DCFR News

Vol. 17 No. 1 April–September 2014

FROM DIRECTOR'S DESK

Through an unrelenting pursuit to make scientific developments that can result in increased fish production and livelihood security in the Indian uplands, the ICAR-Directorate of Coldwater Fisheries Research is striving forward in aspects of resource assessment, conservation and aquaculture of different coldwater fish species. In terms of species diversification for coldwater aquaculture, *Chagunius chagunio* and *Barilius bendelisis* have been captive bred successfully. Significant achievements have been made in stock assessment of different farm raised rainbow trout using molecular markers and also in GIS assisted site selection for aquaculture development in Sikkim. The challenges of coldwater fish diseases are addressed by putting earnest efforts in identification of bacterial and viral pathogens and development of management measures. Attempts are being made to develop cost effective fish feed by incorporating cheaper protein sources. Exploratory surveys are being carried out in remote high altitude areas for resource assessment.

The Directorate also continues in its endeavour to enhance the stock of mahseer in natural habitat through several awareness-cum-ranching programmes across the hill states. Further, various farmer based extension activities, exhibitions, capacity building through training programmes were carried out. Under the Tribal Sub-Plan (TSP) and North-eastern Hill Region (NEH) plan, many demonstrations and training programs were organised in the hilly regions of Uttarakhand, Assam, Arunachal Pradesh and Meghalaya to scientifically intervene and improve aquaculture practices and livelihood security of tribal farmers. I appreciate the overall efforts of all the scientists and staff of this Directorate. Moreover, I sincerely urge the entire research team to aspire and achieve more in their future endeavours.

(A. K. Singh)
Director

Research highlights

Breeding of *Chagunius chagunio*

Chagunius chagunio (commonly known as 'Chaguni' or 'Chippan') is an indigenous cyprinid fish, natively distributed along the Brahmaputra and Ganga river drainages in the Himalayan foot hills. In Kumaon region of Uttarakhand, it fetches good market price of about Rs. 300/kg and has high consumer preference. For the first time, artificial breeding of this fish was carried out at DCFR, Bhimtal. As part of its reproductive biology, the fish was observed to be a batch spawner with peak breeding season in May and September. It attains sexual maturity at the age of 3 years, when it measures 15-20 cm and weighs 100-125 g. Male and female fish were stripped during the month of May 2014, and the fertilized eggs were incubated in flow-through trough and tray system. The relative fecundity was found to be 25000-30000 eggs/kg body weight. The breeding protocol is being further refined and developed.

Mature *Chagunius chagunio*

Breeding of hill trout, *Barilius bendelisis*

The hill trout, *Barilius bendelisis* (Hamilton) is another indigenous cyprinid that is commonly distributed along the Brahmaputra and Ganga drainages in the Himalayan foot hills. It is also identified as a potential candidate for aquaculture and ornamental trade. As a pre-requisite, the fish was successfully bred for the first time at DCFR, Bhimtal through sustained efforts. Spawning was induced

by intraperitoneal administration of ovatide to female (0.6 ml/kg) and male (0.3 ml/kg) mature brooders, at evening hours. 15 hrs post-injection, eggs were stripped from the female fish into a clean and dry enamel tray. About 1000 eggs were fertilized with freshly prepared milt suspension, and were placed in a flow-through trough and tray system maintained at 15-20°C. The fertilization rate was estimated to be 55-60 % and the larvae hatched out in 130-140 hrs. The fish has intermittent spawning period during March-April.

Mature B. *bendelisis*

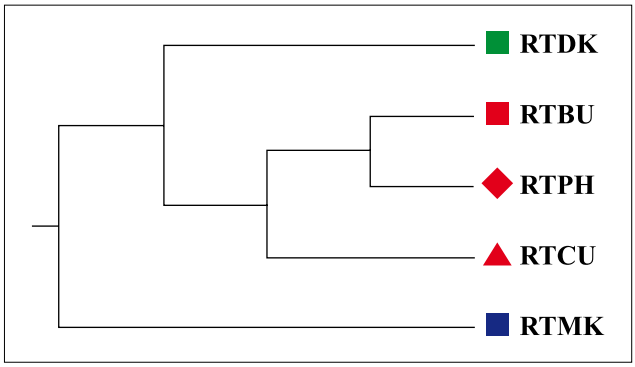
Incubation of eggs in trays

Larval feed for *Labeo dyocheilus*: Evaluating *Azolla* as protein source

The increasing cost and scarcity of conventional feed ingredients has created the necessity to find cost-effective and abundant alternate sources of protein. In this context, a short term feeding trial was conducted by incorporating *Azolla* (a free-floating weed) as the main protein source in the diet of newly hatched *Labeo dyocheilus* larvae. The growth performance results were encouraging and thus *Azolla* can be advocated as an alternative cheaper protein source.

