

**Pend Oreille River TMDL  
Watershed Advisory Group:  
Box Canyon Dam  
Compliance with  
Temperature Standards**



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Washington State Dept. of Ecology**

**June 25, 2007**

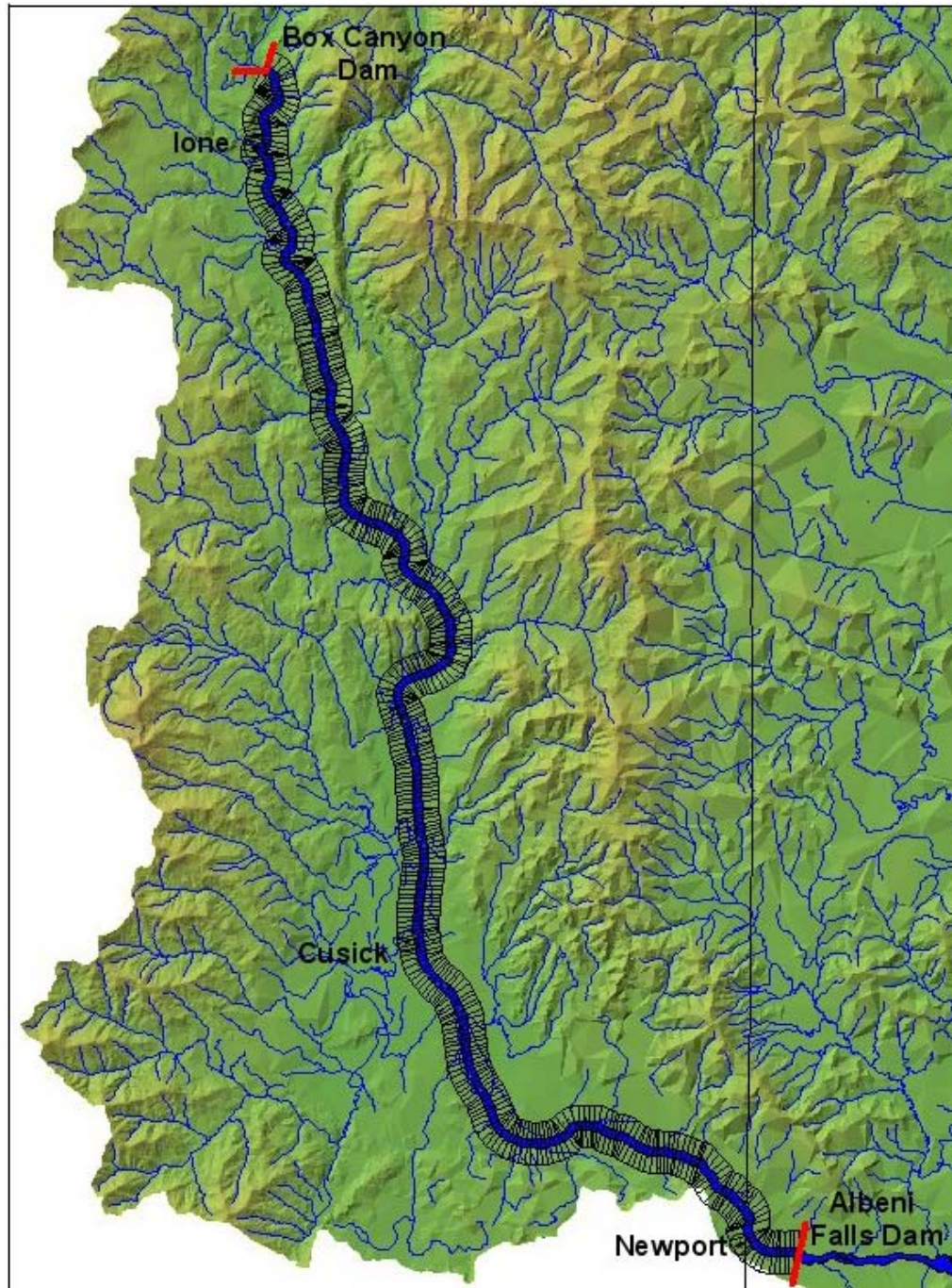


## ***Pend Oreille River Temperature TMDL: Box Canyon Dam Standards Compliance***



### ➤ Introduction

- ***Where we left off...***
  - Model developed by Pend Oreille PUD for relicensing
  - Portland State University recalibrated a model
    - ✧ Presented at January WAG
  - Eight scenarios provided to Ecology
    - ✧ 2004-05 conditions
    - ✧ Comparison of scenarios presented at May WAG
- ***What you will see today...***
  - Analysis of compliance with standards
- ***What you will not see today...***
  - TMDL and allocations





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### ➤ Introduction

- *Maximums and averages (reprise)*
  - Standards based on the one-day maximum temperature
  - Model has 357 segments, upstream to downstream
  - Each segment has multiple layers in water column
  - Daily maximum is:
    - \* The maximum per segment (over the water column)
    - \* The maximum per day (midnight to midnight)



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### ➤ Introduction

#### ▪ *“Loading Capacity”*

- Standard terminology required by TMDL program
- Capacity of water body to absorb human effects and still meet standards
- In this TMDL, equal to *increment of temperature above natural allowed by the standards*
- Thermal loading calculated from flow and temperature
  - ✦ Addressed in final TMDL, but not today



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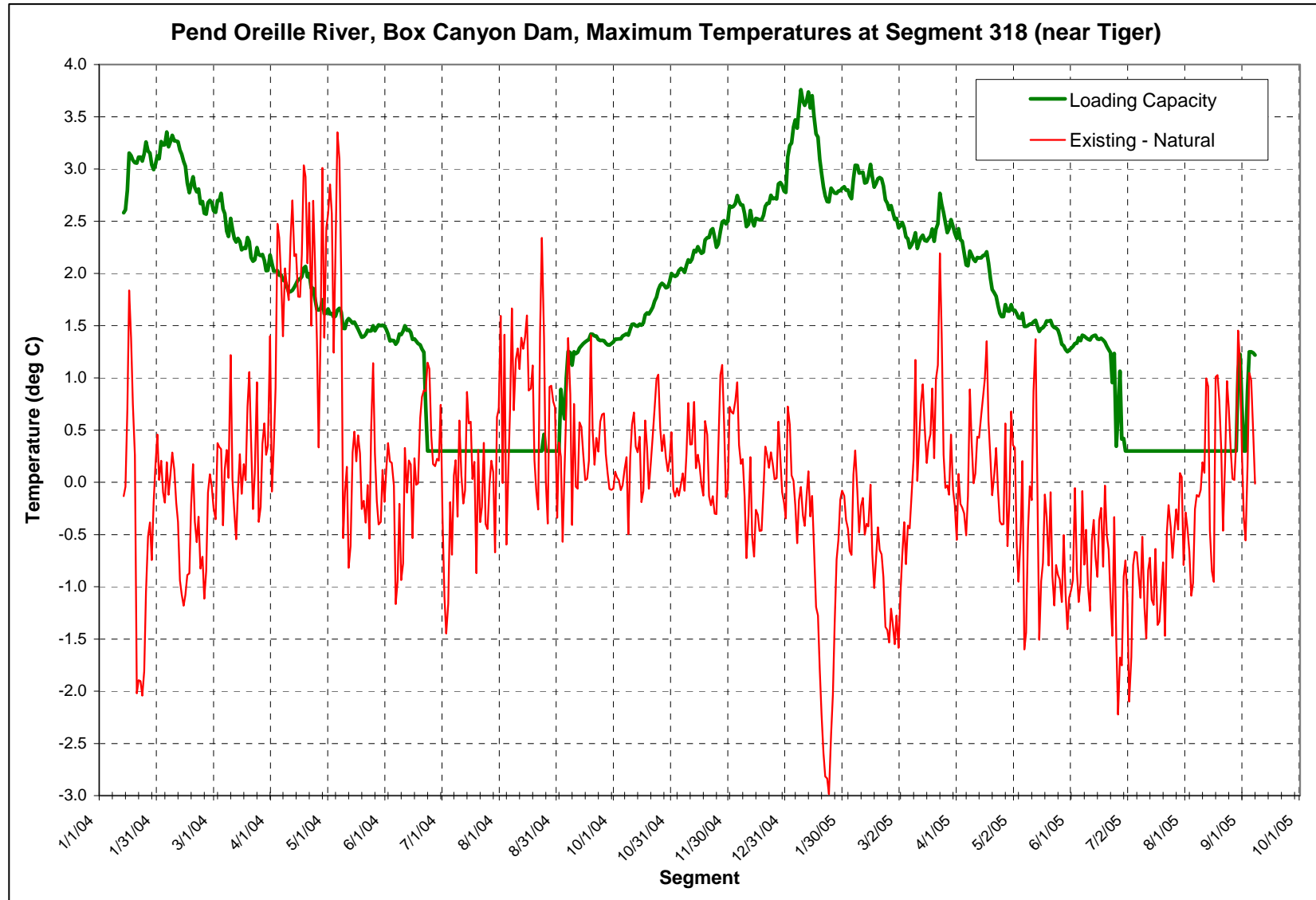
### ➤ Summary of scenarios

**Summary of Box Canyon and Boundary Canyon Modeling Scenarios**

No.	Name	Upstream	Downstream Dam	NPDES	Tributaries	Mainstem shade
1	Existing	Current	Impounded	present	current	current
2	Existing-NPDES	Current	Impounded	removed	current	current
2.5	Existing - Tribs PNV	Current	Impounded	present	PNV temps	current
3	Natural - Impounded	Natural	Impounded	removed	PNV temps	PNV shade
4	Existing - Unimpounded	Current	Unimpounded	present	current	current
7	Existing - mainstem PNV	Current	Impounded	present	current	PNV shade
7.5	Existing - Upstream Natural	Natural	Impounded	present	current	current
8	Natural	Natural	Unimpounded	removed	PNV temps	PNV shade

