

## Ecological site R044AP808MT Upland Grassland Group

Last updated: 9/07/2023  
Accessed: 04/19/2024

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### General information

**Provisional.** A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

### MLRA notes

Major Land Resource Area (MLRA): 044A–Northern Rocky Mountain Valleys

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This MLRA includes the northern portion of the Northern Rocky Mountain Valleys Province of the Rocky Mountain System. The mountain valleys are deeply dissected and are typically bordered by mountains trending north to south. The nearly level broad flood plains are bordered by gently to strongly sloping terraces and alluvial fans. The surrounding mountains and in some areas the valleys experienced glaciation. The average precipitation is 12 to 16 inches generally, though can vary widely. The dominant soil orders are Inceptisols, Mollisols and Andisols. The valleys support coniferous forests, shrublands and grasslands.

Description of MLRAs can be found in: United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

Available electronically at: [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2\\_053624#handbook](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053624#handbook)

### Ecological site concept

- Site does not receive any additional water
- Site not located in a flood plain
- Dominant Cover: Grassland; dominated by rough fescue with Idaho fescue and forbs including twin arnica and Indian blanketflower, minimal shrubs but include Wood's rose. Average production at this site is 1500 dry pounds per acre.
- Soils are
  - o Not saline or saline-sodic
  - o Not limy (Soil is not strongly or violently effervescent ( $\text{CaCO}_3 > 14\%$ ) in surface mineral 18cm)
  - o Moderately deep, deep, very deep
  - o Not ashy or medial textural family
  - o Typically less than 15% stone and boulder surface area (<15% max)
- Soil surface texture silt loam to loam in surface mineral 4"
- Parent material is alluvium, outwash, glacial till
- Drainage class is well drained; no flooding frequency
- Site Landform: stream terraces, outwash terraces, fan remnants, outwash fans, moraines
- Moisture Regime: xeric/ustic
- Temperature Regime: frigid
- Elevation Range: 3000-4000 ft
- Slope: 2-35%

### Associated sites

R044AP805MT	<b>Shallow Grassland Group</b> This associated ecological site resides on shallow soils adjacent to this deep soils ecological site.
R044AP809MT	<b>Upland Sagebrush Shrubland Group</b> This associated ecological site resides on areas with slightly drier or rockier soils adjacent to this ecological site.

## Similar sites

R044AP805MT	<b>Shallow Grassland Group</b> This ecological site is similar to the Upland grassland ecological site in residing in upland areas and having loamy soil characteristics, though with shallow depth. Both ecological sites have a vegetation community of perennial grasslands.
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Rosa woodsii</i>
Herbaceous	(1) <i>Festuca campestris</i> (2) <i>Festuca idahoensis</i>

## Physiographic features

**Table 2. Representative physiographic features**

Landforms	(1) Valley > Stream terrace (2) Valley > Outwash terrace (3) Valley > Fan remnant (4) Valley > Outwash fan (5) Valley > Moraine
Elevation	3,000–4,000 ft
Slope	2–35%
Water table depth	60 in
Aspect	W, NW, N, NE, E, SE, S, SW

## Climatic features

- Moisture Regime: xeric/ustic
- Temperature Regime: frigid
- Representative Value (RV) of range of Mean Annual Precipitation: 14-22 inches
- Representative Value (RV) of range of Mean Average Annual Temperature: 39-45 degrees
- Representative Value (RV) of range of Frost Free Days: 95-120 days

**Table 3. Representative climatic features**

Frost-free period (characteristic range)	44-101 days
Freeze-free period (characteristic range)	91-139 days
Precipitation total (characteristic range)	13-22 in
Frost-free period (actual range)	20-116 days
Freeze-free period (actual range)	64-143 days
Precipitation total (actual range)	11-29 in
Frost-free period (average)	79 days
Freeze-free period (average)	117 days

Precipitation total (average)

