

Cedar River Hatchery Mark Characteristic Report



Prepared for:
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May 2015

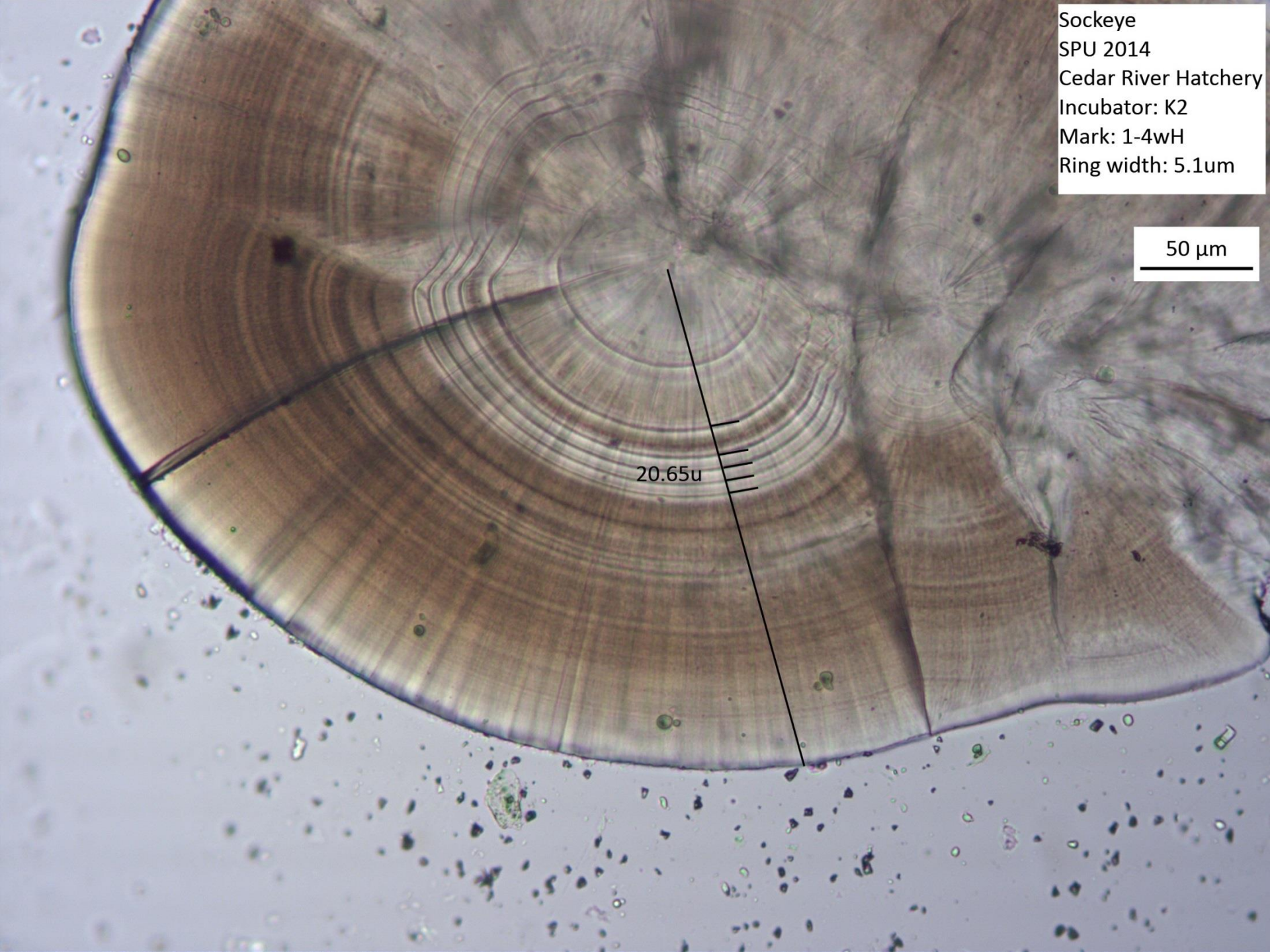
- Agency: Seattle Public Utilities
- Facility: Cedar River Hatchery
- Brood Year: 2014
- Species: Sockeye
- Thermal Mark Characteristics:

[illegible][illegible][illegible][illegible][illegible][illegible]

Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K2
Mark: 1-4wH
Ring width: 5.1um

50 μ m

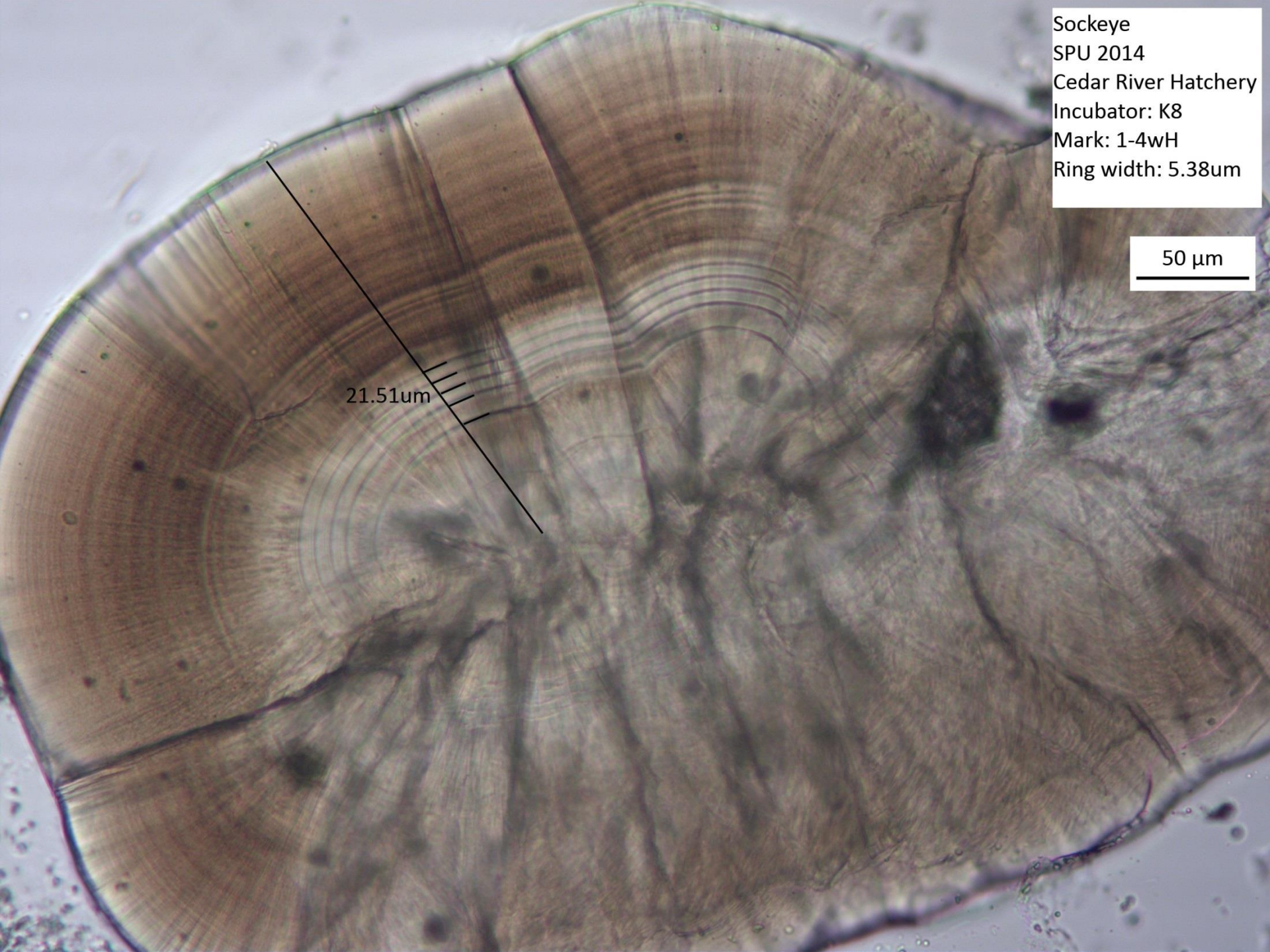
20.65u



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K8
Mark: 1-4wH
Ring width: 5.38um

50 μm

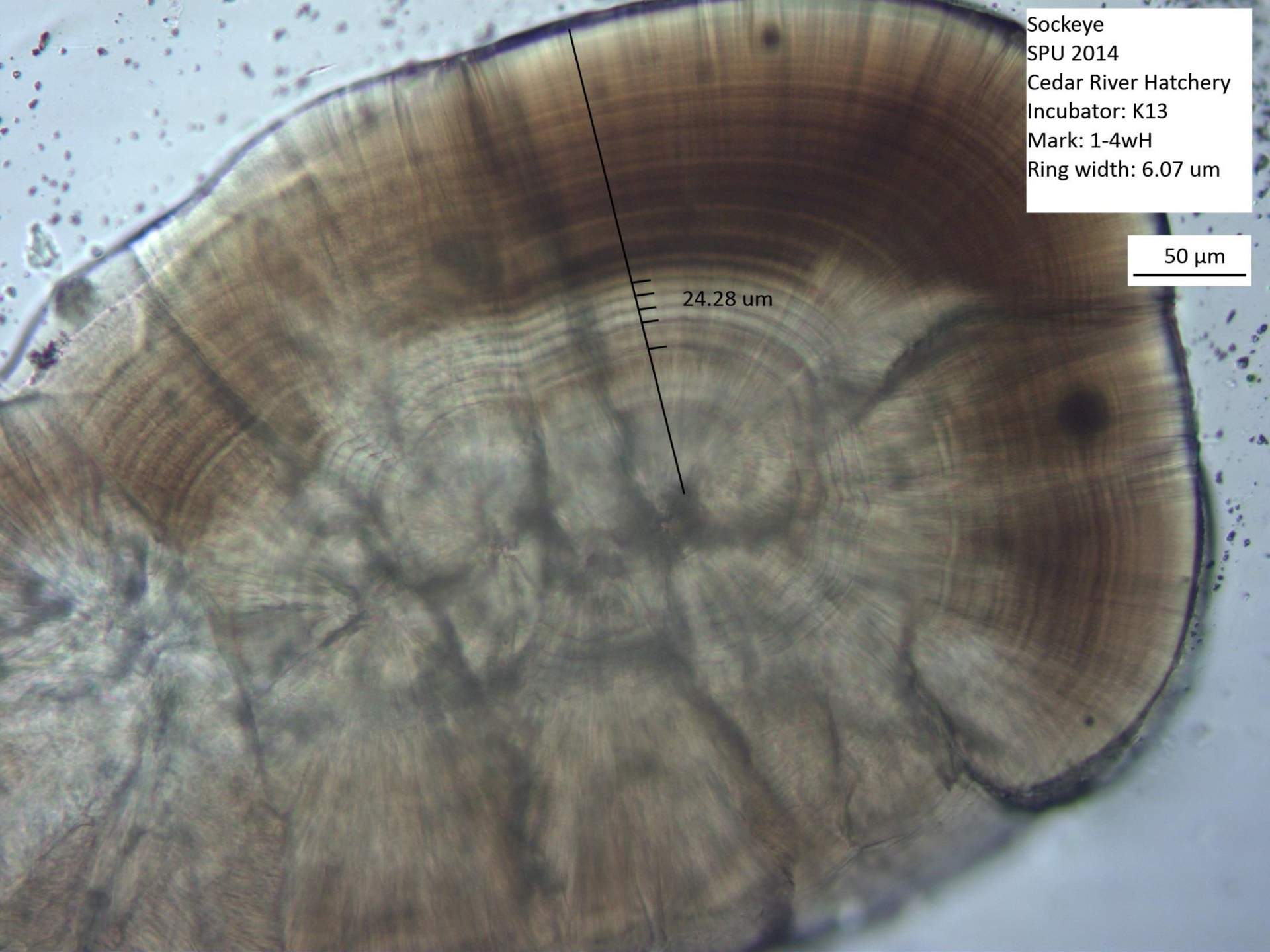
21.51um



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K13
Mark: 1-4wH
Ring width: 6.07 μm