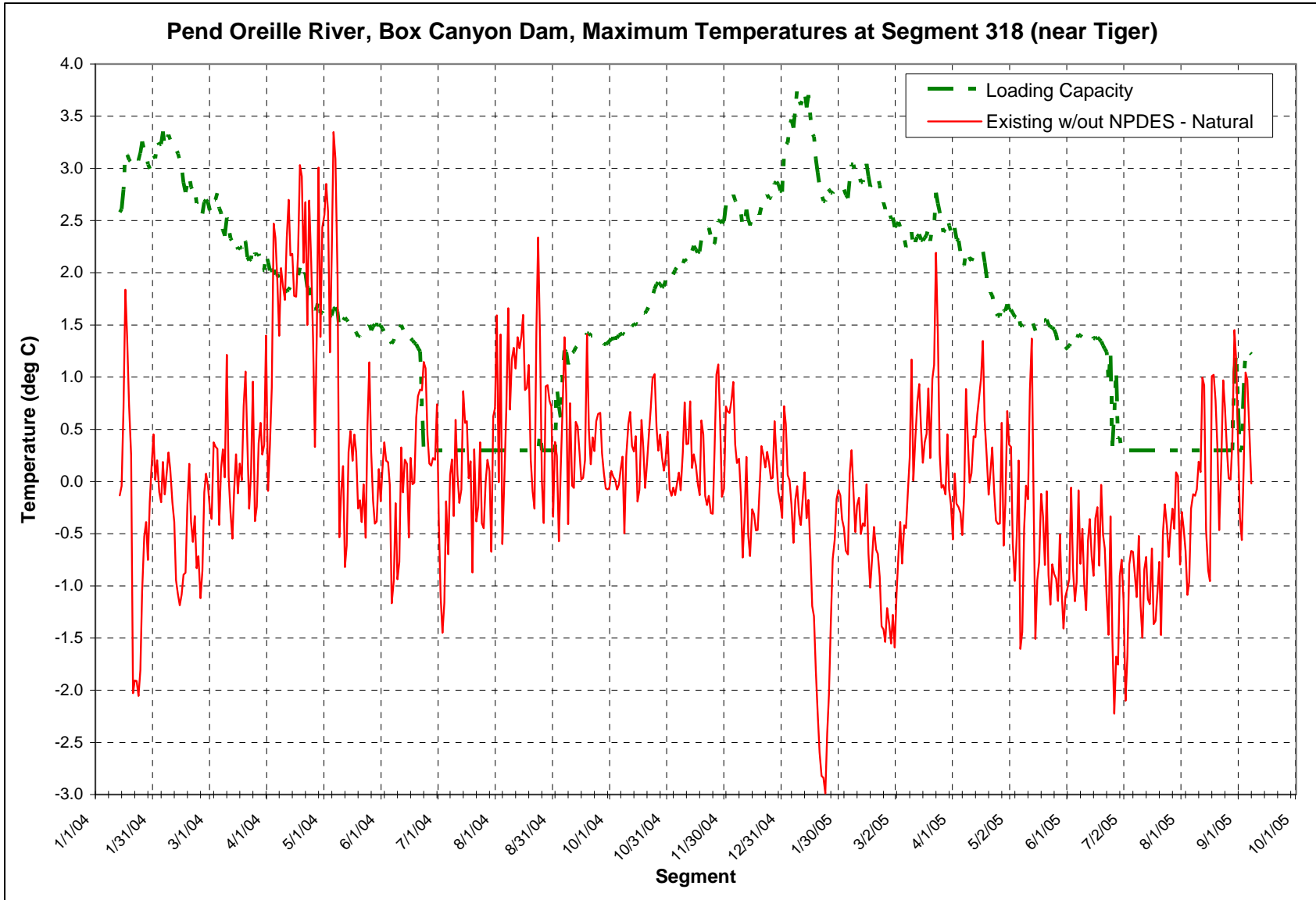


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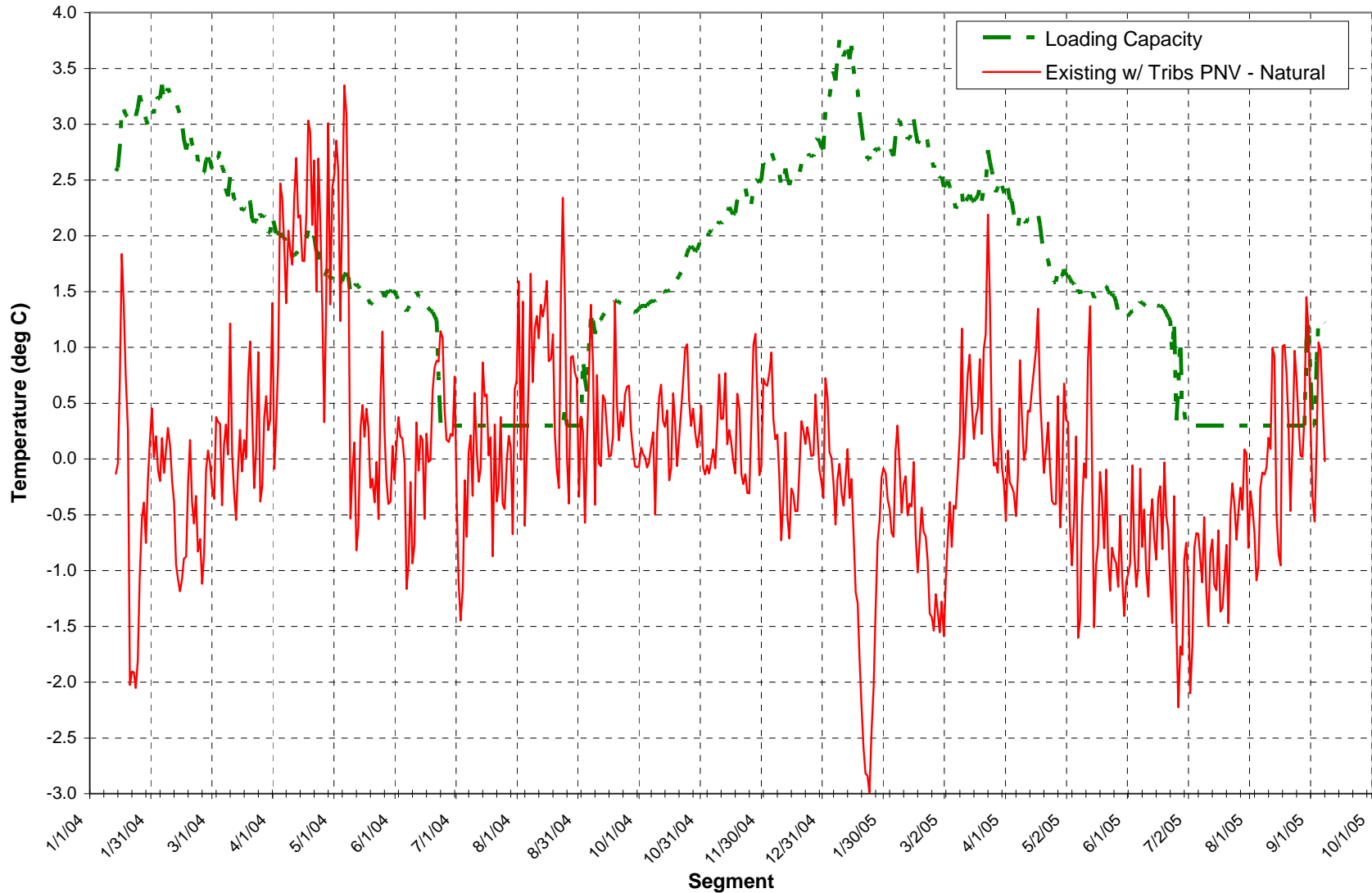




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**Pend Oreille River, Box Canyon Dam, Maximum Temperatures at Segment 318 (near Tiger)**

