



## Prioritizing Ditches for Inspection and Maintenance



### Fact Sheet A2

February 7, 2019

Time and resource limitations prevent maintenance crews from conducting frequent inspections and maintenance to every single ditch in their jurisdiction. To prioritize ditches for maintenance activities, the relative importance of each ditch should be evaluated alongside its maintenance urgency.

Inspection and maintenance prioritization can be simplified into two major questions:

How important is the ditch?

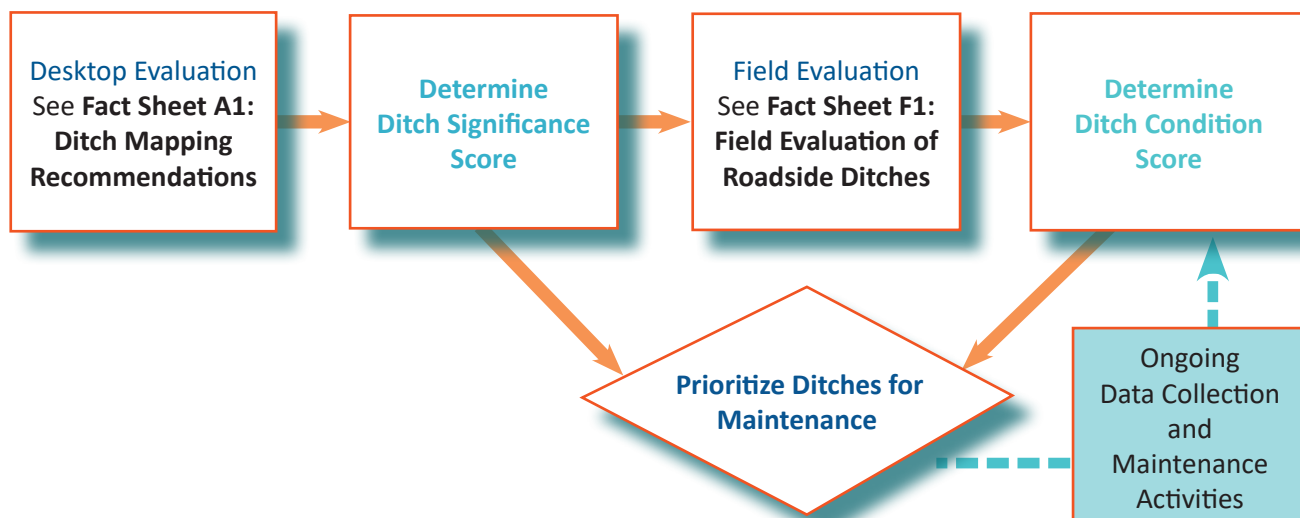
How immediate is the ditch maintenance need?

**Ditch Significance**

**Ditch Condition**

When prioritizing ditches for inspection, ditch condition is often unknown. *Ditch Significance* may serve as the initial primary metric for sorting and ranking ditches for inspection and/or routine maintenance. After *Ditch Condition* data is collected in the field, ditches can then be prioritized for corrective maintenance.

### Prioritize Ditches for Inspection

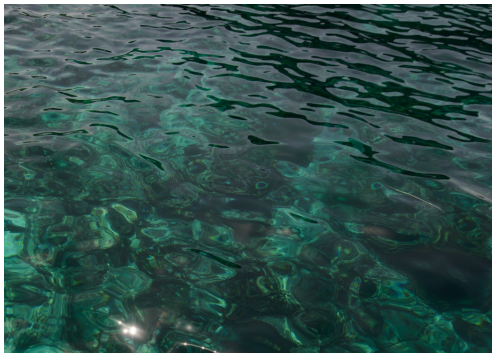




## Ditch Significance Score

Several key criteria can be used to determine the relative importance of a ditch. Data collection to evaluate ditch significance typically requires a desktop assessment, as discussed in **Fact Sheet A1: Ditch Mapping Recommendations**. The primary ditch significance criteria include:

### Water Quality



- Does this ditch have a high likelihood of capturing polluted flows based on the road type or land use?
- Does the ditch drain into a sensitive waterbody?
- Does this ditch infiltrate to potential drinking water sources?

### Contributing Drainage Area Characteristics



- Are there steep slopes in the general vicinity?
- Are there erosion hazard areas or landslide hazard areas in the general vicinity?
- Does the ditch segment have a large drainage area? (if drainage areas have been delineated)

### Date of Last Maintenance/Inspection and Available Data



- How long ago was the last routine maintenance action/inspection?
- Is the ditch condition known?

