

**On approval of the Rules for ornithological support of flights of state aviation of the Republic of Kazakhstan**

***Unofficial translation***

Order № 268 of the Minister of Defense of the Republic of Kazakhstan dated April 23, 2019. Registered in the Ministry of Justice of the Republic of Kazakhstan on April 24, 2019 № 18580.

*Unofficial translation*

      In accordance with subparagraph 27) of Article 15 of the Law of the Republic of Kazakhstan dated July 15, 2010 "On Use of Air Space of the Republic of Kazakhstan and Aviation Activity", **I ORDER**:

      1. To approve the attached Rules for ornithological support of flights of state aviation of the Republic of Kazakhstan.

      2. The office of the Commander-in-Chief of the air defense Forces of the Armed Forces of the Republic of Kazakhstan in the manner established by the legislation of the Republic of Kazakhstan shall ensure:

      1) state registration of this order in the Ministry of Justice of the Republic of Kazakhstan;

      2) sending a copy of this order to the Republican state enterprise on the right of economic management "Institute of legislation and legal information of the Republic of Kazakhstan" of the Ministry of Justice of the Republic of Kazakhstan for official publication and inclusion to the Standard control bank of regulatory legal acts of the Republic of Kazakhstan in the Kazakh and Russian languages within ten calendar days from the date of state registration;

      3) placement of this order on the Internet resource of the Ministry of Defense of the Republic of Kazakhstan after its first official publication;

      4) sending information to the Legal department of the Ministry of Defense of the Republic of Kazakhstan on implementation of measures provided for in subparagraphs 1), 2) and 3) of this paragraph within ten calendar days from the date of state registration.

      3. Control over execution of this order shall be assigned to the heads of state aviation management bodies of the Republic of Kazakhstan.

      4. This order should be brought to the officials in the part concerning them.

      5. This order shall be enforced upon expiry of ten calendar days after its first official publication.

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| *Minister of Defense* |
| *of the Republic of Kazakhstan Major-General* | *N. Yermekbayev* |

      "AGREED"

      Ministry of Internal Affairs

      of the Republic of Kazakhstan

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      Committee for National Security

      of the Republic of Kazakhstan

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|  | Approved by the order of the Minister of Defense of the Republic of Kazakhstan dated April 23, 2019 № 268 |

**Rules for ornithological support of flights of state aviation of the Republic of Kazakhstan**  
**Chapter 1. General provisions**

      1. The rules for ornithological support of flights of state aviation of the Republic of Kazakhstan (hereinafter – the Rules) are developed according to subparagraph 27) of Article 15 of the Law of the Republic of Kazakhstan dated July 15, 2010 "On Use of Air Space of the Republic of Kazakhstan and Aviation Activity".

      2. Basic terms and definitions used in these Rules:

      1) aviation ornithology - an applied discipline of general ornithology, which studies the fauna, ecology, behavior and migration of birds in terms of ensuring flight safety, as well as the development and implementation of measures on prevention of collisions of aircrafts (hereinafter-AC) with birds;

      2) Ornithology - a branch of vertebrate zoology that studies birds, their embryology, morphology, ecology, systematics, and geographic distribution;

      3) a difficult ornithological situation – presence or appearance of birds in the path of the aircraft (on the runway during take-off and run or flight path), which can lead to a collision with it;

      4) birds - one of the most common classes of vertebrates, the vast majority of which have the ability to fly. According to modern estimates, the number of bird species does not exceed 8,600. The large number, wide distribution, and their flights (migrations) cause a significant danger to the AC;

      5) wintering birds-arriving in this area for the winter, and flying away in the spring;

      6) flock of birds - a set of individuals, having a common space of life activity for a long period of time;

      7) ornithology – the science about birds, a section of Zoology, studying the life of birds (their morphology, physiology, systematics, ecology, biography);

      8) ornithofauna – a set of birds, inhabiting a certain territory or found on it at any time of the year;

      9) an ornithological situation – an actual distribution, quantitative and species composition, the nature of the habitat and behavior of birds in the air and on the ground, by place and time;

      10) settled birds- living in this area all year round. They are very close to sedentary nomadic birds. They also live in a certain area, but from the second half of summer until the next spring, they move in search of food;

      11) migratory birds– which fly for the winter from this area to another and return only in the spring for laying eggs and hatching offspring;

      12) ornithological support of flights - a set of measures aimed at preventing aircraft collisions with birds.

      Footnote. Paragraph 2 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      3. The plan of measures for ornithological support of flights shall be developed by meteorological division of the military unit (hereinafter- meteorological division).

      4. The plan of measures includes identification and elimination of conditions, contributing to the concentration of birds at the airport and surrounding area, conducting classes with specialists of the meteorological division (hereinafter- meteospecialists) on aviation and ornithological topics and other specifics of flight support.

      5. Meteorological specialists at airfields and persons in charge of ornithological support shall undergo training courses (trainings)at least once every 2 years in accordance with the combat training course (special training program) and at least once every 5 years upgrade their qualification in specialized courses.

      Footnote. Paragraph 5 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      5-1. At joint airfields, in coordination with the airport management, meteorologists shall undergo practical training with experience swap, in organizing direct interaction with the airport's aviation ornithologist and measures to identify and eliminate conditions conducive to the concentration of birds.

      Footnote. The Rules have been supplemented with Paragraph 5-1 pursuant to the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      6. Meteospecialists, engineer-weather forecaster on duty when providing flights shall carry out:

      1) ensuring flights for the purpose of flight safety in ornithological terms in accordance with these Rules;

      2) analysis and forecast of ornithological situation;

      3) providing information to the commander (senior flight shift) and flight personnel about the ornithological situation at the airfield;

      4) consultations and conducting classes with flight personnel, management team, combat control officers (hereinafter-CCO) and personnel of the meteorological service (hereinafter-meteorological service), the near- driving radiomarker point, the distant-driving radiomarker point;

      5) control of the correctness and timeliness of taking measures on prevention aircrafts collisions with birds.

      7. Aviation ornithology classes shall be held before the spring and autumn periods of the year. In aviation ornithology classes are studied:

      1) features of ornithological situation in different seasons of the year in the area of the aerodrome(species composition, places of accumulation and main routes of flights of birds that are dangerous for aircraft flights);

      2) distribution of cases of collisions of aircrafts with birds at this aerodrome by seasons of the year, periods of day, altitude;

      3) organization of ornithological flight support at the airfield;

      4) visual and radar observations of ornithological situation in the area of the airfield;

      5) elimination of conditions in the area of the airfield, contributing to concentration of birds;

      6) actions of the crews in flight to reduce the probability and danger of aircraft collisions with birds;

      7) consequences of aircraft collisions with birds (material damage, dangerous situations in flight).

**Chapter 2. Procedure for ornithological support of flights of state aviation of the Republic of Kazakhstan**

      8. The procedure for ornithological support of flights includes:

      1) organization of ornithological support of state aviation flights;

      2) identification and elimination of conditions, contributing to concentration of birds;

      3) birds watching;

      4) conducting an ornithological survey of the aerodrome area;

      5) frightening away birds from airfields;

      6) actions of the crews during flights in complicated ornithological conditions.

      Paragraph 1. Organization of ornithological support of flights of state aviation

      9. Ornithological support of flights shall be organized by a senior aviation chief of the aerodrome and carried out by the personnel of the duty crew of the meteorological unit, command post, units of communications and radio-technical support, the persons of the starting team and crews, performing flights.

      10. To develop measures preventing aircraft collisions with birds, a non-staff ornithological commission shall be established at the airfield, chaired by the deputy commander of the aviation unit (deputy head of the aviation department, division of the Aviation Service of the National Security Committee of the Republic of Kazakhstan (hereinafter -AS of NSC RK), and an action plan for ornithological support of flights shall be approved twice a year. If several aviation units (departments, divisions of AS of NSC RK) are based at the airfield, a single commission shall be established under the chairmanship of the deputy commander of the unit (deputy head of the aviation department, division of AS of NSC of the Republic of Kazakhstan), the commander (head of the aviation department, division of the AS of NSC RK) who is the senior aviation commander at this airfield.