50 μm

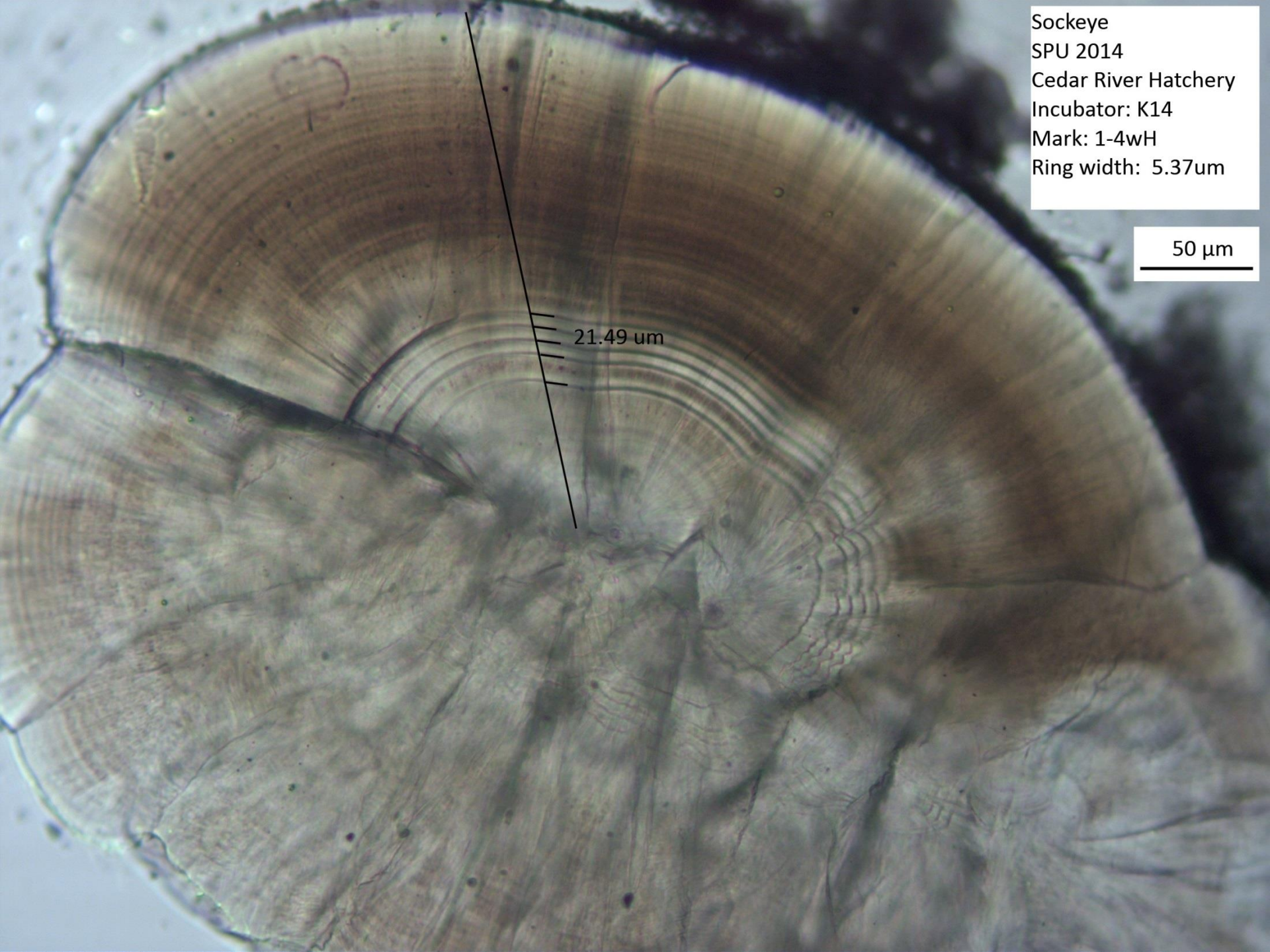
24.28 μm



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K14
Mark: 1-4wH
Ring width: 5.37um

50 μ m

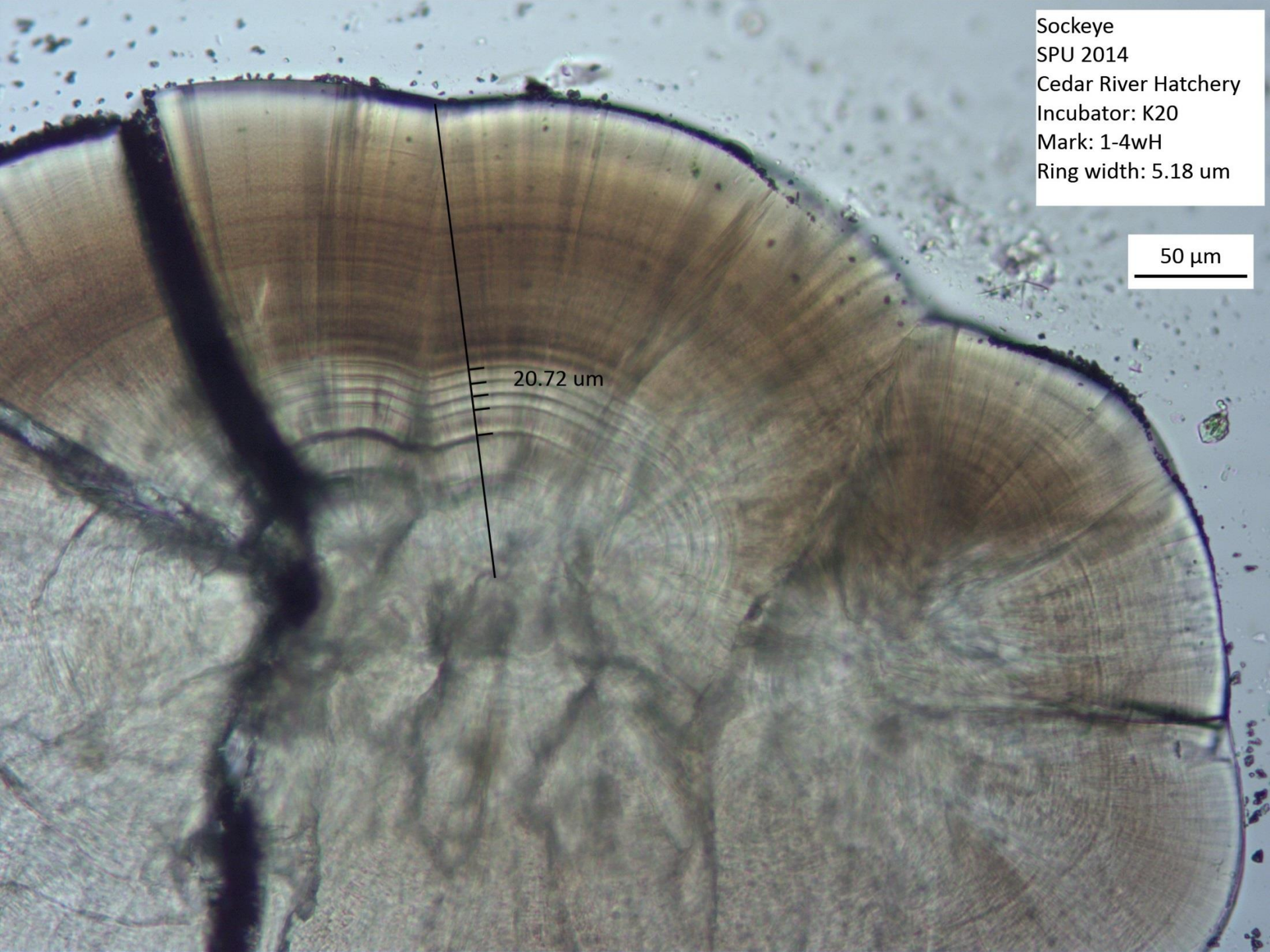
21.49 um

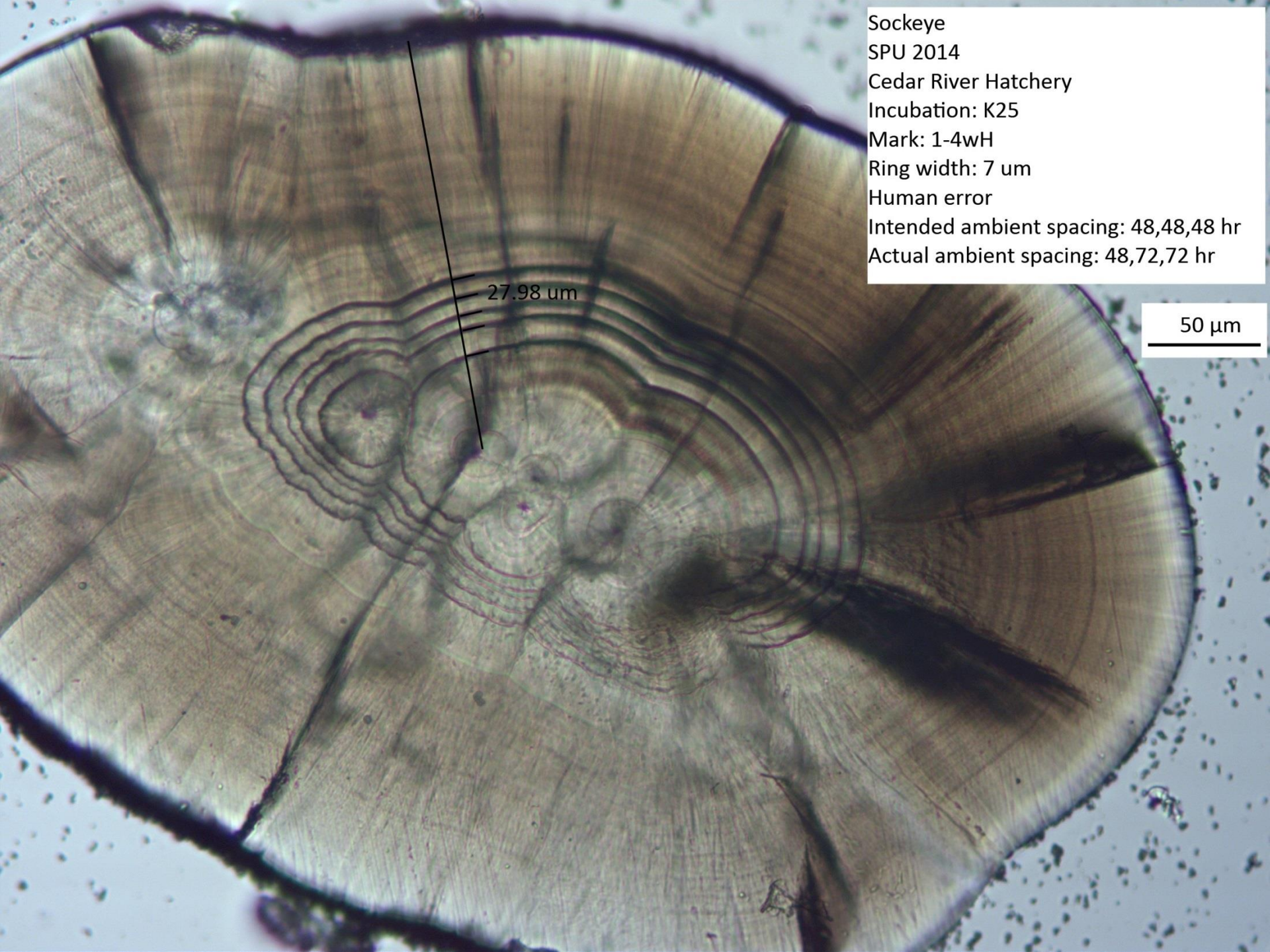


Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K20
Mark: 1-4wH
Ring width: 5.18 μm