Stock assessment of farm raised rainbow trout (*Oncorhynchus mykiss*)

Different stocks of rainbow trout from Dachigam (Western Himalaya); Bairangana, Champawat and Patlikul (Central Himalaya); and Munnar (Nilgiri hills) were evaluated for allelic and genetic diversity using 15 polymorphic microsatellite loci. Substantial genetic differentiation was observed among stocks using FSTAT v.2.9, which indicated average Fst and Rst value of 0.118 and 0.519, respectively. The genetic clustering analysis carried out using ARLEQUIN v.3.5 and MEGA v.5.05 demonstrated that stocks from RTMK (Munnar, Kerala) and RTDK (Dachigam, Kashmir) formed individual clusters, whereas RTBU, RTCU (Bairangana and Champawat, Uttarakhand) and RTPH (Patlikul, Himachal Pradesh) stocks were grouped in another cluster indicating a common origin of the culture stocks. Moreover, the data revealed significant genetic variability among different stocks showing allelic and gene diversity (Na=4.2-9 alleles/locus, mean 6.09; Ho=0.042-0.934, He=0.612-0.824) when calculated using GDA v.1.1. Pair wise genetic differentiation revealed mean Fst=0.118, indicating a moderate level of genetic differentiation. The average inbreeding coefficient (Fis) was 0.31. The mode shift test analyzed using BOTTLENECK v.1.2.02 did not show any distortion of allele frequency and showed a normal "L" shaped distribution.



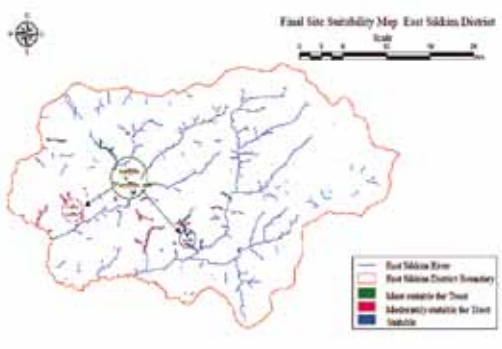
Phenogram (UPGMA) constructed based on Nei's genetic distance among stocks

Selection of suitable sites for aquaculture in Sikkim using GIS

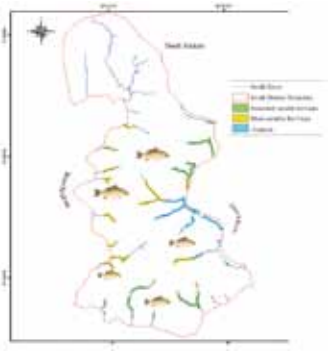
Suitable sites for aquaculture in the eastern and southern districts of Sikkim were assessed using geoinformatic tools. The maps generated provide long-term outline to policy makers and planners of aquaculture development. The following data were used in the study.

Data	Source
Village boundary map (1:50000)	Survey of India
Open access SRTM satellite data (28 m resolution)	USGS Earth Explorer (NASA)
Land use land cover	India Waris (ISRO)

Separate thematic maps were prepared based on the different physico-chemical parameters of water and soil in east and south Sikkim, using spatial analyst. Map for water availability and accessibility was also prepared. Analytical Hierarchical Process (AHP) was used to find the weightage of the criteria. Criteria base analysis was carried out for the different parameters and reflected in map that indicates the suitability of the site for aquaculture, as shown below.