18 in

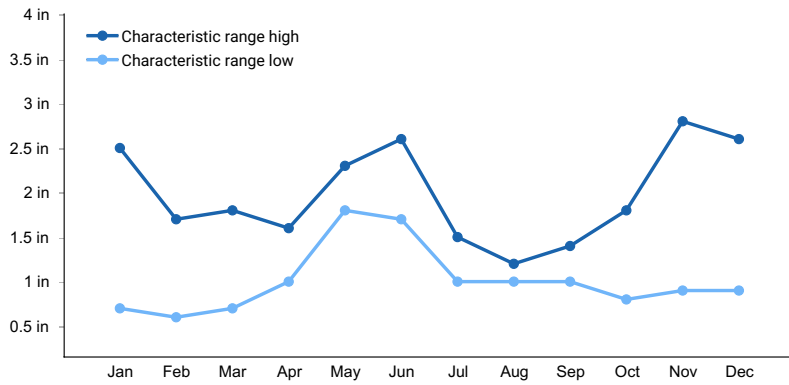


Figure 1. Monthly precipitation range

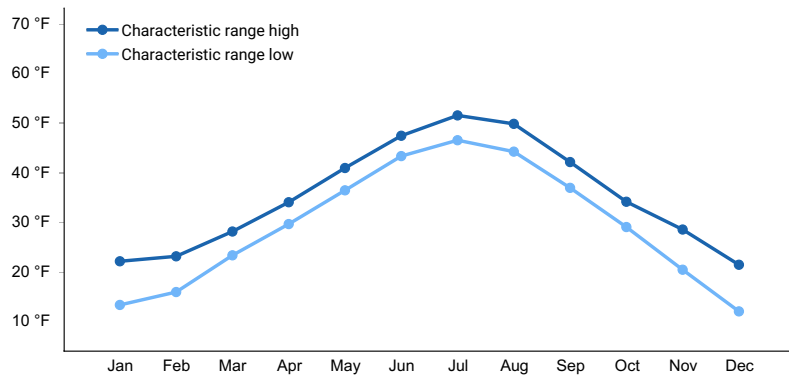


Figure 2. Monthly minimum temperature range

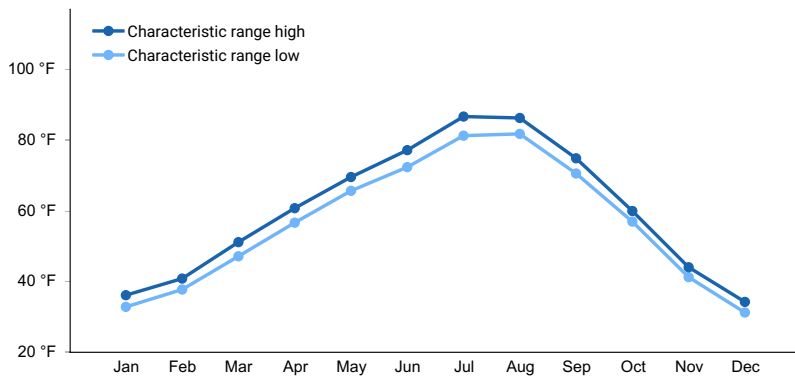


Figure 3. Monthly maximum temperature range

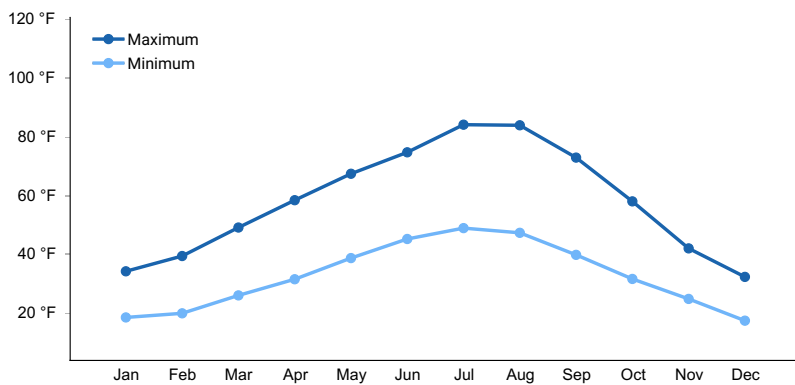
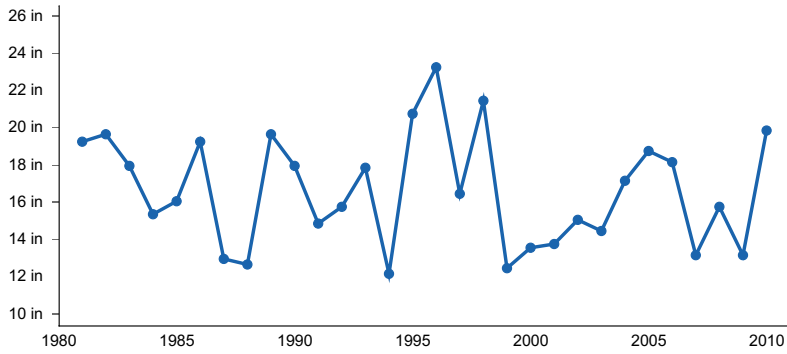
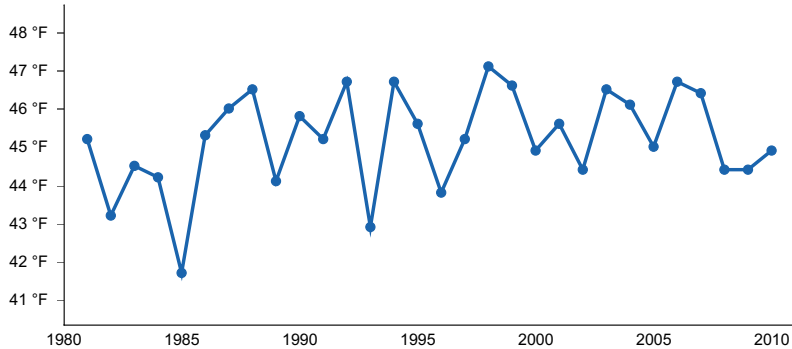