50 μm

20.72 μm





Sockeye

SPU 2014

Cedar River Hatchery

Incubation: K25

Mark: 1-4wH

Ring width: 7 μm

Human error

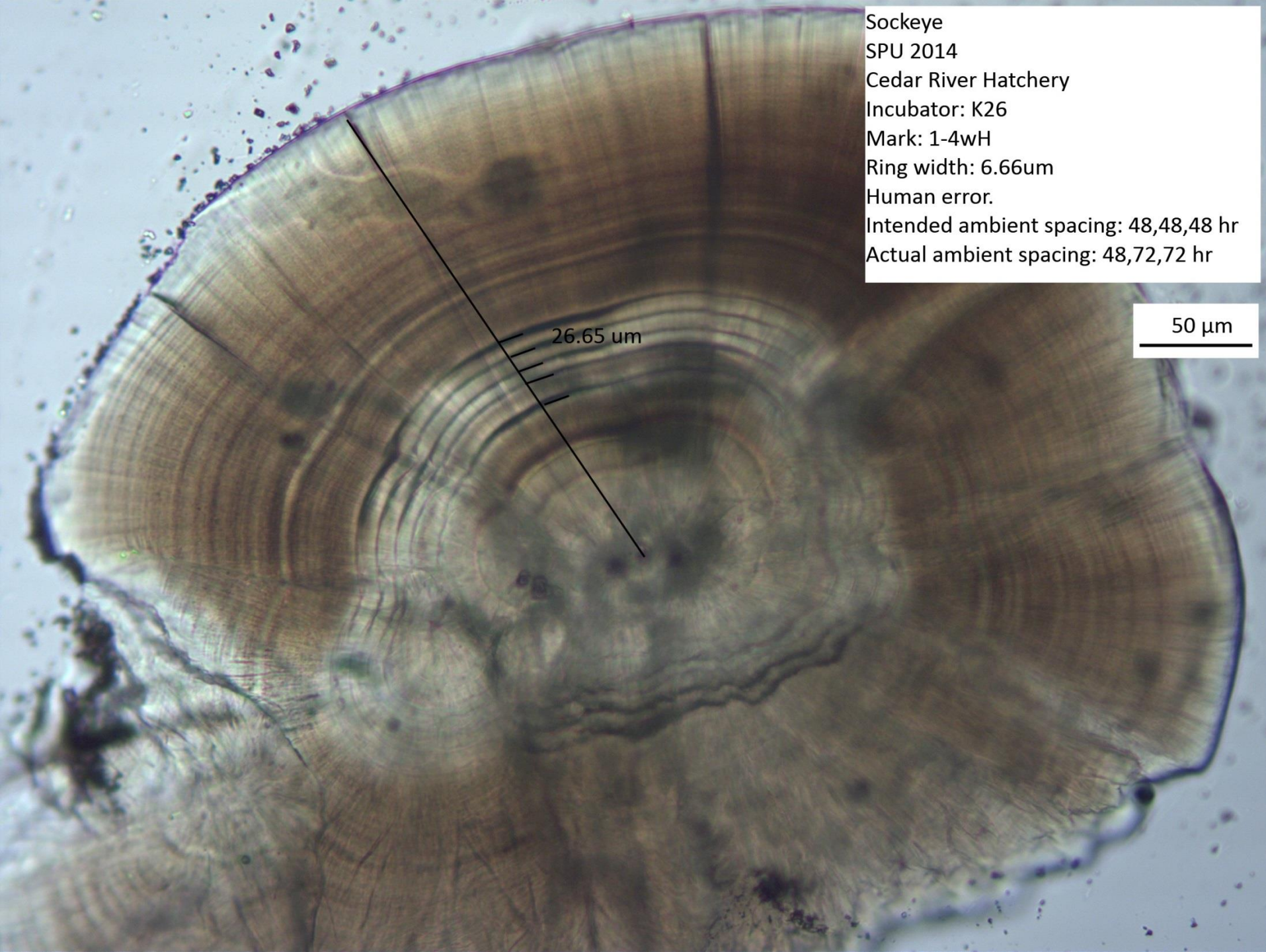
Intended ambient spacing: 48,48,48 hr

Actual ambient spacing: 48,72,72 hr

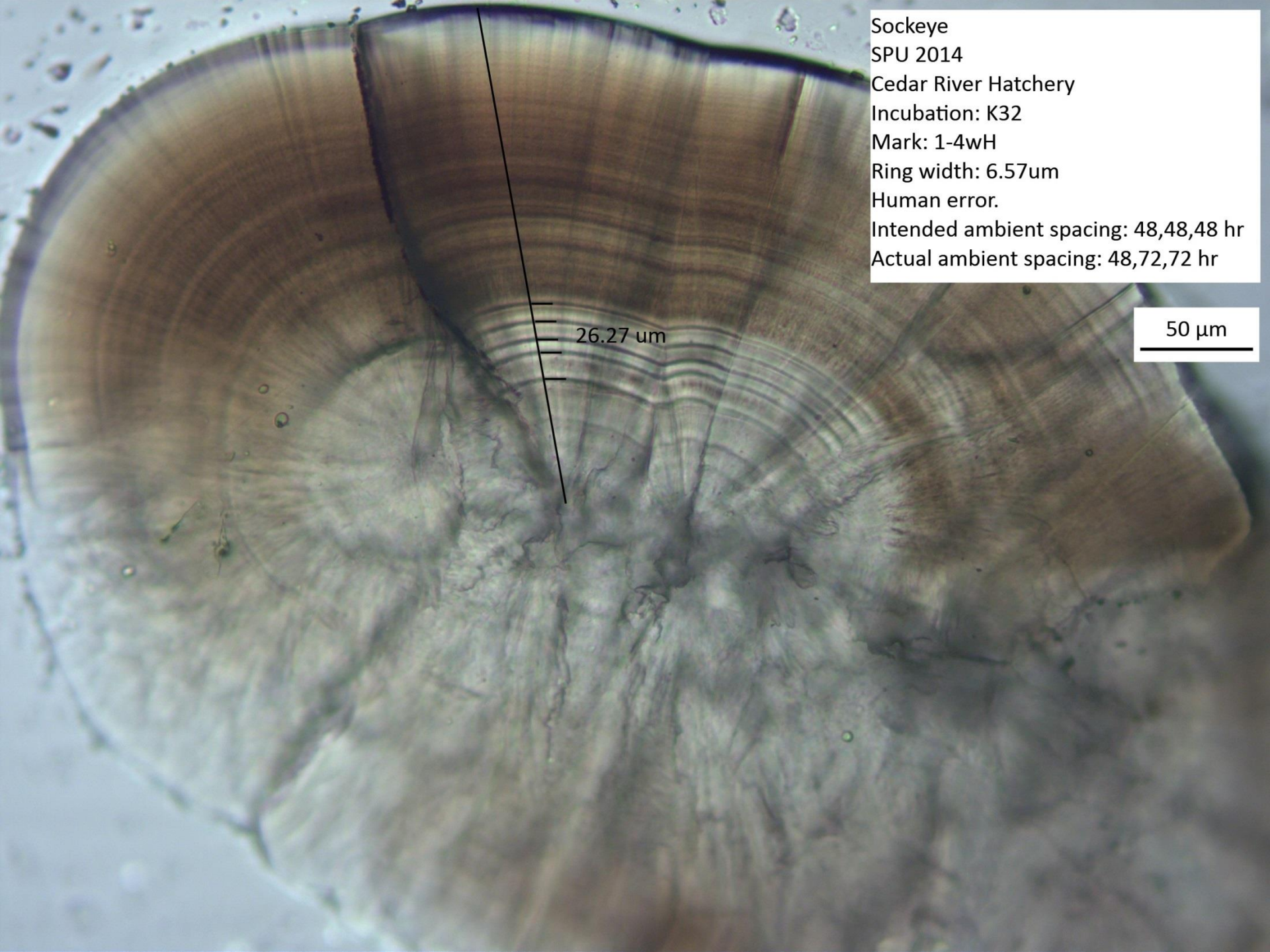
27.98 μm

50 μm

Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K26
Mark: 1-4wH
Ring width: 6.66um
Human error.
Intended ambient spacing: 48,48,48 hr
Actual ambient spacing: 48,72,72 hr



50 μ m



Sockeye

SPU 2014

Cedar River Hatchery

Incubation: K32

Mark: 1-4wH

Ring width: 6.57um

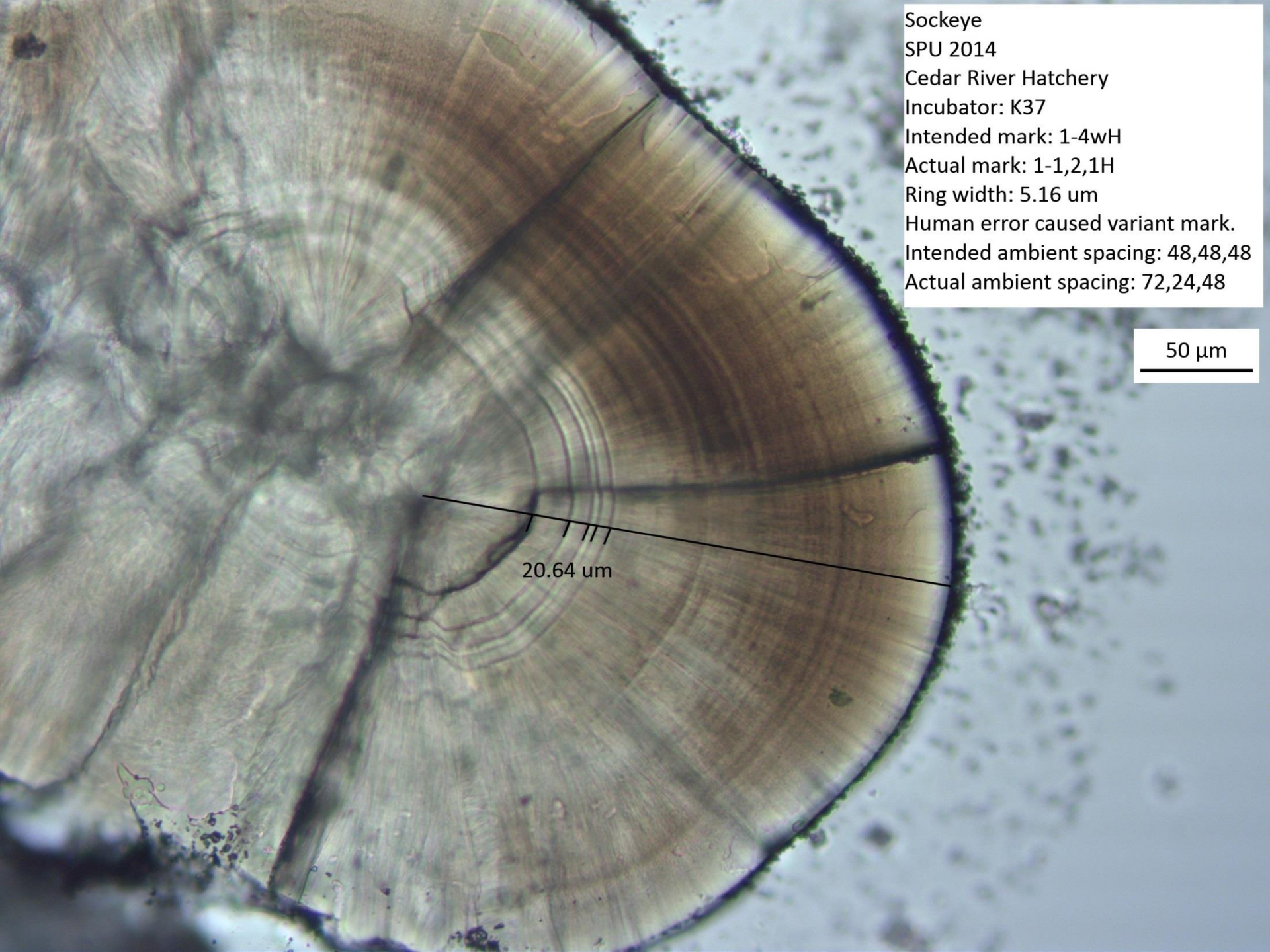
Human error.

Intended ambient spacing: 48,48,48 hr

Actual ambient spacing: 48,72,72 hr

26.27 um

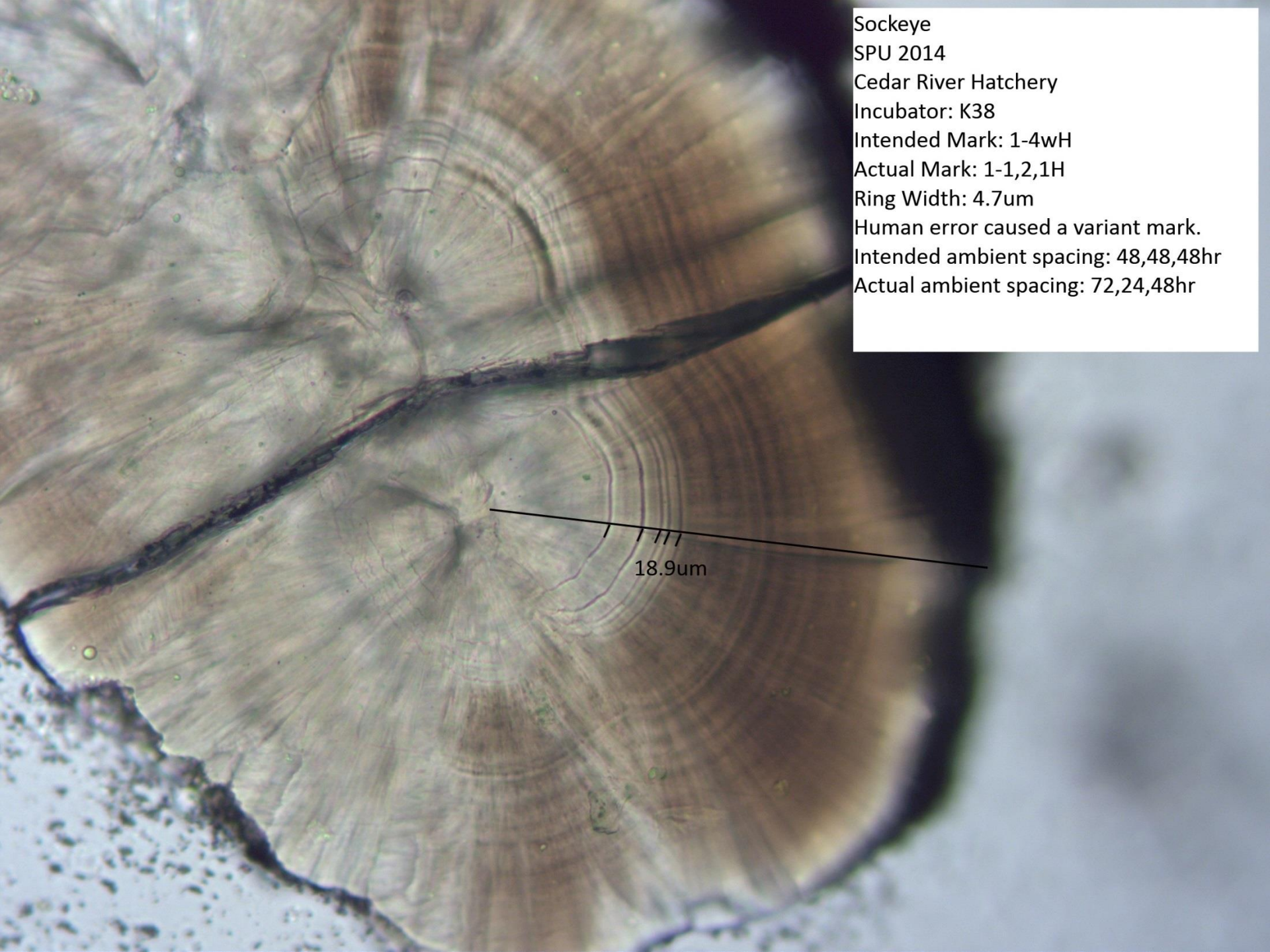
50 μ m



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K37
Intended mark: 1-4wH
Actual mark: 1-1,2,1H
Ring width: 5.16 μm
Human error caused variant mark.
Intended ambient spacing: 48,48,48
Actual ambient spacing: 72,24,48