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## Ditch Significance Score

A streamlined evaluation for ditch significance with a standardized scoring system is recommended as part of the desktop evaluation. Table 1 provides recommendations for scoring ditch significance, and can be adjusted to add categories, ratings, and/or to adjust threshold values that reflect local conditions and priorities.

Table 1. Recommendations for Ditch Significance Scoring					
Category \ Score	1	2	3	4	5
Road Type/ Classification	Local Road	Minor Collector	Major Collector	Minor Arterial	Principal Arterial
Receiving Waterbody Quality	No known water quality issues	No known water quality issues, but is within ¼ mile of receiving water	303(d) listed for phosphorus or fecal coliform, shellfish bed closures, or beach closure	Any 303(d) listed parameter (other than phosphorus or fecal coliform)	TMDL
Located in WHPA*	No WHPA	10-year travel time	5-year travel time	1-year travel time	6-month travel time
Slope of Adjacent Road	Low (< 5%)	Low to Moderate (5-10%)	Moderate (10-15%)	Moderate to Steep (15-20%)	Steep (> 20%)
Erosion/ Landslide Hazard Areas	No	Not applicable	Not applicable	Yes, but not directly adjacent to ditch	Yes; directly adjacent to ditch
Drainage Area Size (in acres)	Small (< 0.25)	Small to Moderate (0.25-0.50)	Moderate (0.50-0.75)	Moderate to Large (0.75-1.0)	Large (> 1.0)
Date Last Visited	< 1 year	1-3 years	3-5 years	5-10 years	>10 years
Adjacent Land Use	Undeveloped (Forest, Natural, or Undisturbed)	Single Family Residential (Rural)	Single Family Residential (Urban)	Multi-Family Residential Light Commercial Agricultural Golf Course	Industrial Heavy Commercial Livestock
Spill Frequency	None reported	Low (1-2 spills/ accidents per year)	Moderate (3-5 spills/ accidents per year)	Moderate-High (6-9 spills/ accidents per year)	High (10 or more spills/accidents per year)

\*WHPA = Wellhead Protection Area



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## Ditch Significance Score

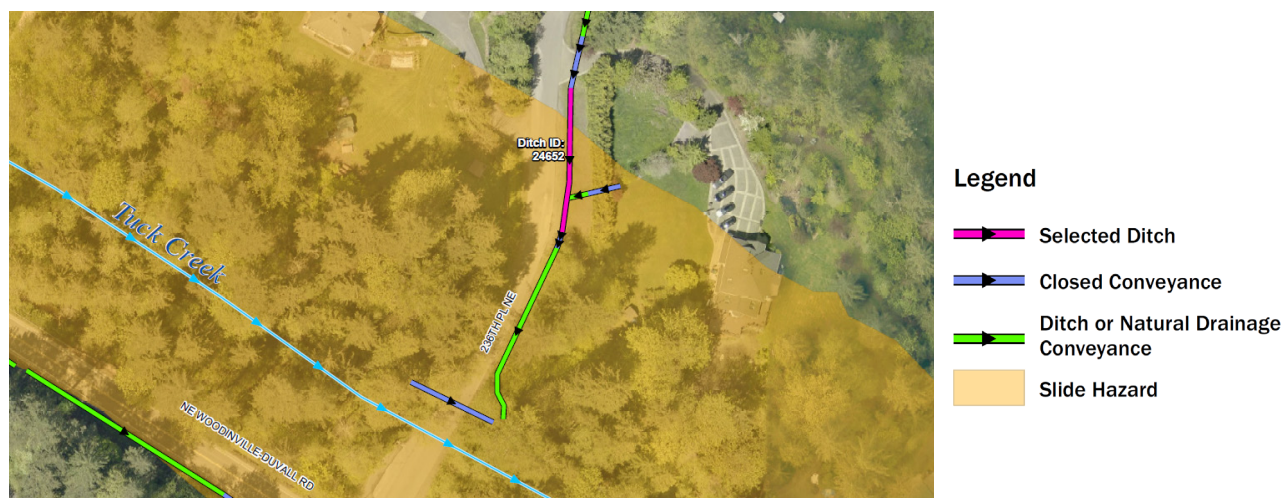
A score of 5 across several data fields would contribute to an overall high priority ditch significance score, placing the ditch in the “Moderate-High” or “High” inspection priority bracket. For specific high-urgency concerns, “red flag” items or weighted scores can be used to improve accuracy of the calculated score to match real-world priorities.

