Forest Service GDE Level 1 Inventory

Site Name _____

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Site Information

Springs Online Site ID _____ State _____ County _____

Land unit (Forest Service, BLM, private, etc.) _____

Land unit detail (district) _____

Proclaimed national forest _____

Note: If no GDE is located within 100 meters of a mapped location, or feature is not a GDE, please describe in "Site Description" below and update in Springs Online.

Land manager ID _____ Designation (wilderness, etc.) _____

Site description (setting, history, context, cultural concerns, etc.):

Access directions (route):

Sensitivity (select one):
- ☐ Not sensitive
- ☐ Location is sensitive
- ☐ Survey data are sensitive
- ☐ Nothing about this spring should be released

General Survey Information

Survey date _____ Time start _____ End _____

Examiners (full names) _____

Project _____

Area of GDE (m^2) _____

Weather:
- ☐ Recent rain
- ☐ Rain during survey
- ☐ Snowfall, hail, or sleet during survey
- ☐ Snow on ground
- ☐ No current or recent precipitation

Air Temperature _____ **°F or °C**

Area determined by (select one):
- ☐ Measuring average length and width
- ☐ Estimating
- ☐ Estimation from map or image
- ☐ GPS traverse of GDE boundary
- ☐ Sketching perimeter on image with GPS
- ☐ Other (describe in general notes)

Site condition (survey notes):

Georeferencing

GPS Model _____

GPS accuracy or position error (m) _____

Georeference comments _____

Georeference source (select one):
- ☐ GPS
- ☐ Map
- ☐ Survey GPS
- ☐ Other _____

Datum (select one):
- ☐ NAD83
- ☐ WGS84
- ☐ NAD27

Latitude DD _____ Longitude DD _____

UTM zone _____ Easting _____ Northing _____

Elevation _____ ft or m

Elevation determined by:
- ☐ GPS
- ☐ Topo map
- ☐ Other _____

Reference point description:

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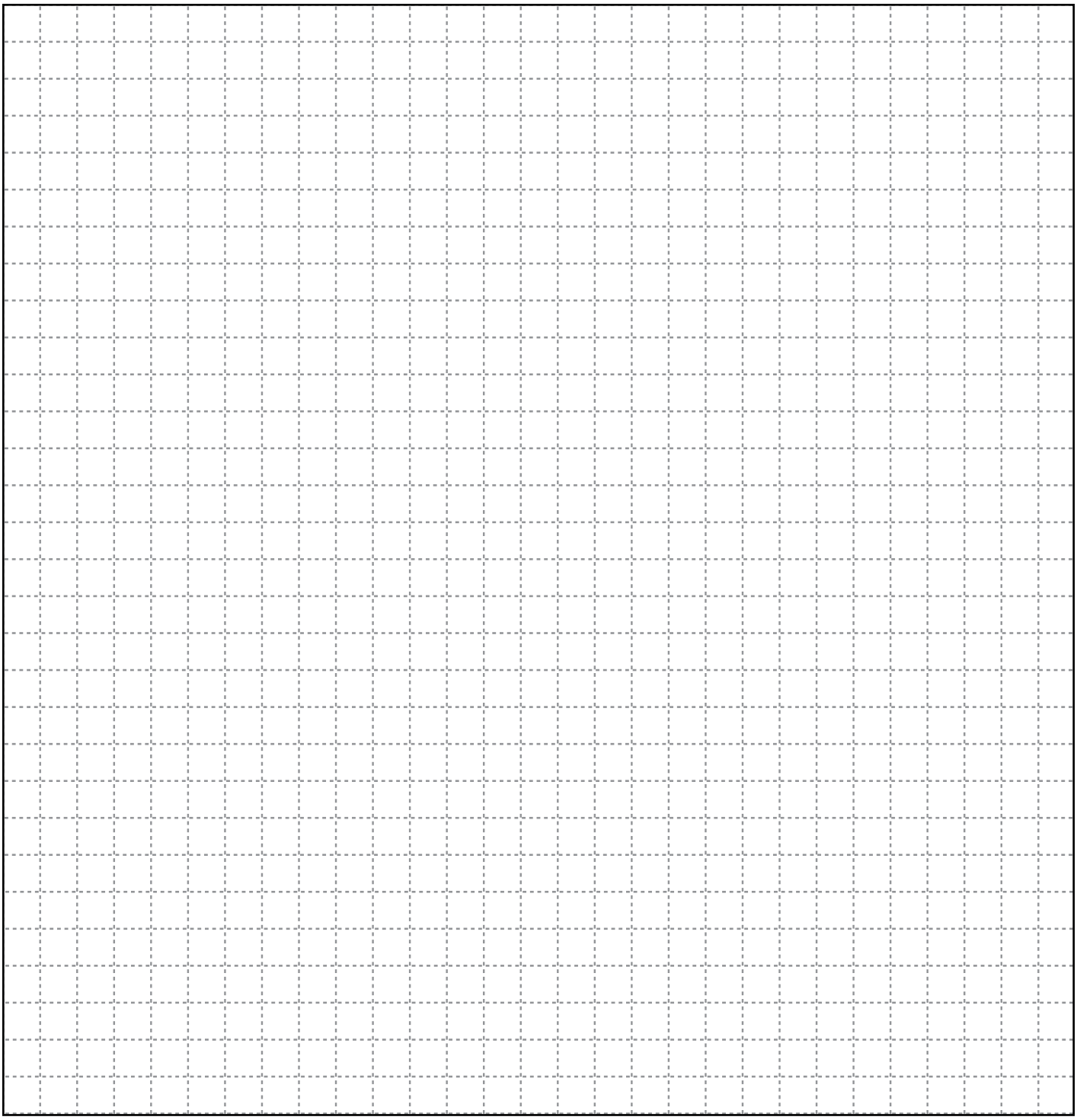
Sketchmap