      Footnote. Paragraph 10 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      11. In organization and implementation of activities for ornithological support of flights take part:

      1) officials of the military unit (directorate, department of the AS of the National Security Committee of the Republic of Kazakhstan):

      deputy commander of the military unit (for combat training) - head of the combat and physical training department (deputy head of the aviation department, AS department of the National Security Committee of the Republic of Kazakhstan);

      deputy commander of the military unit (for material and technical support) - head of the material and technical support department (hereinafter - MTS) (deputy head of the aviation department, AS department of the National Security Committee of the Republic of Kazakhstan);

      head of the airfield engineering service of the MTS;

      the head of the radio technical communications support (hereinafter - RTS) unit

      head of the meteorological service of the Headquarters;

      2) persons of the flights management group:

      manager of flights (hereinafter – MF);

      assistant of the manager of flights;

      head of the near zone;

      head of the landing zone;

      head of the distant zone;

      combat control officer;

      duty officer for receiving and releasing aircrafts;

      3) flight support group:

      meteorological engineer on duty;

      weather observer on duty;

      observer for landing planes;

      observation posts at communication center facilities of command and dispatcher post (hereinafter - CDP), runway command post (hereinafter -RCP), radio-technical landing system, radio-technical short-range navigation system, long-range radio marker station (hereinafter referred to as LRMS), middle radio marker station (hereinafter referred to as - MRMS);

      4) cordon team and ornithological posts.

      Footnote. Paragraph 11 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      12. Meteospecialists of the military unit in the course of providing flights at the aerodrome shall carry out:

      1) visual, aerovisual ornithological observations, collection of data on flights and birds migrations coming from the calculations of CDP, SCP, radar landing system, calculations of NDRP and DDRP, cordon teams, other meteorological units, weather reconnaissance aircrafts and aircrafts crews that performed flights. Transmission of visual observations of ornithological situation shall be carried out by the code for transmitting data about ornithological situation (hereinafter-CMS-OO) code scheme according to Appendix 1 to these Rules;

      2) bringing data to the command, calculations of control points, flight personnel about the actual and expected ornithological situation in the area of basing and flights, and during seasonal migrations, recommendations and suggestions for limiting or stopping flights by altitude, routes and time of day;

      3) transfer of data from ornithological observations to the meteorological center (hereinafter-the meteorological center) and other meteorological divisions on the request;

      4) development of suggestions for conducting aerial and radar reconnaissance of ornithological situation;

      5) participation in organization and conduct of ornithological surveys of airfields, preparation and generalization of reference data on the characteristic features of ornithological situation in the area of basing and flights in different seasons of the year;

      6) drawing up maps-schemes of ornithological situation of the area of basing and flights;

      7) participation in the investigation of aviation accidents and incidents related to collisions of aircraft with birds;

      8) participation in the development of suggestions on elimination of factors, attracting birds to the airfields and on the use of devices to scare away birds;

      9) research and implementation of new effective ways of assessing and predicting ornithological situation, forms of its visual display and bringing it to the management and flight personnel.

      13. The meteo center shall perform the following activities:

      1) organizes collection of data on ornithological situation in the areas of basing aviation units, including from organizations dealing with the issues of ornithology (hunting farms, national parks, reserves) and carries out their centralized bringing to the meteorological divisions of the units;

      2) carries out control over conduct of ornithological support of flights in the units and provides them with the necessary assistance;

      3) develops and transmits a forecast about the expected ornithological situation on the territory of the Republic of Kazakhstan to the meteorological divisions;

      4) studies the dependence of birds migration parameters (altitude, time, flight intensity, etc.) on changes in meteorological conditions in different seasons of the year, participates in scientific researches on aviation ornithology;

      5) develops methodological documentation for ensuring flight safety in ornithological terms.

      14. The locations of devices of frightening away birds at the aerodrome shall be determined by the senior aviation chief of the airfield.

      15. The division of communication and radio engineering support of flights of the aviation unit at the airport shall carry out:

      1) conduct of radar and visual observations on the NDRP and DDRP for birds and reports the results to the persons of the flight management group and the meteorological division;

      2) providing ornithological posts (operational groups) with means of communication for transmitting information about birds migrations;

      3) recording on tablets (tracing paper) flights of flocks of birds and photographing during flights of indicators of a circular review with marks from them;

      4) conducting practical trainings with calculations of command posts, radar landing systems, operators of radar systems and meteospecialists on recognition and detection of birds on radar indicators.

      16. To prevent aircraft collisions with birds during flight operations, analysis of ornithological flight support shall be made twice a year, which includes:

      1) clarification on the results of an ornithological survey of visual and radar observations and an ornithological survey of the terms, places of crowds and migrations of birds at the aerodrome and aerodrome territory;

      2) clarification of the reasons for concentration and mass migrations of birds in the area of the airfield;

      3) identification of the most frequently repeated circumstances of aircraft collisions with birds (type of aircraft, altitude and speed of flight, place of collision, type of birds, time of day and year);

      4) determining the consequences of collisions (the number and nature of aircraft damage, material damage due to repairs, downtime, discontinued takeoffs and forced landings of aircraft);

      5) analysis of the activity of units on ensuring protection measures of the aircraft from collisions with birds;

      6) organization and implementation of visual, aerovisual, and ornithological observations;

      7) collection, generalization and analysis of data on flights and migrations of birds in the area of the airfield, polygons and flight routes;

      8) organization and conducting radar observations of the ornithological situation in the area of the airfield;

      9) informing the command, air traffic control centers and aircrew about the actual and expected ornithological situation in the area of basing and flights, timely warning of its complication;

      10) conducting measures on elimination of the factors, attracting birds to the airfields;

      11) use of acoustic, bioacoustic, pyrotechnic and other means to scare away birds from airfields;

      12) analysis of aircraft collisions with birds, research and implementation of new effective means of frightening away birds into practice of ornithological flight safety.

      Footnote. Paragraph 16 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      17. Data on aircraft collisions with birds shall be recorded within 1 hour after the end of flights in the data log of aircraft collisions with birds at the airfield according to the form of Appendix 2 to these Rules and shall be verbally reported to the weather center immediately.

      Footnote. Paragraph 17 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      18. To develop measures preventing aircraft collisions with birds at the aviation base, a non-staff ornithological commission chaired by the deputy commander of the military unit (deputy head of the aviation department, AS department of the NSC of the Republic of Kazakhstan) shall conduct an ornithological survey of the airfield area twice a year in the spring (March-May) and autumn (September-November) seasons.

      Footnote. Paragraph 18 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      19. Ornithological surveys is also carried out in cases of:

      1) increasing the number and activity of birds based on visual, aerovisual and radar observations;

      2) changes in the conditions in the area of the aerodrome associated with human activity (development of agricultural land, intensive construction of residential buildings and garden and cottage cooperatives).

      20. The freelance ornithological commission studies the peculiarities of ornithological situation of the aerodrome area and determines the degree of its danger, as well as takes necessary preventive measures aimed at preventing aircraft collisions with birds.

      According to the results of ornithological survey of the aerodrome area, an act shall be drawn up, which indicates the time of the survey, routes, group composition, survey results, and is also evaluated:

      1) the state of passive technical means of frightening away birds (mechanical and non-mechanical stuffed animals, scarecrows with mirror elements and rotating parts, models of birds of prey);

      2) availability and serviceability of available standard (service) acoustic means of frightening away birds (translators of recordings of alarm calls of birds, siren sounds in stationary and mobile versions);

      3) availability and serviceability of acoustic installations for frightening away birds, rocket launchers and hunting rifles;

      4) provision of calculations of observation posts with means of observation.

      21. At least twice a year, the aerodrome's non-staff ornithological commission shall develop an action plan for ornithological support of flights safety to prevent aircraft collisions with birds at the aerodrome according to the form of Appendix 2-1 to these Rules. The Plan shall reflect the timing of the actions.

      Footnote. Paragraph 21 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      22. After the deadline for implementation of the plan of preventive measures, the freelance ornithological commission of the aerodrome assesses the quality and completeness of the measures carried out, the trend of changes in the ornithological situation in the area of the airfield, and decides to take additional preventive measures and methods of frightening away the birds.

      At the end of each training period, the effectiveness of measures on prevention of aircrafts collisions with birds shall be considered at a meeting of methodological council of aviation units.

      23. In order to quickly obtain ornithological information, birds watching shall be organized at airfields. Birds are divided into several large groups according to their habitats:

      1) waterfowl-whose lifestyle is associated with rivers, lakes and other reservoirs (ducks, geese, gulls);

      2) near water - whose life is associated with moistened areas (sandpipers, herons, shepherdesses, and so on);

      3) steppe and desert - living in the areas with dry open spaces (bustards, little bustards, sandgrouse);

      4) forest or dendrophilous - whose life activity is associated with woody vegetation (capercaillie, black grouse, magpies);

      5) birds of cultural landscape that live on agricultural lands (crows, rooks, sparrows).