Aquaculture suitability map for East Sikkim



Aquaculture suitability map for South Sikkim

The outcome of the study is summarized in the following table:

Dispersion of all classes	South Sikkim	East Sikkim
Total area of district (sq.km.)	735	937
Area under forest (sq.km.)	348.4	409.8
Area under glaciers (sq.km.)	34	217.1
Area under urbanization (sq.km.)	2.7	17.2
Area under grassland (sq.km.)	39.7	31.6
Area under wasteland (sq.km.)	1.1	37
Area under village boundary/ agriculture (sq.km.)	300.4	221.4
Most suitable area for aquaculture (ha)	784	301
Moderately suitable area for aquaculture (ha)	825	501
Unsuitable area for aquaculture (ha)	451	98

Surveillance of coldwater fish diseases in Himachal Pradesh

Disease surveillance was conducted in three districts of Himachal Pradesh. Samples were collected from 19 rainbow trout and 5 carp farms. A total of eleven farms in Kullu, eight in Mandiand and four in Chamba were sampled. Five morbid fish were randomly selected and twelve tissue samples were obtained from each fish. The samples of each tissue were pooled and transported on ice for detailed laboratory analysis. From these 23 farms, 1342 samples were collected during a span of six months i.e. from April-September 2014. Out of 1342 samples collected, 1102 were analysed by RT-PCR for the presence of infectious pancreatic necrosis virus and viral haemorrhagic septicaemia virus along with the positive controls developed earlier by our laboratory. So far none of the samples tested positive in RT-PCR, which suggests the absence of the said viruses from the farms surveyed.

Chryseobacterium - causative agent of bacterial gill disease isolated from *Tor putitora*

Golden mahseer (*Tor putitora*) was sampled periodically from Bhimtal lake for monitoring the health status of the natural population. Ten isolates of *Chryseobacterium* were recovered from diseased gills of 8 fish, showing clinical symptoms of bacterial gill disease (BGD). One isolate was identified as *Chryseobacterium scophthalmum*, TPBLGL 18 (NCBI accession no. KM822770). It was gram negative, short rod shaped, forming yellow colonies in Shieh medium supplemented with Tobramycin. The antibiotic sensitivity study showed that *Chryseobacterium scophthalmum* was resistant to 17 antibiotics viz., Amphotericin-B Ap^{100} & Ap^{120}, Bacitracin B^{8} & B^{10}, Cloxacillin CX^{30} & CX5, flucanazol Fu25 & Fu10, Iteraconazole It10, Ketoconazole Kt10, Metronidazole Mt5, Nystatin Ns100, Oxacilin Ox^{5}, Penicillin-G P^{2}, Polymixin-B Pb50, Spectinomycin Se^{100} and Tobramycin Tb^{10} out of the 55 tested antibiotics. Detailed study of its prevalence, virulence and patho-physiology is being carried out in our bacteriology laboratory.

Golden mahseer showing symptoms of Bacterial Gill Disease

Exploration of high altitude resources

Some of the coldwater streams, rivers and lakes in Kumaon Himalaya are poorly explored as they are located in difficult terrains. In July, an effort was made by researchers from DCFR to assess the coldwater fisheries resources in remote locations of Pithoragarh district, Uttarakhand. Coldwater resources such as Parwati Lake(4512 m above msl, 30°21.15N, 80°39.37E), Kuti Yangti river (3845 m above msl, 30°18.59N, 80°45.43E) and Kali river at Gungi (3223 m above msl , 30°10.46N, 80°51.73E) were identified as potential targets for developing fisheries and aquaculture activities. Nevertheless, information on the abundance and diversity of fish species is not yet available and is currently being explored further.

Parwati lake

Extension activities and awareness programmes

- A farmers' meet was organized on 13th April 2014 at Katahar village, Champawat, Uttarakhand, to provide seed and feed to 35 fish farmers.
- Front line demonstration programme on breeding of improved common carp strains was organized on 30th April 2014 for the fish farmers of Bheti village, Lohaghat (Chommola). Dr. S.K. Srivastava, Dr. S. Chandra and Dr. S.K. Gupta coordinated the programme.
- Seed ranching programme of golden mahseer was organised at Kosi river, Ramnagar, Uttarakhand on 25th April, 2014 to increase the native mahseer population. On this occasion, 2000 (hatchery cum cage reared) advanced fingerlings of golden mahseer were released, in the presence of QRT committee Dr. M. Sinha, former Director, CIFRI; Dr. V.R. Chitranshi, former ADG (I. Fy.); Dr. P.C. Mahanta,

former Director, DCFR; Prof. M.M. Goswami, dept. of zoology, Gauhati university; Prof. M.H. Balkhi, Dean, college of fisheries, SKUAS&T-K and Forest range officer, Ramnagar. In July 2014, cage raised fingerlings of golden mahseer were released in Sadiyatal lake and Nainital lake.

