

| 新（修正案）                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 旧（第 18 回協議会提案）                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <p data-bbox="471 359 1199 399" style="text-align: center;"><b>信濃川中流域の河川環境改善に係る提言（案）</b></p> <p data-bbox="976 506 1457 579" style="text-align: right;">平成 21 年 3 月<br/>信濃川中流域水環境改善検討協議会</p> <p data-bbox="219 709 341 741"><b>はじめに</b></p> <p data-bbox="219 789 1457 989"><u>信濃川は、日本一の長さを誇る大河であり、その豊かな水の流れが自然の恵みを持たらすとともに、流域の社会経済活動を支えて来た。しかしながらその一方では、西大滝ダム及び宮中取水ダム地点での発電取水により、中流域において減水が生じ、河川環境が本来の姿から大きく変化しており、このため魚類の生息及び遡上降下が困難になるなど弊害も生じている。</u></p> <p data-bbox="219 995 1457 1152"><u>このため、「信濃川中流域水環境改善検討協議会」では、平成 10 年度から平成 20 年度まで、信濃川中流域の減水区間（西大滝ダムから魚野川合流点まで）における河川環境について、試験放流を含め様々な調査を実施するとともに、減水区間で最低限確保すべき河川流量についての検討等を行ってきた。</u></p> <p data-bbox="219 1159 1457 1400"><u>本提言は、減水による河川環境への影響に関し、これまで学術的に検討した結果を踏まえ、今後の改善に向けての基本となる考え方を示したものである。河川環境が、かつての信濃川の姿に向けより望ましいものとなるためには、本提言における学術的な検討を踏まえつつ、多くの関係者による検討・取り組み等、河川環境と水利用の調和に向けた努力が今後も継続される必要がある。本協議会としても、引き続き河川環境に関わる調査・検討を行い、河川環境の改善が実現されるよう努めていくものとする。</u></p> <hr data-bbox="255 1430 1451 1436"/> <hr data-bbox="225 1472 881 1478"/> | <p data-bbox="1724 359 2451 399" style="text-align: center;"><b>信濃川中流域の水環境改善に係る提言書（案）</b></p> <p data-bbox="2234 506 2715 579" style="text-align: right;">平成 21 年 2 月<br/>信濃川中流域水環境改善検討協議会</p> <p data-bbox="1484 709 1605 741"><b>はじめに</b></p> <p data-bbox="1484 995 2715 1110">「信濃川中流域水環境改善検討協議会」では、平成 10 年度から平成 20 年度まで、信濃川中流域の減水区間（西大滝ダムから魚野川合流点まで）における水環境について、さまざまな視点での調査、検討を行ってきた。</p> <p data-bbox="1484 1117 2715 1232">ここに示す提言は、<u>これまでに行ってきた減水区間における河川環境への影響を学術的に分析した結果を踏まえ、減水区間における各視点からの確保すべき流量のあり方について示したものである。</u></p> <p data-bbox="1484 1362 2715 1436"><u>本提言に基づき、信濃川中流域の河川環境をより望ましいものとしていくための取組が継続され、河川環境の整備につながることを期待したい。</u></p> |

| 新（修正案）                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 旧（第 18 回協議会提案）                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| <p style="text-align: center;"><u>一 提 言 一</u></p> <p><u>信濃川中流域の減水区間では、西大滝ダム及び宮中取水ダム地点での発電取水により減水が生じ、河川環境が本来の姿から大きく変化しており、魚類の生息等が困難となっている。このため、減水区間を、かつての信濃川の姿に向けてより望ましいものとするべく、河川流量の確保及び河川構造物の適切な管理・改善に向けての取り組みを、多くの関係者の参画のもと行うべきである。</u></p> <p><u>減水が生じている区間で確保することとなる河川流量は、関係者による望ましい河川環境の確保に向けての今後の取り組みを経て決まるものであるが、このときに、この河川流量が、少なくとも本協議会で学術的に検討された最低限確保すべき河川流量を下回らないようにするべきである。この最低限確保すべき河川流量とは、減水区間において、魚類の生息及び遡上降下が可能なものとする等のために最低限必要となる河川流量を示したものであり、これをもって減水が生じる前の信濃川の豊かな河川環境を再現することはできないことに留意する必要がある。</u></p> <p><u>サケなどの魚類の遡上降下が円滑に行われるために、各施設管理者により宮中取水ダム及び西大滝ダムの魚道等の構造改善が行われるべきである。</u></p> <p><u>今後も引き続き国が中心となってモニタリングを行い、河川環境の調査、及び河川環境をより望ましいものとするための取り組み状況等についての調査を継続し、毎年モニタリング内容を評価し、この評価を踏まえ、本協議会は必要に応じ新たな提言を行う。</u></p> | <p style="text-align: center;">提 言</p> <p>1. <u>信濃川中流域における確保すべき流量について</u><br/> 信濃川中流域では、発電取水に伴う減水により、河川環境にさまざまな影響が生じていると考えられる。<u>河川環境はさまざまな要因とその相互作用によって構築されており、その全てを明らかにすることはできないが、減水による影響と確保すべき流量についての検討を行うために、以下のような複数の視点からの検討を行った。</u></p> <ul style="list-style-type: none"> <li>・河川の形態    ・河川水温    ・付着藻類    ・底生生物    ・魚類    ・河川景観</li> <li>・河川水質    ・周辺の地下水位    ・サケなどの魚類の遡上降下</li> </ul> <div style="border: 1px solid black; padding: 10px; margin-top: 20px;"> <p><u>信濃川中流域で確保すべき流量は、学術的な検討の結果、宮中減水区間については、最も厳しい地点で44m<sup>3</sup> /s(宮中ダム直下で40m<sup>3</sup> /s)、また、西大滝減水区間については、最も厳しい地点で20m<sup>3</sup> /s(西大滝ダム直下で20m<sup>3</sup> /s)となる。</u></p> <p><u>サケなどの魚類の自由な遡上降下のために、宮中ダム及び西大滝ダムの魚道の構造改善が行われることが望ましい。</u></p> <p><u>また今後、河川環境を適切に整備し、望ましい環境を確保するために、モニタリングを継続し、改善状況等を把握することが望ましい。</u></p> </div> |