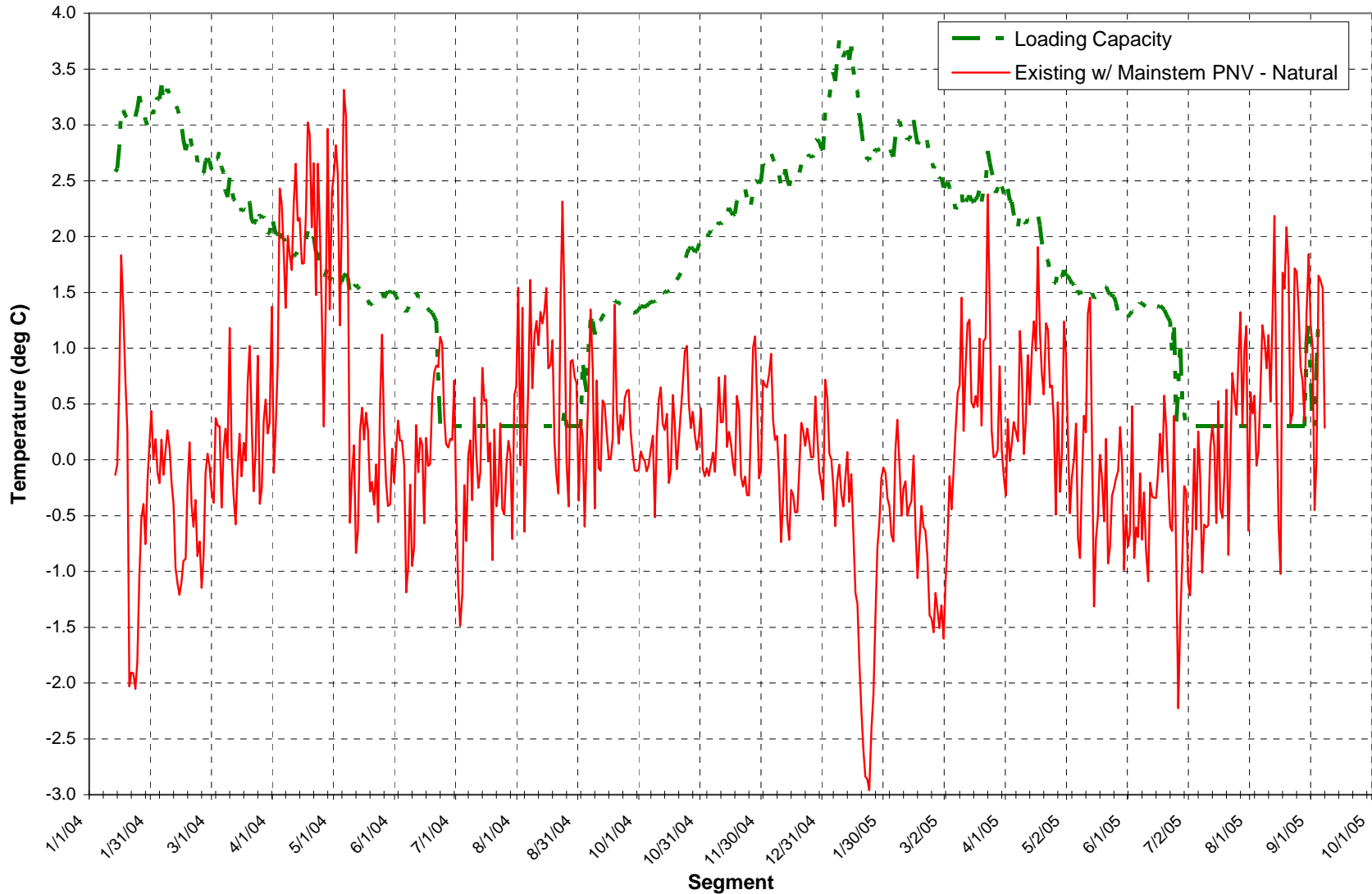




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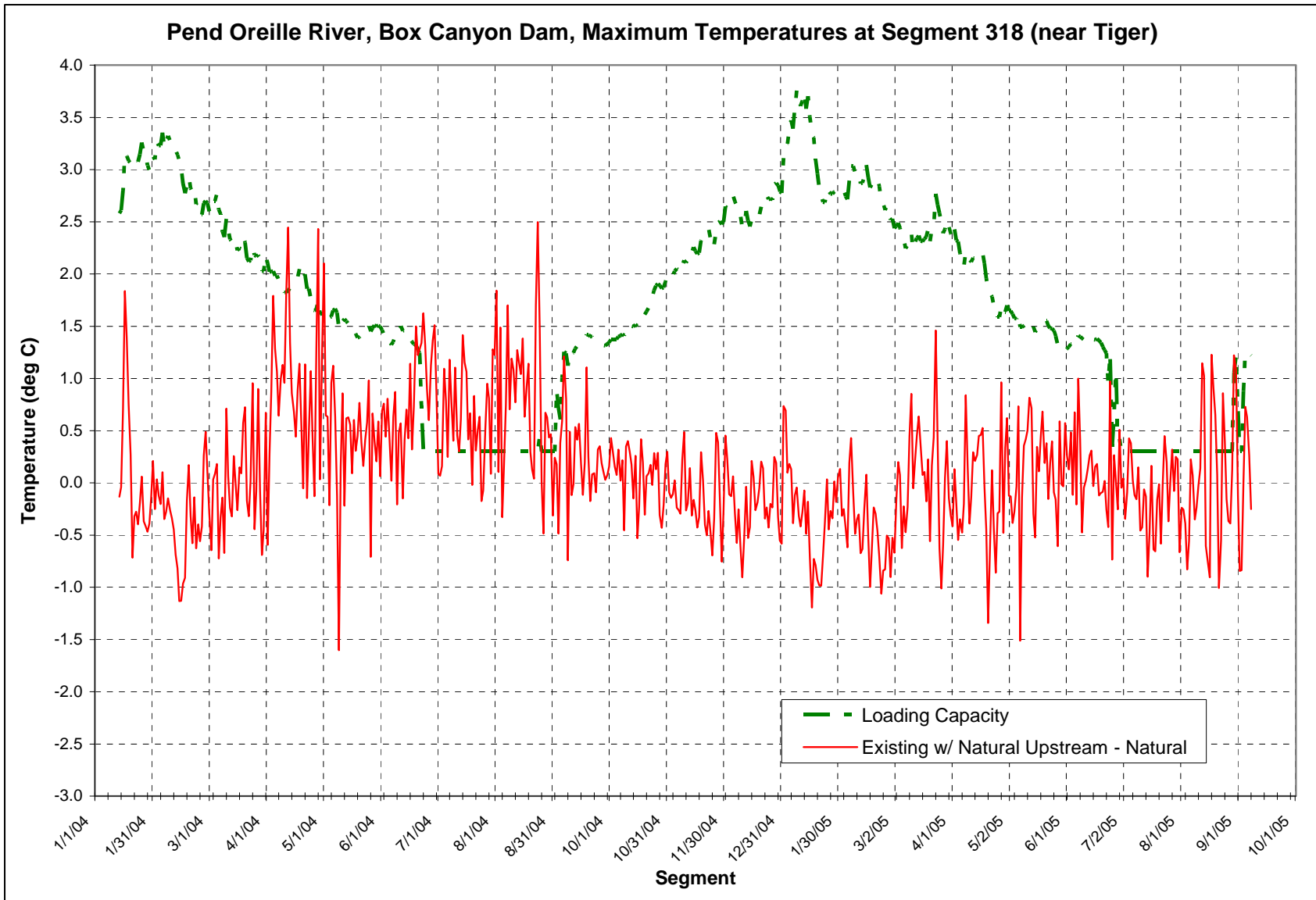


Pend Oreille River, Box Canyon Dam, Maximum Temperatures at Segment 318 (near Tiger)





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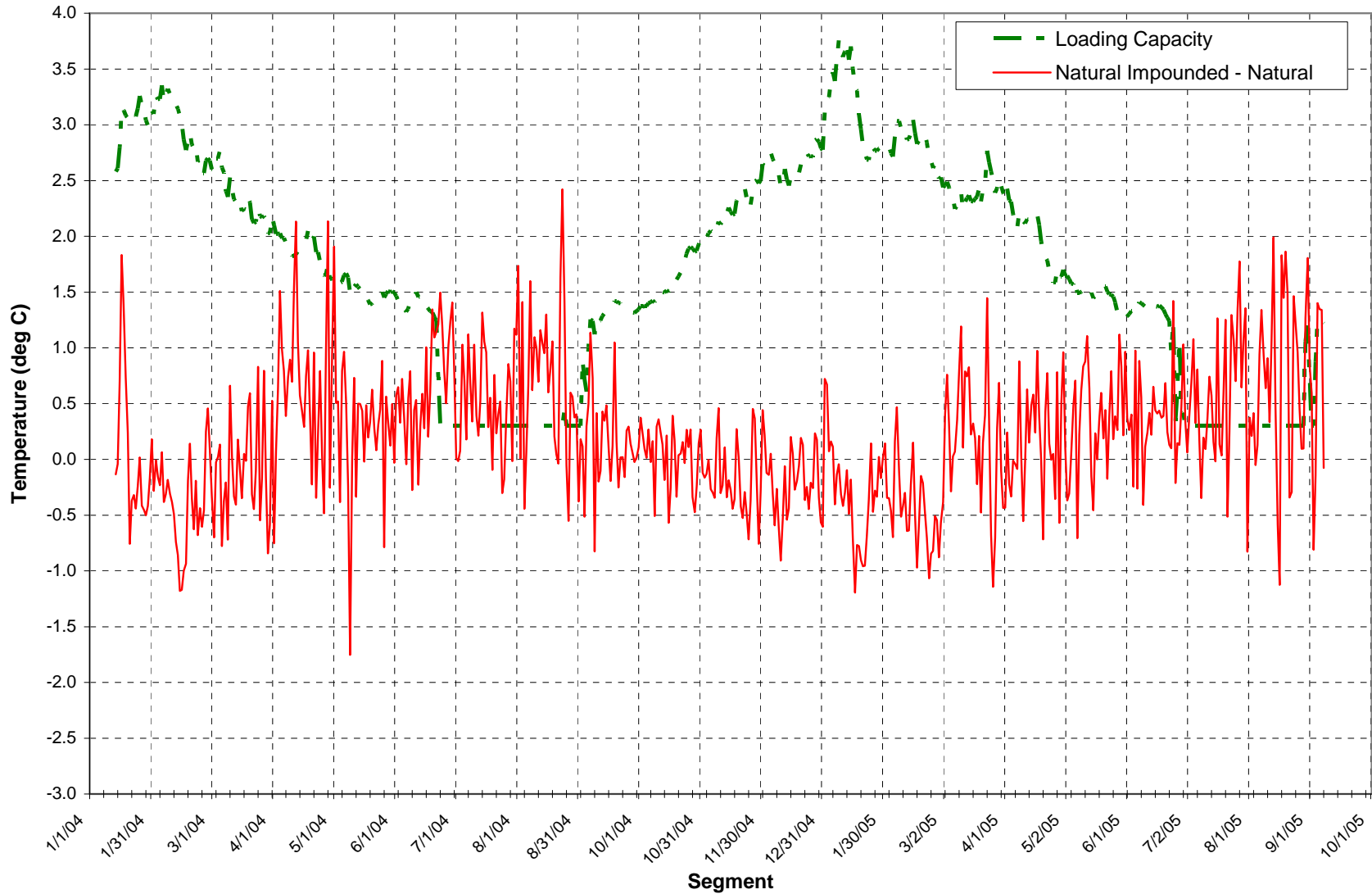




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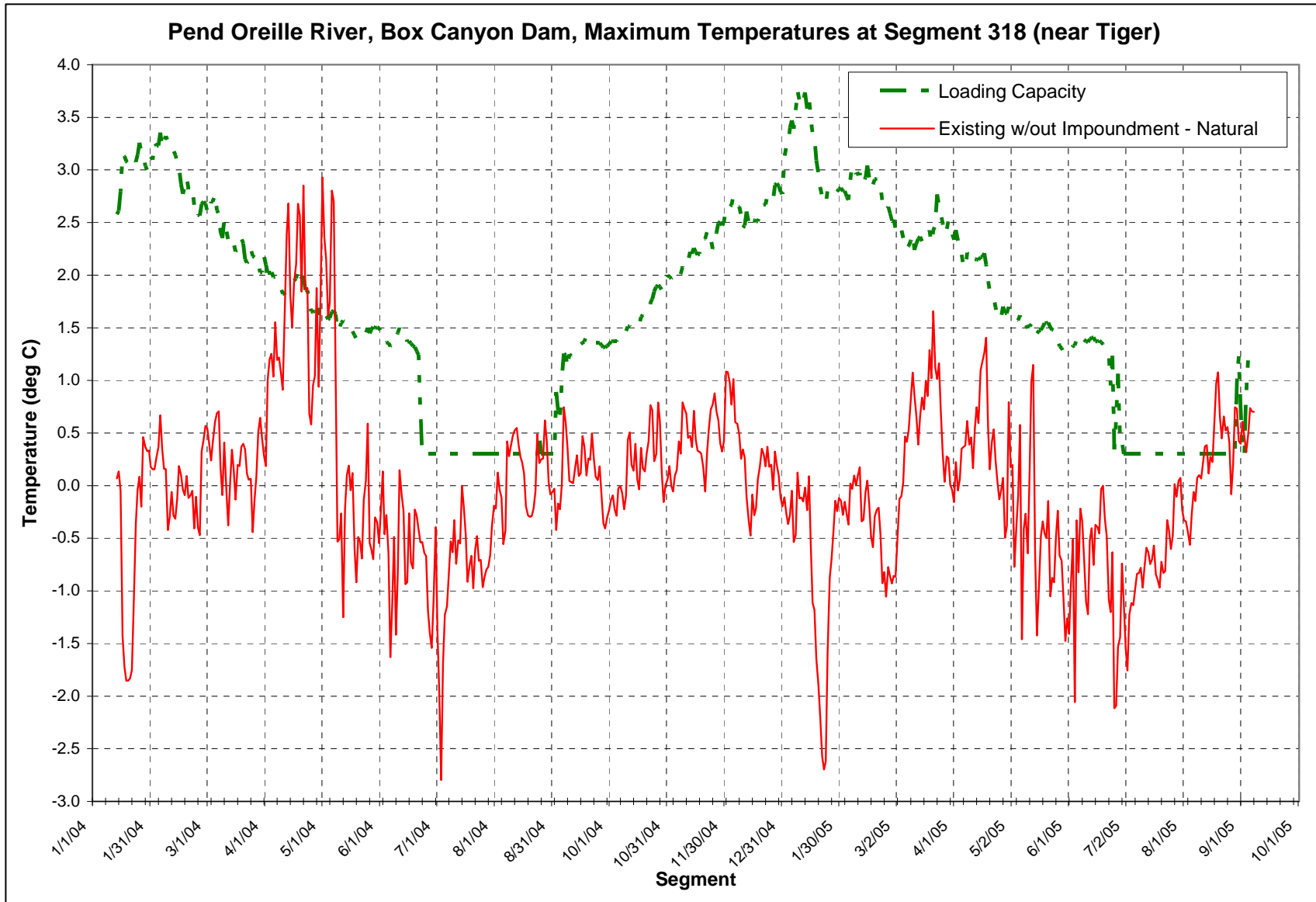


