10.53477/2668-2028-21-14

DIVERS' ACTIONS IN THE RIVERINE AREA

Bogdan VOINESCU
Commander (N), Graduate student, "Carol I" National Defense University
bogdan.voinescu33@gmail.com

Ionel POPESCU
Lieutenant Commander (N), Graduate student, "Carol I" National Defense University
popeye09189@yahoo.com

Abstract: *This approach proposes an analysis and a presentation of divers' actions in the riverine area in order to combat the risks and the threats which can occur there, correlated with the features and the characteristics of the environment and with the objectives of the Navy. The identification of new insights and opportunities of involving the divers in this domain through concrete, focused actions having a maximum effect in the preservation of a security climate in the riverine area is the novelty of this approach. While analyzing the actual possibilities of divers' actions in the riverine area, this article is pleading regarding the importance of using divers in this environment and it is structured on two directions. The actions of the military divers in the riverine area contain these directions that meet the national objectives regarding maintenance or getting the control over the main economic and military objectives concomitant with the research, capture or destruction of enemy`s forces. I am addressing this approach to the specialists and to those who are interested in divers' way of actions in the riverine environment. Divers are an especially important tool among the whole range of military actions in the riverine area. The actions taken by divers usually offer depth to the campaign and they have a significant role in preserving the riverine area.*

Keywords: *divers; riverine environment; riverine area.*

Through this approach, my aim is to analyze and to present divers' actions in the riverine area for the combat of the risks and threats that can occur in this area, correlated with the characteristics and the features of the riverine environment and with the objectives of the Navy. The identification of new insights and opportunities of involving the divers in this domain through concrete, focused actions having the maximum of effect in the preservation of a security climate in the riverine area is the novelty of this approach. While analyzing the actual possibilities of divers' actions in the riverine area, this article is pleading regarding the importance of using divers in this environment and it is structured on two directions. The first direction is represented by the presentation of divers' actions and contribution to the realization of the executive objectives of the fight against water diversion in the riverine area. The second direction is generated by the analysis of military actions and the research, capture or destruction of enemy's forces. Through this approach, I am addressing the specialists and those who are interested in divers' way of action in the riverine environment. I consider that the divers are an especially important tool among the whole range of military actions in the riverine area. In the riverine area, the divers are capable of unidirectional actions or can be used in decisive actions underwater. The actions taken by divers usually offer depth to the campaign and they have a significant role in preserving the riverine area.

To begin with, I consider the presentation of several concepts such as *riverine area*, *riverine zone,* types of *divers* and their classification as being relevant to a further presentation of the way of action in the specific riverine area, depending on its particularities and characteristics.

As a result of the analysis of NATO's doctrine, I observed that the *riverine area* is defined as an environment which is related to three dimensions, located on the surface, underwater and by air. These dimensions meet the areas in which *"lines of communication"*[1] can be realized only in certain conditions utilizing specially designed means.

In the national specialized bibliography, the *riverine area* is presented as *"the environment that is situated in the area of responsibility of the Riverine Fleet"*[2] and it represents

[1] ATP-08(B), *Doctrine for Amphibious Operations,* Vol. I, Change 3, NSA, 2008, 1101 (1), pp.11-1.
[2] Lucian Valeriu Scipanov, *Forţele Fluviale, nucleul capabilităţilor riverane*, Editura militară, Bucureşti, 2020, p. 236.

„the afferent area of the third dimensions (aerial, terrestrial and underwater) which interferes, delimits and corresponds to the Danube River and its banks, to the Danube Delta and to the deltaic lakes, fens, swamps, waterways, the Danube – Black Sea Canal, the lagoon complex Razem-Sinoe, the interior waters from the coast delimitated by the main lines, the sea and river ports, the beaches and the mouths of the Danube river"[3].

The concept of *riverine area*, as it is presented in the book titled "*The Fluvial Forces, the core of riverine capabilities"*[4], represents *"the interior area of the seashore, coast or delta which comprises the land area as well as the river area (flowing water), characterized by a limited number of lines (routes) of communication"*[5].