      24. According to the nature of their stay in a certain region (area), birds are divided into settled, migratory and wintering.

**Paragraph 2. Identification and elimination of conditions, contributing to birds concentration**

      25. An activity on changing ecological and ornithological situation in the vicinity of the aerodrome in an unfavorable way for birds are carried out only if they allow you to eliminate the actual reasons for concentration of birds at this aerodrome or regular mass migrations of birds through its territory (otherwise, the number of birds at the aerodrome may even increase).

      Changing of environmental situation, that is, the conditions for the birds' habitat, gives the most effective results for regulating their numbers at the airfield. Frightening away birds with bioacoustic, mock-up and other means, as well as shooting, causes a temporary effect and does not replace measures on elimination the main factors, attracting birds.

      When planning and conducting such measures on elimination of birds, it is necessary to take into account that biologically illiterate actions can cause undesirable and even opposite consequences, since instead of some birds, other more dangerous for flights bird species may appear at the airfield.

      Elimination and maintenance of a small number of birds at the aerodrome is possible only with a systematic, purposeful change in environmental conditions.

      26. Divisions of engineering-aerodrome service of the MTS department eliminate conditions, contributing to concentration of birds on the runway (hereinafter-the runway), collect and determine the remains of birds found on the runway and near it, shot down by the aircraft.

      27. During flight operations, the cordon team (ornithological checkpoints), having received an indication from the flight director about bird gathering, shall immediately go to the airfield territory where birds posing a potential threat to aircraft have been detected.

      By means of a smooth-bore (hunting) gun, pyrotechnic means, light-signal flare, the cordon team shall take actions to scare the birds away from the airfield territory until the birds do not pose a threat to the flight and aircraft movement.

      Footnote. Paragraph 27 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      28. In cases of mass accumulation of birds in the spring-summer-autumn periods, shooters with a sufficient amount of ammunition are placed in the following places:

      1) landing points, take-off points of the aircraft (outside the runway);

      2) in places where the taxiways are adjacent to the runway until the "lights out" command of the MF.

      29. All measures on elimination conditions, contributing to concentration of birds are divided into groups:

      1) conducted at airfields;

      2) conducted on the aerodrome territory.

      30. The reasons for concentration of birds at airfields are eliminated by divisions of engineering-aerodrome service of the MTS of the military unit.

      31. The main activities undertaken at the airfields include:

      1) cutting down thickets of bushes within the airfield;

      2) mowing grass cover on the airfield;

      3) cutting down trees and thickets of bushes near the aerodrome that attract birds for nesting, resting and spending the night;

      4) mowing the grass cover at the aerodrome to the optimal height (in most cases, it is 20-25 centimeters, but at separate airfields it can be installed taking into account the analysis of long-term observations and recommendations of the freelance ornithological commission);

      5) reducing the possibility of nesting birds on aerodrome structures (hangars and other buildings);

      6) reclamation works on wetlands (wetted) sections of the airfield, their drainage and backfilling;

      7) elimination of access to food waste from kitchens, canteens, by storing food waste in closed containers, complete disposal of waste in rooms closed from birds;

      8) setting traps for catching birds;

      9) installation of dead carcasses and stuffed birds in places of birds concentration;

      10) preventing the use of the aerodrome territory for agricultural crops that attract birds;

      11) conducting chemical treatment on the territory of the aerodrome against insects that attract birds;

      12) cutting down at the very beginning of nesting of birds of upper branches of trees on which nesting colonies of birds are located or knocking down nests by means of water cannons;

      13) elimination or prevention of creation of food waste within a radius of 15 kilometers (hereinafter – km) from the aerodrome or their transfer to the side so that birds flying to landfills from places of accumulation do not cross the runway and approaches to it;

      14) plowing and replowing of agricultural fields with grain crops surrounding the airfield, only at night;

      15) construction of the fur farms, slaughterhouses and other objects contributing to mass gathering of birds dangerous for flights of aircraft, as well as farms (piggeries, cowsheds, poultry farms, fur animal farms, fish ponds) that contribute to mass accumulation of birds is not allowed closer than 15 km from the aerodrome control point;

      16) draining of small reservoirs near the airfield, which are a place of accumulation of birds flying through the aerodrome territory;

      17) mowing of high coastal vegetation on reservoirs located near the airfield, which is a place of mass nesting, recreation and overnight stay of birds;

      18) production and repair of means for frightening away birds (turntables, stuffed animals, scarecrows);

      19) installation and placement of means of active birds frightening away at the aerodrome in accordance with the scheme of placement of means of active birds frightening away at the aerodrome to Appendix 3 to these Rules;

      20) allocation of posts for the period of flights (from the cordon team) and providing them with means for frightening away birds.

      32. Frightening away birds from airfields shall be performed using various means (bioacoustic installations, guns, rocket launchers, pyrotechnics, air guns, mechanical repellents, mirror balls, laser installations, carcasses of dead birds, rattles, gas guns, models of birds of prey, fire engines, flags and other means).

      33. Various types of herbs and their seeds also attract birds. Therefore it is necessary to study the actual composition of the grass cover and determine its attractiveness for birds and specify in the act of ornithological commission of the unit.

      If there are herbs, attracting birds, it is advisable to provide for their gradual replacement. The composition of the grass mixture for each aerodrome should be selected taking into account climatic characteristics and species composition of birds in this area (for example, flowering clover attracts insects and, consequently, insectivorous birds, seeds serve as food for pigeons, partridges, and leaves for waterfowl).

      34. Elimination measures at airfields and near-aerodrome territories, contributing to accumulation of birds shall be conducted only in agreement with local executive bodies.

      35. Catching birds at airfields shall be done with pitfalls, nets, webs, traps, sleeping pills and other means.

**Paragraph 3. Birds watching**

      36. Aerovisual, visual, and radar observations of birds are conducted at the airfield.

      Visual observations are the main way to collect information about the number, behavior, and species composition of birds. The personnel of meteorological service, NDRP and DDRP, the units of the MTS are involved to them.

      Visual observations are conducted from observation points located at the CDP, command post, SCP, meteorological site, NDRP and DDRP for 2 hours in the morning and evening and 1 hour at noon. Special posts are also set up for these purposes.

      37. During visual observations, the observer accurately determines the species composition and quantitative ratio of local and migratory birds (in low-cloud weather and daytime, visual observations at the aerodrome are divided into two types:

      1) hourly observations are made in the daytime hourly (5-10 minutes at the beginning of each hour);

      2) operational observations during aviation flights.

      Visual observations are made simultaneously with meteorological observations, and on the NDRP and DDRP at the direction of the MF command.

      38. During visual observations, the visible part of the sky and the surrounding shall be examined, the greatest attention is paid to the area adjacent to the runway at the take-off and landing course. The zone of responsibility of the duty observer at the meteorological site has a radius of 1.5 km, and on the CDP, SCP, nearest driving beacon, distant driving beacon-1 km. It is advisable to set the sizes of responsibility zones for visual observations at airfields taking into account that an observer without binoculars can detect single medium-sized birds and small flocks of small birds, specified in the scheme of responsibility zones for birds observations according to Appendix 4 to these Rules.

      39. In a large flock, the number of birds shall be determined by their number in one part, followed by recalculation for the entire flock. In this case the number of birds depending on the size of the flock shall be rounded: small, medium and large flocks (5-20, 20-50, 50-100 birds) – up to ten; large flocks (over 100 birds) – to hundreds, and flocks of over 1,000 birds to thousands.

      The observer studies the main types of local (settled) and migratory birds at his airfield. When identifying unfamiliar flying birds, the observer must specify the approximate size: small-from a sparrow, medium-from a pigeon, large-from a goose, according to the silhouettes of birds on the ground according to Appendix 5 to these Rules, in flight and on the water according to Appendix 6 to these Rules. The results of observations shall be recorded in a special journal of ornithological observations in the form, AB-20 according to Appendix 7 to these Rules.

      40. Operational ornithological observations are made only during flights. The order and time of their conduct shall be set by the MF for each flight shift. In addition to observations at the meteorological site, NDRP and DDRP operational observations of birds are made by the assistant of the MF, the duty forecaster of the CDP, the observer of aircrafts coming in for landing, specially set posts, as well as the starting team and cordon.