Figure 4. Monthly average minimum and maximum temperature



**Figure 5. Annual precipitation pattern**



**Figure 6. Annual average temperature pattern**

### Climate stations used

- (1) BONNERS FERRY [USC00101079], Bonners Ferry, ID
- (2) SANDPOINT EXP STN [USC00108137], Sandpoint, ID
- (3) EUREKA RS [USC00242827], Eureka, MT
- (4) TROY [USC00248390], Troy, MT
- (5) TROUT CREEK RS [USC00248380], Trout Creek, MT
- (6) PLEASANT VALLEY 5 SE [USC00246580], Marion, MT
- (7) OLNEY [USC00246218], Whitefish, MT
- (8) KALISPELL 9 NNE [USC00244560], Kalispell, MT
- (9) THOMPSON FALLS PH [USC00248211], Thompson Falls, MT
- (10) SAINT REGIS 1 NE [USC00247318], Saint Regis, MT
- (11) MISSOULA INTL AP [USW00024153], Missoula, MT
- (12) SAINT IGNATIUS [USC00247286], Saint Ignatius, MT
- (13) POLSON [USC00246635], Polson, MT
- (14) WESTERN AG RSCH CTR [USC00248783], Corvallis, MT
- (15) STEVENSVILLE [USC00247894], Stevensville, MT
- (16) DEER LODGE 3 W [USC00242275], Deer Lodge, MT
- (17) TRIDENT [USC00248363], Three Forks, MT
- (18) TWIN BRIDGES [USC00248430], Sheridan, MT

### Influencing water features

- Site does not receive any additional water
- Site not located in a flood plain
- Dominant Cover: Grassland

### Wetland description

DOES NOT APPLY

## Soil features

- o Not saline or saline-sodic
- o Not limy (Soil is not strongly or violently effervescent ( $\text{CaCO}_3$  greater than 14 percent) in surface mineral 18 cm)
- o Moderately deep, deep, very deep
- o Not ashy or medial textural family
- o Typically less than 15 percent stone and boulder surface area (less than 15 percent max)
- Soil surface texture silt loam to loam in surface mineral 4 inches
- Drainage class is well drained; no flooding frequency

**Table 4. Representative soil features**

Parent material	(1) Alluvium (2) Outwash (3) Till
Surface texture	(1) Silt loam (2) Loam
Drainage class	Well drained
Soil depth	20–60 in
Surface fragment cover >3"	0–15%

## Ecological dynamics

1.1 Mid-statured bunchgrasses dominant (bluebunch, rough fescue, Idaho fescue, green needlegrass, Richardson's needlegrass, Columbia needlegrass), limited needle and thread, Sandberg bluegrass, prairie Junegrass, low but diverse forb component including blanketflower, yellow penstemon, yarrow, old man's whiskers, western stoneseed, rosy pussytoes). Shrubs are a relatively small component and include Wood's rose, common snowberry and lesser prairie sagewort..