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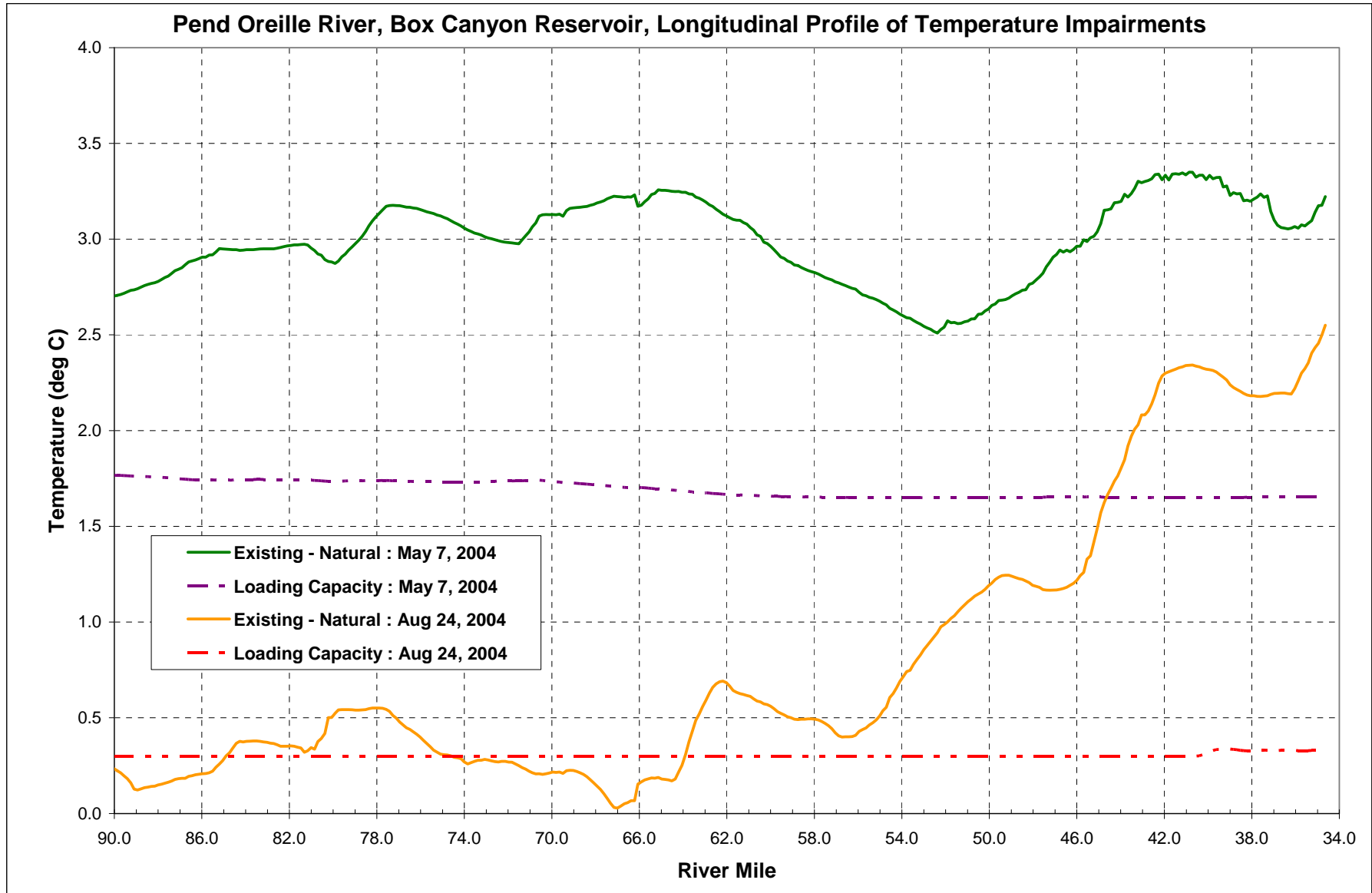


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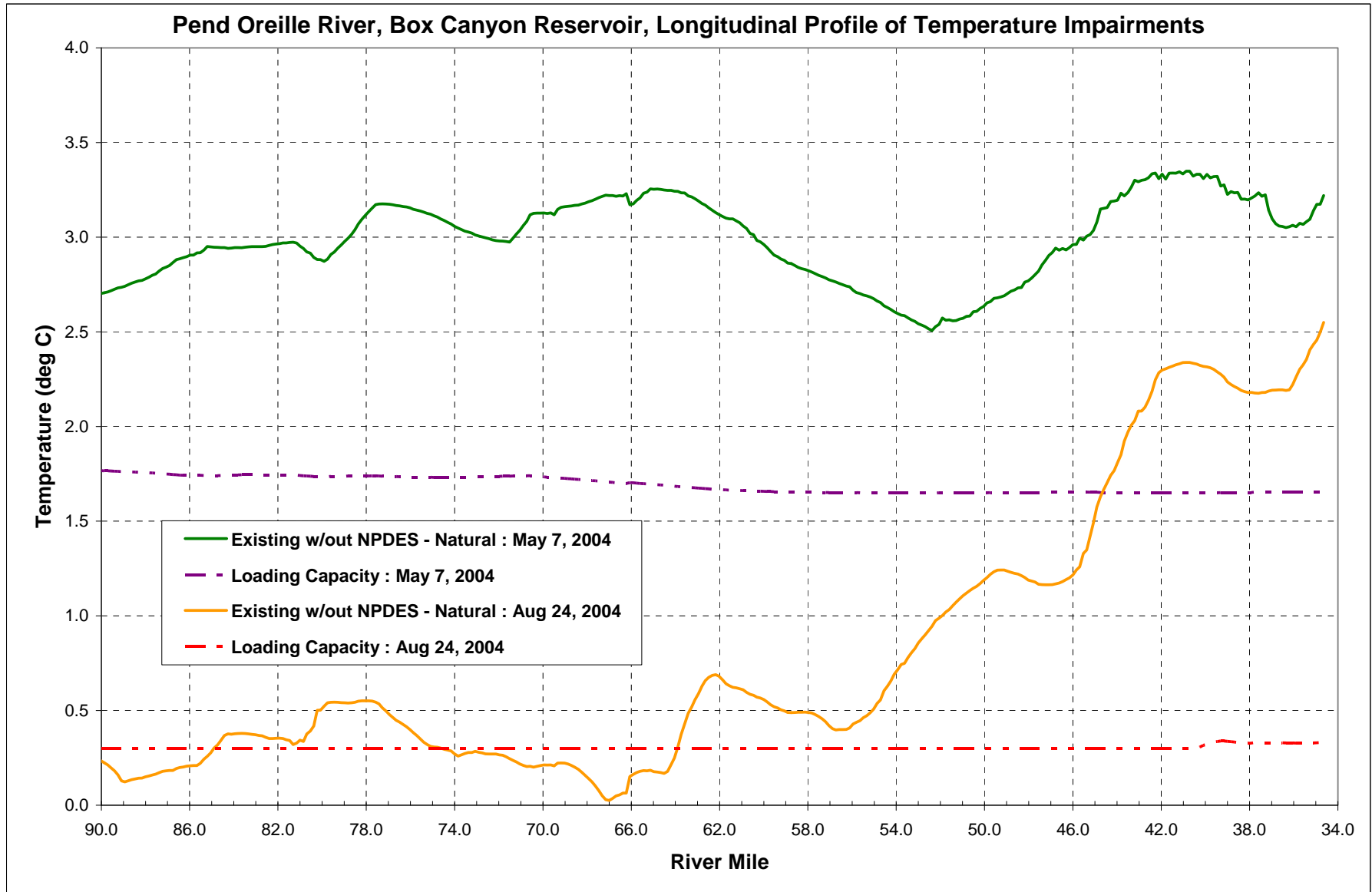