      41. The main task of the observers is continuous monitoring of the actual ornithological situation and timely reports on it to the MF. At the same time, it is of particular importance to detect timely complications of ornithological situation that threaten flights safety.

      42. Radar observations of birds shall be carried out by duty calculations on regular radar facilities for recognizing flashes from flocks of birds on radar indicator screens (hereinafter - radar) provided for in the features of identifying flashes from birds on radar screens according to Appendix 8 to these Rules.

      43. Ornithological observations shall be carried out in the presence of meteorological conditions favorable for bird flights, when the duration of precipitation does not exceed 1/6 of the day, and the average surface wind speed is not more than 8 meters per second, by landing, control and surveillance radars in the areas of responsibility established for their calculations 15-20 minutes every 3 hours on flight days. Marks from flocks of birds on radar indicators shall be photographed, their heights and directions of movement shall be determined.

      Footnote. Paragraph 43 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      44. In order to ensure flights safety from an ornithological point of view, regular radar stations at airfields are the main technical means for conducting birds observations. These include:

      1) radar detection and guidance, the zone of confident detection from 25-30 to 60-70 km, depending on the flight altitude;

      2) dispatch radars, the zone of confident detection of flying birds at an altitude of 500 meters (hereinafter-m), is located within 15-20 km;

      3) landing systems, birds detection zone at a distance from 1 to 15 km at an altitude of up to 2000 m.

      The course and landing locator provides the ability to simultaneously determine the position of birds and aircrafts coming in for landing. This allows the head of the landing zone on the radar system to warn the MF, and if necessary, the pilot about a dangerous approach to birds and promptly give him commands to change the course and altitude or to go to the second circle.

      45. The time of observations and data transmission from radar systems is specified by the MF for each flight shift, depending on the complexity of ornithological situation.

      Radar reconnaissance of ornithological situation is conducted:

      1) 1 hour and 20-25 minutes before the departure of the weather scout, as well as 30 minutes before the start of flights;

      2) during flights as directed by the MF.

      46. The results of observations are reported by the operators on duty of radar systems and the head of the landing zone to the MF, reported to the meteorological division or to the duty forecaster at the CDP and recorded in a special journal in the form AB-18. The duty forecaster records the results of radar ornithological observations in the starting journal, puts them in a special journal, on a special tablet, analyzes them and, together with other information about birds, reports the general ornithological situation to the MF.

      Radar observations should be carried out with special care during seasonal bird migrations by the on-duty calculations. If necessary, during these periods, observations are organized on the night preceding the planned flights for the next night, which allows to determine in advance possible ornithological conditions for flights and their changes.

      Identification of echoes from birds on the radar indicator is made taking into account their distinctive features of echoes from birds according to Appendix 9 to these Rules.

      47. Aerovisual method of birds observation and assessment of situation allows to visually observe birds, determine their species composition, number, concentration features and nature of migrations, keeping young birds in flocks, and other important characteristics. Birds observations and assessment of ornithological situation using helicopters or transport aircrafts shall be carried out over a large area in a relatively short time and the taken results can be quickly used to ensure flights safety. Observations are made not only for flying birds, but also for sitting on trees, land and water.

      48. Aerovisual surveys of the territory of airfields and areas of helicopter (aircraft) flights are recommended to conduct during the transition seasons of the year and when the ornithological conditions become more complicated during the flights organization, in order to determine or clarify ornithological situation.

      The presence of an observer or an ornithologist on the board of a helicopter (transport aircraft), who conducts qualified observations allows to obtain complete and high-quality ornithological data.

      49. When organizing aerovisual observations, to provide for the stages of work:

      1) organization of the flight;

      2) direct maintenance of aerovisual observations for the survey of necessary areas or territories;

      3) processing and analysis of observation results obtained during the flight;

      4) report of data to the command, FM and the meteorological center.

      The result of aerovisual observations is preparation of a special map-scheme.

      50. In areas where crowds of birds, soaring predators, storks or pelicans dangerous for aviation are detected, it is planned to leave the observer on land transport in order to examine them more detailed simultaneously from the air and the ground.

      51. It is best to record the results of observations on video and photography, as well as recording in a specially prepared journal.

      During the processing of the material received as a result of departure or flight, the following operations are performed:

      1) video and photo processing, entries in journal;

      2) counts of birds in the crowds, detected during the flight;

      3) comparison and averaging of data recorded by several observers;

      4) linking places of crowds and flying flocks detected during the flight to a geographical location on the working map-scheme;

      5) detailed display of all received information on the main map-scheme.

      The results of processing and analysis of the flight data shall be reported to the command and to the meteorological division, an ornithological summary shall be compiled, which is sent to the specified addresses by telegram.

**Paragraph 4. Conducting an ornithological survey of the aerodrome area**

      52. Ornithological survey of the aerodrome is carried out in order to determine the nature of ornithological situation, routes and altitudes of birds flights, their daily activity and nature of seasonal migration, number and species composition of flocking birds, features of their behavior (nesting, feeding, resting), as well as identifying conditions, contributing to concentration of birds at the aerodrome area.

      53. At the planning stage, the aerodrome ornithological commission makes a preliminary assessment of ornithological situation, determines the upcoming scope of work, and outlines the final results of the work.

      During the preliminary assessment of ornithological situation, the statistics of aircrafts collisions with birds in the aerodrome area over the past 5-7 years are analyzed, data from previous ecological and ornithological surveys of the aerodrome area are studied, and the results of visual, aerial and radar observations of ornithological situation over the past month are summarized.

      54. Based on the results of a preliminary assessment of ornithological situation, a Plan for an ornithological survey of the aerodrome area shall be drawn up, which is approved by the senior aviation chief of the airfield.

      The Plan for ornithological survey of the aerodrome area shall indicate:

      1) routes of ground-based ornithological survey;

      2) zones (sectors) of responsibility for visual and radar observations of birds;

      3) type of land and water transport used in the process of ornithological survey;

      4) attracted radar means of birds watching;

      5) time of detection of daily migrations of birds (morning, midday and evening hours);

      6) terms of conducting survey and responsible persons.

      55. An ornithological survey of the aerodrome area shall be carried out by ground and aerovisual study of ornithological situation by a group of specialists consisting of up to 3-5 people for 1-2 days using cars, boats and other vehicles, if necessary - on foot.

      56. During the ornithological survey of the aerodrome, a ground survey of the airfield shall be carried out, as well as a survey of the area and airspace within a radius of 4-6 km from the aerodrome control point, while:

      1) the number and species composition of birds constantly living at the aerodrome, periodically arriving in search of food and convenient places for recreation, flying in transit or accidentally flying into the area of the aerodrome is established;

      2) nesting areas of rooks, jackdaws, crows, sparrows, pigeons and a number of other birds near the aerodrome are determined;

      3) factors, attracting birds to the aerodrome, which include: landfills of food waste, high grass cover in the area of the runway, the presence of elevators, dacha cooperatives, agricultural fields, orchards, vineyards, accumulation of a large number of earthworms in rainy weather on concrete taxiways and runways, presence of concentrations of small insects over wetlands in the morning, evening and on rainy days are identified;

      4) daily activity of birds' flights is specified, their nesting places, overnight stays, diaries and crowds are established;

      5) the routes of feeding flights of birds are determined.

      57. At the end of ornithological survey of the area near the runway, a survey of more remote sites in the area of the aerodrome (take-off and landing courses, polygons, low-altitude routes, etc.) is conducted. At this stage, the survey is conducted mainly by radar and ground methods.

      58. During the conduct of ornithological survey in cases of detection of nesting colonies of birds in the area of the aerodrome, the following information is recorded:

      1) location of nests (on the ground, in the grass, in warehouses, trees, in reeds);

      2) places for feeding birds (near a reservoir, on a fur farm, landfills of food waste, agricultural lands);

      3) age of the colony;

      4) annual dynamics of the number of birds (increases, decreases, fluctuates, does not change);

      5) protected status of the colony location (national park, reserve, sanitary zone);

      6) type of human activity in the vicinity of the colony (berry picking, hunting, grazing, agricultural works);

      7) the degree of anxiety on the part of the person (strong, weak, absent);

      8) counting the number of birds in a colony is performed using the following methods:

      by-piece recount of all nests in the case of small colonies;

      recount of all nests on any site in other cases, with further extrapolation of the received information to the entire area of the colony. In this case the number of nests per 1 square meter (hereinafter-sq. m.) in the center and on the periphery of the colony in places with different densities of nesting birds, and then displays the average density per 1 sq.m. is taken into account which is extrapolated to the entire area of the colony.