Ditch Significance Score*	9	10-18	19-27	28-36	37-45
Inspection Priority	Low	Low-Moderate	Moderate	Moderate-High	High

\*Scoring intervals can be customized, and will vary if weighting or additional criteria are added to the recommended framework

## Ditch Significance Score Example

Category	Rating	Score
Road Type/Classification	Major Collector	3
Receiving Waterbody Quality	On the 303(d) list for temperature	4
Located in WHPA	No WHPA	1
Slope of Adjacent Road	Low to Moderate (5-10%)	2
Erosion/Landslide Hazard Areas	Yes, directly adjacent to ditch	5
Drainage Area Size	Small to Moderate (0.25-0.50 acres)	2
Date Last Visited	3-5 years	3
Adjacent Land Use	Single Family Residential (Urban)	3
Spill Frequency	Moderate (3-5 spills/accidents per year)	3
Total Ditch Significance Score		26



Example of Mapped Landslide Hazard Areas

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## Ditch Condition Score

Assessment of ditch condition requires field data collection, which can occur during adjacent road or ditch maintenance activities or as part of a proactive inspection program. Field assessment for ditch condition is discussed in **Fact Sheet F1: Considerations for Field Evaluation of Roadside Ditches**.

Table 2 provides recommendations for scoring ditch condition. The intent of the rating matrix is to correlate the field condition assessment with a relative score that can be applied to all ditches within the jurisdiction. This rating may be evaluated in further detail to prioritize the ditch segment for ongoing inspections and to schedule routine and/or corrective maintenance. This rating matrix can be adjusted to add categories, ratings, scoring values (e.g., 1 for good, 3 for moderate, and 5 for poor), and/or to adjust threshold values (e.g., 90% vegetation coverage, < 25% capacity).

Table 2. Recommendations for Ditch Condition Scoring			
Rating (Score) Category	Good (1)	Moderate (3)	Poor (5)
Capacity and Conveyance	Ditch flows freely, no debris build-up evident	Ditch flows freely, some minor build-up evident	Ditch functions to < 25% of capacity
	No evidence of localized flooding	Not applicable	Evidence of localized flooding
Structural Components	No damaged components present	Damaged components, but not causing flow blockages	Damaged components causing flow blockages
	No debris buildup at inlet or outlet	Debris buildup at inlet or outlet blocking 25% of inlet/outlet capacity	Debris buildup at inlet or outlet blocking 50% of inlet/outlet capacity
Vegetation	Covering 90% of ditch bottom	Covering 75-90% of the ditch bottom	Covering < 75% of ditch bottom and/or causing line-of-sight issues
	Recently mowed (< 1 year ago)	Mowed last year (2 years ago)	Not recently mowed (3 or more years ago)
	No noxious weeds present	Noxious weeds present, but are actively being managed	Noxious weeds present and not being managed
Integrity	No bare spots	10-20% bare spots	> 40% bare spots
	No evidence of nuisance animals	Evidence of illegal dumping	Evidence of nuisance animals or illicit connections

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## Ditch Condition Score Example



The ditch condition score for this example would be calculated as follows:

Category	Rating			Score
<b>Capacity and Conveyance</b>	Ditch flows freely, no debris build-up evident	Ditch flows freely, some minor build-up evident	Ditch functions to < 25% of capacity	1
	No evidence of localized flooding	Not applicable	Evidence of localized flooding	1
<b>Structural Components</b>	No damaged components present	Damaged components, but not causing flow blockages	Damaged components causing flow blockages	1
	No debris buildup at inlet or outlet	Debris buildup at inlet or outlet blocking 25% of inlet/outlet capacity	Debris buildup at inlet or outlet blocking 50% of inlet/outlet capacity	1
<b>Vegetation</b>	Covering 90% of ditch bottom	Covering 75-90% of the ditch bottom	Covering < 75% of ditch bottom and/or causing line-of-sight issues	5
	Recently mowed (< 1 year ago)	Mowed last year (2 years ago)	Not recently mowed (3 or more years ago)	3
	No noxious weeds present	Noxious weeds present, but are actively being managed	Noxious weeds present and not being managed	1
<b>Integrity</b>	No bare spots	10-20% bare spots	> 40% bare spots	5
	No evidence of nuisance animals	Evidence of illegal dumping	Evidence of nuisance animals or illicit connections	1
<b>Total Ditch Condition Score</b>				<b>19</b>