The *riverine area,* according to the definition of the specialized dictionaries, is defined as the interior area or coast area which comprises the land area and the water area, being characterized by surface natural lines of communication.

In my opinion, the *riverine area* represents an extension of the seashore area near the coast and it consists of the rivers, channels, natural levee deposits and the areas bordering them, the lakes, the deltas, the lagoon complexes, the port waters, the river basins, the flooded areas, golfs and fens.

In the case of Danube River, the *riverine area* can be defined as an area that comprises the following elements: the river and the river area, the Danube Delta, the arms and the inner navigation channels, lakes and ponds and other areas near these.

In the *riverine area*, there are different environment conditions, according to the particularities of the section in which the mission is to be executed, and for this reason the divers must adapt their modalities of accomplishing the mission judging by these geographical conditions. Because of this fact, a permanent evaluation of the risks and the threats, altogether with a careful analysis from the mentioned section of riverine action is necessary, because *"Diving into the river is a real challenge because of the characteristics which diving into a water with strong currents has, where the visibility is close to zero, and the natural obstacles are basically everywhere"*[6].

The main purpose of military divers is the defense of the objectives in the area which is under the responsibility of the Navy, regardless if these are placed at the surface of the water, on land or underwater, of the waterways and of the riverine area. The specializations of the military divers, depending on the missions and the area of responsibility, are the following: combat divers, E.O.D. divers, river divers and deep divers. The river divers act in the riverine area and *"they are specialized divers in developing activities in flowing waters and in lagoon areas (securing the armored personnel carriers and/or the assault boats during the water crossing, discovering/eliminating the underwater obstacles, the control of the immersed structures, searching and recovering the materials)."*[7]

The terms *fluvial* and *riverine* are often used as synonyms and yet these differ each from one other. I consider that the simplest explanation for this difference belongs to Professor Lucian Valeriu Scipanov and it is the following: *riverine* means *fluvial* plus *something* else. In this way, if the *river forces* act according to other forces on the river, their actions become *riverine.* Consequently, if, during a military joint action, the operation area has a river as a central element, then the operation is normally riverine.

As a partial conclusion, I appreciate that the demographic ascension, the urbanization and the fact that a significant part of world's population lives in areas near the coast demonstrate that the future operations and humanitarian interventions will most probably take place in the

[3] *Ibidem.*
[4] Lucian Valeriu Scipanov, *op. cit.*, p. 243.
[5] *Ibidem.*
[6] Cpt. Bogdan Voinescu, revista Marina Română, ediția octombrie-decembrie 2011, p. 16.
[7] FN 1, *Doctrina Forțelor Navale*, Secțiunea a II-a – Contribuția Forțelor Navale la puterea militară, SMFN, București, 2019, Art. 34, pct. 6, lit.d.

riverine area. The operations in the *riverine area* are much more different than the operations which are executed only on land or on the open sea because they are developed in a *"hostile or potentially hostile"*[8] environment. For this reason, I strongly believe that divers' actions in the *riverine area* must be well prepared ahead of the time, taking into account the geographical features of this area and being executed so that all the specific procedures are respected.

The preparation of divers' actions in the riverine area

In this chapter, I intend to present the influence of the geographical characteristics in the riverine area upon divers' actions and the preparation modalities for accomplishing their missions.

I consider the recognition activity of the areas in which the mission is to be executed as being a very important step in organizing divers' missions. In my opinion, because the characteristics of the environment and the depth of the water are in a continuous fluctuation in the riverine area, the realization of recognition from which all the important surrounding elements can emerge before the execution of the mission is planned is necessary. I would like to highlight the fact that, according to the level and to the type of the mission, taking extra time as a caution measure is needed for the execution of the recognition because the sections can be supervised, which can increase the difficulty of this activity depending on the actual circumstances.