Ranching of golden mahseer in Nainital lake

- Demonstration cum rainbow trout seed stocking programme in farmer's pond was organized by Dr. S.K. Srivastava, Dr. S. Chandra, and Dr. S.K. Gupta on 8th June 2014 at Katarh village, Simalta in Champawat District.
- Under the Tribal Sub-Plan, demonstration cum seed distribution programme was organized by Dr. R.S. Patiyal on 30th June 2014 at Himkhola, Uttarakhand. Carp seeds were distributed to 20 tribal farmers to develop their livelihood options.
- An awareness camp on the management of Jhora fishery was organized on 27th July 2014 at Kalingpong, Darjeeling, West Bengal. Seed and feed was given to the adopted farmers. Similarly, another awareness camp on integrated fish farming was organized on 9th September 2014 at Nongmahir, Meghalaya.

- In continuation of the painstaking endeavour of DCFR, Bhimtal towards stock enhancement of mahseer, 10,000 fingerlings of golden mahseer and 2000 fingerlings of chocolate mahseer was ranched at Nongmahir Lake, Meghalaya on 9th September 2014, in the presence of Additional chief secretary, Principal secretary (fisheries) and Director of fisheries, Government of Meghalaya; Director, ICAR research complex for NEH Region, Barapani; and Deputy commissioner, Ribhoj District, Meghalaya. This lake was identified as a suitable mahseer habitat and initiative was taken up to develop a Mahseer Eco-Park. On this occasion, Dr. D. Sarma, Dr. M. S. Akhtar, Mr. Rajesh, M. and Mr. Abhay K. Giri arranged an exhibition on site displaying educational extension material in Khari languages to create awareness among local people and to sensitize them to save and protect mahseer. About 200 fish farmers participated in the awareness-cum-mahseer ranching programme. The chief guest of the programme, Shri K.S. Kropha, Additional chief secretary, distributed certificate of appreciation to 20 DCFR adopted fish farmers.

Awareness campaign and seed ranching program organized at Nongmahir lake, Meghalaya

- Dr. N. N. Pandey displayed a DCFR exhibition in 'Kisan Mela' organized by VPKAS, Almora on 30th September at Hawalbagh, Almora.

Training programmes

- ICAR short course on "Application of molecular tools in coldwater fisheries management" was organized during 2nd - 11th June, 2014 at DCFR, Bhimtal. 21 participants from 8 states of India attended the training programme. The participants were given an overview of the available molecular techniques and their applications in the study of genetic variability and diversity of species and populations. Detailed lectures and practical sessions were offered on mtDNA based species barcoding, development of microsatellite markers, gene discovery and bioinformatics tools. Primer designing, gene search and multiple sequence alignments was demonstrated to the participants. Field visits to CITH, Mukteswar; IVRI, Mukteswar and PDFMD, Mukteswar, were organised. Guest lecture on different genome browsers/softwares and analysis of Next Generation Sequencing data were also delivered. The training was co-ordinated by Dr. A. Barat, Dr. P.K. Sahoo and Dr. S. Ali.

- National Fisheries Development Board (NFDB) sponsored

training programme on "Hatchery management and seed production practices of golden mahseer" was organized at DCFR, Bhimtal during 23rd to 27th September, 2014. It was attended by a diverse group of 28 participants including officials from different state fisheries departments and assistant professors from all over the country. Dr. A.K. Singh, Director, DCFR, inaugurated the programme and briefed about the need to conserve and rehabilitate golden mahseer, the king of game fishes. The training integrated both theoretical and practical aspects of hatchery management, breeding and seed production of golden mahseer. A training manual and conservation sticker on *'Join us for rehabilitation and propagation of golden mahseer'* was released on the occasion. The program was co-ordinated by Dr. M.S. Akhtar, Dr. D. Sarma, Mr. S.K. Mallik and Dr. Ciji A.

Important events

Institutional meetings

The Institute Research committee (IRC) meeting of the Directorate was held on 1st and 2nd April 2014 under the chairmanship of Dr. A. K. Singh, Director. All the scientists presented their research achievements and proposals, which was followed by thorough deliberations.

