVEL | ACTIVE |
| 3 | CITY OF WHITEFISH | ACTIVE |
| 30 | JTL GROUP DBA MCELROY AND WILKEN | ACTIVE |
| 305 | DOTEN NEIL | ACTIVE |
| 38 | NORVELL LINDA EVART | ACTIVE |
| 486 | PLUM CREEK TIMBERLANDS LP | ACTIVE |
| 500 | PLUM CREEK TIMBERLANDS LP | ACTIVE |
| 515 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 516 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 517 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 518 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 519 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 520 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 521 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 522 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 523 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 524 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 525 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 526 | FLATHEAD COUNTY ROAD DEPARTMENT | ACTIVE |
| 54 | JTL GROUP DBA MCELROY AND WILKEN | ACTIVE |
| 545 | MISSION VALLEY CONCRETE | ACTIVE |
| 55 | PACK AND COMPANY | ACTIVE |
| 650 | LHC INC | ACTIVE |
| 661 | THORNBERRY RONALD AND ESTHER | ACTIVE |
| 671 | AC ENTERPRISES LLC | ACTIVE |
| 706 | BEASLEY JOE | ACTIVE |
| 721 | BROWNN PAMELA | ACTIVE |
| 724 | BRASH PROJECTS LLC | ACTIVE |
| 83 | HAMILTON HOWARD D | ACTIVE |
| | RUSSELL WILLIAM M | ACTIVE |
| | SPOKLIE ROBERT | INACTIVE |

## TABLE - MDEQ SMALL MINER EXCLUSION STATEMENTS

| PROGRAM | COMPANY NAME | OPERATION TYPE | MINERAL | STATUS |
|---|---|---|---|---|
| 07-011 | STAHLBERG BRYAN K | OPEN PIT | TALUS | SHUTDOWN |
| 07-021 | JENSEN PAUL | OPEN PIT | SHALE, ROCK | ACTIVE |
| 07-027 | JARVIS WILLIAM | ROCK PICKER | RIP RAP ROCK | ACTIVE |
| 07-032 | F H STOLTZE LAND & LUMBER CO | OPEN PIT | ROCK | ACTIVE |
| 07-034 | GRIZZLY LOGGING & GRAVEL PRODUCTS INC | ROCK PICKER | ROCK | ACTIVE |
| 07-035 | KLEMPEL JOE & GINA | OPEN PIT | ROCK | ACTIVE |
| 07-036 | ANDERSON MASONRY INC | OPEN PIT | DECORATIVE ROCK | ACTIVE |

## TABLE - MDEQ OPERATING PERMITS, HARD ROCK

| PROGRAM | MINE NAME | OPERATION TYPE | MINERAL | STATUS |
|---|---|---|---|---|
| 00045 | ESSEX QUARRY | OPEN PIT | BALLAST, RIP-RAP | ACTIVE |
| 00123 | HOG HEAVEN MINE | OPEN PIT, UNDERGROUND, VAT LEACH | COPPER, GOLD, LEAD, OXIDES, SULFIDE, ZINC | ACTIVE |
| 00151 | WEAVER GRAVEL QUARRY | OPEN PIT | TALUS ROCK | ACTIVE |
| 00167 | MULTIPLE QUARRY PERMIT | MULTIPLE QUARRY SITES | ROCK | ACTIVE |
| 00175 | MULTIPLE QUARRY PERMIT | GENERAL QUARRY | ROCK | ACTIVE |

## Legend

- ✚ Small Miner Exclusion Statements - Hard Rock
- ▲ Existing MDEQ Open-Cut Permits
- Rivers, Lakes & Streams