Use the checklist to verify you have included all aspects of the survey site

___ Scale
___ North arrow
___ Reference point
___ GDE boundary
___ Major geomorphic features
___ Structures or features
___ Sources
___ Standing water
___ Deepest water
___ GPS measurement
___ Water quality sampling
___ Soil holes
___ Flow measurements
___ Flow direction arrows
___ Photo points, direction



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Site Geomorphology

GDE Type
Indicate primary (1) and secondary (2)

____ Anthropogenic (secondary only)
____ Cave
____ Exposure
____ Fountain
____ Geyser
____ Gushet
____ Hanging garden
____ Helocrene
____ Hillslope
____ Hypocrene
____ Limnocrene
____ Mound
____ Rheocrene

Surficial Material
Indicate primary (1) and secondary (2)

____ Alluvium
____ Colluvium
____ Eolian deposit
____ Glacial deposit
____ Human caused/constructed
____ Lacustrine sediments
____ Landslide deposit
____ Marl
____ Residuum
____ Rock (no surficial material present)
____ Talus deposit
____ Tufa or travertine deposit
____ Volcanic ash
____ Other/unknown _____

Source Geomorphology
Indicate primary (1) and secondary (2)

____ Bedding
____ Conduit
____ Contact
____ Fault
____ Fracture
____ Seepage or filtration
____ Other/unknown _____

Primary Lithology
(groundwater source aquifer)

☐ Igneous
☐ Sedimentary
☐ Metamorphic
☐ Unconsolidated

Geology Notes (to add to survey notes in Springs Online):

Secondary Lithology

Evidence of Groundwater
(multiple answers allowed)

☐ Flow from spring source, contact, joint, or fault
☐ Peat/muck accumulation
☐ Standing water
☐ Wetland vegetation
☐ Other

Relative Area of GDE
(must sum to 100)

____ % spring emergence
____ % channel
____ % wetland/riparian
____ % open water
____ % peatland
____ % other/unknown

Characteristics

____ Average slope (degrees)
____ Aspect (magnetic north) *or*
____ Aspect (true north)

Water Table

Inflow Pattern (select one):

☐ Groundwater inflow dominated
☐ Surface water inflow dominated
☐ Both groundwater and surface

Outflow Pattern (select one):

☐ Groundwater outflow dominated
☐ Surface water outflow dominated
☐ Both groundwater and surface
☐ Evapotranspiration dominated

Measurement location description:

Location (select one):

☐ Center of site
☐ Pool
☐ Downgradient from orifice
☐ Other _____

Source (select one):

☐ Depression
☐ Soil hole
☐ Standing water or pool
☐ Well/piezometer
☐ Other _____

Water Table Depth (cm) _____ Hole Depth (cm) _____ Is Hole Dry? ☐

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Soils

Soil Hole Location (select one):
- ☐ Targeted, center of site
- ☐ Targeted, other
- ☐ Unbiased, random
- ☐ Unbiased, systematic

Extraction Method(select one):
- ☐ Auger/core
- ☐ Push probe
- ☐ Shovel
- ☐ Other _____

Hole depth (cm) _____

Soil pit comments:

Depth of peat or muck:

Layer	Upper depth (cm)	Lower depth (cm)
Peat (fibric)		
Mucky peat (hemic)		
Muck (sapric)		