The Quinquennial Review Team (QRT) meeting and the Institute Management committee (IMC) meeting was held at Bhimtal on 24th and 26th April 2014, respectively, under the chairmanship of Dr. M. Sinha. Other members and special invitees present during the meeting were Prof. M.M. Goswami, Prof. M.H. Balkhi, Dr. V.R. Chitranshi and Dr. P.C. Mahanta. The committee reviewed the research based achievements and future orientation of the Directorate, and had discussions with scientific and administrative staff on various research programs and administrative developments.

The Research Advisory Committee (RAC) meeting was convened on 20th May 2014 at Bhimtal, it was chaired by Dr. J.R. Dhanze and the other esteemed members were Dr. S.D. Singh, Dr. H.S. Raina, Dr. S.N. Mohanty and Dr. B.S. Yarki. The committee critically examined the progress and achievements of ongoing and completed projects, after brief project presentation by the respective principal investigators.

Director's visit to Champawat field centre

Dr. A.K. Singh visited the farm facilities of the Directorate at Champawat on 18th April 2014 and appraised the functioning and requirements of the unit. He inspected the site selected for open recirculation system and suggested renovations to be carried out in the trout hatchery.

Distinguished visitors

Dr. S.K. Bandyopadhyay, honorable ASRB member visited DCFR on 19th April 2014 and briefed about ASRB's talent search programme and informed the house about different scales of measurements of scientific output.

Dr. A.S. Ninawe, Advisor, DBT visited the Directorate on 16th August 2014, briefed the project evaluation and approval trends, and encouraged the researchers to submit multidisciplinary and multi-institutional projects to DBT for funding.

DCFR observed 'Fish farmers day' at Belkheda tribal village in Uttarakhand

Fish farmer's day and scientist-farmer interaction meet were jointly held at Belkheda, Nanakmatta, Uttarakhand on 10th July 2014. Dr. A.K. Singh, Director, DCFR presided

over the programme, which was co-ordinated by Dr. S.K. Srivastava and Dr. Suresh Chandra, DCFR field centre, Champawat. It was attended by 71 women and 50 men tribal fish farmers. In his presidential address, Dr. Singh highlighted the importance of aquaculture for income generation and livelihood security of the marginal tribal farmers with small land holdings; appreciated the efforts of the concerned scientist in initiating fish culture in the tribal area; and encouraged the farmers to continuously avail DCFR's technological support. On his visit to farmer's ponds, he expressed satisfaction in the growth of the stocked fish and gave valuable suggestions for up scaling of farming practices. Later in the evening, a lively farmer - scientist interaction meet was organised. The Director, programme co-ordinators and Dr. D. Sarma contributed in the deliberations and addressed the queries raised by the farmers. Further on the occasion, fish seeds were distributed to the farmers and released in the culture ponds constructed under the Tribal sub plan (TSP). Fish feed was also distributed to the adopted progressive fish farmers of Sauvuara, Belkheda and Pippiliya tribal villages.

Farmers meet organized on ICAR foundation day

To commemorate the ICAR Foundation Day on 16th July, DCFR organised a one day programme on 'Ornamental fish culture' at Khunari Village, Champawat, Uttarakhand. The event was coordinated by Dr. R.S. Patiyal and Dr. S. Chandra and attended by 45 farmers. The chief guest, Shri K.S. Nagniyal, I.P.S., superintendent of police, Champawat, appreciated the efforts of farmer Shri Naveen Chandra Joshi and DCFR scientists for developing the infrastructure for ornamental fish rearing in the remote district and expressed hope that this small beginning will create awareness among local people towards entrepreneurship opportunities in ornamental fish rearing and generate secondary income to poor families. 400 Koi and Gold fish seed produced by DCFR was distributed and released in the farmer's pond.

IPR workshop

An awareness workshop on "Intellectual property management in fisheries and agriculture sectors" was organized on 19th July 2014 to sensitize the scientists, researchers and other associated members of the sector towards IPR issues and rights provided under the law. The workshop was held under the chairmanship of Dr. A.K. Singh, Director, and around fifty participants from different ICAR institutes attended the workshop.

68th Independence Day celebration

Enduring the heavy rain, the 68th Independence Day was celebrated on 15th August 2014 with a flag hoisting ceremony. Dr. A. K. Singh, Director, unfurled the national flag and urged the gathering to work in unison towards novel scientific breakthroughs in fish farming and conservation that will augment the socio-economic well-being of the upland population.