In order to be able to execute a mission safely, this recognition must take into account the following aspects:

- the width of the river, its depth and water hydrology[9];
- the identification of natural and arranged obstacles (maps or information from the locals and authorities can be utilized);
- the identification of the access or evacuation routes in case of emergency, the places for launching the boats on the water and the risk areas;
- the identification of the places in which the current can be controlled (for example, dams and harbor locks);
- the recognition of the area in order to discover the vegetation or the landscaped elements for anchoring the boats for mission's execution in proper conditions.

Another very important aspect is represented by the analysis of the watercourse. This analysis begins from upstream (at least one hundred meters) the diving section and until the downstream of the named section (at least two hundred meters away). The areas containing underwater obstacles and weaker currents are furtherly marked in order to be utilized so that the received objectives are fulfilled.

After the execution of this analysis, the identification of the possible accident threats that can occur during the mission is necessary. While accomplishing these types of missions there can occur various accidents, reason for which the beforehand preparation and the instruction of the first aid measures in case of necessity are important. A part of the dangers that can appear are:

- drowning;
- arterial embolism;
- the entanglement of the tending line;
- the cessation of the communications with the diver;
- running out of the air supply;
- the pollution and drainage of the contaminated water;
- floating waste;
- sharp cables or obstacles which are positioned by the enemy;

[8] F.N.-1.3.1, *Doctrina pentru operații amfibii*, SMFN, București, 2018, Capitolul I, secț. 2, art. 5 (1).

[9] Hydrology represents a part of geography in which the general properties of the water (movement, distribution and quality) are studied, according to www.dexonline.ro, accessed on the following date: 10.02.2021.

- lack of visibility;
- pulmonary overventilation;
- the loss of the diver;
- underwater obstacles carried by currents;
- leg or diving equipment blocking;
- transiting watercrafts;
- enemy contact.

After the recognition and the establishment of the risk elements and of the way of action are executed, the prioritization of the execution of the mission according to the elements in the field is necessary. The following necessary stage is to be evaluated for the execution of the mission of divers and it is the selection of the involved personnel, of the diving equipment and of the weapons. For the optimal decision all the aspects mentioned above must be taken into account, and only after this a realistic plan of action through which useless risks are not assumed can be made. When the selection of the mission's participants takes place, it is compulsory that their experience is taken into consideration, altogether with the way in which divers behave in the proximity of strong currents and according to this evaluation the involvement of the personnel is decided.

Choosing the weapons, the diving device type, the technique and the diving equipment are made based on the given mission, the objectives that are to be fulfilled and the characteristics of the riverine area. The next step consists of choosing the underwater breathing machine and the diving technique while taking into account the safety measures, the evacuation possibilities in the section in which the mission is performed and the logistic ones, because *"Diving in flowing waters, more than a usual dive, is permanently demanding diver's abilities and skills and it is always different from the previous one. This aspect makes you aware of the fact that among the objectives that you have to accomplish for fulfilling the given mission is necessary for a diver, to pay attention to all the details so that the dive is realized in conditions of maximum safety"*[10].

If we refer to mission's execution modalities, these will be chosen after taking into account the natural elements in the section of action. Therefore, we can state that the condition for successful missions in the riverine area is that the divers act according to the particularities of the place and to use them to their advantage in order to fulfill their objectives. As far as the previous affirmation is concerned, I would like to support it by exemplifying the fact that, when the divers act in the direction of the current, they succeed in managing and focusing their energy for the fulfillment of the mission.

My firm belief is that the success of divers' actions is ensured through planification and control based on the following imperatives: unity of effort, adaptability, the legitimacy and the perseverance.

Divers' actions in the riverine area

Through this chapter, my aim is to present the ways in which divers enter the riverine area, their discovery possibilities, the diving activities and the types of mission they can develop.