**Gravel Pits: Flathead County Inventory (thru 2006)**

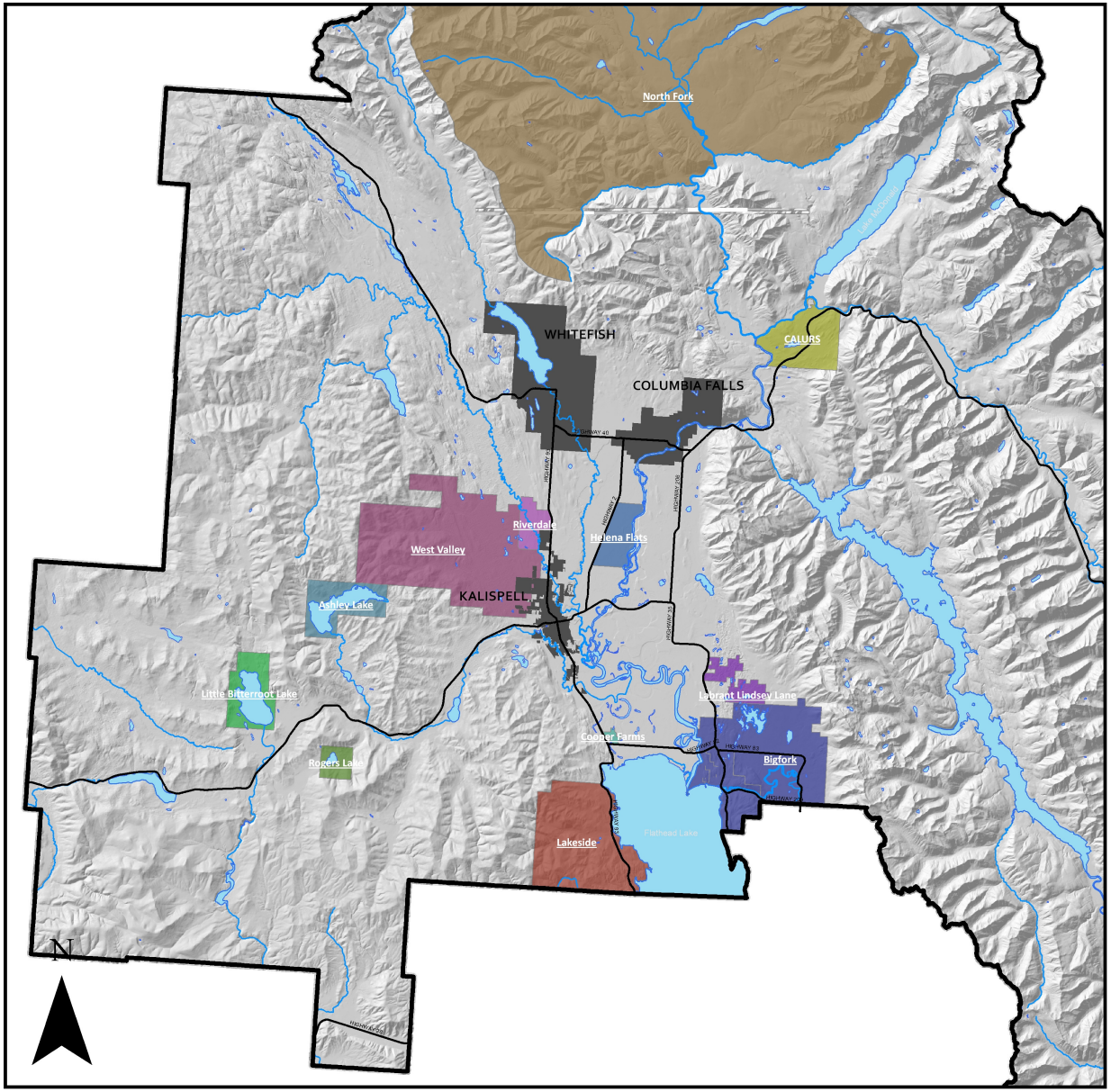
- ACTIVE
- INACTIVE
- RECLAIMED
- UNKNOWN
- City Planning Jurisdictions/Interlocal Agreement Areas

**Surficial Soils: MT Bureau of Mines and Geology**

- QTs - Quaternary or Tertiary Sediment
- Qaf - Alluvial Fan Deposit
- Qal - Alluvium of Modern Channels and Floodplains
- Qao - Alluvium, Older
- Qe - Eolian Deposit
- Qge - Glacial Esker Deposit
- Qgi - Glacial Ice Contact Deposit
- Qgl - Glacial Lake Deposit
- Qgls - Glacial Lake Deposit, Sandy
- Qgo - Glacial Outwash Deposit
- Qgoo - Glacial Outwash Deposit, Older
- Qgt - Glacial Till
- Qgta - Glacial Till, Ablation Deposit
- Qlk - Lake Deposit
- Qls - Landslide Deposit
- Qoa - Unidentified
- Tk - Kishenehn Formation
- Ybe - Belt Supergroup Rocks, Undivided

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 1 2 4 6 Miles




# MAP 11.1

# NEIGHBORHOOD PLANS

## FLATHEAD COUNTY GROWTH POLICY

LEGEND

- Lakes & rivers
- City Jurisdiction

**Neighborhood Plan**

- Ashley Lake
- Bigfork
- CALURS
- Cooper Farms
- Helena Flats
- Labrant Lindsey Lane
- Lakeside
- Little Bitterroot Lake
- North Fork
- Riverdale
- Rogers Lake
- West Valley

SEAL OF FLATHEAD COUNTY • STATE OF MONTANA •

0 2.5 5 10 15 Miles

SOURCE: FLATHEAD COUNTY GIS DEPARTMENT
FILE PATH: S:\FCPZ\LONG RANGE PLANNING\GROWTH POLICY\GROWTH POLICY UPDATE 10-11\MAPPING\CHAPTER 11 - NEIGHBORHOOD PLANS