Fen characteristics observed? ◯ yes ◯ no

Comments _____

Histosol or histic epipedon observed? ◯ yes ◯ no

Comments _____

Depth to mineral layer (cm) _____

Texture _____

Color _____

Redox concentrations _____

Redox depletions _____

Reduced matrices _____

Hydrogen sulfide odor? ◯ yes ◯ no

Reaction to HCl? ◯ yes ◯ no

Water Quality

Measurement Location (select one):
- ☐ Spring source
- ☐ Down-gradient of source
- ☐ Stream exiting wetland
- ☐ Standing water
- ☐ Center of site
- ☐ Hole
- ☐ Well/piezometer
- ☐ Other _____

Source of Water (select one):
- ☐ Standing water
- ☐ Flowing water
- ☐ Other _____

Time (24 hr) _____

Parameter	Measurement	Device	Comment
Water temp. (°C)			
Air temp (°C)			
pH			
Specific Cond (µS/cm)			
ORP (mV)			
DO (mg/L)			
DO %			

Flow

Flow Measurement Method (select one):
- ☐ Volume
- ☐ Weir
- ☐ Current meter
- ☐ Flume
- ☐ Other _____

Flow measurement location:

Site % captured _____

Flow (L/s) _____

Reason if Flow Not Measured (select one):
- ☐ Diffuse outflow
- ☐ Hazard
- ☐ Little outflow
- ☐ No outflow
- ☐ Spring is dry
- ☐ Other _____

Surface Water (select one):
- ☐ Dry—no evidence of groundwater
- ☐ Saturated soil with no open water
- ☐ Patches of standing or flowing water
- ☐ Extensive standing water
- ☐ Flowing water in developed channel
- ☐ Extensive standing and flowing water

Hydroperiod (select one):
- ☐ Perennial
- ☐ Ephemeral/intermittent
- ☐ Unknown/not determined

Additional notes on flow:

Entered by: _____ Date _____ Checked by: _____ Date _____

Flow (continued)

Raw Flow Measurements (optional):

Measurement location	Volume unit	Time unit

If multiple locations, average or add together? _____

Photographs

Photo No.	Location	Caption	Distance	Orientation
	Reference point			
	Center of site			
	Water chemistry measurement			
	Soil core sampling			
	Spring source (if applicable)			
	View downstream from source			
	View upstream from source			
	Flow measurement			
	Overview from a hill			

Photographer name(s) _____

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Vegetation

Surrounding Vegetation (select one):
- ☐ Herbaceous/nonvascular
- ☐ Shrub dominated
- ☐ Tree dominated
- ☐ No dominant life form
- ☐ Nonvegetated

Bryophyte Abundance (select one)
- ☐ None
- ☐ Minor component
- ☐ Common component
- ☐ Very abundant

Dominant life form	Rank (1 = most, 6 = least)	Dominant species (enter only one)	Specimen collected?
Tree			
Shrub/sub-shrub			
Graminoid			
Forb/herb			
Aquatic plants			
Bryophyte			

Plant List

Species	Setting, comment, collection notes

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Vegetation (continued)

Plant List (continued)

Species	Setting, comment, collection notes

Entered by: ______________ Date ________ Checked by: ______________ Date ________

Aquatic and Terrestrial Fauna

Faunal Species

Invertebrate Taxon	Number	Life Stage	Detection	Comments

Vertebrate Species	Number	Age Class	Detection	Comments

Disturbances

Hydrologic Alteration (multiple okay)

- ☐ Water diversion (permanently diverted)
- ☐ Water diversion (water eventually returns to site)
- ☐ Upgradient extraction of surface water or groundwater (prespring emergence)
- ☐ Downgradient capture of surface water or groundwater (postspring emergence)
- ☐ Extraction of water within a wetland
- ☐ Extraction of water at spring source
- ☐ Regulated water flow by impoundment/dam
- ☐ Pollution
- ☐ Flooding
- ☐ Wells
- ☐ None observed
- ☐ Other: _____

Diverted volume (include unit of measure) _____

Percent diverted _____

Soil Alteration (multiple okay)

- ☐ Channel erosion
- ☐ Compaction
- ☐ Debris flow
- ☐ Deposition
- ☐ Displacement of soil
- ☐ Erosion (general)
- ☐ Evaporate deposition
- ☐ Excavation
- ☐ Ground disturbance (general)
- ☐ Gully erosion
- ☐ Mass wasting
- ☐ Mining
- ☐ Pedestals or hummocks (by people or animals)
- ☐ Pedestals (small-scale, rain-splash induced)
- ☐ Pipes
- ☐ Rill erosion
- ☐ Ruts (from vehicle tread)
- ☐ Sheet erosion
- ☐ Slump
- ☐ Splash erosion/soil crust
- ☐ Wind erosion
- ☐ Soil mixing/churning
- ☐ Soil removal (peat mining)
- ☐ Trails by people
- ☐ None observed
- ☐ Other: _____