      If reservoirs are located within a radius of 5-20 km from the aerodrome control point, they shall be examined from a boat or using binoculars from trees growing on the shore of the reservoir, or another elevated place.

      During the survey of reservoirs the following shall be determined:

      the area of the reservoir;

      type of coast (sloping, steep, scrap, rugged, sandy, muddy, clay, gravel, rocky);

      composition of the prevailing land and water vegetation;

      presence of thickets of cattail, bulrush and reed;

      openness of the reservoir (presence of woody and shrubby vegetation on the banks).

      If necessary, the average dates of formation and destruction of the ice cover are specified.

      59. A partial view of the species composition of birds, living on the reservoir must be obtained by collecting and further identifying of feathers that are washed ashore by the wind, as well as by the traces of birds left in the tidal band.

      60. The results of the survey and observations of birds are compared and supplemented (if possible) with information from the nearest hunting grounds (reserves), as well as from other sources, and are plotted on the map of ornithological situation, which is placed in the class of preflight instructions.

      61. The method of ornithological survey of the aerodrome area in different periods of annual birds activity has certain features that must be taken into account when planning and conducting these activities.

      62. In particular, in the spring period, in addition to taking into account local birds, routes, paths, altitudes and flights terms of migrating birds, places of their rest and feeding shall be determined. This survey is carried out by radar and aerovisual methods, and ground survey is carried out only near the runway, NDRP and DDRP.

      63. In the late summer period in the process of ornithological surveys all ways of birds watching are used, while the terms of formation of young birds on the wing, routes, and altitude of its flights after breeding dispersal, ways and altitude of flight (arrival) of heat-loving migrants from the North, direction and altitude of movements of waterfowl and near water birds are determined.

      64. After the completion of ornithological survey of the aerodrome area, an act on the aerodrome survey shall be drawn up and a set of measures on prevention aircraft collisions with birds shall be developed.

**Paragraph 5. Frightening birds away from aerodromes**

      65. Persons from cordon team, personnel of communications, and radio-technical support personnel shall be involved in frightening birds away at the aerodrome using a large number of different means: bioacoustic installations, guns, rocket launchers, gas cannons, ratchets, mirror balls, nets, and so on.

      Selection and use of the most appropriate means of frightening birds away shall be carried out at each aerodrome, based on local characteristics of ornithological situation. In this case the following shall be taken into account:

      1) at continuous or too frequent use of any frightening means, its effectiveness decreases over time due to habituation of birds to it;

      2) if several methods of frightening are used simultaneously (for example, playing distress calls and firing flashes and guns, installing frightening objects and firing flashes, etc.) or if they are alternated, the effectiveness of frightening increases;

      3) birds are most easily scared during migration (in the spring and autumn), since during these periods many birds have a weak attachment to the territory;

      4) local birds (especially in the summer) are less susceptible to frightening means, but in the spring and autumn they need to be scared from the aerodrome, as they are often the cause of crowds of migrating birds;

      5) shooting from rocket launchers and bioacoustic frightening sometimes leads to the fact that the birds rise up in the air and, before flying away, some time (1-2 minutes) circling over the place of frightening, creating an even greater danger for aircraft flights. In this regard, these methods of frightening should be used 5-10 minutes before take-off (landing) of the aircraft, or temporarily do not scare away flocks of birds located further than 150 m from the runway.

      66. Bioacoustic frightening (reproduction of alarm calls of birds through loudspeakers) is performed by the personnel of communications and radio-technical support.

      67. Four types of bioacoustic installations are used at the aerodromes: stationary (speakers are installed on the airfield on the NDRP), mobile (all equipment is installed on a passenger car), semi-mobile (equipment is installed on a special cart, the equipment is switched on and off by radio) and portable.

      68. High efficiency of bioacoustic frightening birds away is achieved when the following basic conditions are met:

      1) recording of a bird's cry on a magnetic tape is made qualitatively (in stationary conditions, with the help of special equipment);

      2) the bioacoustic installation can reproduce recorded birds calls without distortion;

      3) recording of the cry of exactly the type of birds that are scared away is broadcasted;

      4) duration and frequency of the broadcast of the cry correspond to the norms for this type of birds and ornithological situation.

      69. For frightening away feeding and resting birds, the broadcast of frightening signals should be performed 2-3 times in a row.

      70. Very often, birds form mixed flocks of different species. In this case, it is recommended to use alarm signals of this type of birds, which is larger in size and more numerous in the flock.

      71. Weather conditions must be taken into account when using bioacoustic means of frightening. For example, strong headwind and crosswind and rain significantly reduce the range of the signal.

      72. It is advisable for the persons, who scare birds away to observe their reaction to the transmitted signals. In the case of reducing the effectiveness of bio-acoustic frightening away to replace the signals. In addition, it is necessary to periodically reinforce the broadcast signals with demonstration of real danger (that is, shots from rocket launchers, hunting rifles, and so on).

      73. Birds of certain species (for example, pigeons) do not actually emit alarm calls and therefore bioacoustic frightening them is associated with certain difficulties.

      74. Frightening birds away from the aerodrome with shots from rocket launchers is carried out by the personnel of the cordon team as directed by the FM. Frightening is performed by firing shots in the direction of birds so that the rocket flies close to them. In the summer, this method is used if there is no danger of burning dry grass.

      75. Frightening birds with special scarecrows, in which the gas automatically explodes with a strong sound, is performed in rare cases due to low efficiency of this method. This method of frightening is used primarily for those birds that are hunted (ducks, geese, sandpipers, and others), while scarecrows are installed near permanent places of accumulation of birds. For more operative use, it is recommended to install the guns in a trailer truck. In operation of gas guns it is required to comply with fire safety measures.

      76. Frightening birds from the aerodrome using various objects (rattles, flags, carcasses of dead birds, and so on) is performed in places of constant accumulation of birds (in cases when the cause of accumulation of birds cannot be eliminated). Installation of these objects is carried out by the employees of the aerodrome service, and they are guided by the recommendations of specialists-ornithologists from local biological institutions.

      Paragraph 6. Actions of crews during flights in difficult ornithological situation

      77. When preparing for a flight, the commander of the aircraft takes into account information about ornithological situation.

      Takeoff and landing, in difficult ornithological situation, must be performed with the lights on in the landing position.

      78. When flying along the route, if crowds of birds are detected, the crew takes measures on prevention a collision with them by bypassing them on the left, right or above them. If it is impossible to bypass the zone with a difficult ornithological situation, the commander of the aircraft reports this to the MF (flight control body), at his command to stop the task and acts according to his instructions.

      79. When the aircraft is on the landing course, after receiving information about difficult ornithological situation from the flights management team, at the aerodrome or when visually detecting birds, the crew shall:

      1) increase prudence;

      2) include landing lights if they were not turned on earlier;

      3) if necessary, go to the second round with the report to the MF.

      80. Before making a decision to take off, the commander of the aircraft takes into account ornithological situation in the area of the aerodrome and the flight route.

      At the executive start, after receiving information from the flights management group about complication of ornithological situation, the commander of the aircraft evaluates the possibility of taking off. Take-off in these conditions is performed with the headlights on.

      81. When flying along the route, if crowds of birds are detected, the crew bypasses or flies over them. It is recommended to be especially careful when meeting with large birds of prey in the air that may be aggressive towards the aircraft. In this case, it is necessary to take actions to prevent approach with them.

      82. If it is impossible to bypass the zone of difficult ornithological situation, the commander is recommended to return the aircraft to the point of departure or to land at the nearest alternate aerodrome.

      83. When flying at low altitudes, it is recommended to fly over bird markets and places of possible accumulation of birds on the ground and water at a safe aititude, which guarantees against collisions with birds. Aircraft crews who notice crowds of birds, posing danger for flights during the flight, immediately transmit information about them to the MF.

|  |  |
| --- | --- |
|  | Appendix 1 to the Rules for ornithological support of flights of state aviation of the Republic of Kazakhstan |

**Code for transmitting data about ornithological situation (KMI-OS) Code scheme**

      99990 YYGGnIIiii P1А1 Z1B1В1 1K1R1d1d1 22h1h1h1 ЗЗН1Н1Н1

      55555 P1А1 Z1B1В1 1K1R1d1d1 22h1h1h1 ЗЗН1Н1Н1

      Meanings of alphabetical and digital symbols in the code scheme

      Group 99990:

      9999-distinctive code digits;

      0-distinctive digits indicating that data on ornithological situation is transmitted in subsequent groups.