As far as the execution of the mission is concerned, I consider that the most dangerous and complicated stage in fulfilling the mission received by the divers to be the stage of infiltrating and entering the objective. During this stage of infiltrating and entering the objective there can occur possible countermeasures because the enemy tries to reach the action section of the complete research effective – diversion with the special equipment and the related weapons, a condition that is necessary for the successful accomplishment of the received mission. It is, practically, the most propitious and indicated for exposure, disarmament and annihilation of the

[10] Cpt. Bogdan Voinescu, revista Marina Română, ediția octombrie – decembrie 2011, p. 16.

divers, because the danger of uncovering the mission is bigger than in any other stage. We cannot afford to overlook the fact that the divers can adopt different methods of ingress, according to the complexity and the type of the mission, the distance from the riverine section, the number of performers, the tactics situation, the possibilities of enemy countermeasures and the available way of entrance, each method bearing more procedures.

By analyzing the content of multiple specialized studies, I discovered that *"for the riverine area, the riverine forces mean a national capability destined to the area of Fluvial Flotilla's responsibility, the lagoon area, the mouths of the river and the Danube Delta"*[11], subject which was discussed by Professor Lucian Valeriu Scipanov, one of the few authors who analyze the riverine area.

Next, I would like to present divers' entrance methods in the area of riverine operations and the possibilities of their discoveries:

- by air: This type of entering is realized with the help of the aircrafts or parachuting in the *riverine area*. This presents a high risk of being discovered with the help of advanced systems of air-based surveillance. In the areas of interest, the assembling of the observational systems, research, detection and anti-aircraft defense is necessary because the aircrafts transporting combat divers execute flights at low heights (airdropping by helicopter) or really high (parachuting through multiple procedures). The executive attempt of interference with the surveillance and observational devices over short periods of time in order to facilitate the launching in the device is very probable. Attention: most likely, the launching will be executed at night and can be doubled by real or simulated actions;

- by water: this way of entrance and infiltration, which is executed with surface watercrafts, is the most utilized method of the divers taking into consideration of the targets and objectives in the *riverine area*. The entrance of surface ships can be uncovered with the help of observational means from the shore and will surely be executed at the same time with the development of covert actions and simulation (misinformation), which suggests something else rather than the launching of divers in the own dispositive. The divers will adopt this method in order to enter certain objectives which are found in the close vicinity of the bank and not the objectives that can be found in the depth of the dispositive.

- by land: a type of entrance and infiltration which takes place through forcing the defense means that needs to own enough information about the organization, the control's periodicity and the surveillance of the objective, detection systems and security systems. This type of entrance is hiddenly executed through the illegal cross of objective's limit. The observation, patrol and verification of the objective's perimeter with strictness and the control of the documents of any person entering the area can lead to the discovery of the true personal identity.

The diving activity in the riverine area

Analyzing the characteristics of flowing waters and taking into consideration my own experience in this domain, I can state that it is recommended that diving operations are executed with a single diver underwater in order to avoid the entanglement or the blocking of the tending line[12] because of underwater obstacles. In the case in which, for the fulfillment of the mission, the presence of two or more divers is compulsory, the equipment for autonomous divers is preferred, with the indication that these have to be well equipped with face masks so that divers have stability and protection against the possible interruptions from the air source.

During the dive, as well as during the preparation of the section that stands for the execution of the diving action, there must be at least one watercraft to oversee the section in

[11] Lucian Valeriu Scipanov, International Scientific Conference "Strategies XXI", suppl. Technologies – Military Applications, Simulations and resources, București, 2018, Vol. 2, p. 172.

[12] Tending line – the line which is tied to the one of diver's hands so that he can be brought back and continuously monitored.

which the dive is executed and observers who announce the threats that occur because of the naval traffic or other problems in time.

The surface team must always carry an at least fifty meters tending line and to plan in advance two means of communication with the diver so that they are able to react in case of necessity.

The missions which are executed in waters with many currents demands a good knowledge of hydrological forces that occur at the surface and to the bottom of the water in order to make sure that the divers and the watercrafts will safely operate.