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| 新（修正案）                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 旧（第 18 回協議会提案）                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| <p>(5) 魚類の生息及び遡上降下から見た確保すべき河川流量のあり方</p> <p>宮中減水区間において、魚類の生息環境となる水域及び移動環境としての滞筋を確保するためには、最も河川環境が厳しくなる地点（信濃川 54.8km 付近）で <math>44\text{m}^3/\text{s}</math> 以上の河川流量を確保すべきである。さらに、宮中減水区間全体で滞筋が連続するためには、宮中取水ダム直下で <math>40\text{m}^3/\text{s}</math> 以上の河川流量を確保すべきである。</p> <p>西大滝減水区間において、魚類の生息環境となる水域及び移動環境としての滞筋を確保するためには、最も河川環境が厳しくなる地点（千曲川 11.3km 付近）で <math>20\text{m}^3/\text{s}</math> 以上の河川流量を確保すべきである。さらに、西大滝減水区間全体で滞筋が連続するためには、西大滝ダム直下で <math>20\text{m}^3/\text{s}</math> 以上の河川流量を確保すべきである。</p> <p>(6) 河川景観から見た確保すべき河川流量のあり方</p> <p>河川景観についてのアンケート調査の結果からは、河川流量が多ければ多いほど好ましいという傾向が得られた。また、見かけの河川の幅と水面の幅の比に基づく検討では、良好な河川景観のために必要な河川流量は、宮中減水区間においては最も厳しい地点（魚沼橋地点）で <math>34\text{m}^3/\text{s}</math>、西大滝減水区間においては最も厳しい地点（信濃川橋地点）で <math>8\text{m}^3/\text{s}</math> となった。</p> <p>これらの地点を含め、減水区間で人々に好まれる信濃川の良好な河川景観を維持するためには、宮中減水区間では宮中取水ダム直下で <math>25\text{m}^3/\text{s}</math> 以上、西大滝減水区間では西大滝ダム直下で <math>1\text{m}^3/\text{s}</math> 以上の河川流量を確保すべきである。</p> <p>(7) 河川水質から見た確保すべき河川流量のあり方</p> <p>宮中減水区間、西大滝減水区間のいずれにおいても、河川水質と河川流量の間には、明確な関係を見いだすことができなかった。</p> <p>(8) 周辺の地下水位から見た確保すべき河川流量のあり方</p> <p>宮中減水区間において、地下水位の低下と河川流量の間に明確な関係を見いだすことはできなかった。</p> <p>以上の(1)～(8)の各々の視点から学術的に検討した結果を比較すると、信濃川中流域の減水区間において最低限確保すべき河川流量は、以下ようになる。</p> <p>宮中減水区間において、確保すべき河川流量が最も大きな値となるのは、(5)での検討より、最も河川環境が厳しくなる地点で滞筋を確保するための <math>44\text{m}^3/\text{s}</math> 以上である。従って、この河川流量 <math>44\text{m}^3/\text{s}</math> 以上を確保すべきである。さらに、宮中減水区間全体で滞筋を連続させるためには、宮中取水ダム直下で <math>40\text{m}^3/\text{s}</math> 以上の河川流量を確保すべきである。また(2)(3)</p> | <p>量は提示しないが、現在の河川流量を下回らないことが望ましい。</p> <p>2. 5 魚類の生息及び遡上降下から見た確保すべき流量のあり方</p> <p>西大滝減水区間において、魚類の生息環境となる水域を確保するためには、年間を通じて最も厳しい地点で <math>20\text{m}^3/\text{s}</math> の河川流量を確保すべきである。</p> <p>宮中減水区間において、魚類の生息環境となる水域を確保するためには、年間を通じて最も厳しい地点で <math>44\text{m}^3/\text{s}</math> の河川流量を確保すべきである。</p> <p>なお、サケなどの魚類の自由な遡上降下のために、宮中ダム及び西大滝ダムの魚道構造の改善が行われることが望ましい。</p> <p>2. 6 河川景観から見た確保すべき流量のあり方</p> <p>河川景観についてのアンケート調査の結果からは、流量が多ければ多いほど好ましいという傾向が得られた。また、見かけの河川の幅と水面の幅の比に基づく検討では、良好な河川景観のために必要な流量は、西大滝減水区間においては最も厳しい地点で <math>8\text{m}^3/\text{s}</math>、宮中減水区間においては最も厳しい地点で <math>34\text{m}^3/\text{s}</math> となった。</p> <p>以上のことから、人々に好まれる信濃川の良好な河川景観を維持するためには、西大滝減水区間では <math>8\text{m}^3/\text{s}</math>、宮中減水区間では <math>34\text{m}^3/\text{s}</math> の流量を確保すべきである。</p> <p>2. 7 河川水質から見た確保すべき流量のあり方</p> <p>西大滝減水区間、宮中減水区間のいずれにおいても、河川水質の維持と流量の間には、明確な関係を見いだすことができなかったため、河川水質の維持のために確保すべき河川流量は提示しないが、現在の河川流量を下回らないことが望ましい。</p> <p>2. 8 周辺の地下水位から見た確保すべき流量のあり方</p> <p>宮中減水区間において、地下水位の低下と信濃川の流量の間に明確な関係を見いだすことはできなかった。</p> |

| 新（修正案）                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 旧（第 18 回協議会提案）  |    |    |    |    |    |    |            |    |     |     |     |                                    |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  | 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| <p>からも、宮中取水ダム直下で 40 m³/s 以上の河川流量を確保するべきである。</p> <p>西大滝減水区間において、確保するべき河川流量が最も大きな値となるのは、(5)での検討より、最も河川環境が厳しくなる地点で滞筋を確保するための 20 m³/s 以上である。従って、この河川流量 20 m³/s 以上を確保するべきである。さらに、西大滝減水区間全体で滞筋を連続させるためには、西大滝ダム直下で 20 m³/s 以上の河川流量を確保するべきである。</p> <p><b>2. サケなどの魚類の遡上降下が円滑に行われるための対策</b></p> <p>宮中取水ダムの魚道には横波が発生しており、西大滝ダムの魚道は流れが穏やかすぎる等流況が悪く、さらに両ダムとも、魚道の入り口が見つけにくいこと、取水口への稚仔魚の迷入及び放水路への遡上成魚の迷入が発生していること等の問題点があり、魚類の遡上降下の障害となっているため、各施設管理者により魚道等の構造改善が行われるべきである。</p> <p><b>3. 