      Group YYGGn:

      YY — number of the month when the observation ends;

      GG — time in hours of the observation end;

      n — observation period, expressed as the number of days for which data on ornithological situation is transmitted.

      Group IIiii:

      IIiii-index of the point, on which the data on ornithological situation is reported.

      Group P1A1 Z1B1B1:

      P1 — the nature of birds flights. Encoded according to Table 1;

      Table 1

|  |  |  |  |
| --- | --- | --- | --- |
| Code digit | The nature of the birds flights (P1) | Code digit | The nature of the birds flights (P1) |
| 0  1  2  3  4 | Not determined  Flights of local birds  Migration  Soar flights  Flights of local birds and migration | 5  6  7  8  9 | Flights of local birds and soarers  Migration, flights of local birds and soarers  Flights of young birds  Migration outbreak (1-4 days)  Flights of birds are not detected |

      A1 — daily activity of birds flights. Encoded according to Table 2;

      Table 2

|  |  |  |  |
| --- | --- | --- | --- |
| Code digit | Daily activity of birds (A1) | Code digit | Daily activity of birds (A1) |
| 0  1  2  3  4 | Not determined  In the morning  In the evening  In the morning and in the evening  In the daytime | 5  6  7  8  9 | At night  During daylight hours  In the dark  Around the clock  Flights of birds are not detected |

      Z1 - a way of watching birds. Encoded according to Table 3;

      Table 3

|  |  |  |  |
| --- | --- | --- | --- |
| Code digit | Birds watching way (Z1) | Code digit | Birds watching way (Z1) |
| 0 | No observations were made | 5 | Visual and radar |
| 1 | Visual | 6 | Radar and aerovisual |
| 2 | Radar | 7 | Visual and aerovisual |
| 3 | Aerovisual (reconnaissance) | 8 | Special flyover |
| 4 | Message of ornithologists | 9 | All types of observations |

      B1 B1 — size and species of birds. Encoded according to Table 4;

      Table 4

|  |  |  |  |
| --- | --- | --- | --- |
| Code digit | Size and species of birds (B1B1) | Code digit | Size and species of birds (B1B1) |
| 00 | Type not determined | 10 | Medium-sized birds of prey (buzzards, harriers, hawks) |
| 01 | Small sparrows | 11 | Large birds |
| 02 | Swallows, swifts | 12 | Ducks (mallards, grey, pintails, teals) |
| 03 | Starlings | 13 | Herons |
| 04 | Small birds of prey (kestrels, red-footed falcon) | 14 | Geese |
| 05 | Medium-sized birds | 15 | Large birds of prey (eagles, vultures) |
| 06 | Pigeons | 16 | Very large birds |
| 07 | Corvids | 17 | Storks |
| 08 | Sandpipers (lapwings) | 18 | Cranes |
| 09 | Gulls | 19 | Swans |

      Group lK1R1d1d1:

      1-distinctive digit;

      K1 — number of flocks; Encoded according to Table 5; Table 5

|  |  |  |  |
| --- | --- | --- | --- |
| Code digit | Number of flocks (K1) | Code digit | Number of flocks (K1) |
| 0  1  2 | Not determined  1-5 flocks  6-10 flocks | 3  4  5 | 11 — 15 flocks  16 — 25 flocks  More than 25 flocks |

      R1— size of the summed flock. Encoded according to Table 6;

      d1 d1 — direction of movement of flocks (birds) in tens of degrees.

      Group 22 h1h1h1:

      22 — distinctive digits;

      h1 h1 h1 — altitude of the lower border of the flight of birds in tens of meters

      Group 33 H1H1H1:

      33 — distinctive digits;

      H1 H1 H1 — altitude of the upper border of the flight of birds in tens of meters.

      Group 55555:

      55555-distinctive digits indicating that information about other birds species follows.

      Table 6

|  |  |  |  |
| --- | --- | --- | --- |
| Code digit | Size of the summed flock (R1) | Code digit | Size of the summed flock (R1) |
| 0  1  2  3  4 | Individual birds (up to four)  Small flock (5-20)  Average pack (21-100)  Large flock (101— 1000).  Very large flock (> 1000) | 5  6  7  8 | Small and medium flocks  Medium and large flocks  Flocks of all sizes  Flock size is not determined |

      Note:

      1. In case when the observation belongs to a certain period (GG), the digit 0 is put in place of h. If the observation period is 9 days or more, 2 time groups are used for encoding (the number and time of the beginning and end of observations), and the digit 9 is put in place of h in both groups.

      2. When encoding different birds species, the group 55555 is placed before the characteristics of the second and subsequent species (P1A1 Z1B1B1). If all birds species have the same characteristics, encoded in groups with distinctive digits 1, 22, 33, these groups are used only once after listing the birds species.

      3. The size of the summed flock (R1) is determined by multiplying the number of flocks by the number of birds in them during the observation period.

      4. If the direction of flight of birds (flocks) is not set, 00 is placed in place of d1d1, and 99 is set for flights of birds in different directions.

      5. If the flight of birds is observed not in the layer, but at a certain altitude, the same altitude is indicated in the groups 22h1h1h1 and ZZH1H1H1.

      Examples:

      1) in the area of point 31417 in the period from 8 o'clock on the 19th to 8 o'clock on the 20th, there was a round-the-clock migration of ducks, geese and cranes. During the day, up to 5 flocks of 50-100 birds flew at altitudes from 2000 to 3000 m to the North-West. In the daytime, there were disordered flights of local corvids up to four flocks of 15 — 20 birds at altitudes up to 300 m.

      The encoded message will look like this:

      99990 20081 31417 28512 55555 28514 55555 28518 11333 22200 33300 55555 16507 11299 22000 33030;

      2) in the area of point 35700 between 8 о’clock on the 15th to 8 о’clock on the 16th visually and during aerial reconnaissance of weather flying of sandpipers, geese, swans were observed in the morning and evening at the altitude of 500-800 m to the North.

      During the observation period, six flocks of 20-50 birds per flock flew by. During daylight hours, soaring of two flocks of storks by 10-15 birds were observed at altitudes of up to 2500 m.

      The encoded message will look like this:

      99990 16081 35700 23708 55555 23714 55555 23719 1233622050 33080 5555536717 11299 2200033250;

      3) in the area of point 35700 in the period from 8 o'clock on the 15th to 8 o'clock on the 16th, the number of birds was not detected.

      The encoded message will look like this:

      99990 16081 35700 99900.

|  |  |
| --- | --- |
|  | Appendix 2 to the Rules for ornithological support of flights of state aviation of the Republic of Kazakhstan |

      Form

**Log of aircraft collisions with birds at the airfield (Sample)**

      Footnote. Appendix 2 as amended by the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

      Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Time of the event \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Aircraft type\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Aircraft № \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Person who reported the incident: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Bird remains found on the runway:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Location of detection (to the runway axis): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Flight phase (altitude, speed, take-off and landing): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Species and number of birds: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Place where the bird hit the aircraft: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Damages: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Crew data: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Runway course: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Time of the last runway survey: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Ornithological situation at the time of the event: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Meteorological conditions: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Reported to (time of report) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      Duty officer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      (military rank, signature, surname, name, patronymic (if any)

      "\_\_\_" \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 20\_\_\_. Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
|  | Appendix 2-1 to the Rules for ornithological support of flights of state aviation of the Republic of Kazakhstan |

      Form

      **Approved**

**by Commander** **of** **military** **unit 000000**

**(head** **of** **the** **aviation**

directorate, AS NSC RK department)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(military rank, signature, surname,

name, patronymic (if any)

"\_\_" \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 20 \_\_ .