50 μm

20.64 μm



Sockeye

SPU 2014

Cedar River Hatchery

Incubator: K38

Intended Mark: 1-4wH

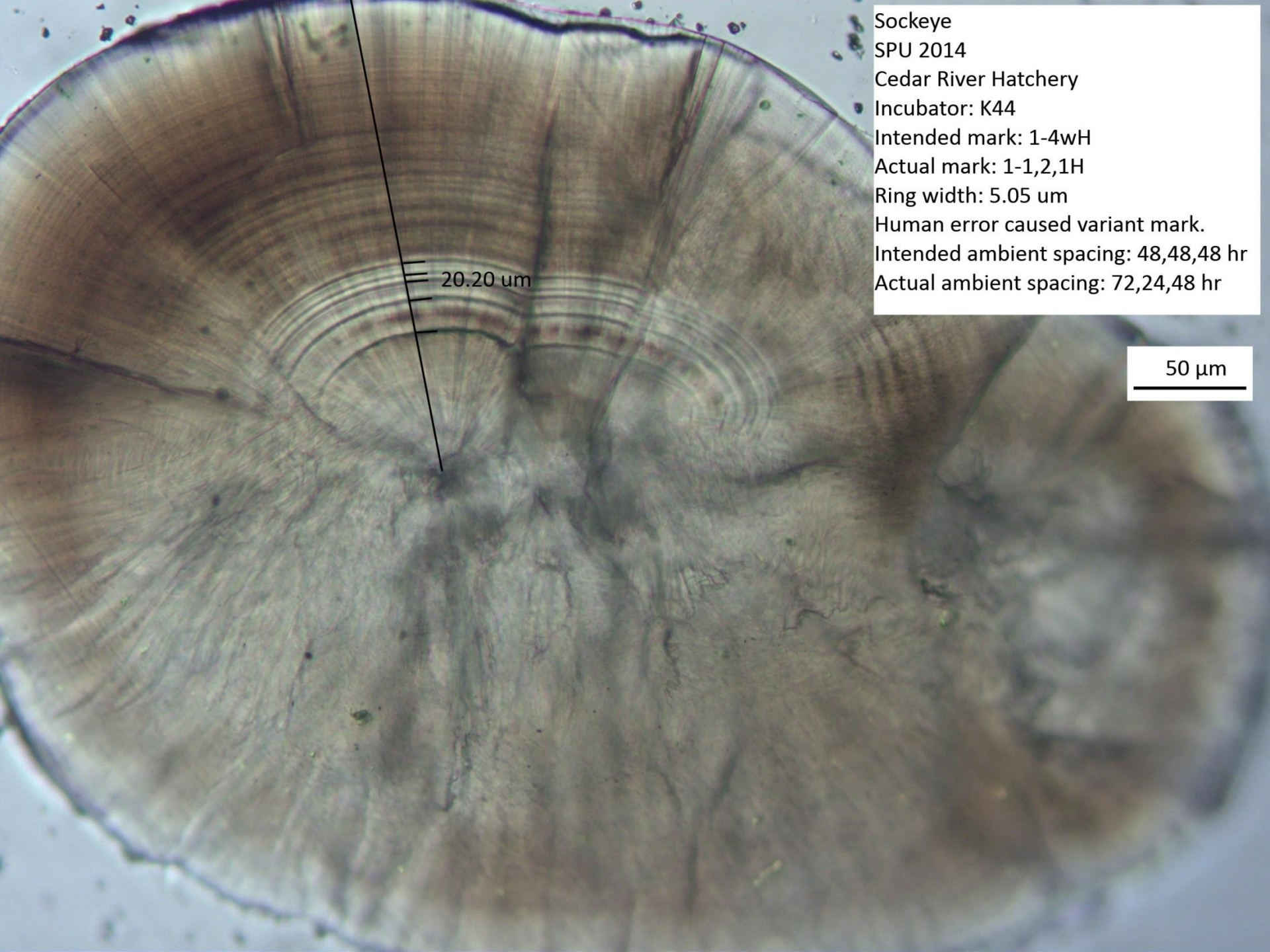
Actual Mark: 1-1,2,1H

Ring Width: 4.7um

Human error caused a variant mark.

Intended ambient spacing: 48,48,48hr

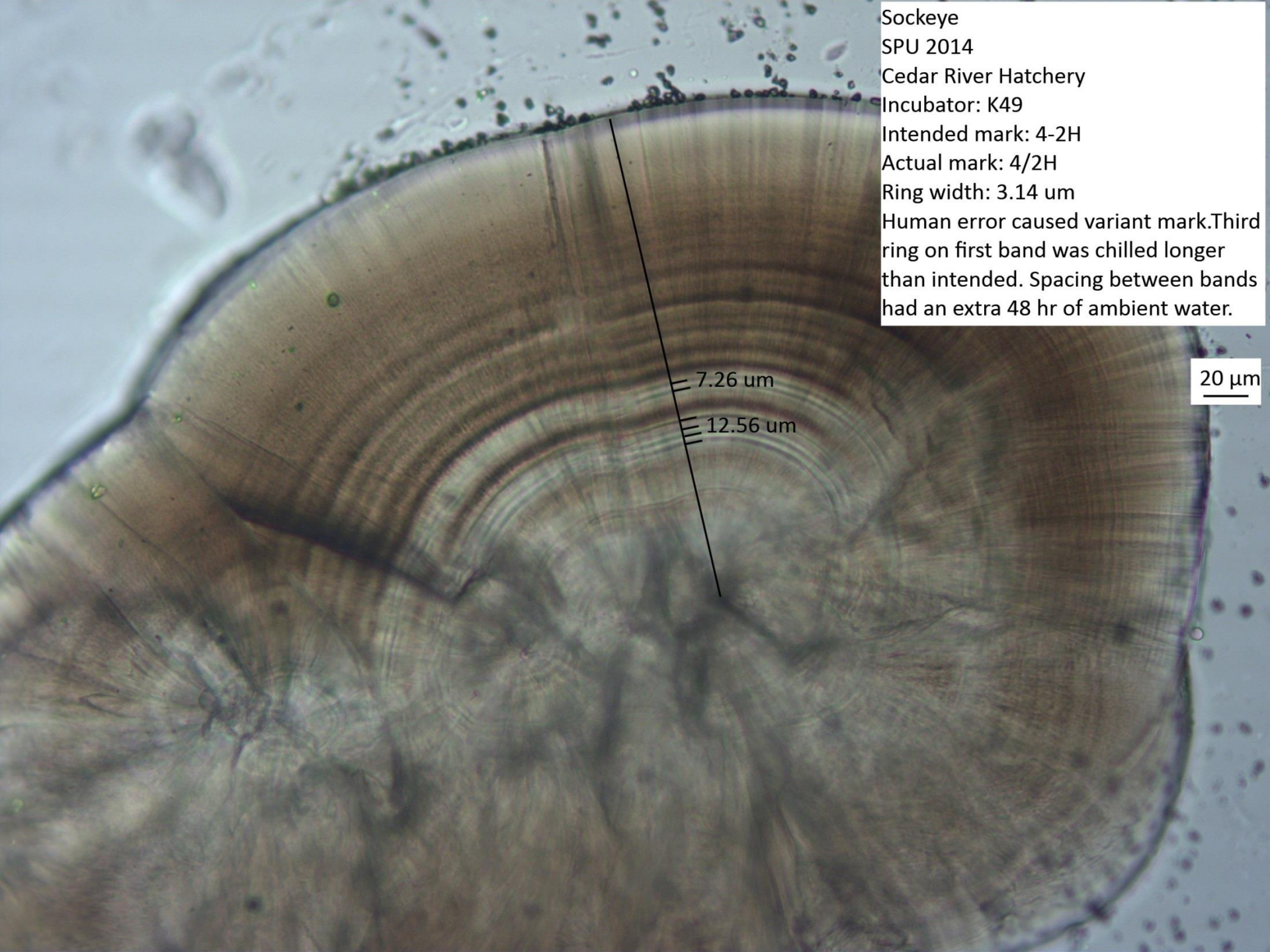
Actual ambient spacing: 72,24,48hr



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K44
Intended mark: 1-4wH
Actual mark: 1-1,2,1H
Ring width: 5.05 μm
Human error caused variant mark.
Intended ambient spacing: 48,48,48 hr
Actual ambient spacing: 72,24,48 hr

20.20 μm

50 μm



Sockeye

SPU 2014

Cedar River Hatchery

Incubator: K49

Intended mark: 4-2H

Actual mark: 4/2H

Ring width: 3.14 um

Human error caused variant mark. Third ring on first band was chilled longer than intended. Spacing between bands had an extra 48 hr of ambient water.

7.26 um

12.56 um

20 um

Sockeye

SPU 2014

Cedar River Hatchery

Incubator: K50

Intended mark: 4-2H

Actual mark: 4/2H

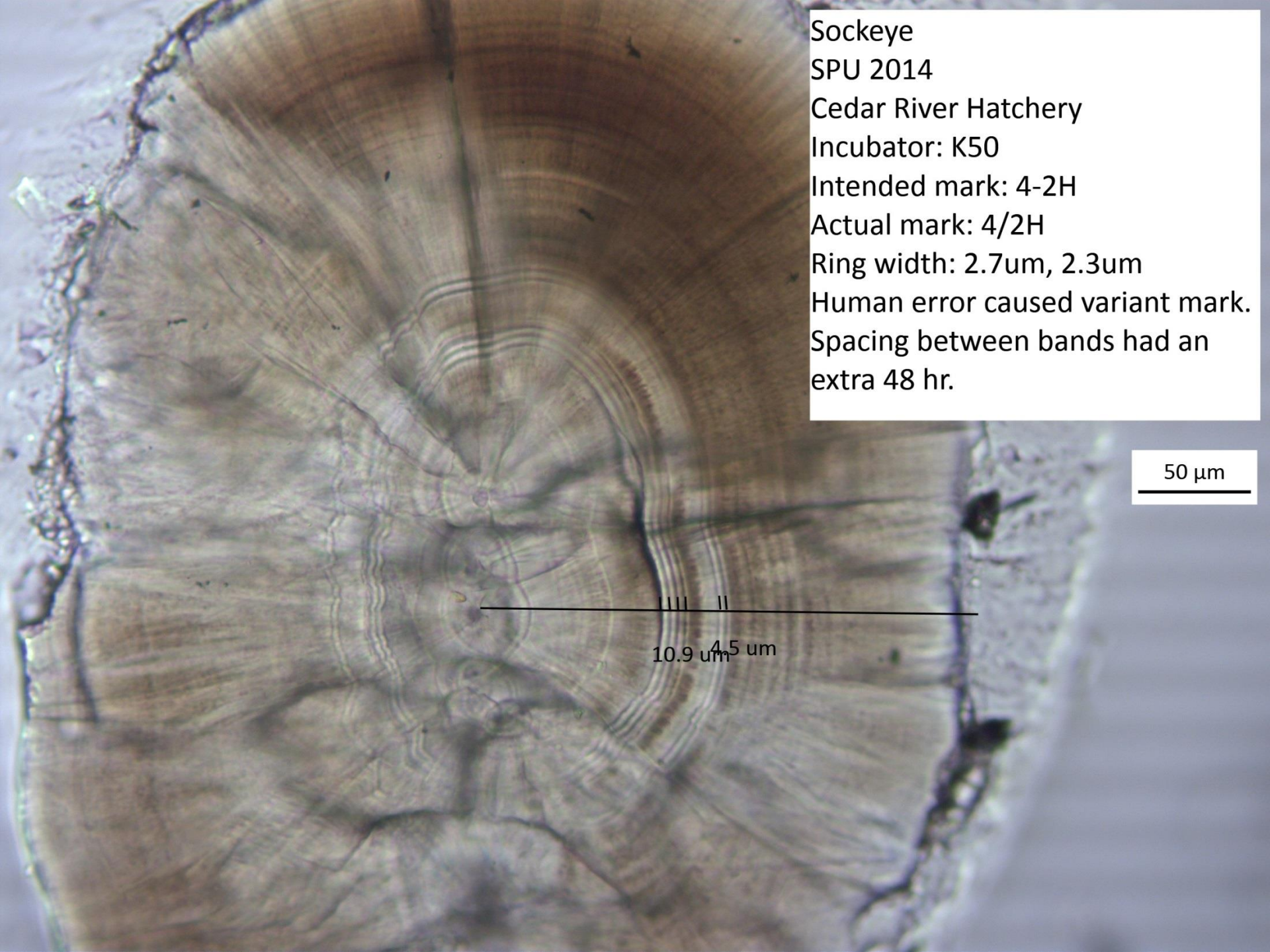
Ring width: 2.7 μ m, 2.3 μ m

Human error caused variant mark.