1.1a Extended drought, improper grazing, climate change, catastrophic fire (limited on this site)

1.2 Mid-statured bunchgrasses subdominant to increaser bunchgrasses such as needle-and-thread or Idaho fescue. Shrubs increasing, clubmoss possible (limited extent), mat forming forbs increasing

1.2a Proper grazing management, favorable growing conditions, time

T1A Poor post settlement grazing (late 1800's), drought with improper grazing, multiple spring grazing, fire suppression

T1B Sodbusting, introduction of tame pasture species and other invasive plants, overgrazing, drought, heavy human disturbance, extreme fire (multiple years or very intense)

T1C Poor post settlement grazing (late 1800's), drought with improper grazing, multiple spring grazing and/or long term overgrazing, fire suppression

T3A Sodbusting, invasive plants, overgrazing, extended drought, adjacent to construction or disturbance event

2.1 Mixed grass dominated site (needle and thread or Idaho fescue), mid-statured bunchgrasses existent under shrub canopy, possible conifer encroachment, forbs, mat forming subshrubs and shrubs increase

2.1a Improper grazing management, drought, fire, climate change

2.2 Needle-and-thread or Idaho fescue losing dominance to Sandberg bluegrass and prairie Junegrass. Decreaser bunchgrasses very rare and limited under shrub canopy. Broom snakeweed and Fringed sagewort beginning to replace shrub component

2.2a Proper grazing management, time, Integrated Pest Management, brush management

3.1 Shortgrass State lacks mid-statured bunchgrasses. Sandberg bluegrass and prairie Junegrass dominant grasses, increaser shrubs nearly replace larger shrub species. Remaining larger shrub species heavily hedged.

T2A Overgrazing, introduction of weeds, drought, heavy human disturbance

R2A Fire, range seeding, timely moisture, proper grazing management, IPM

R3B Possibly not feasible, range seeding, time, proper grazing management, IPM

T2B Sodbusting, introduction of tame pasture species and other invasive plants, overgrazing, extended drought, adjacent to construction or disturbance event, extreme fire (multiple years or very intense)

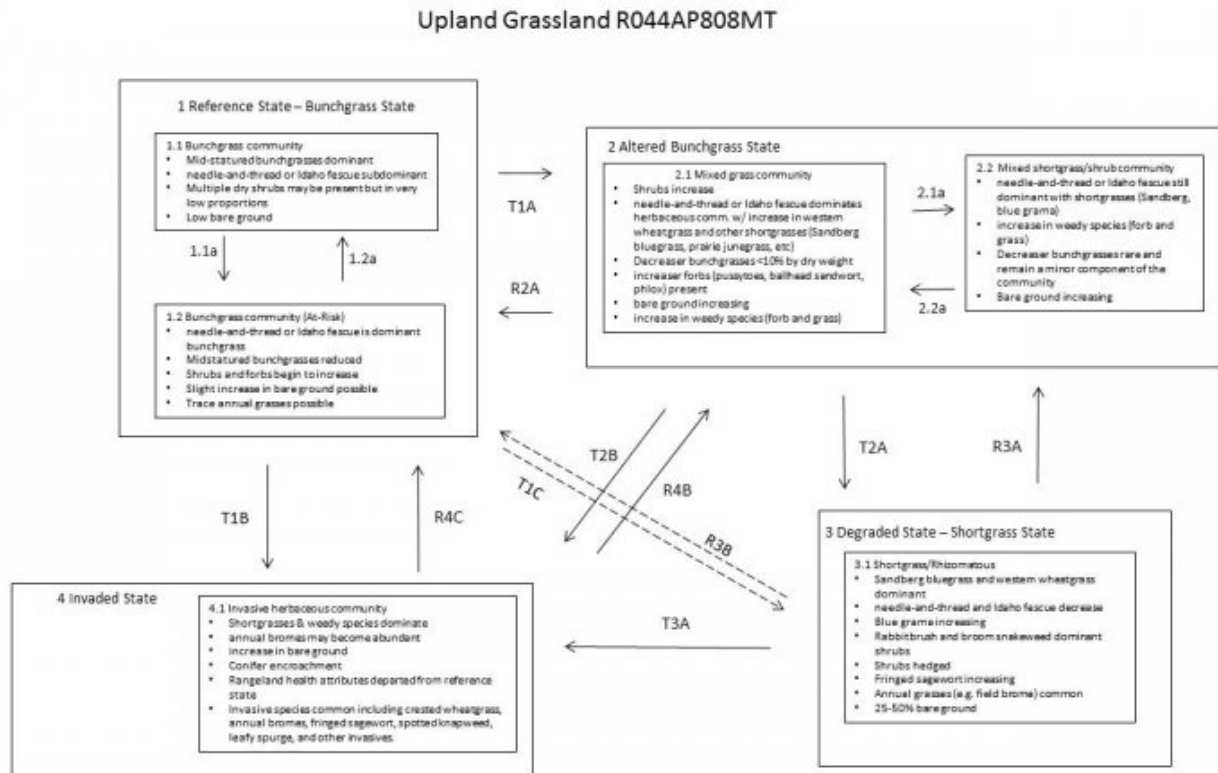
4.1 Invaded State may resemble reference however contains noxious or invasive weeds such as cheatgrass or knapweed. Conifer encroachment common.