**Action plan of ornithological support of flights safety to prevent aircraft collision with birds**

      Footnote. The Rules have been supplemented with Appendix 2-1 pursuant to the order of the Minister of Defense of the Republic of Kazakhstan dated 05.10.2020 № 505 (effective ten calendar days after the date of its first official publication).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| № | Actions | Time of execution | Responsible person | Date, note of execution |
| 1. |  |  |  |  |
| 2. |  |  |  |  |
| 3. |  |  |  |  |

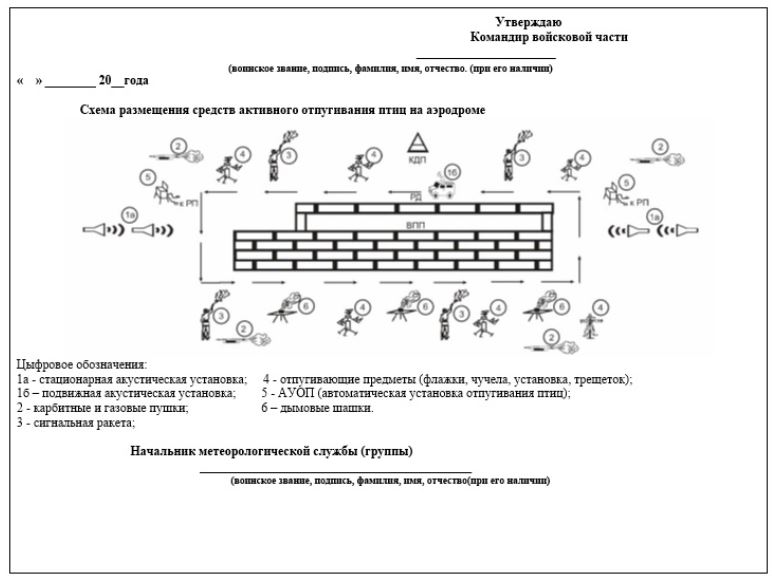
      Head of non-staff ornithological commission of military unit 000000

      (directorate, AS NSC RK department)

      \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

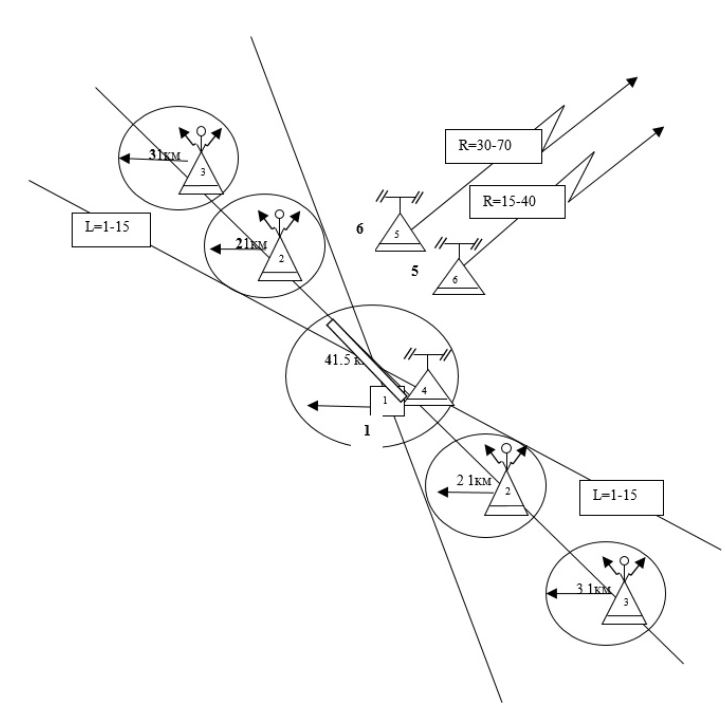
      (military rank, signature, surname, name, patronymic (if any)

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|  | Appendix 3 to the Rules of ornithological support of flights of state aviation of the Republic of Kazakhstan |



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|  | Appendix 4 to the Rules of ornithological support of flights of state aviation of the Republic of Kazakhstan |
|  | Approve Chief of the military unit staff \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (military rank, signature, surname, name, patronymic (if any)  “ ” \_\_\_\_\_\_\_\_ 20 year |

**Scheme of zones of responsibility for the birds watching at the aerodrome**



      Note:

      1) meteo site; 2) NDRP; 3) DDRP; 4) landing locator; 5) dispatcher locator; 6) detection and guidance locator: R –radius of responsibility zones; L - range of detection of birds by the landing locator.

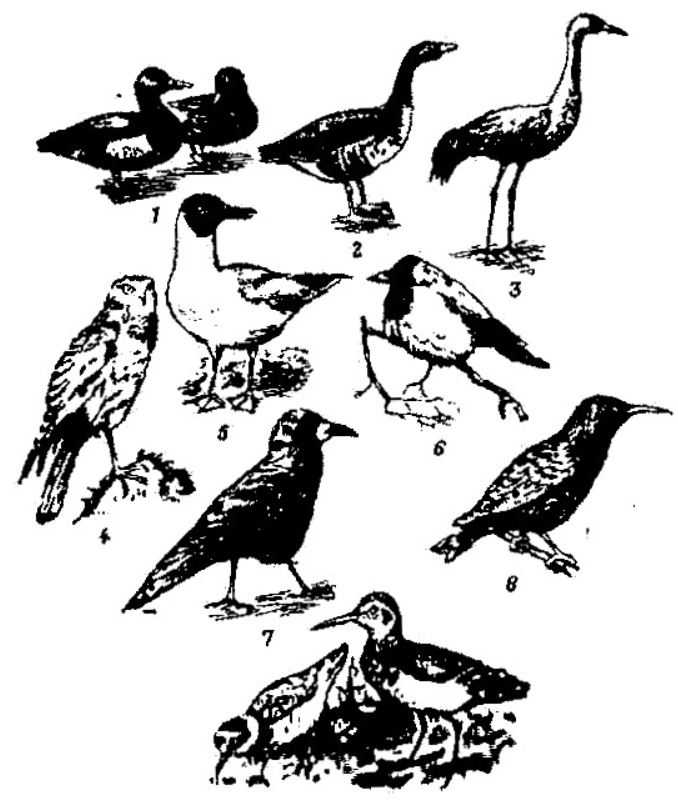
      Chief of the meteorological service (group) of the military unit

      \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      (military rank, signature, surname, name, patronymic (if any)

      "\_\_\_" \_\_\_\_\_\_\_\_ 20 \_\_\_year

|  |  |
| --- | --- |
|  | Appendix 5 to the Rules of ornithological  support of flights of state aviation of the Republic of Kazakhstan Silhouettes of birds on the ground |

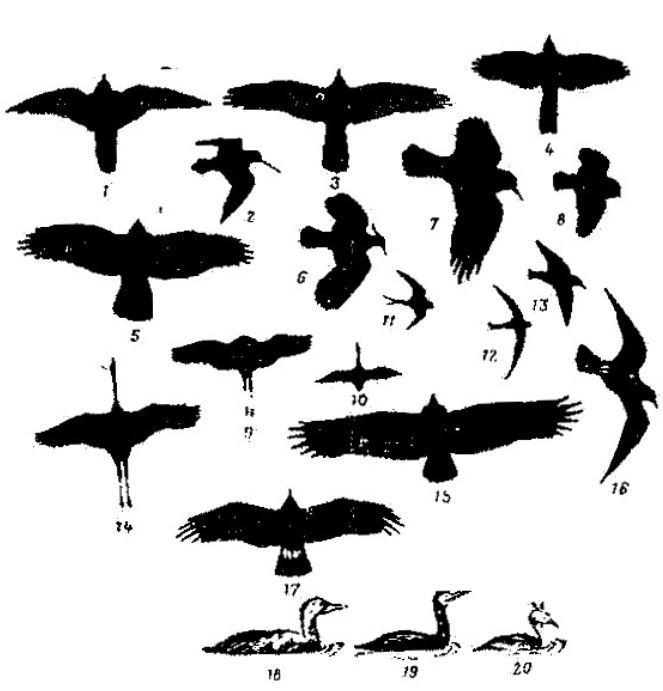


      Application:

      1-duck; 2-goose; 3-crane; 4-harrier; 5-gull; 6-crow; 7-rook; 8- starling; 9-sandpipers.

|  |  |
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|  | Appendix 6 to the Rules of ornithological support of flights of state aviation of the Republic of Kazakhstan |

**Silhouettes of birds in flight and on the water**



      Application:

      1-falcon; 2-sandpiper; 3-harrier; 4-hawk; 5-buzzard; 6-lapwing; 7-rook; 8-owl; 9-heron; 10-duck; 11-swallow; 12-swift; 13-starling; 14-crane, stork; 15-vulture; 16-gull; 17-eagle; 18-loon; 19-boklan; 20-grebe.