Spacing between bands had an
extra 48 hr.

50 μ m

10.9 μ m
4.5 μ m



Sockeye

SPU 2014

Cedar River Hatchery

Incubator: K55

Mark: 4-2H

Ring width: 2.8 μm , 2.2 μm

20 μm

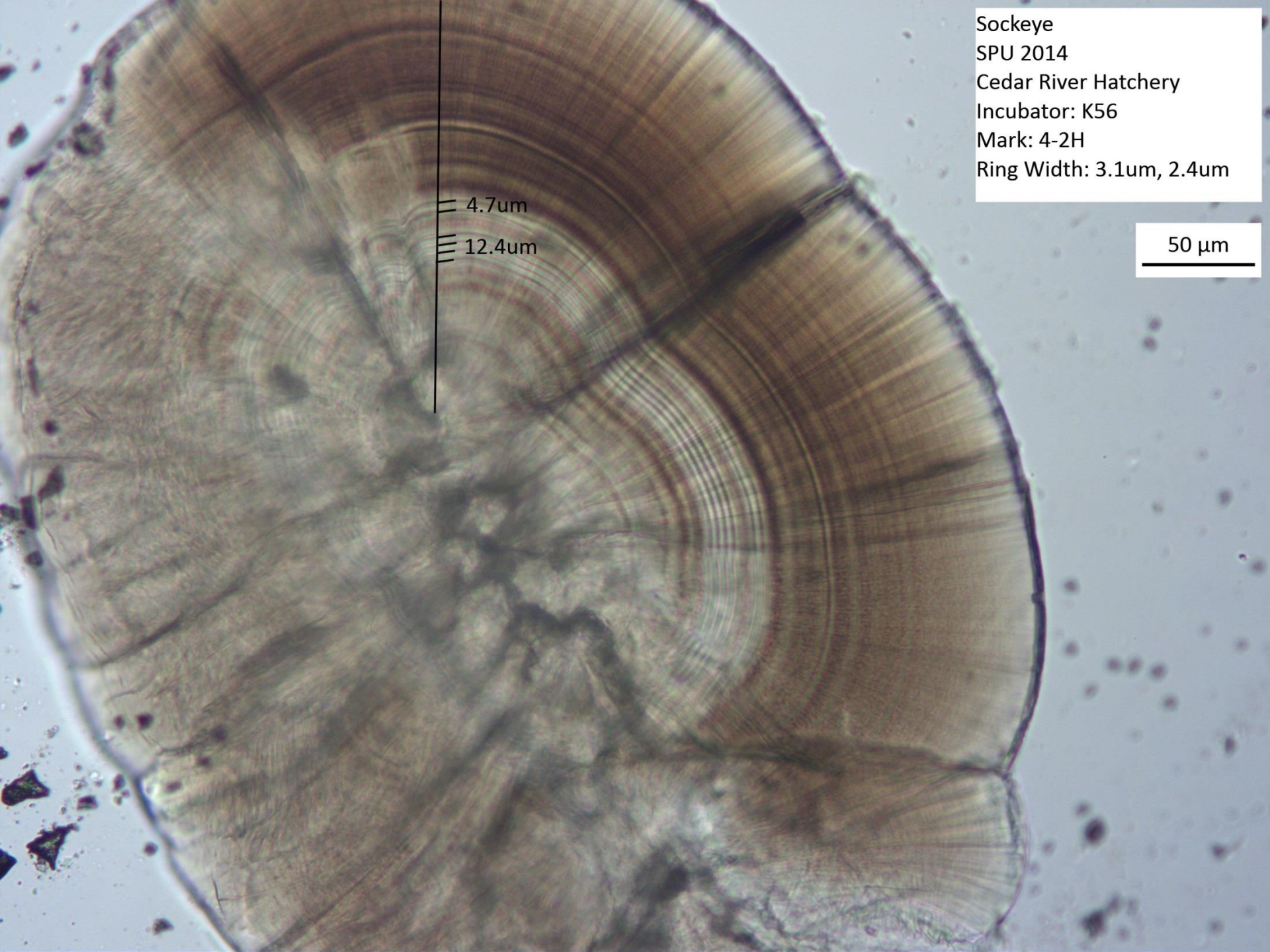
4.36 μm

11.09 μm

Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K56
Mark: 4-2H
Ring Width: 3.1um, 2.4um

4.7um
12.4um

50 μ m

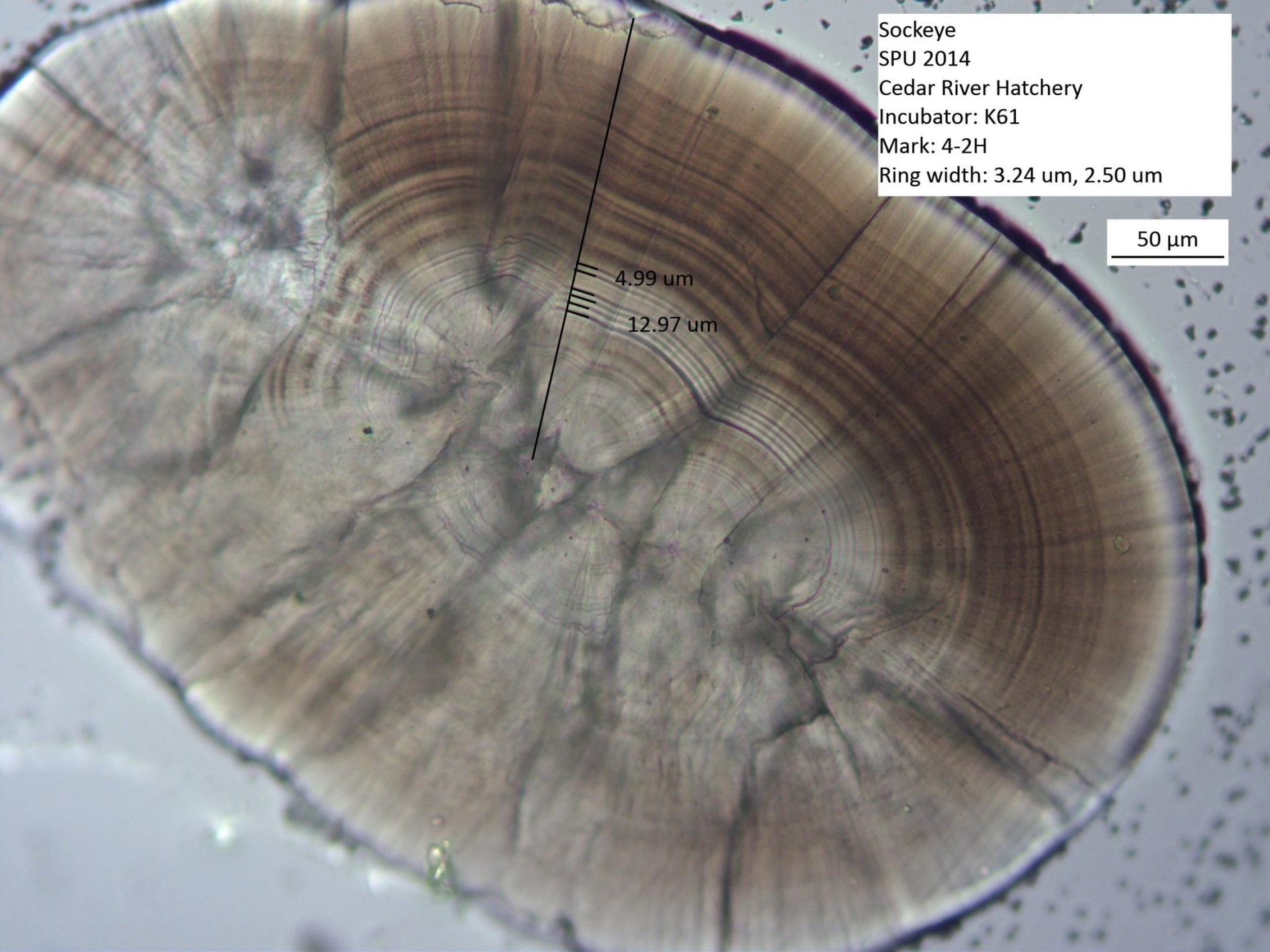


Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K61
Mark: 4-2H
Ring width: 3.24 μm , 2.50 μm

50 μm

4.99 μm

12.97 μm

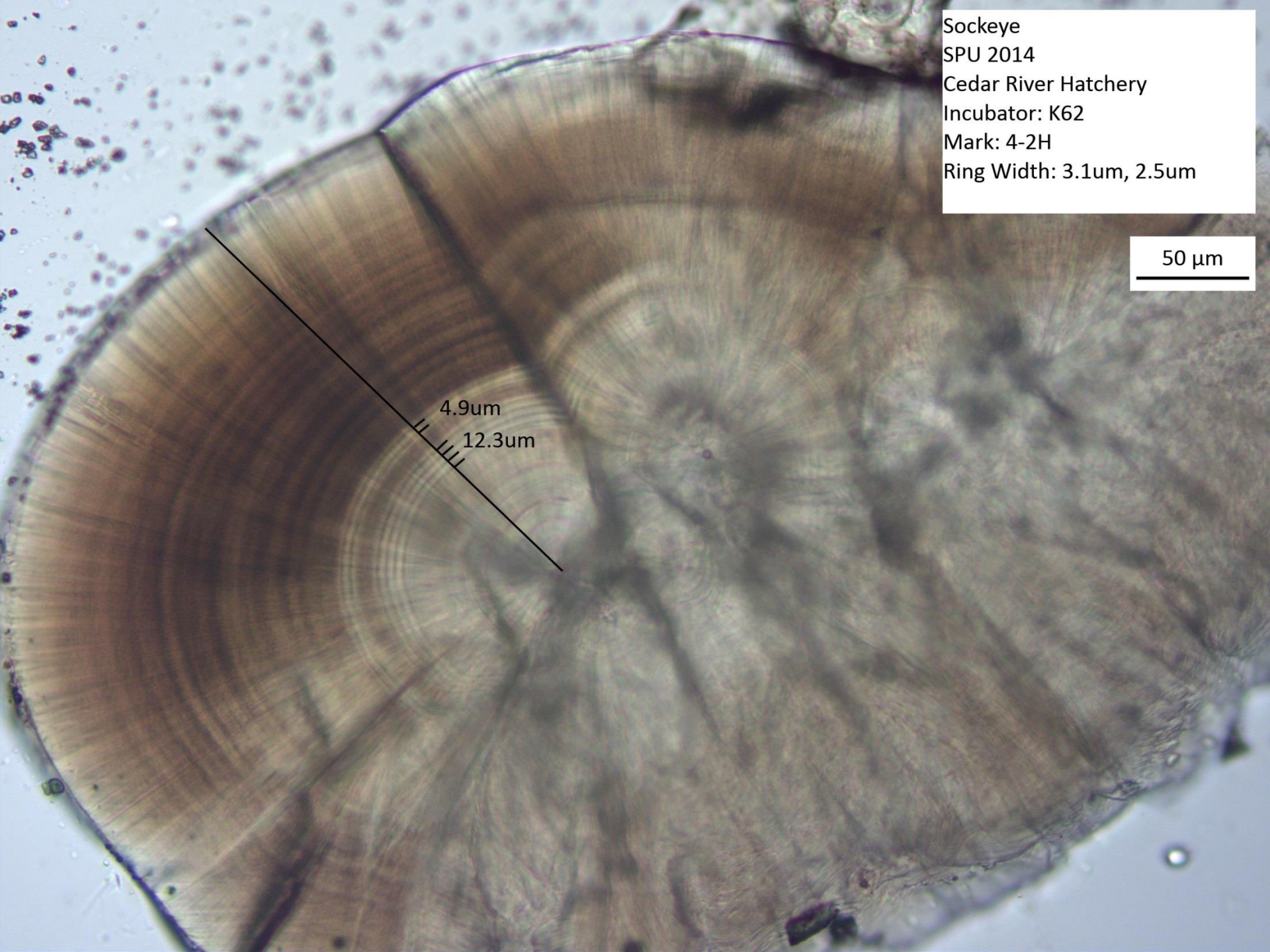


Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K62
Mark: 4-2H
Ring Width: 3.1um, 2.5um