On-campus book exhibition

An exhibition of books was arranged during 19th and 20th August 2014 to facilitate the scientists, technical staffs and student users of the library with recent knowledge and advancements in fisheries and allied subjects, and to enrich the library of DCFR with new texts. Five book distributors/ publishers participated in the exhibition.

Foundation Day celebration

DCFR celebrated its 27th Foundation Day on 24th September 2014. In his opening remarks, Dr. A.K. Singh, Director, highlighted the historical progress of the Institute; its achievements and services to the upland fish farmers; the future challenges to surmount in fisheries resource management, hill aquaculture and conservation; and the coordinated action to be pursued and strengthened through linkages with state fisheries departments and educational institutes. The chief guest Dr. B.S. Bisht, ex-VC, GBPUA&T, Pantnagar along with Dr. P.C. Mahanta, former Director,

DCFR and Dr. J.C. Bhatt, Director, VPKAS, Almora graced the function and emphasized the potential of aquaculture to enhance livelihood in hill areas. On the occasion, Dr. Ajay Rawat, a renowned environmentalist delivered an exhilarating talk on "Himalayan Biodiversity". Besides all the scientists, technical staff and research students of this Directorate, local dignitaries, invitees and farmers attended the function. The celebration was preceded by tree plantation within the campus, and ended with the distribution of carp seed to 11 farmers of Khatima region under TSP programme and handing over of 10,000 golden mahseer fingerlings to the Department of Fisheries, Darjeeling, West Bengal.

Hindi 'Saptah samaroh' celebration

The Hindi section conducted several intramural linguistic competitions during September 2014 to promote and recognise Hindi knowledge among the scientific, technical and administrative staff of the institute.

Safai Abhiyan

Preceding the 'Swachh Bharat Abhiyan' campaign initiated by Honorable Prime Minister, all the staff members and scholars were actively involved in "safai abhiyan" during 29th and 30th of September 2014, to ensure cleanliness and sanitation in the Directorate's premises.

Awards and Recognition

- Dr. A. K. Singh (Director) was conferred the "Vigyan Ratn award" to honour scientific excellence by the Council of Science & Technology, Government of Uttar Pradesh, India.

- Dr. Amit Pande (Principal Scientist) achieved the distinction of being selected as "ICAR National Fellow" by the Indian Council of Agricultural Research, New Delhi, to recognize his meritorious scientific contribution and to facilitate research activities under the project "Development of a method for detecting the presence of any virus signal in clinical samples of fish" in the next five years.

- Dr. Ciji Alexander (Scientist) received the prestigious "Jawaharlal Nehru award for PG outstanding doctoral thesis research in agricultural and allied sciences-2013" instituted by the Indian Council of Agricultural Research, New Delhi.

Joining

The following newly recruited Agricultural Research Service scientists joined the Directorate in the month of April 2014.

Mr. Abhay Kumar Giri (Aquaculture)

Dr. Ciji Alexander, Dr. Biju Sam Kamalam J. and Mr. Rajesh M. (Fish Nutrition)

Mr. Ritesh Kumar Tandel (Fish Health)

अनुसंधान की दृष्टी से यह अवधि शी०मा०अनु०निदेशालय के लिए काफी महत्वपूर्ण रहा है। इस अवधि में शीतजल में पायी जाने वाली दो मछलियों का प्रजनन पहली बार हुआ जिसमें देशी साइप्रिनिड मत्स्य प्रजाति चगुनियस चगुनियो जिसे सामान्यतः चगुनी नाम से भी जाना जाता है का मई माह में कृत्रिम प्रजनन किया गया, इसके साथ सजावटी तथा खाद्य प्रजाति की पर्वतीय हिलट्राउट, बेरिलियस बैन्डेलिसिस का भी प्रथम बार सफलतापूर्वक प्रजनन किया गया।

भू स्थैतिक सूचना उपकरणों के प्रयोग द्वारा सिक्किम के पूर्वी और दक्षिणी जिलों में मत्स्य पालन के लिए उपयुक्त स्थलों का मूल्यांकन अध्ययन में एस०आर०टी०एम सैटेलाइट आँकड़ो को प्रयुक्त किया गया। हिमांचल प्रदेश के 3 जिलों में मत्स्य रोगों की जाँच की गयी साथ ही 19 रेन्बो ट्राउट व 3 कार्प फार्मों से नमूनों को एकत्रित किया गया। कुल 1342 नमूने एकत्रित किए गए जिनमें से 1102 का विश्लेषण RT-PCR के द्वारा किया गया है।