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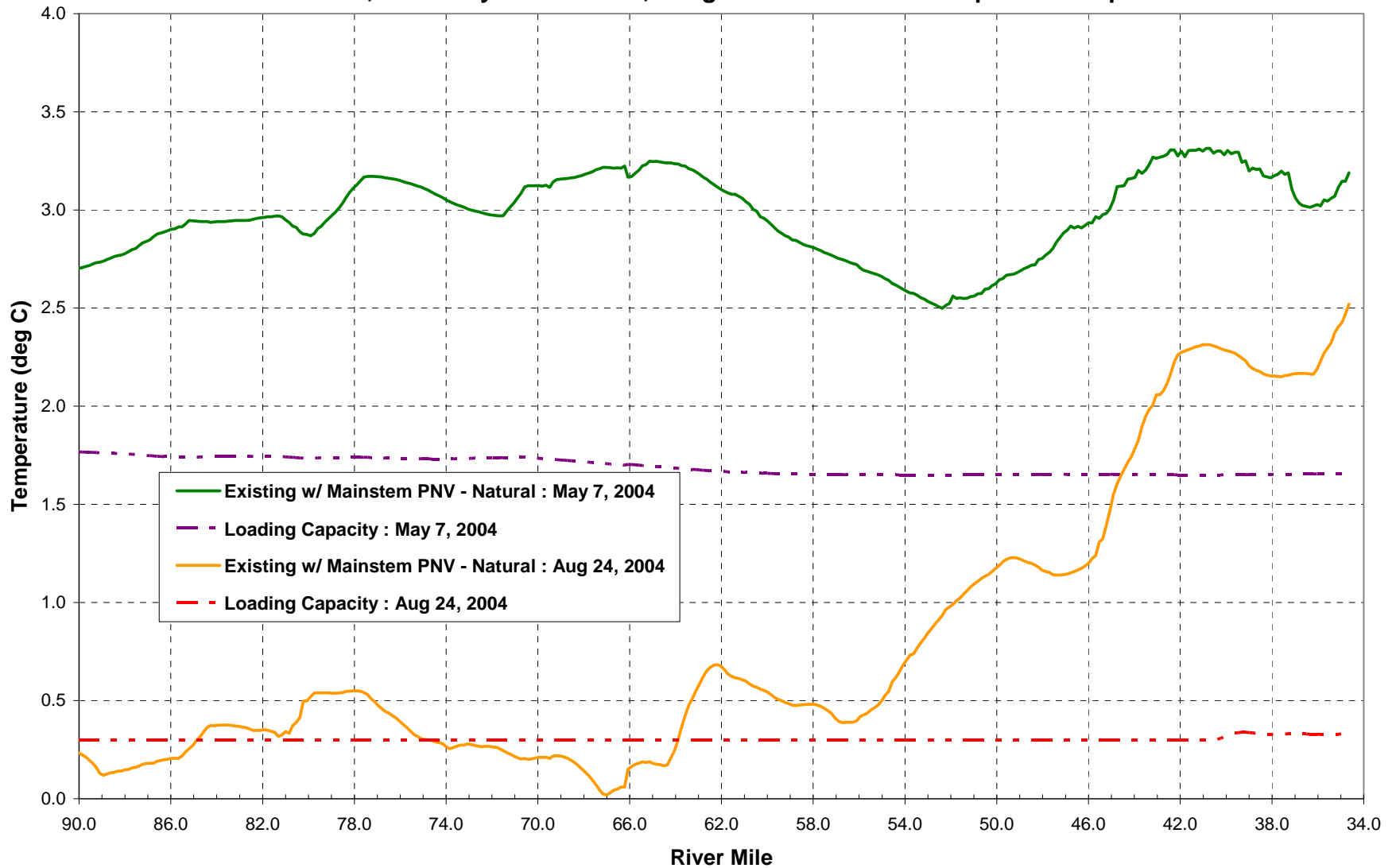




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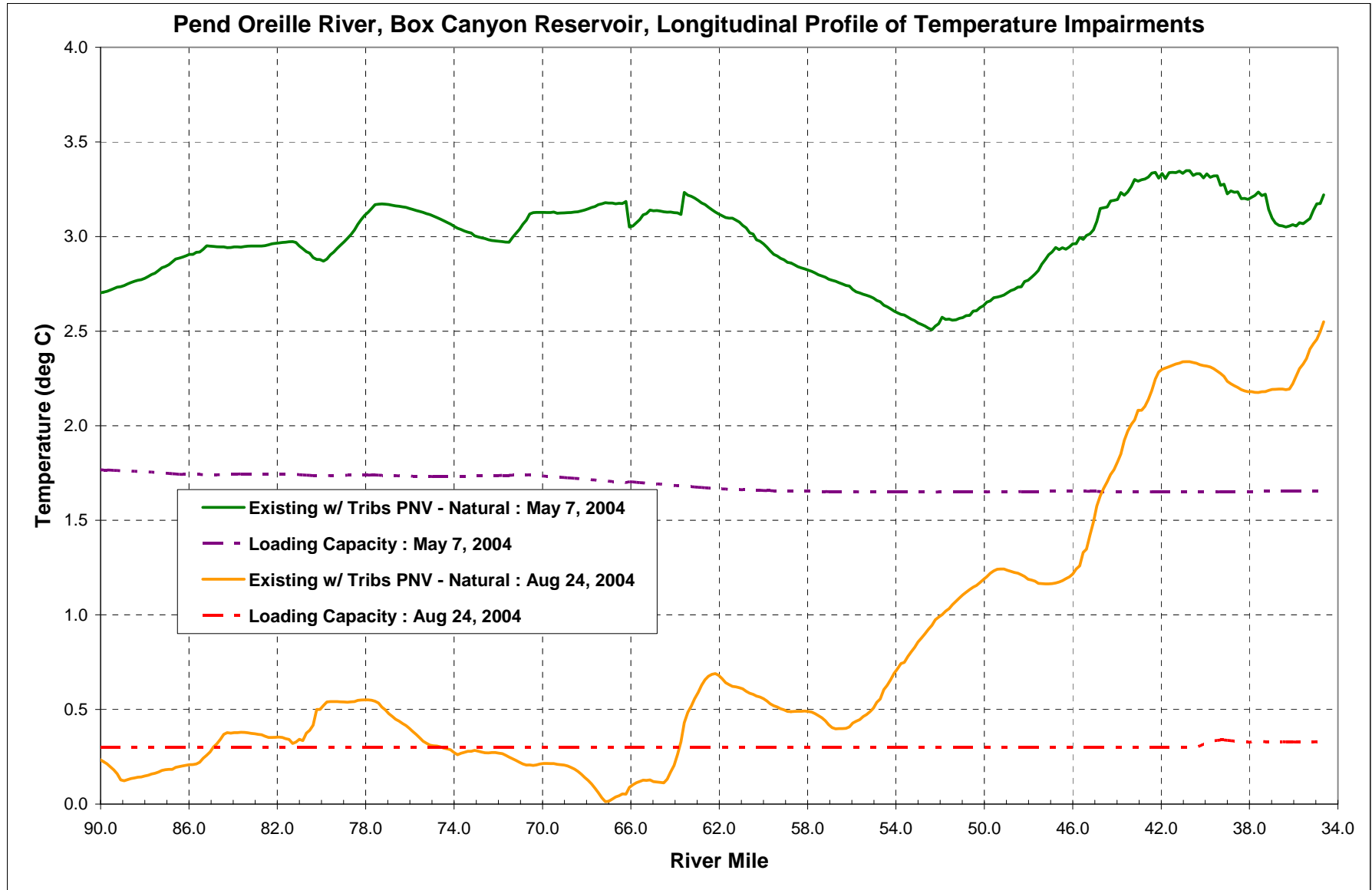
**Pend Oreille River, Box Canyon Reservoir, Longitudinal Profile of Temperature Impairments**







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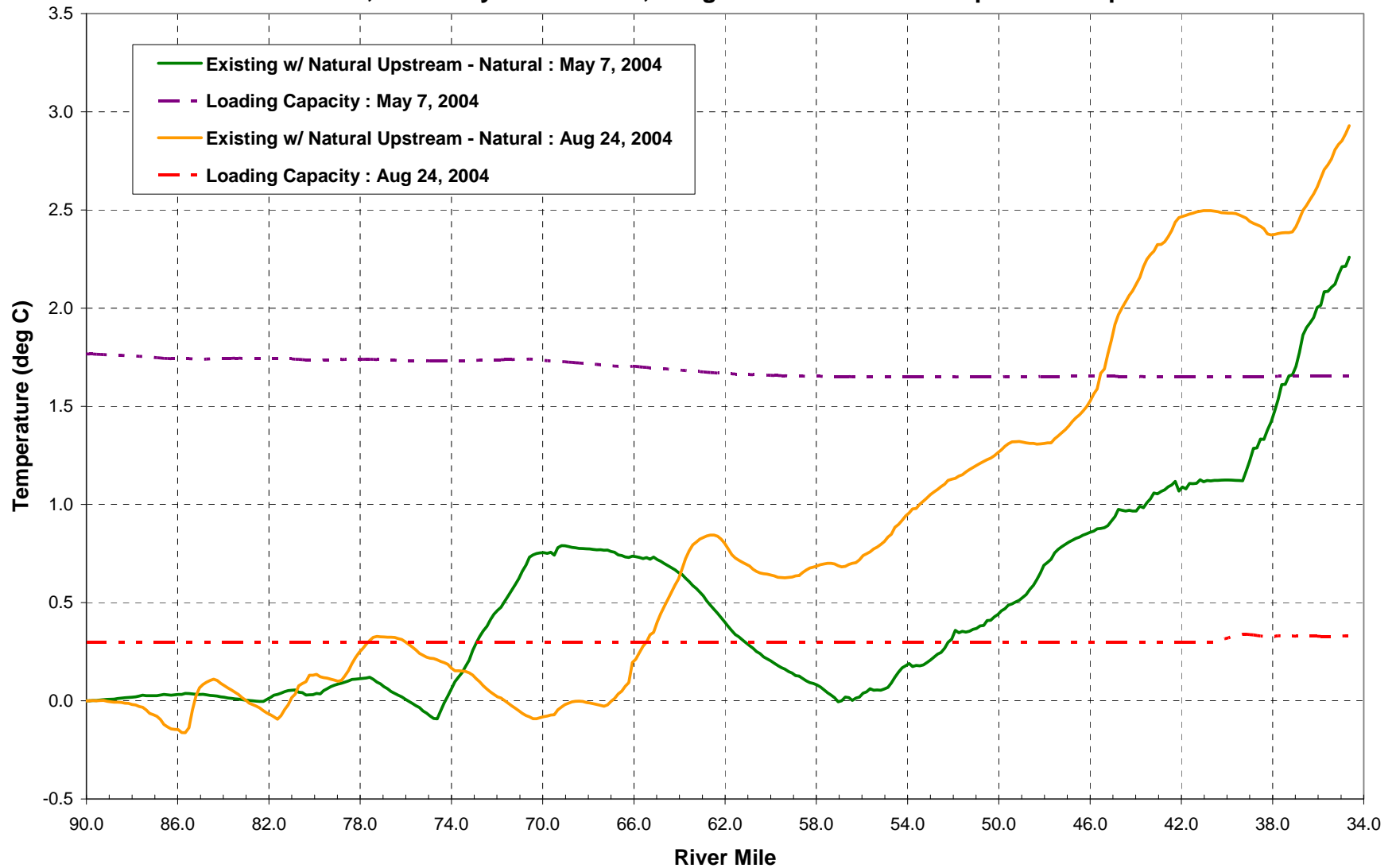