Structures (multiple okay)

- ☐ Buried utility corridors
- ☐ Enclosure (such as spring house, spring box, or concrete enclosure)
- ☐ Erosion control structure
- ☐ Exclosure fence
- ☐ Oil and gas well
- ☐ Pipeline
- ☐ Point source pollution
- ☐ Power lines
- ☐ Road (includes construction and maintenance)
- ☐ None observed
- ☐ Other: _____

Recreational Effects (multiple okay)

- ☐ Camp sites
- ☐ Tracks or trails by vehicles (ATV, 4-wheel drive, etc.)
- ☐ None observed
- ☐ Other: _____

Animal Effects (multiple okay)

- ☐ Beaver activity
- ☐ Feral animals
- ☐ Grazing or browsing (by ungulates)
- ☐ Wild animals
- ☐ Livestock
- ☐ Trails by animals
- ☐ Trampling (by ungulates, native or nonnative)
- ☐ None observed
- ☐ Other: _____

Miscellaneous (multiple okay)

- ☐ Fire
- ☐ Tree cutting (timber harvest or other)
- ☐ Refuse disposal
- ☐ None observed
- ☐ Other: _____

Archaeological, paleontological, cultural, historic sites/use:

Management Indicator Tool

Management Indicators	True (Yes)	False (No)	Does not apply	Unable to assess	Comment
Hydrology					
1. **Aquifer Functionality:** No evidence suggests that the aquifer supplying groundwater to the site is being affected by groundwater withdrawal or loss of recharge.					
2. **Watershed Functionality:** Within the watershed, no evidence suggests upstream/ upgradient hydrologic alteration that could adversely affect the GDE site.					
3. **Water Quality:** Changes in water quality (surface or subsurface) are not affecting the groundwater dependent ecosystem site.					
Geomorphology and Soils					
4. **Landform Stability:** No evidence of human-caused mass movement or other surface disturbance affecting the GDE site stability.					
5. **Runout Channel:** The channel, if present, is functioning naturally and is not entrenched, eroded, or otherwise substantially altered.					
6. **Soil Integrity:** Soils are intact and functional. For example, saturation is sufficient to maintain hydric soils, if present; there is not excessive erosion or deposition.					
Biology					
7. **Vegetation Composition:** Site has anticipated cover of plant species associated with the site environment, and no evidence suggests that upland species are replacing hydric species.					
8. **Vegetation Condition:** Vegetation exhibits seasonally appropriate health and vigor.					
9. **TES, SOI/SOC, Focal Floral Species:** Anticipated floral species are present (will vary by ecological region and will require some baseline information).					
10. **Faunal Species:** Anticipated aquatic and terrestrial faunal species associated with the site environment are present.					
11. **TES, SOI/SOC, Focal Faunal Species:** Anticipated faunal species are present (will vary by ecological region and will require some baseline information).					
12. **Invasive Species:** Invasive floral and faunal species are not established at the site.					

Management Indicator Tool (continued)

Management Indicators	True (Yes)	False (No)	Does not apply	Unable to assess	Comment
Disturbances					
13. **Flow Regulation:** Flow regulation is not adversely affecting the site.					
14. **Construction and Road Effects:** Construction, reconstruction, or maintenance of physical improvements, including roads, is not adversely affecting the site.					
15. **Fencing Effects:** Protection fencing and exclosures are appropriate and functional.					
16. **Herbivore Effects:** Herbivory is not adversely affecting the site.					
17. **Recreational Effects:** Recreational uses, including trails, are not adversely affecting the site.					
18. **Other Disturbance Effects:** Wildland fire, insect, disease, wind throw, avalanches, or other disturbances are not adversely affecting the site.					
Administrative Context					
19. **Cultural Values:** Archaeological, historical, or Tribal values will not affect inventory, restoration, use, or management of this site.					
20. **Land Ownership:** The entire site and immediate area is under the jurisdiction and management of the Forest Service.					
21. **Other Landowner Actions:** Activities or management on lands outside Forest Service jurisdiction are not adversely affecting the site.					
22. **Land Management Plan:** The land and resource management plan provides for effective site protection.					
23. **Environmental Compliance:** Authorized and administrative uses are in compliance and are not adversely affecting the site.					
24. **Water Uses:** There are no substantial water uses in the watershed, or in the aquifer supplying groundwater to the site, that could directly or cumulatively adversely affect the GDE.					
25. **Water Rights:** Water rights are filed for the site under State law or water uses exempted under State law are documented. Forest Service Federal reserved rights documented as appropriate. Third-party water use is in accordance with all elements of the water right or conditions of the exemption and with Forest Service authorization that allows the use.					