शोध के साथ–साथ विभिन्न गतिविधियों को गतिशीलता प्रदान करते हुए निदेशालय में विभिन्न कार्यक्रम भी आयोजित किए गए। भारतीय कृषि अनुसंधान परिषद की स्थापना दिवस में 16 जुलाई 2014 को उत्तराखण्ड के चम्पावत जिले के खुनाटी ग्राम में ''औरनामेंटल फिश कल्चर'' पर शीत जल मात्स्यिकी अनुसंधान निदेशालय द्व ारा कृषक महोत्सव का आयोजन किया गया, इस अवसर पर संस्थान द्वारा उत्पादित 400 कोई एवं गोल्ड फिश मछली के बीज कृषको को वितरित किए गये। निदेशालय में 68 वाँ स्वतंत्रता दिवस धूमधाम से मनाया गया। इस अवसर पर डॉ. ए० के० सिंह निदेशक द्वारा ध्वजारोहण किया गया।

दिनाँक 29–30 सितम्बर 2014 को निदेशालय में माननीय प्रधानमंत्री जी की पहल पर ''स्वच्छ भारत अभियान'' के तहत सफाई कार्यक्रम चलाया गया तथा माह अप्रैल–सितम्बर 2014 के मध्य निदेशालय में विभिन्न विस्तार गतिविधियाँ यथा दिनाँक 19 जुलाई 2014 को ''इंटलैक्च्युअल प्रॉपर्टी मैनेजमैंट इन फिशरीज एण्ड एग्रीकल्चर सैक्टर्स'' पर आई.पी.आर से सम्बन्धित नियमों एवं कानूनों के सम्बन्ध में जन–जागरण कार्यशाला; दिनाँक 13 अप्रैल 2014 को किसान सम्मेलन, 30 अप्रैल 2014 प्रदर्शनी, 25 अप्रैल 2014 को सीड रैंचिग, 8 जून 2014 को रेन्बो ट्राउट बीज संग्रहण, 30 जून 2014 को जनजातीय उपयोजना में बीज वितरण कार्यक्रम, 27 जुलाई 2014 को कलिंगपोंग में झोरा मात्स्यिकी प्रबन्धन पर जनजागरण कार्यक्रम तथा 9 सितम्बर 2014 को नोगमाहेर मेघालय में जनजागरण कार्यक्रम आयोजित किए गए।

बैठकें

- दिनाँक 1–2 अप्रैल 2014 को संस्थान की अनुसंधान समिति की बैठक; दिनाँक 24 अप्रैल 2014 को क्यू०आर०टी० समिति की बैठक; दिनाँक 26 अप्रैल 2014 को संस्थान की प्रबन्धन समिति की बैठक तथा 20 मई 2014 को अनुसंधान सलाहकार समिति की बैठकें आयोजित की गई।

आगन्तुक

- 19 अप्रैल 2014 को कृषि वैज्ञानिक चयन मण्डल के माननीय सदस्य डॉ० एस०के० बान्दोपाध्याय; 16 अगस्त 2014 को डॉ० एस०के० निनानवे, सलाहकार डी०बी०टी० द्वारा निदेशालय का भ्रमण किया गया।

ICAR-Directorate of Coldwater Fisheries Research
(Indian Council of Agricultural Research)
Bhimtal-263 136, District-Nainital (Uttarakhand)

Direction & Guidance : Dr. A.K. Singh, Director
Editorial committee : Dr. R.S. Patiyal, Dr. S. Chandra, Sr. Scientists
Dr. Ciji A. and Dr. B.S. Kamalam, Scientists
Assistance : Shri A.K. Joshi, Sr. Technical Officer
Shri A.K. Saxena, Sr. Lab Technician
Published by : Director, ICAR-Directorate of Coldwater Fisheries Research
Tel : 05942-247279; 247280 Fax: 05942-247693
E-mail : dcfrin@rediffmail.com, dcfrin@gmail.com, director@dcfr.res.in
Printed at : M/s Royal Offset Printers, A-89/1, Naraina Industrial Area, Phase-I, New Delhi 110 028