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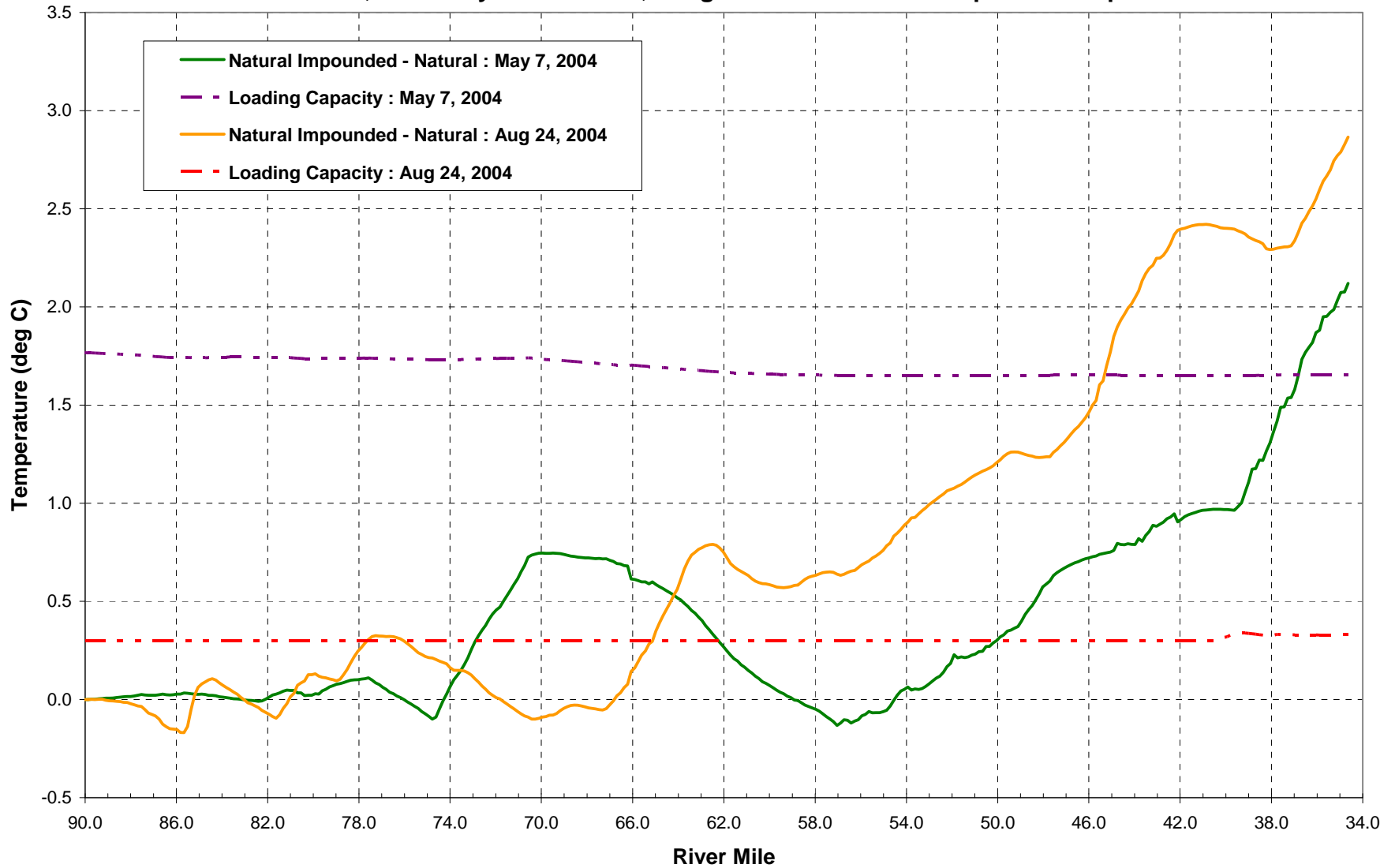




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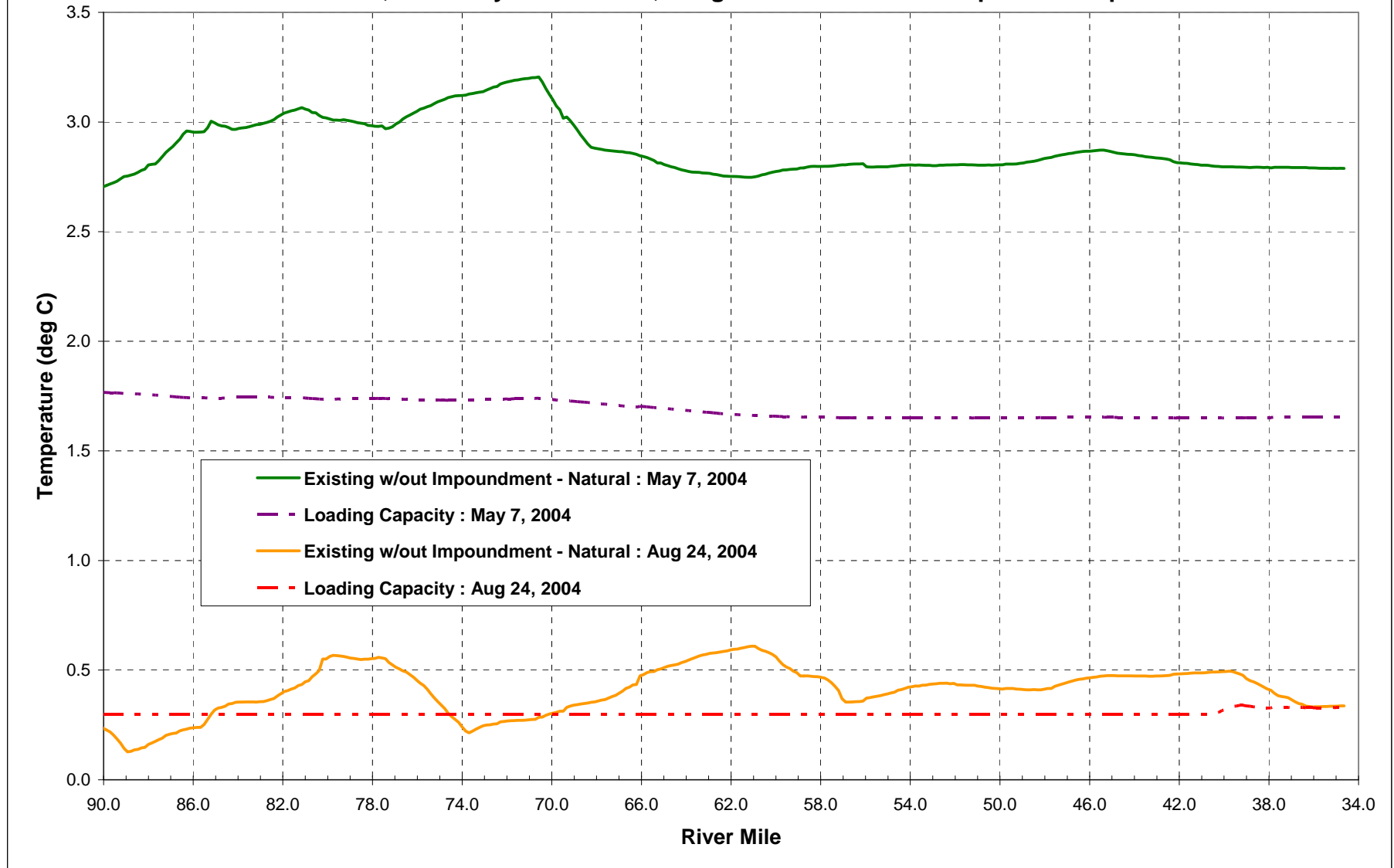




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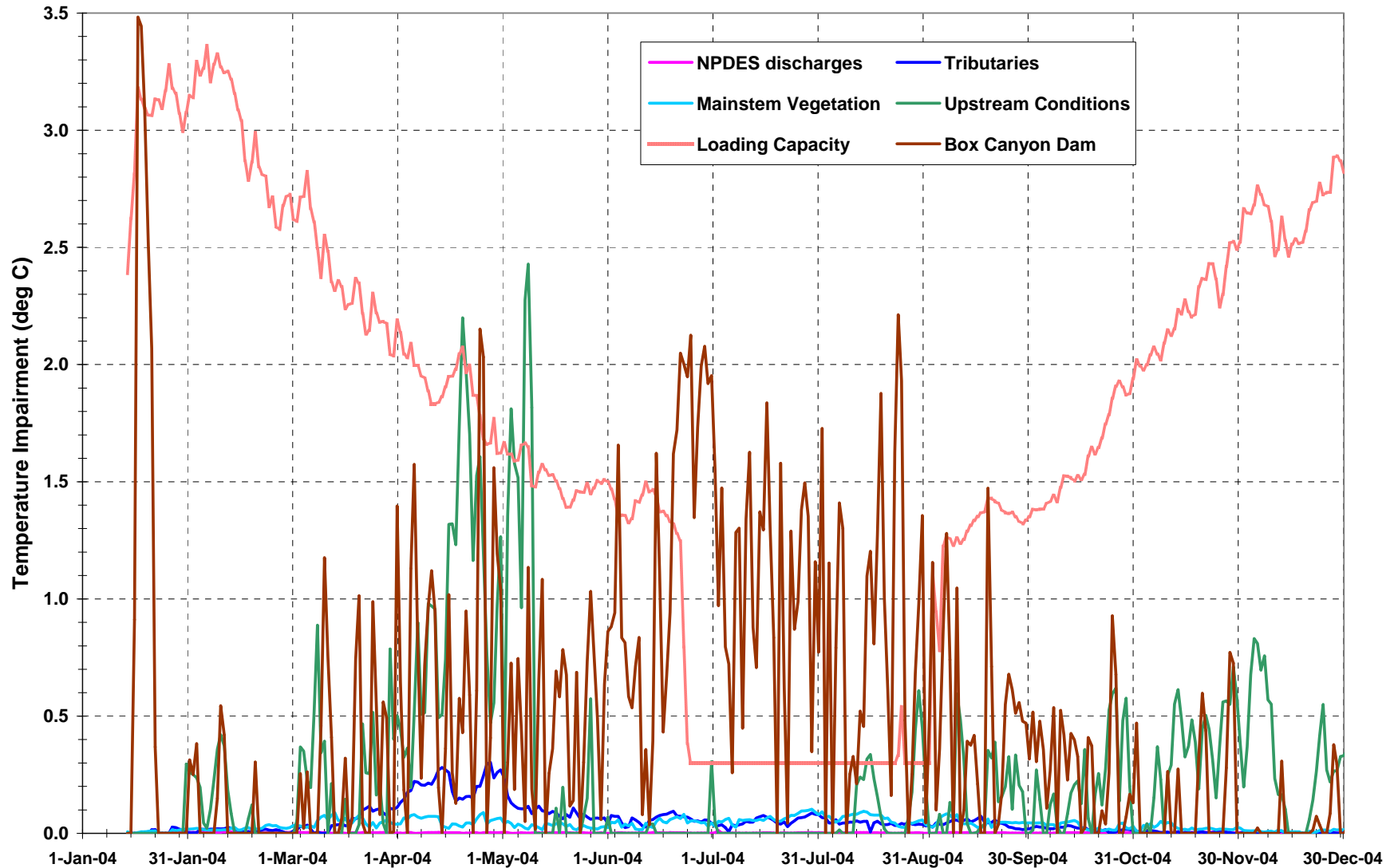