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|  | Appendix 7 to the Rules of ornithological support of flights of state aviation of the Republic of Kazakhstan Form (AB-20) |

**Journal of ornithological observations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Observation time | Species and size of birds | Number of birds, flocks | Size of the flocks | Altitude of the flight | Direction of the flight | Nature of the flight |
| 09:00 |  |  |  |  |  |  |
| 10:00 |  |  |  |  |  |  |
| 11:00 |  |  |  |  |  |  |
| 12:00 |  |  |  |  |  |  |
| 13:00 |  |  |  |  |  |  |
| 14:00 |  |  |  |  |  |  |
| 15:00 |  |  |  |  |  |  |
| 16:00 |  |  |  |  |  |  |
| 17:00 |  |  |  |  |  |  |
| 18:00 |  |  |  |  |  |  |
| 19:00 |  |  |  |  |  |  |
| 20:00 |  |  |  |  |  |  |
| 21:00 |  |  |  |  |  |  |
| 22:00 |  |  |  |  |  |  |
| 23:00 |  |  |  |  |  |  |
| 00:00 |  |  |  |  |  |  |
| 01:00 |  |  |  |  |  |  |
| 02:00 |  |  |  |  |  |  |
| 03:00 |  |  |  |  |  |  |
| 04:00 |  |  |  |  |  |  |
| 05:00 |  |  |  |  |  |  |
| 06:00 |  |  |  |  |  |  |
| 07:00 |  |  |  |  |  |  |
| 08:00 |  |  |  |  |  |  |

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      On duty \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

      (military rank, signature, surname, name, patronymic (if any)

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|  | Appendix 8 to the Rules of ornithological  support of flights of state aviation of the Republic of Kazakhstan |

**Features of identification of flashes from birds on radar screens**

      The task of recognizing flashes from flocks of birds on radar indicator screens is quite complicated one and requires certain skills. The main difficulty lies in the fact that the flashes from birds are hardly noticeable and extremely diverse in their appearance, which makes it difficult to develop a single method of recognizing them, as well as specify any feature, allowing to distinguish them from other flashes with complete confidence.

      At the same time, there are a number of features inherent in flashes from birds, by totality of which it can be quite reliably to identify them.

      These include the size, brightness, shape, severity of borders, speed and direction of movement, image constancy, location on the radar screen.

      Flashes from birds may differ slightly in size and brightness, since these signs depend on the number and size of birds, their distance from the radar, relative placement of birds in the flock, position of the bird's body relative to the radar antenna, and other factors.

      The size of flashes from dense flocks of birds on the landing radar screen in most cases corresponds to the size of flashes from small aircrafts, and from single birds it often has the size of a dot.

      Brightness of flashes from birds on radar screens is significantly less than the brightness of the echo-signals from the aircraft and is constantly changing, and sometimes these flashes resemble interference.

      The shape of the echo-signal from birds most often appears on screens as a rounded spot or dot. In cases when the detected large flock of birds (thousands of individuals) is widely stretched along the front, the flash from it can be a line or an arc.

      The borders of flashes from birds do not have such sharp outlines as the marks from the aircraft and ground objects, and at the same time are not as blurred as the marks from clouds.

      The speed of movement of flashes from birds is relatively small about 20-50 km / h, so it is quite difficult to visually notice the shift of flashes from birds on the screen.

      During the flight in direction of the wind at high altitudes, the flight speed of birds can reach 120-150 km/h, while it is relatively easy to notice the shift of flashes, which only allows to distinguish them from the stationary echo signals formed by ground objects.

      At the same time, when identifying flashes only by the speed of their movement, it is necessary to take into account the speed and direction of the wind at different altitudes, which is difficult to implement in operational work. The difference in speed makes it easy to distinguish flashes from birds from marks from the aircraft, which move much faster on the radar screen.

      Direction of movement of flashes allows to distinguish the birds flashes from the echo-signals generated by balloons, pilot balloons, radiosonds, clouds that move only with the flow. Thus, a low-speed target that moves at an angle to the wind direction is almost always a flock of birds.

      Unlike other targets, echo-signals of flashes from birds can dramatically change their brightness, size, shape, and direction of shift, and sometimes disappear. This is due to the fact that birds often change the speed, altitude, direction of flight and adjust in the air.

      Flashes from birds are often located on the radar indicator screen in groups, sometimes consisting, especially in the spring and autumn, of dozens or even hundreds of individual marks.

      The frequency and time of appearing of flashes from birds on the radar screen largely due to seasonal peculiarities of birds migration, as a result of which in the summer and winter periods flashes from birds are mostly found in the daytime (very often in the winter in the dark twilight), but in the spring and autumn around the clock and at night they are sometimes even more often than during the day.

      Single flashes are observed on the radar indicator screen in the summer and winter, and in the spring and autumn there are multiple flashes from birds, which is associated with seasonal migrations. Knowing the seasonal characteristics of bird migrations in this area greatly facilitates to identification flashes from them.

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|  | Appendix 9 to the Rules of ornithological  support of flights of state aviation of the Republic of Kazakhstan |

**Distinctive features of echo-signals from birds**

      Identification of flashes from birds on radar indicator screens is relatively difficult and requires a certain skill from the duty calculations of all regular aerodrome radar facilities. The main difficulty is that these flashes are relatively inconspicuous and extremely diverse in appearance. In this regard, it is difficult to give a single and accurate description of flashes from birds, as well as to specify any of their characteristics, allowing to distinguish them with complete confidence from other flashes.

      However, all flashes from birds are characterized by a number of features, by the totality of which it can be quite reliably to identify these flashes.

      The main distinguishing features of flashes from birds include:

      size;

      brightness;

      shape;

      severity of the borders;

      travel speed;

      direction of travel;

      constancy of the image;

      location on the radar indicator screen.

      Size of flashes.

      Flashes from dense flocks of birds on the screen of the landing radar indicator in most cases correspond in size to flashes from small aircraft, and from single birds often have the size of a dot.

      Brightness of flashes.

      the brightness of flashes from birds is significantly less than the brightness of echo-signals from the aircraft on the screens of landing radars.

      Flashes from birds may differ slightly in size and brightness, since these signs depend on the number and size of birds, their distance from the radar, relative placement of birds in the flock, position of the bird's body relative to the radar antenna, and other factors.

      Form of flashes.

      Echo- signals from birds most often appear on the screens in the form of circular spot or dot.

      In rare cases, when a large flock of birds (thousands of individuals) is found widely stretched along the front, the flash from it can be a line or an arc.

      Intensity of flashes borders.

      Flashes from birds do not have such sharp outlines as marks from the aircraft and ground objects, and at the same time are not as blurred as marks from clouds.

      Speed of movement of flashes.

      Most birds fly at a speed of about 20-50 km/h, so it is quite difficult to visually notice the offset of flashes from birds on the screen. During the flight in the wind at high altitudes, the flight speed of birds reaches 120 km/h and even 150 km/h. In this case, it is relatively easy to notice the shift of the flashes from birds, which allows to distinguish them from stationary echo-signals formed by ground objects, as well as balloons, pilot balloons, radiosondes, clouds and other air formations moving at wind speed.

      However, when identifying flashes only by the speed of their movement, it is necessary to take into account the speed and direction of the wind at different altitudes, which is difficult to implement in operational work. The difference in speed makes it easy to distinguish flashes from birds only from aircraft and helicopter markings moving much faster on the radar screen.

      Direction of movement of the flashes.

      Birds fly in all possible directions, which makes it possible to distinguish the birds flashes from echo-signals of balloons, pilot balloons, radiosondes, clouds moving only in the wind. A low-speed target that goes at an angle to the wind direction is almost always birds.

      Constancy of the image flashes.

      Unlike other markers, birds echo-signals can dramatically change their brightness, size, shape, direction of shift, and sometimes disappear. This is due to the fact that birds often change the speed, altitude and direction of flight, rearrange themselves in the air, and fly in more or less dense groups.

      Location of flashes.

      Birds echo-signals are often located on the radar indicator screen in groups, sometimes consisting (especially in the spring and autumn) of dozens or even hundreds of individual markers.

      Frequency and time of appearance of birds flashes on the radar indicator screen is largely due to the seasonal characteristics of birds migrations. Therefore, in the summer and winter, birds flashes are mainly found in the daytime (in the winter, very often in the dark twilight), and in the spring and autumn around the clock, and at night they are sometimes observed more often than during the day. In the summer and winter, the radar indicator screen usually shows single flashes from birds, and in the spring and autumn, often dozens of flashes. Knowledge of seasonal characteristics of birds flights in this area makes it much easier to identify flashes from birds.

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