In order to determine the behavior of the current in the action area, floating objects or mannequins can be utilized. Also, an underwater recognition of the areas in the proximity of the banks has to be executed in order to identify the rocks or other obstacles that could prevent a quick evacuation in case of emergency.

Flowing waters often change behaviors and this is why constant measurements have to be executed and based on them the initial plans may be rectified as many times as it is needed. It is very important that the speed of the flowing current is determined with most of the possible accuracy and this is why I will present two ways of determining of the flowing current in the following lines:

- the quick method implies the use of a floating object over a previously measured distance. The object is positioned in point A and the time in which it gets to B is tracked. The current equals the distance, measured in square meters and divided by the time which is measured through seconds.
- the scientific method implies utilising a mechanic machine that measures the flowing current.

In the *riverine area*, there are different conditions depending on the particularities of the section in which the mission is executed, and for this reason the divers must adapt the way of accomplishing the mission according to the geographical conditions. For this reason, the permanent evaluation of risks and a careful analysis as far as riverine section's particularities are concerned is needed.

Analysing several specialized studies, I realised that *"the riverine area belongs to a complex environment which includes the following elements: the bank area, the coast area, the Delta area, the rivers, the arms and waterways, lagoon complexes, lakes and swamps, the area in their proximity including the air space."*[13] Taking into consideration my experience in the *riverine area* and according to the identified doctrinal elements, I can mention that some of the most important types of missions that can be executed by the divers in *the riverine area,* such as:

- the research of the crossing points of the river, the marking and the arrangement of the disembarkation points, the sand banks and the evacuation routes of the troups;
- the protection of the forces, ships, river crossing equipments and the immersed structures against the underwater threats;
- the search, discovery, identification and marking of the mines and underwater obstacles;
- placement of mines and underwater obstacles;
- the execution of diversion operations;
- tactical deployment in severe weather conditions, either cold or hot;
- gathering information about the risks and execution threats which can occur among the critical infrastructure;
- the participation at the prevention or the rejection of terrorist attacks launched against the critical infrastructure from water or land in the riverine area;
- the evacuation of the personnel out of the riverine platforms, NEO (Noncombatant Evacuation Operation);

[13] Lucian Valeriu Scipanov, International Scientific Conference ”Strategies XXI”, suppl. Technologies – Military Applications, Simulations and resources, Bucureşti, 2018, Vol. 2, p. 173.

- the execution of search and rescue operations in the riverine area;
- taking part into the defense of own communication ways;
- the execution of the noninvasive control of the immersed structures (dams, airlocks, docs, platforms, pipes, submarines);
- refloating the ships that block the waterway;
- maintenance work and reparation on immersed structures (montage, cut, welding);
- the execution of the search for fluvial or naval mines launched by the enemy in the port waters, fluvial or maritime sections, in navigable channels or in fluvial lakes and the adjoining terrestrial space;
- the recovery and destruction of the found mines and UXOs (unexploded ordnance);
- executing EOR (explosive ordnance reconnaissance) and researching EOD (explosive ordinance disposal) of the river areas and internal water courses, coast, seashore, delta and ensures the safe mooring for watercrafts, providing information about possible threats;
- taking part in the defense of the river ports, the stationing places through the antimine control of the military and economic objectives;
- executing the antimine control of docs, locks, dams;
- supporting other groups or teams such as EOD when their effectives and their time are limited;
- providing the protection of the logistics means and of the routes for supplies in the area of responsibility;
- directly supporting the forces for special operations and their actions;
- taking part in the recovery of ammunition and weaponry from the civil population in the operation area;
- execution of the recognition, identification, neutralization and/or the destruction of UXOs in the military areas for training and instruction, from the back of the operative dispositive;
- search, discovery, identification, marking and recovery of materials, weapon systems and sunken boats;
- taking part into the arrangement of the underwater structures for the execution of strategic designs;
- execution of the tactical deployment in extreme hot or cold weather conditions;
- execution of noninvasive underwater control over the underwater immersed structures.