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**Pend Oreille River above Box Canyon Dam, 2004**

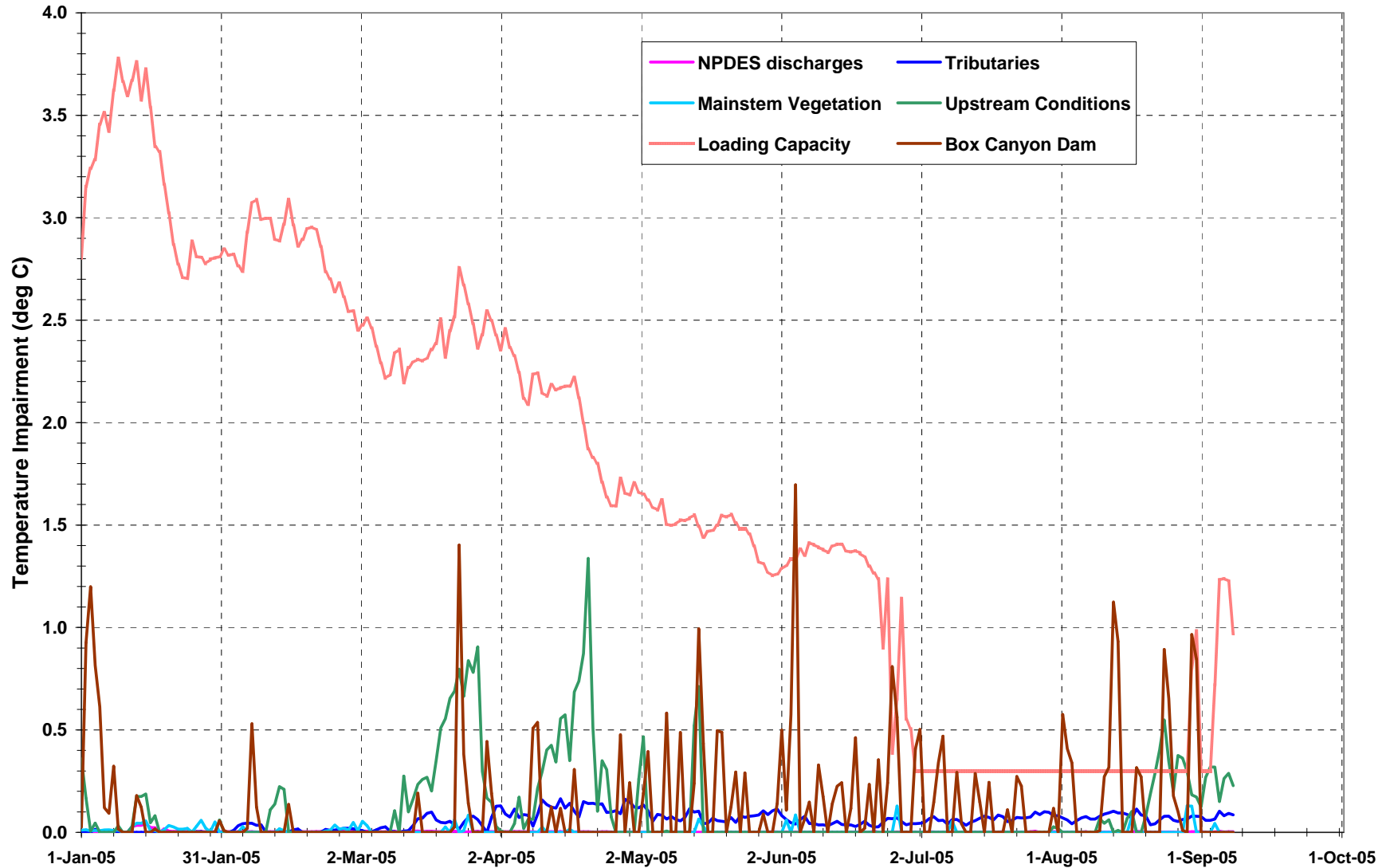




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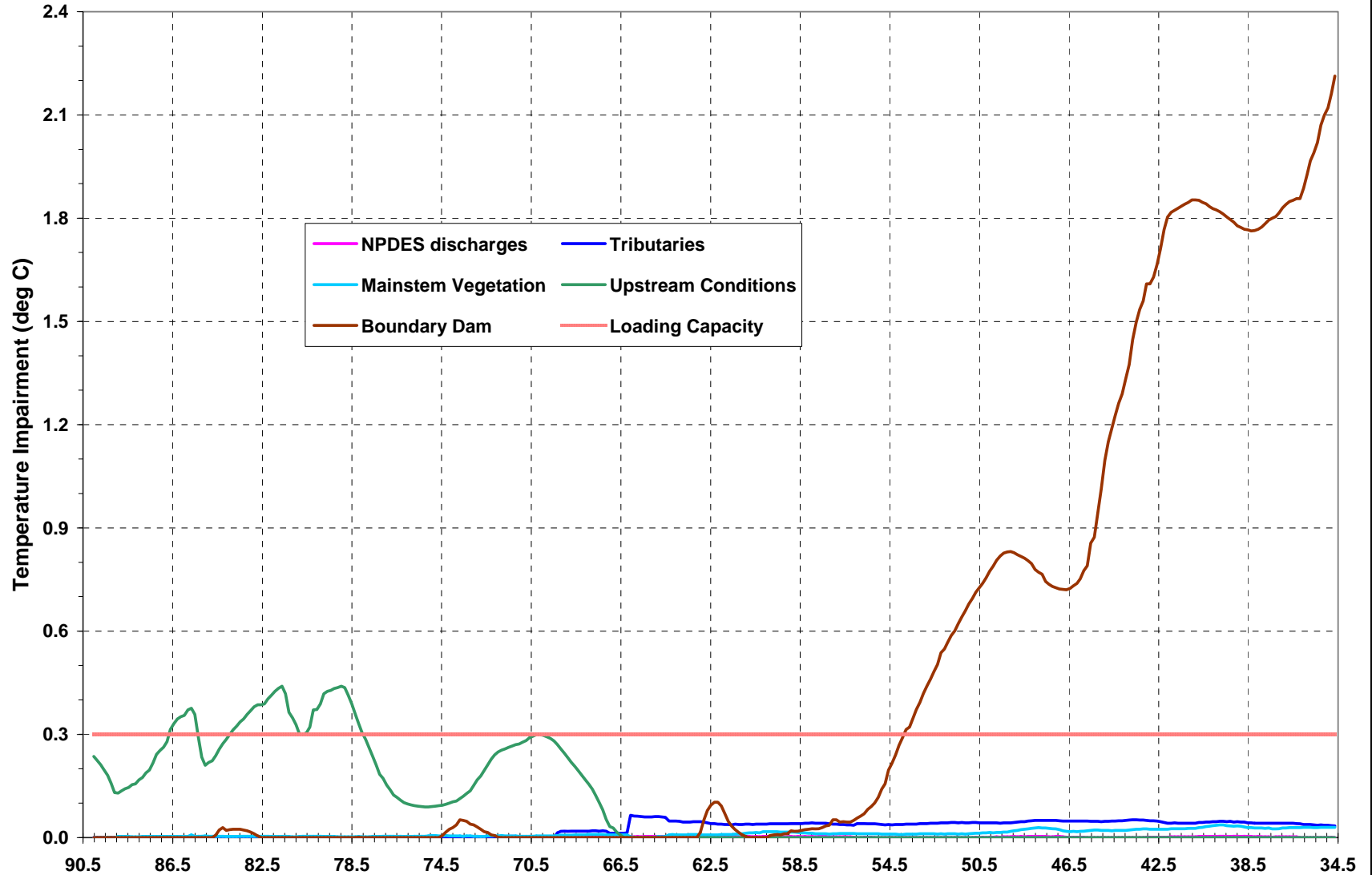