50 μ m

4.9um

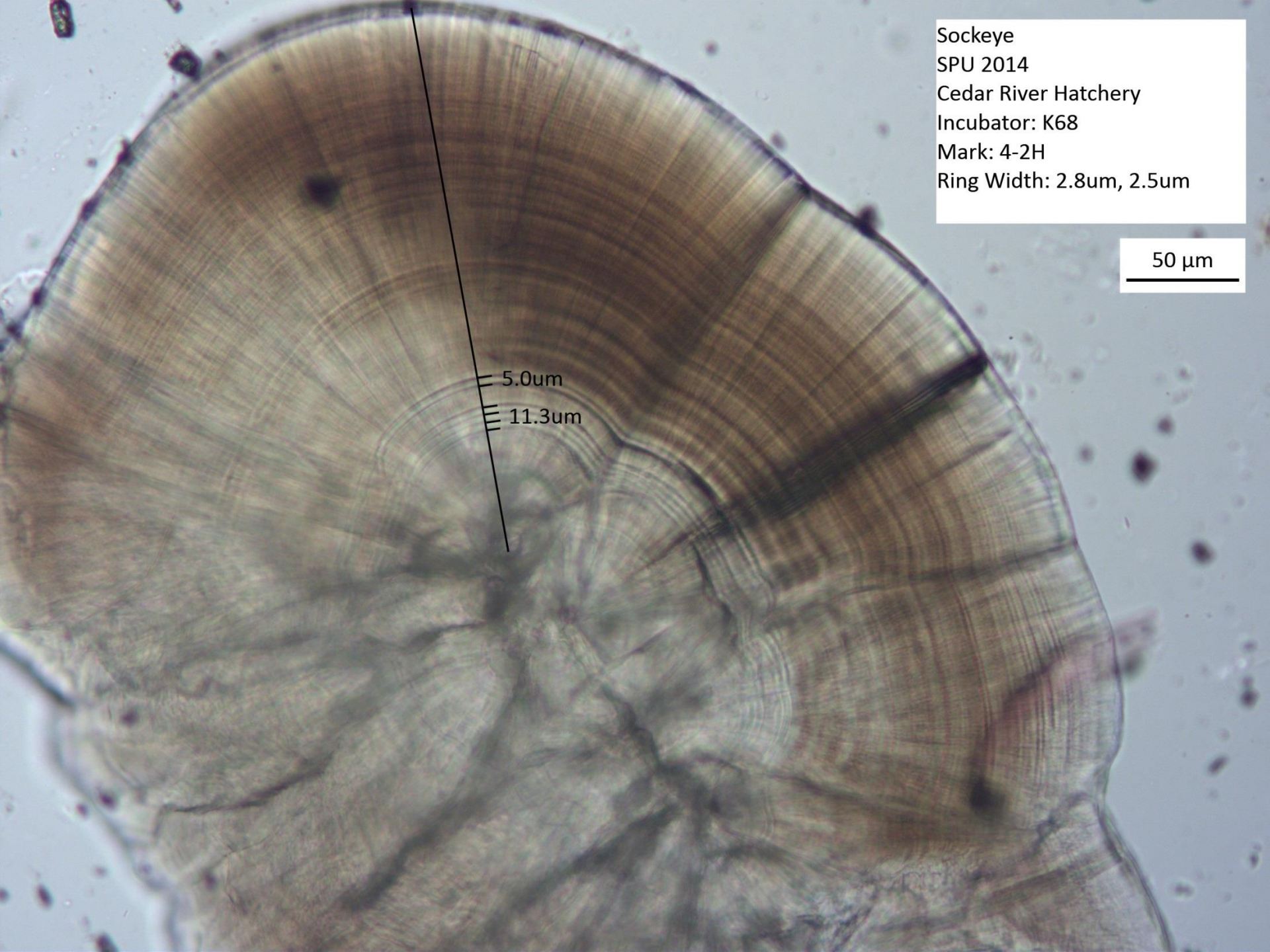
12.3um



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K68
Mark: 4-2H
Ring Width: 2.8um, 2.5um

50 μ m

5.0um
11.3um



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K74
Mark: 4-2H
Ring width: 3.1um, 2.9um

50 μm

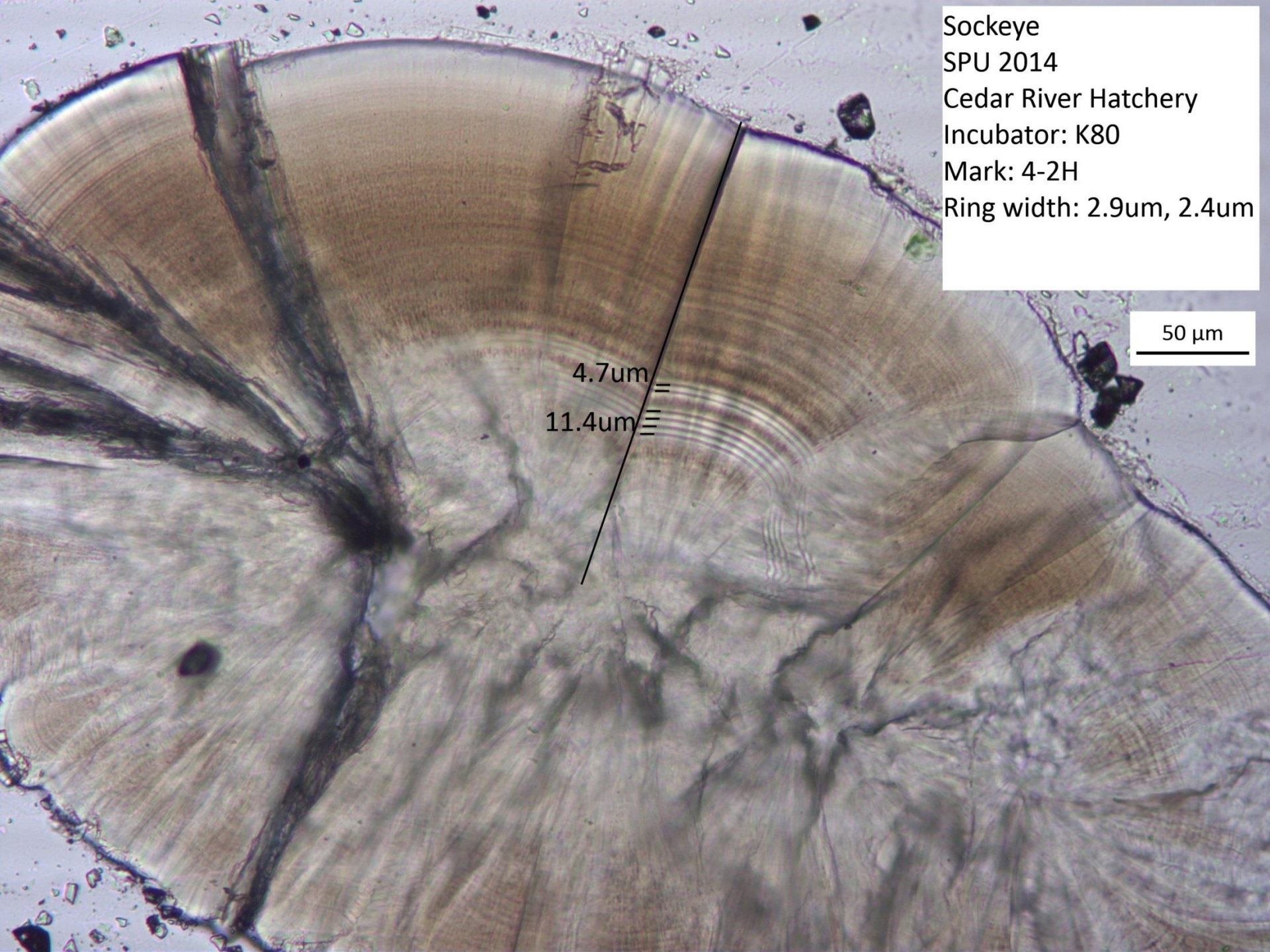
5.8um

12.4um

Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K80
Mark: 4-2H
Ring width: 2.9um, 2.4um