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## Ditch Condition Score Example

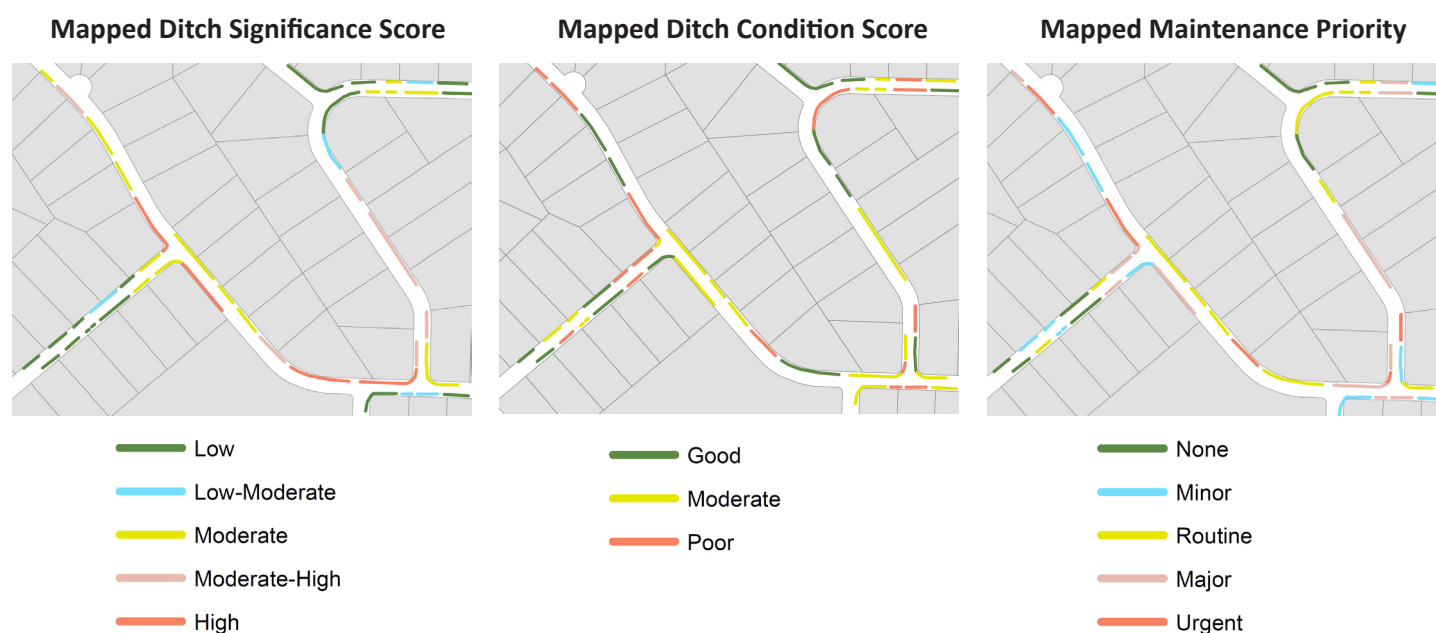
A score of 5 across several data fields would contribute to an overall high ditch condition score. For specific high-urgency concerns, “red flag” items or weighted scores can be used to improve accuracy of the calculated score to reflect local priorities. This prioritization score can be used to determine high-risk, high-need ditches based on local priorities and concerns. Ideally, this rating system would be integrated with the ditch database and updated as inspections and maintenance activities are performed.

The overall maintenance priority of a ditch should incorporate both the Ditch Significance Score and the Ditch Condition Score. This combined score can be used to prioritize ditches for maintenance on an ongoing basis.

## Combined Ditch Significance and Ditch Condition Score

Combined Ditch Significance and Ditch Condition Score*	17	18-34	35-51	52-68	69-85
Overall Maintenance Priority	None	Minor	Routine	Major	Urgent

\*Scoring intervals can be customized, and will vary if weighting or additional criteria are added to the recommended framework.



This fact sheet was developed by Herrera Environmental Consultants with input from King County and the Regional Operations and Maintenance Program (ROADMAP). Project funding was provided by a National Estuary Program grant from the Washington State Department of Ecology.