Conclusions

In my opinion, the riverine area is equally dangerous and unpredictable. I conclude that divers' missions in the riverine area must be planned according to its particularities and characteristics. The conditions of the work environment (depth, temperature, visibility) in the riverine area, the number of available divers and the intensity of the organized actions imply taking the most optimal choice for the execution of the mission.

I consider that the novelty of this article consists of the attempt to identify the role of the divers in the riverine area, the missions they can execute and the optimal means for their preparation and accomplishment. The divers in the riverine area are capable of unidirectional actions or can be utilized in decisive actions in depth.

My firm belief is that the divers represent specialized forces who can act with the maximum of efficiency for the defense of the economic objectives regarding the riverine area, the lagoon area in the Danube Delta or the surface of the river. The geographical placement of Romania and the current global and regional tendencies emphasize the importance of the riverine area as a special area of interest. The riverine areas are more complex than other objectives because their particularities demand the use of highly prepared forces for quick and precise action. To conclude, the divers are, unquestionably, the proper force to choose for the

complex missions in the riverine areas and they are preferred because they have the capacity to operate and to cross through all the environments in an efficient way. The military operations in the riverine area are more complex than other military operations due to the particularities and the links between all the implied forces. As a consequence, I think that the divers are the ideal tool for decisive actions in the riverine area.

BIBLIOGRAPHY

1. *S.M.G. 18 – Doctrina pentru operaţii întrunite a Armatei României*, Bucureşti, 2014.
2. *FN 1 – Doctrina Forțelor Navale, Secțiunea a II-a – Contribuția Forțelor Navale la puterea militară,* SMFN, București, 2019.
3. *F.N. – 1.3.1, Doctrina pentru operații amfibii, SMFN*, București, 2018.
4. *F.N. – 9/1 Instrucțiuni privind executarea activității de scufundare,* București, 2007.
5. MUREȘAN Ioan-Mircea Gl., dr., gl. de brigadă dr. VĂDUVA Gheorghe, *Războiul viitorului, viitorul războiului,* Editura Universităţii Naţionale de Apărare ”Carol I”, Bucureşti , 2006.
6. DEGERATU Mircea, PETRU Aron, IONIȚĂ Sergiu, *Manualul scafandrului*, București, 1999.
7. FN 9.5, *Competențe minime ale scafandrilor*.
8. PUICHILIȚĂ Aurel, *Concepții moderne de întrebuințare a scafandrilor de luptă în armatele N.A.T.O.,* Editura Universităţii Naţionale de Apărare “Carol I”, București, 2004.
9. FLEȘERIU Cătălin-Sorin, *Executarea diversiunii sub apă, de către scafandri de luptă, în perioada ripostei maxime*, Editura Academiei de Înalte Studii Militare, București, 2001.
10. ATANASIU Traian, GRAD Vasile, MIHAI Cornel, GEORGESCU Ştefan, *Acţiunile scafandrilor deminori în viziunea flotelor occidentale,* Editura ExPonto, București, 2000.
11. ATP-08(B), *Doctrine for Amphibious Operations*, Vol. I, Change 3, NSA, 2008, 1101 (1).
12. SCIPANOV Lucian Valeriu, *Forțele Fluviale, nucleul capabilităților riverane*, Editura Militară, București, 2020.
13. VOINESCU Bogdan, cpt., Revista „Marina Română”, ediția octombrie-decembrie 2011.
14. SCIPANOV Lucian Valeriu, International Scientific Conference ”Strategies XXI”, suppl. Technologies-Military Applications, Simulations and resources, București, 2018, Vol. 2.
15. NISTOR Florin, *Să redescoperim arta operativă maritimă,* Editura Universității Naționale de Apărare ”Carol I”, București, 2017.
16. FM 7-93, *Long-Range Surveillance Unit Operations*, HQ, Department of the Army, Washington DC, 1995.
17. FM 31-20-5, *Special Reconnoissance Tactics*, Techniques and Procedures for Special Forces, HQ, Department of the Army, Washington DC.