50 μ m

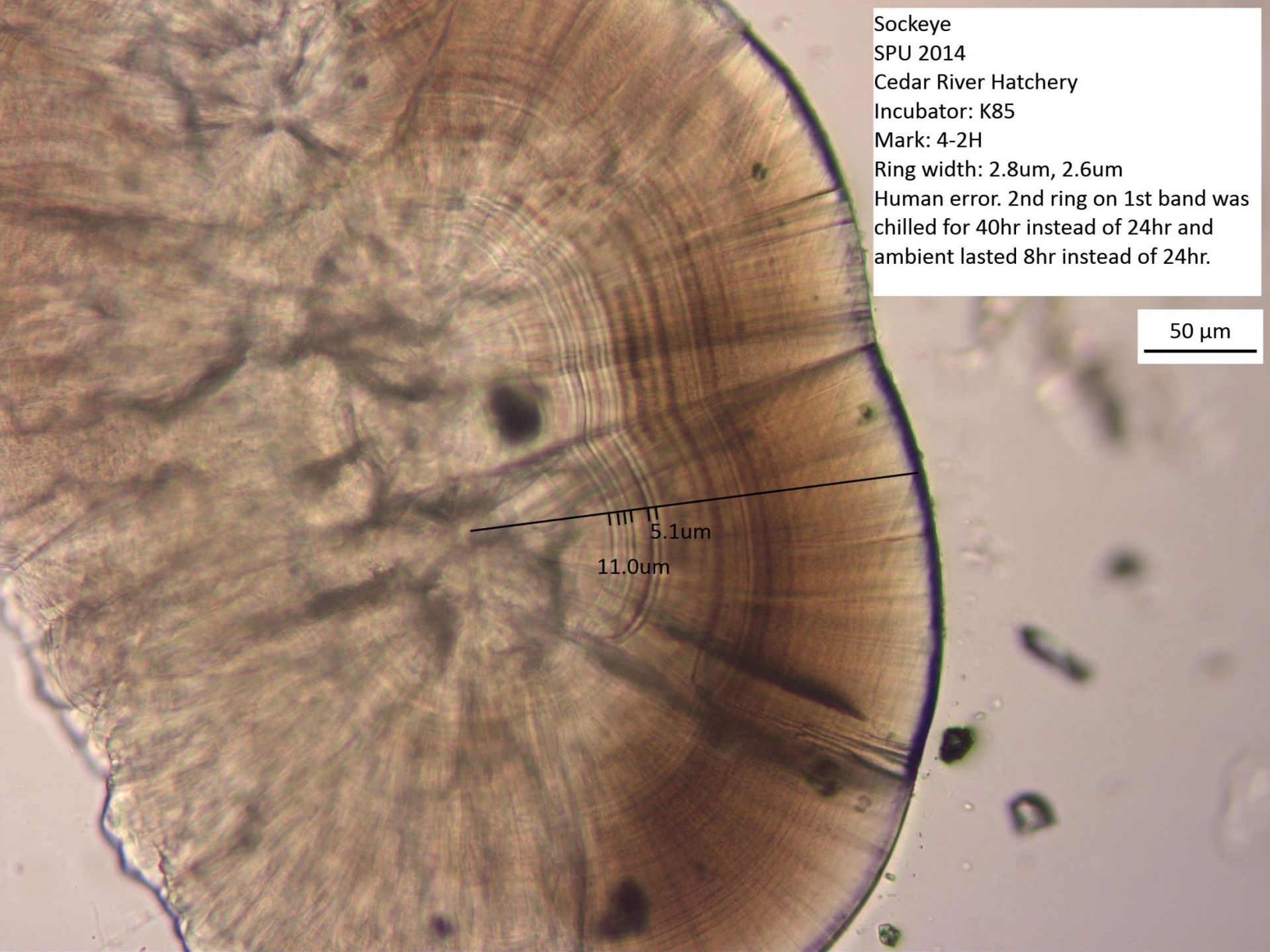
4.7um =
11.4um =

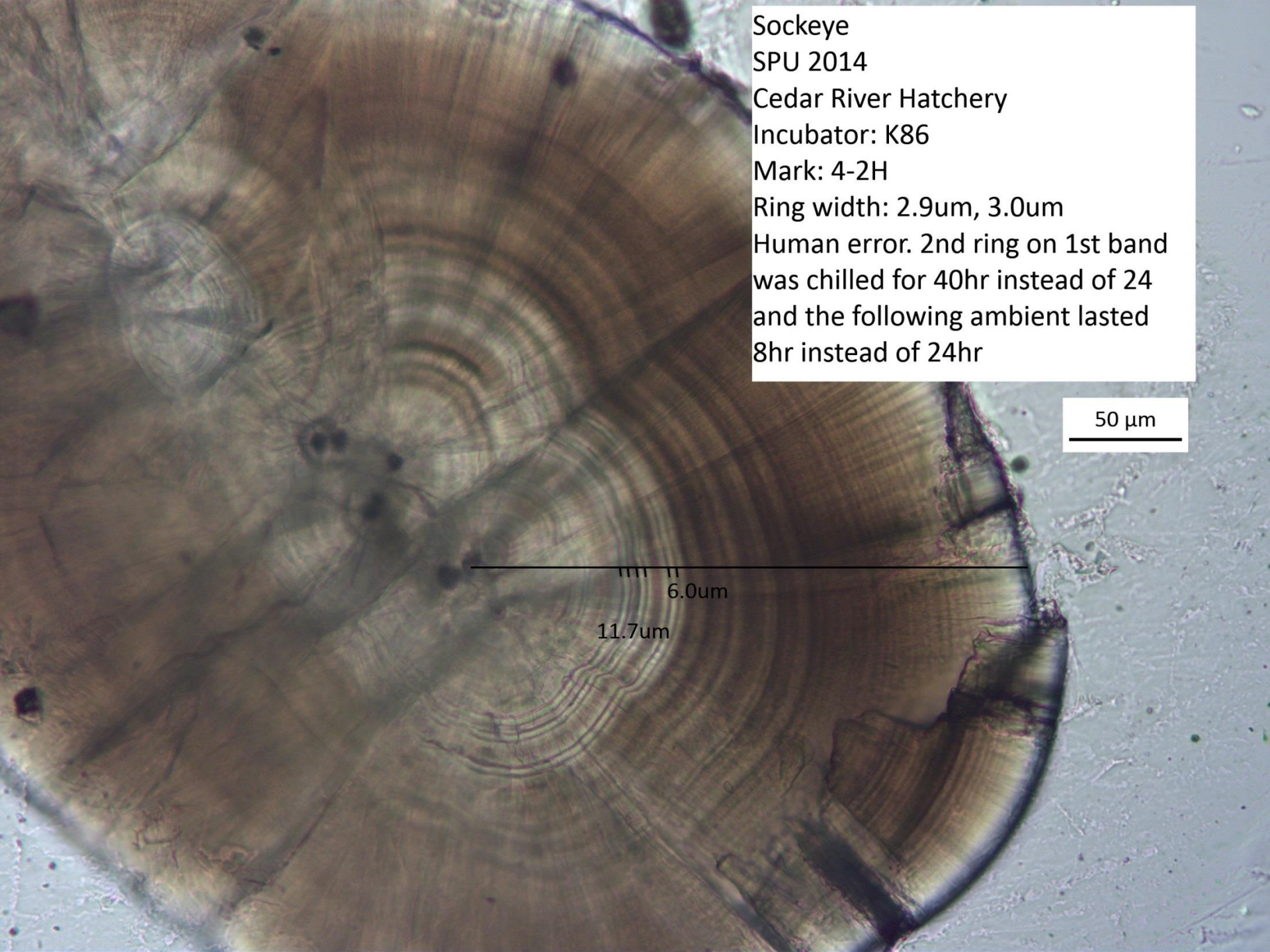


Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K85
Mark: 4-2H
Ring width: 2.8um, 2.6um
Human error. 2nd ring on 1st band was
chilled for 40hr instead of 24hr and
ambient lasted 8hr instead of 24hr.

50 μ m

5.1um
11.0um





A high-magnification micrograph of a biological specimen, likely a cross-section of a shell or bone, showing concentric rings and a central structure. The rings are composed of alternating light and dark bands. A scale bar in the bottom right indicates 50 μm. A horizontal line with tick marks is positioned across the center, with labels 11.7 μm and 6.0 μm indicating specific measurements.

Sockeye

SPU 2014

Cedar River Hatchery

Incubator: K86

Mark: 4-2H

Ring width: 2.9μm, 3.0μm

Human error. 2nd ring on 1st band
was chilled for 40hr instead of 24
and the following ambient lasted
8hr instead of 24hr

50 μm

6.0μm

11.7μm

Sockeye

SPU 2014

Cedar River Hatchery

Incubator: K91

Intended Mark: 4H

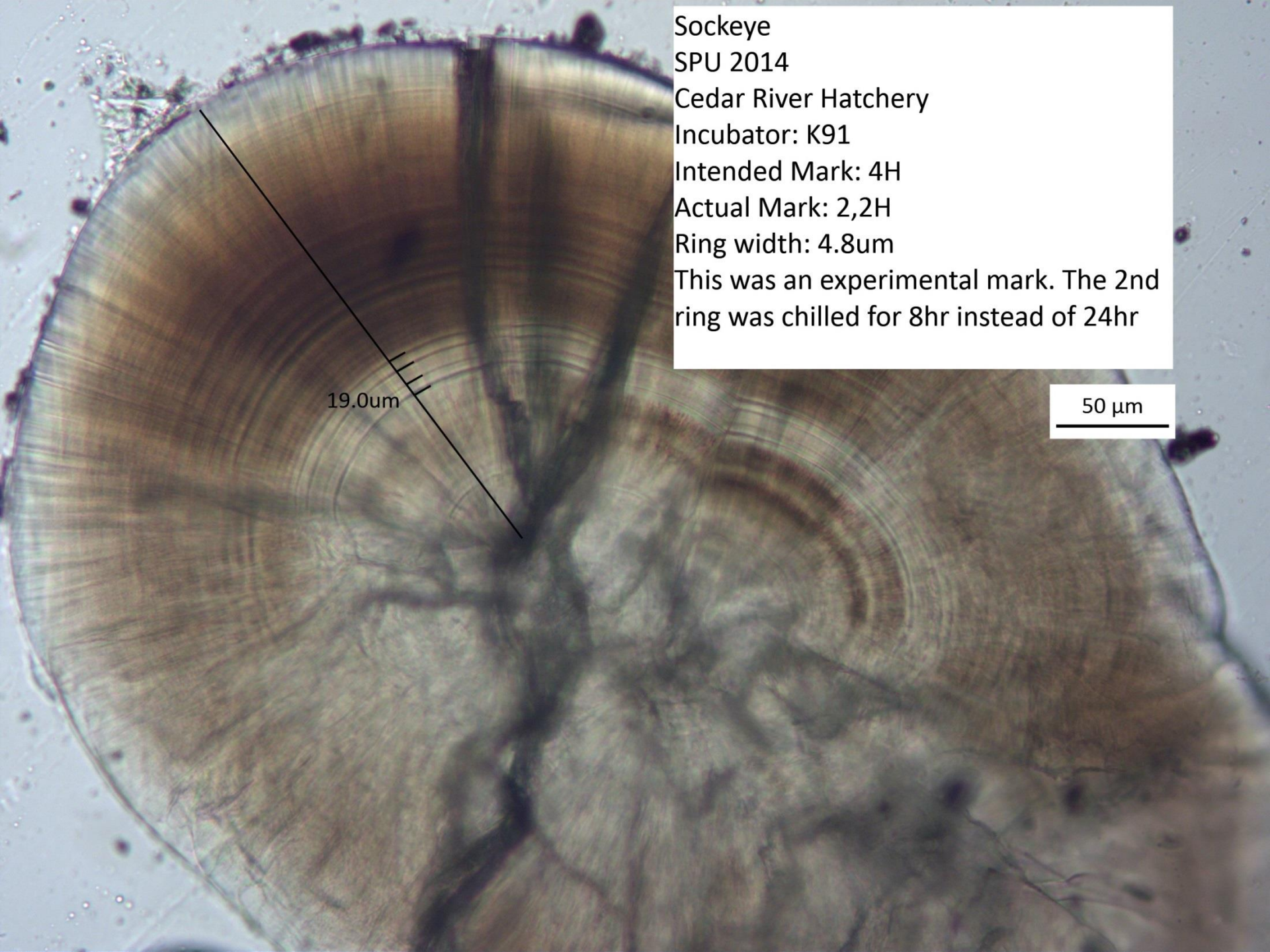
Actual Mark: 2,2H

Ring width: 4.8um

This was an experimental mark. The 2nd ring was chilled for 8hr instead of 24hr

19.0um

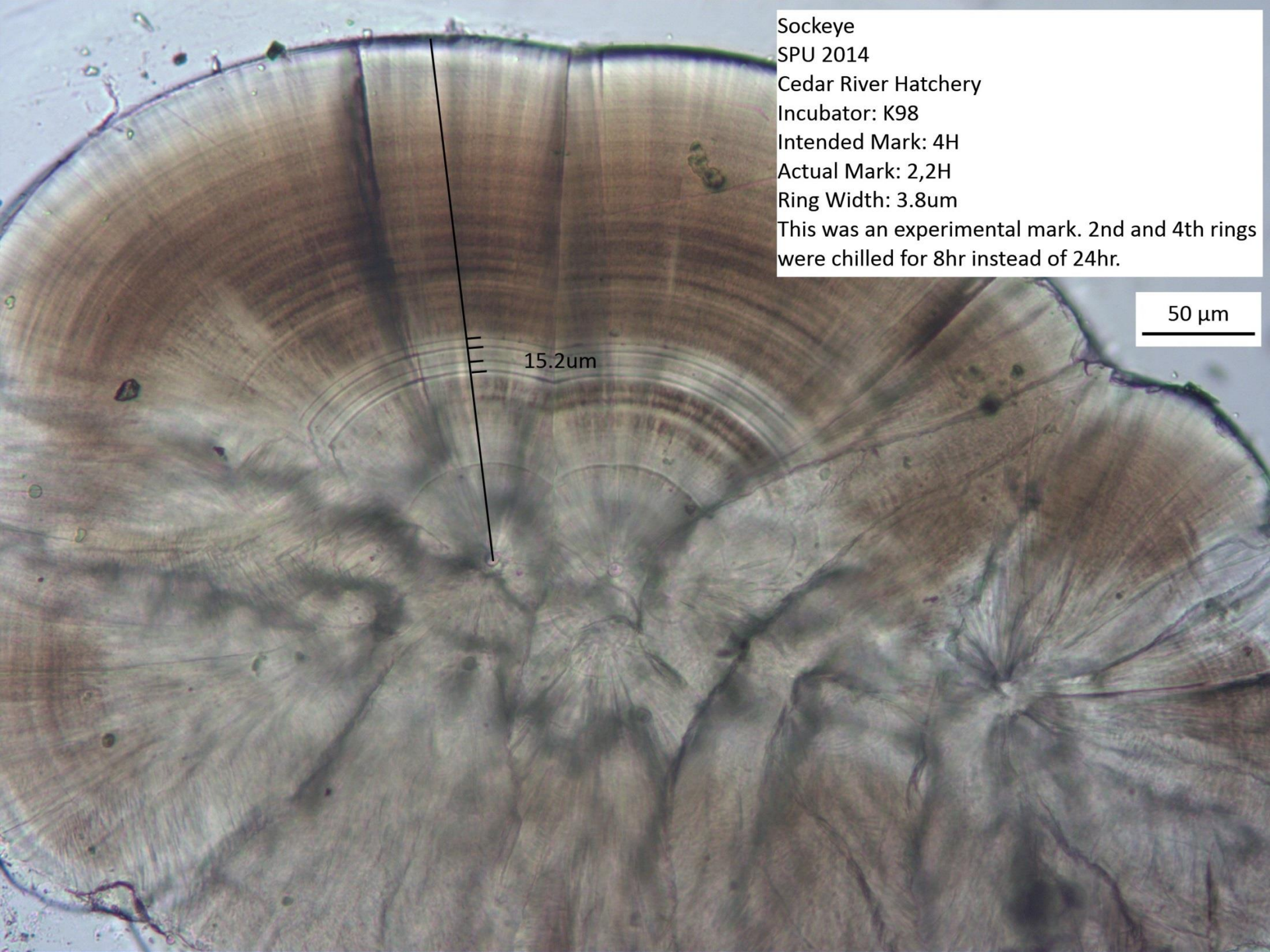
50 µm



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K92
Intended Mark: 4H
Actual Mark: 2,2H
Ring width: 4.4um
This was an experimental mark.
The 2nd ring was chilled for 8hr
instead of 24hr.