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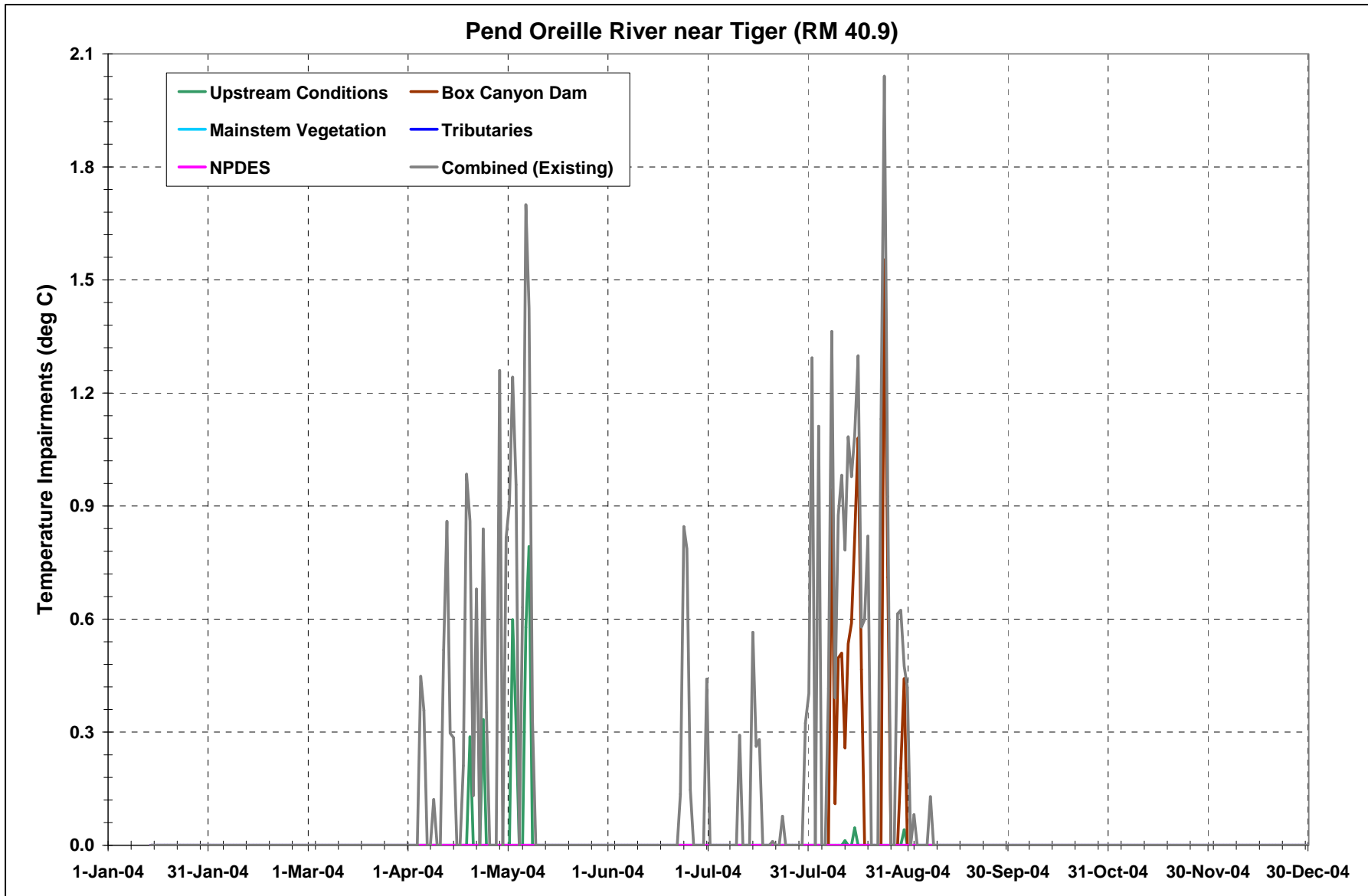


**Pend Oreille River, Box Canyon Reservoir - August 24, 2004**





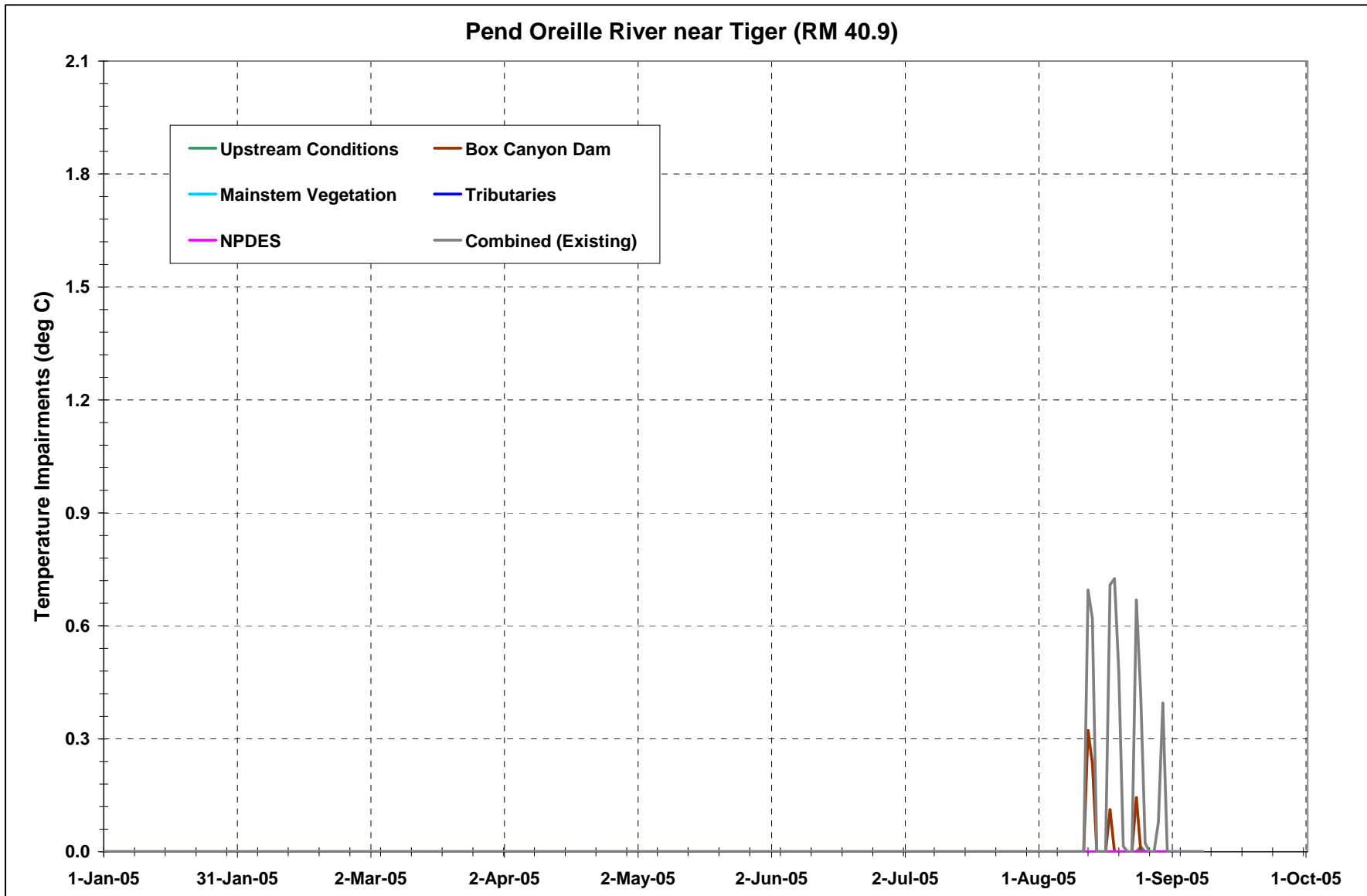
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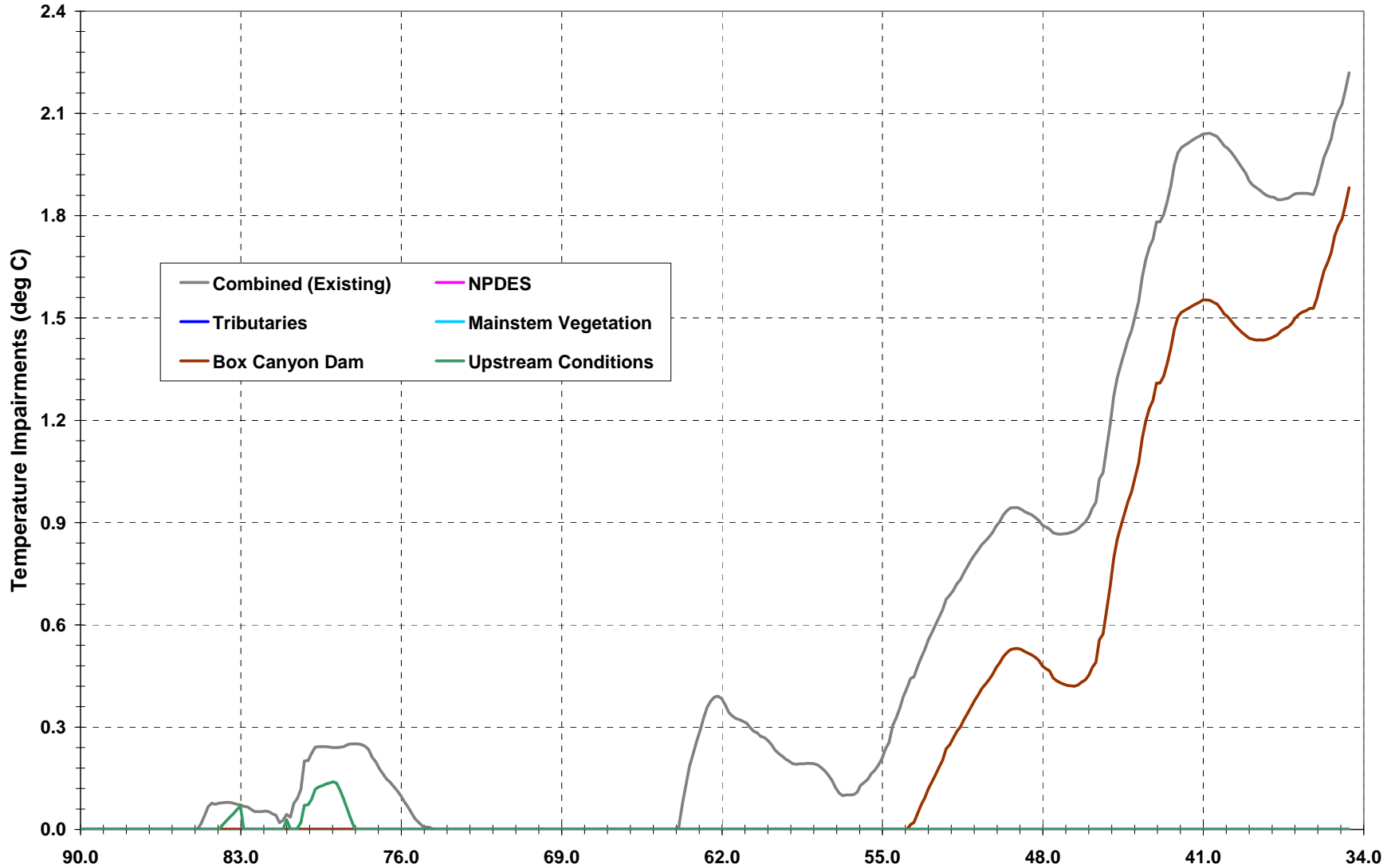




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**Pend Oreille River, Box Canyon Reservoir - August 24, 2004**





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### ➤ Next Steps

- Final model quality check
- Development of allocation approach
- Draft TMDL document

### ➤ *Questions?*