河川環境の継続的な把握とその評価</b></p> <p>信濃川中流域において、河川を適切に整備・管理し、望ましい環境を確保するために、今後も引き続き国が中心となってモニタリングを行い、河川環境（水温、流況や魚類の生息・遡上状況等）の調査、及び河川環境をより望ましいものとするための取り組み状況等についての調査を継続し、毎年モニタリング内容を評価する。</p> <p>（参考 時期別<u>最低限確保するべき河川流量</u>）</p> <table><tr><th 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流量との間には明確な関係を見いだせなかった | 宮中減水区間 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1月 | 2月 | 3月 | 4月 | 5月 | 6月 | 7月 | 8月 | 9月 | 10月 | 11月 | 12月 | 備考 | 河川形態 | 40 |  |  |  |  |  |  |  |  |  |  |  |  | 水温 |  |  |  |  |  |  |  |  | 40 |  |  |  | 夏季の高水温が課題 | 付着藻類 |  |  |  |  |  |  |  |  | 43 |  |  |  | 異常繁茂した藻類が腐敗して悪臭を発することが指摘されている夏期を対象 | 底生動物 |  |  |  |  |  |  |  |  |  |  |  |  | 非減水区間との明確な差は見られなかった | 魚類 | 44 |  |  |  |  |  |  |  |  |  |  |  | 魚類の移動に必要な水深の確保 | 景観 | 34 |  |  |  |  |  |  |  |  |  |  |  | 見かけの水面幅と水面の比による検討 | 水質 |  |  |  |  |  |  |  |  |  |  |  |  | 流量との間には明確な関係を見いだせなかった | 地下水位 | （水位低下時期） |  |  |  |  |  |  |  |  |  |  |  | 流量との間には明確な関係を見いだせなかった |
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| 河川形態                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 河川水温                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 付着藻類                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 底生動物                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |    |    |    |    |    |    |            |    |     |     |     | 河川流量との間には明確な関係を見いだすことができなかった       |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  | 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| 魚類の生息及び遡上降下                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 20（千曲川11.3km付近） |    |    |    |    |    |    |            |    |     |     |     | 魚類の生息環境となる水域及び移動環境としての滞筋の確保        |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  | 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| 河川景観                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 河川水質                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 河川水温                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |    |    |    |    |    |    | 40         |    |     |     |     | 魚類(温水性魚類)が生息可能とされる水温の上限である28℃を超えない |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  | 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| 付着藻類                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |    |    |    |    |    |    | 43（十日町橋地点） |    |     |     |     | 異常繁茂を千曲川の非減水区間程度に減らす               |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  | 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| 底生動物                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |    |    |    |    |    |    |            |    |     |     |     | 河川流量との間には明確な関係を見いだすことができなかった       |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |    |  |  |  |  |  |  |  |  |  |  |  |                |      |  |  |  |  |  |  |  |    |  |  |  |  |                                    |      |  |  |  |  |  |  |  |            |  |  |  |  |                      |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |         |          |  |  |  |  |  |  |  |  |  |  |  |                              |                                                                                                                                                                                                                                                                                     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| 魚類の生息及び遡上降下                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 44（信濃川54.8km付近） |    |    |    |    |    |    |            |    |     |     |     | 魚類の生息環境となる水域及び移動環境としての滞筋の確保        |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  | 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| 河川景観                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 34（魚沼橋地点）       |    |    |    |    |    |    |            |    |     |     |     | 見かけの河川の幅と水面の幅の比に基づく検討              |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |    |  |  |  |  |  |  |  |  |  |  |  |                |      |  |  |  |  |  |  |  |    |  |  |  |  |                                    |      |  |  |  |  |  |  |  |            |  |  |  |  |                      |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |         |          |  |  |  |  |  |  |  |  |  |  |  |                              |                                                                                                                                                                                                                                                                                     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| 河川水質                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |    |    |    |    |    |    |            |    |     |     |     | 河川流量との間には明確な関係を見いだすことができなかった       |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |    |  |  |  |  |  |  |  |  |  |  |  |                |      |  |  |  |  |  |  |  |    |  |  |  |  |                                    |      |  |  |  |  |  |  |  |            |  |  |  |  |                      |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |         |          |  |  |  |  |  |  |  |  |  |  |  |                              |                                                                                                                                                                                                                                                                                     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| 付着藻類                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 河川形態                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 水温                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 付着藻類                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |    |    |    |    |    |    |            | 43 |     |     |     | 異常繁茂した藻類が腐敗して悪臭を発することが指摘されている夏期を対象 |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  | 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| 底生動物                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 魚類                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 景観                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 34              |    |    |    |    |    |    |            |    |     |     |     | 見かけの水面幅と水面の比による検討                  |  |  |    |    |    |    |    |    |    |    |    |     |     |     |    |      |  |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                     |      |  |  |  |  |  |  |  |  |  |  |  |  |                 |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |             |                 |  |  |  |  |  |  |  |  |  |  |  |                             |      |           |  |  |  |  |  |  |  |  |  |  |  |                       |      |  |  |  |  |  |  |  |  |  |  |  |  |                              |        |  |  |  | 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