50 μm

17.5um



Sockeye

SPU 2014

Cedar River Hatchery

Incubator: K98

Intended Mark: 4H

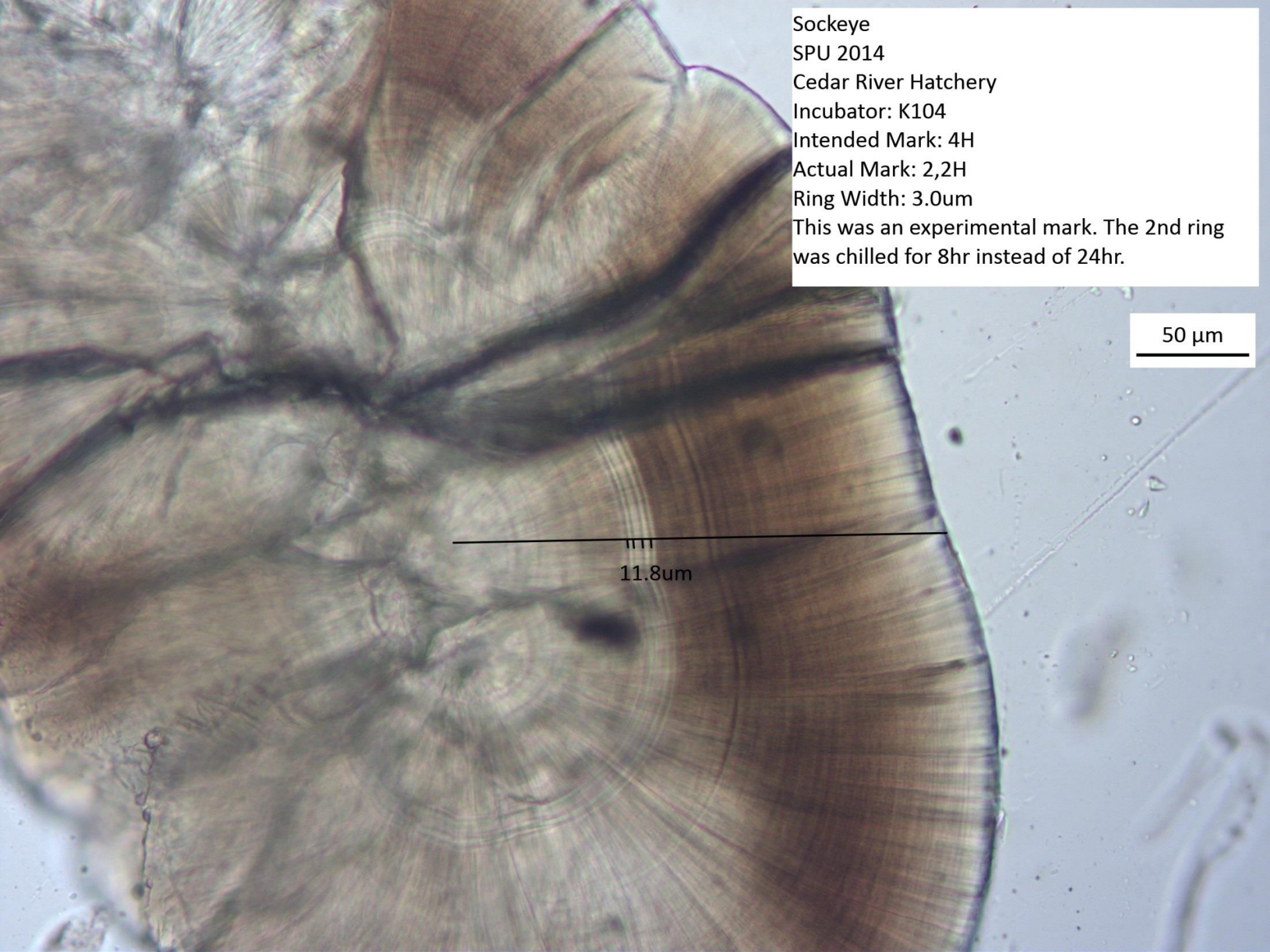
Actual Mark: 2,2H

Ring Width: 3.8μm

This was an experimental mark. 2nd and 4th rings were chilled for 8hr instead of 24hr.

50 μm

15.2μm



A detailed micrograph of a fish scale, likely from a sockeye salmon, showing concentric growth rings. The scale is stained, revealing alternating light and dark bands. A horizontal line with tick marks is drawn across the scale, with the text '11.8um' below it. A scale bar in the top right corner indicates '50 μm'. A text box in the upper right corner provides experimental details.

Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K104
Intended Mark: 4H
Actual Mark: 2,2H
Ring Width: 3.0um
This was an experimental mark. The 2nd ring
was chilled for 8hr instead of 24hr.

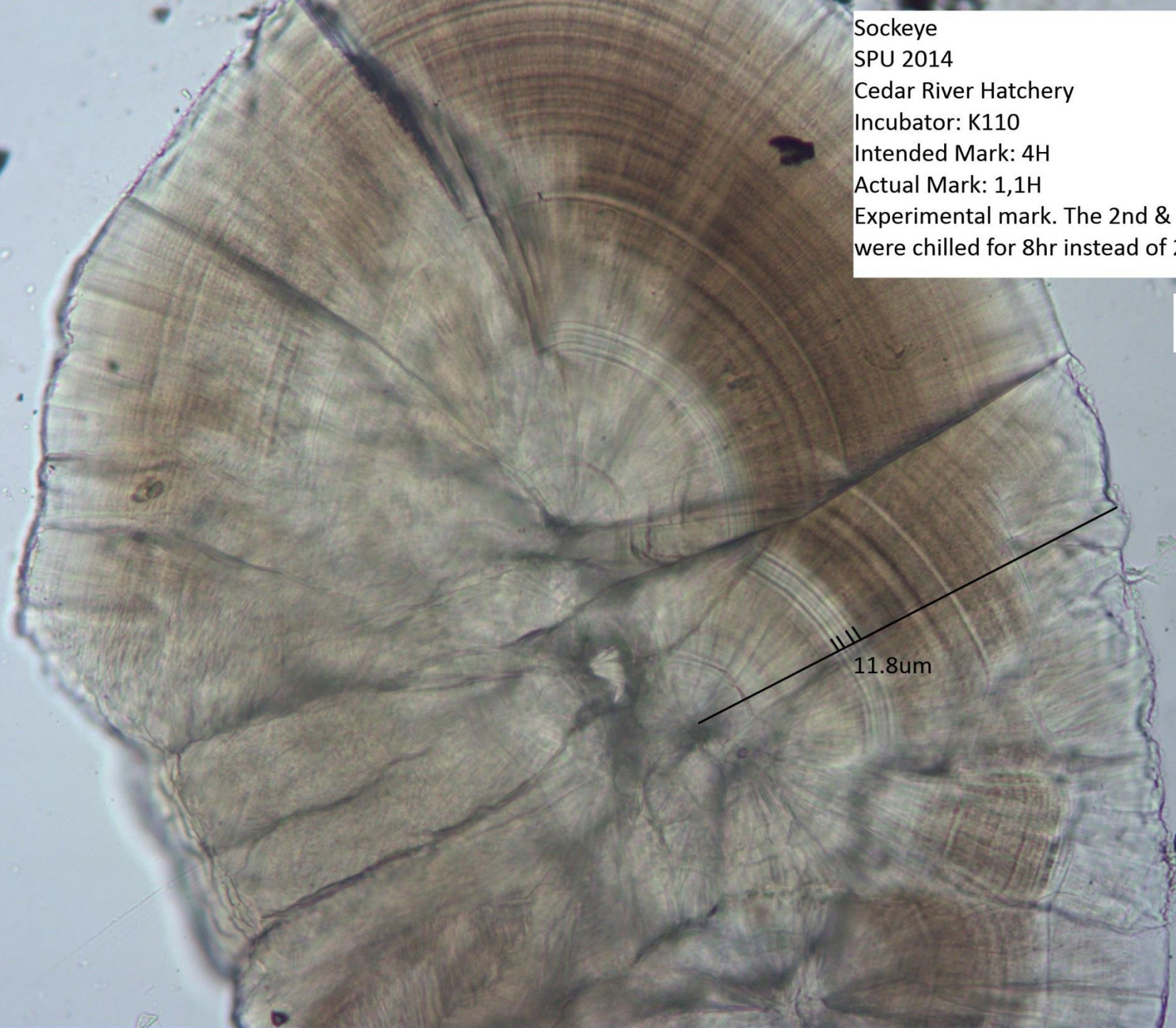
50 μm

11.8um

Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K110
Intended Mark: 4H
Actual Mark: 1,1H
Experimental mark. The 2nd & 4th rings
were chilled for 8hr instead of 24hr.

50 μ m

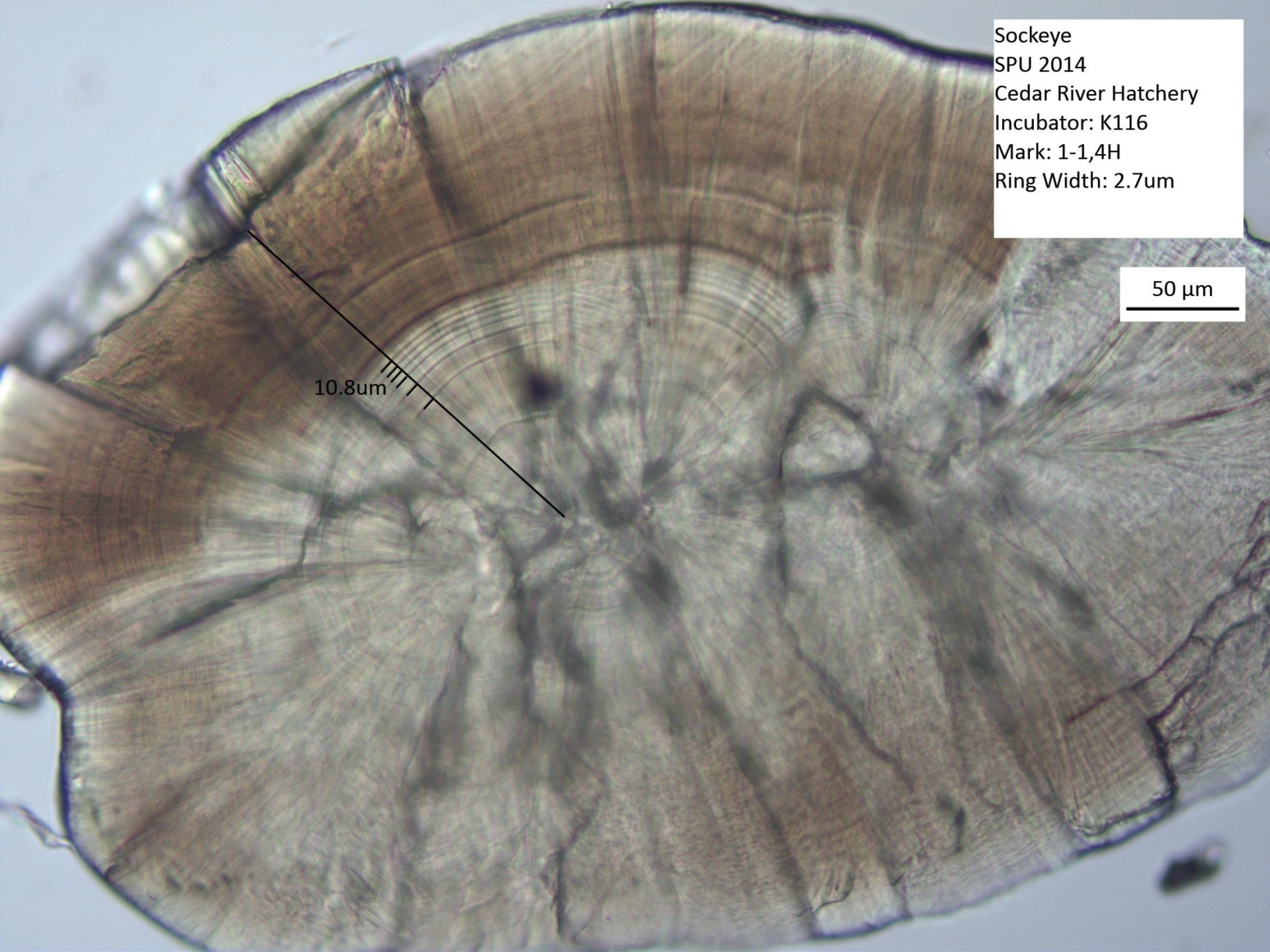
11.8um



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K116
Mark: 1-1,4H
Ring Width: 2.7um

50 μm

10.8um



Sockeye
SPU 2014
Cedar River Hatchery
Incubator: K122
Mark: 1-1,4H
Ring Width: 2.5um
Human error caused the 1st ring on last
band to be faint. The 1st ring was chilled
for 8hr instead of 24hr.

10.0um

50 μ m