R3A Range seeding, time, proper grazing management, IPM

R4A IPM, timely moisture, grazing management, brush management, range seeding

R4B IPM, range seeding, timely moisture, grazing management, brush management, range seeding

## State and transition model



## Legend

### Pathways

- 1.1a Extended drought, improper grazing, climate change, catastrophic fire (limited on this site)
- 1.2a Proper grazing management, favorable growing conditions, time
- 2.1a Improper grazing management, drought, fire, climate change
- 2.2a Proper grazing management, time, Integrated Pest Management, brush management

### Transitions

- T1A Poor post settlement grazing (late 1800's), drought with improper grazing, multiple spring grazing, fire suppression
- T1B Sod busting, introduction of tame pasture species and other invasive plants, overgrazing, drought, heavy human disturbance, extreme fire (multiple years or very intense)
- T1C Poor post settlement grazing (late 1800's), drought with improper grazing, multiple spring grazing and/or long-term overgrazing, fire suppression
- T3A Sod busting, invasive plants, overgrazing, extended drought, adjacent to construction or disturbance event
- T2A Overgrazing, introduction of weeds, drought, heavy human disturbance
- R2A Fire, range seeding, timely moisture, proper grazing management, IPM
- R3B Possibly not feasible, range seeding, time, proper grazing management, IPM
- T2B Sod busting, introduction of tame pasture species and other invasive plants, overgrazing, extended drought, adjacent to construction or disturbance event, extreme fire (multiple years or very intense)
- R3A Range seeding, time, proper grazing management, IPM
- R4A IPM, timely moisture, grazing management, brush management, range seeding
- R4B IPM, range seeding, timely moisture, grazing management, brush management, range seeding

## Animal community

Improper livestock grazing can cause changes to plant community through preferential grazing of certain species, changes to soil and hydrology function. A grazing induced change in vegetation community structure away from native bunchgrasses that have high canopy cover and therefore lower bare soil cover can increase soil erosion. Trampling of vegetation by livestock can also reduce plant vigor. Livestock can introduce non-native species into the native community. Rotational grazing with adequate rest should be implemented.

Wildlife that commonly use this site include big game such as elk, mule deer, white-tailed deer, bighorn sheep, pronghorn and small mammals and birds such as Ferruginous hawk, golden eagle, peregrine falcon, northern harrier, red-tailed hawk and songbirds.

## Recreational uses

HIKING, BIKING, PHOTOGRAPHY

## Wood products

NONE

## Other information

Variation in fire regimes from historical occurrence can cause vegetation community dynamics to change, particularly when fires occur in different season than was common under the historic frequency. Fire suppression can cause potentially devastating and severe fires due to litter accumulation after longer time between fires. Suppression can also allow for encroachment by woody shrub and tree species. An increase in fire cycles can also be detrimental to bluebunch wheatgrass-Idaho fescue grasslands by reducing the post-fire recovery time and native plants may be vulnerable to alien competition. As well, fires that are out of season to historic fire cycles, can cause higher mortality if occurring during the growing season. Herbicide drift from adjoining agricultural lands to mesic rough fescue grasslands can negatively impact the vegetation community of bunchgrasses and perennial forbs with lower vigor or mortality.

## Contributors

Jay Skovlin  
Stephanie Shoemaker

## Approval

Kirt Walstad, 9/07/2023

## Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	04/19/2024
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**



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6. **Extent of wind scoured, blowouts and/or depositional areas:**
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7. **Amount of litter movement (describe size and distance expected to travel):**
- 
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**
- 
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**
- 
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
- 
12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**
- Dominant:
- Sub-dominant:
- Other:
- Additional:
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
- 
14. **Average percent litter cover (%) and depth ( in):**
- 
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**
- 
16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not**

**invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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**17. Perennial plant reproductive capability:**

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